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Top left – HER-2 staining in a breast carcinoma, *Histopathology*

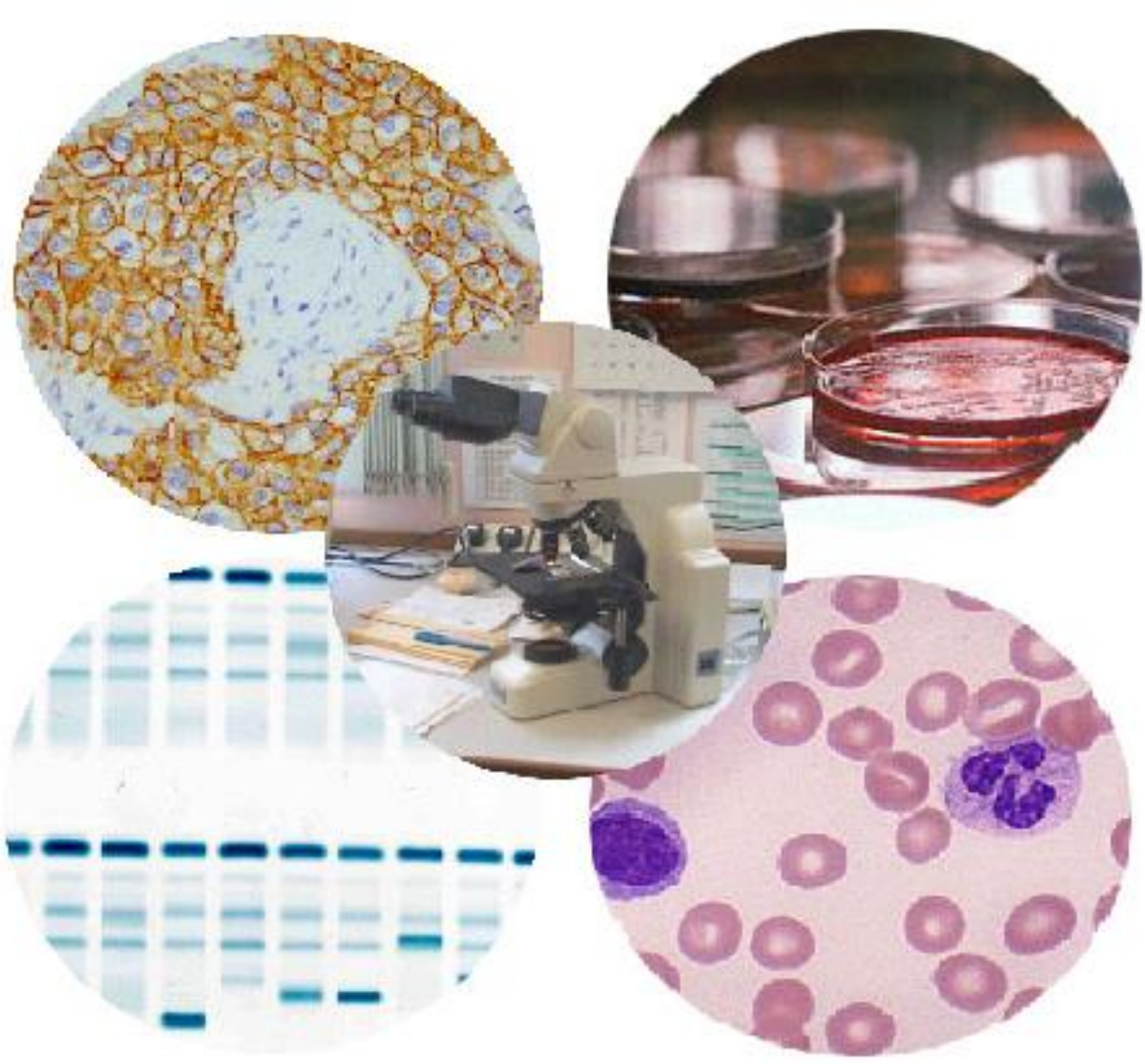
Top right – Culture plates, *Microbiology*

Bottom left – Serum Protein Electrophoresis, *Biochemistry*

Bottom right – Normal blood film, *Haematology*

Centre – Ergonomic microscope, *Cytology*

THE PATHOLOGY GUIDE



www.stockport.nhs.uk . https://labmedservices.stockport.nhs.uk
Pathology, Stepping Hill Hospital

We Care, We Respect, We Listen.

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LOCATION

Pathology Department
Stepping Hill Hospital
Poplar Grove
Stockport
SK2 7JE

Pathology is located from the Poplar Grove entrance, turning right at the roundabout and it's the first building on the right-hand side beyond the bus stop. A map of the hospital and pathology site can be obtained from the web site https://labmedservices.stockport.nhs.uk

THE SERVICE

DEPARTMENT	OPENING HOURS
Blood Science (Haematology and Biochemistry sections, including Point of Care (POCT))	Operate a 24-hour shift system.
Microbiology	**Routine work**: Mon – Fri: 8am – 8pm **Saturday/Sunday/Bank Holidays :** 9am-5pm (reduced staffing) **In core hours, please let the laboratory know if you are sending an urgent sample.** **On-Call**: If emergency laboratory work by a Biomedical Scientist (BMS)is required outside these hours it is necessary to contact the Microbiology BMS on-call staff via the hospital switchboard. If clinical advice is required contact the on-call Consultant Microbiologist also via switchboard
Histology	Routine work Mon– Fri: 8 am - 5.20 pm
Cytology	Routine work Mon – Fri: 8 am – 3.30 pm

ENQUIRES

Enquiries can be made through the internet site https://labmedservices.stockport.nhs.uk or via email pathologyenquiries@stockport.nhs.uk
(All internet references are not hyperlinked but cut and paste into a web browser to access)

BLOOD SCIENCE

Incorporates the Biochemistry and Haematology Departments also includes Blood Transfusion.

CELLULAR PATHOLOGY

From April 2009 the Histopathology with Mortuary service and Cytopathology Departments combined to form a Cellular Pathology Department. The Bereavement centre was added to the service 2013.

CLINICAL ADVICE

Clinical advice is always available to General Practitioners and hospital clinical staff and their team. Consultant advice is available from the Pathology Consultants in Biochemistry, Haematology, Histopathology (Cytology) and Microbiology. All consultant staff are appraised annually, have up-to-date CPD and appropriate Royal College Registration.

The consultant staff are always ready to discuss problems and/or individual cases on the phone at any time including urgent cases out of hours (excluding Histopathology) by contacting SHH switchboard (0161 483 1010). Out of hours calls are permitted from ST3 grade doctors and above. Referrals to a particular consultant can be made in the usual manner.

Clinical advice can only be given by appropriately qualified staff.

The pathology department produces its own newsletter “Path News” which contains a blend of news, up to date information, and clinical advice.

Regular contact with surgeries is maintained to ensure that the service we provide fulfils your requirements. If you would like a visit from any member(s) of laboratory staff to discuss any aspect of service delivery contact the Pathology Operational Lead who will be happy to arrange it.

CONSULTANT AVAILABILITY

To contact a named consultant directly telephone numbers are in the appendix to this guide which is available on the pathology micro sites and websites or via Switchboard (internally ext 100 or 0161 483 1010 externally). If the consultant is unavailable by telephone then the call will automatically transfer to their secretary where a message can be left or another consultant sought to deal with the issue if the matter is urgent.

For Biochemistry a clinical advice line (ext 4919) operates during normal working hours (9am to 5pm Monday to Friday) and is usually answered by a consultant. For microbiology consultant advice during working hours please, ring the microbiology secretary on ext 4491 who will transfer the enquiry to the Medical Microbiologist on duty. For Histopathology (Cytology) consultant advice please call the specific consultant or leave a message with the medical secretary. Most simple urgent clinical enquiries shall have an immediate response, however in complicated cases advice or requests for unusual information a full response may take longer. If a message is left with a secretary a response from a Consultant will usually occur within one working day. Histopathology consultants do not provide out of hours advice.

Advice on any aspects of Infection Control within the practice or the community is also available from the Consultant Microbiologists who work closely with Dr David Baxter - Tel: 426 5486.

TEST REPERTOIRE

Please contact the laboratory if a required test is not listed within this document and clinical advice will be given on test suitability and requirements.

If you require any information regarding how the reference ranges have been derived please contact the laboratory.

REQUEST FORM

Each request received in the lab is considered an agreement. The request form can either be electronic where available or paper. Filling in all the fields is essential to ensure that the samples can be processed. When filling in paper request forms please write in clear writing, preferably in capitals so all characters can be clearly read, this will save any transcription errors. The identity of the person collecting the sample from the patient should be recorded and the collection date and time.
A copy of the blank stock request form can be printed from the Pathology Internet site https://labmedservices.stockport.nhs.uk to request forms to be sent to you.

All staff are reminded that, where the parameter exists for a blood test to be ordered electronically, it must be ordered in that way. Only in exceptional circumstances should a blood test request, from within the Trust, be handwritten. Exceptional circumstances are those such as an emergency, when electronic ordering is not readily available, or when the blood test to be requested is not available to choose in electronic format. If a blood test must be requested in handwritten form, then the test required should be written out in full and not abbreviated. All requests must be made in the requests box within the form and **NOT** in the clinical details section.

SPECIMEN ACCEPTANCE GUIDELINES

This can be found on the intranet and internet (Q-Pulse for the laboratory staff QUS043). To allow the diagnostic and support services to respond to requests for services it is essential that reliable information to identify patients on samples and request forms is given at the time of the request.
The laboratory follows The National Guidelines on minimum data set for sample labelling. The form and sample details must match and errors in the above will result in the discard of non-precious samples.

Positive identification of a patient

If a sample is to be taken from a patient by another person, then positive identification that the patient is the actual person for whom the diagnostic request refers is essential. Positive identification must be achieved by:

- Asking the patient (where the patient is considered capable) to verbally provide their first name, surname and date of birth.
- For hospital patients, checking that the patient's demographic details on the wrist band match those on the request form that the patient answers to the question above.

Sample Bottles

There are a variety of bottles available for the requests required and this document will direct the user to the bottle type required. Please not there are paediatric sample bottles also available if there is difficulty in getting enough sample. Please contact pathology should these bottles be required if you are not in a paediatric area.

Blood Sampling and Labelling

- Only one patient shall be bled at a time.
- Sample tubes should not be pre-labelled.
- The sample tube should be labelled by the person taking the sample.
- Samples must be labelled in the presence of the patient.
- Where the use of address-o-graph labels is permitted, extra vigilance is required.

Both specimens and request forms must have

All request forms and samples must comply with the minimum essential criteria summarised below. It is the responsibility of the requestor that the sample is labelled correctly with full name, date of birth, NHS or hospital number, the date of collection with time if appropriate. Any requests / samples which do not fulfil these criteria will be dealt with by the department.

Data Item	Details on the form	Details on the specimen
First name	Essential	Essential
Surname	Essential	Essential
Date of Birth	Essential	Essential
NHS or hospital number	Essential for Transfusion	Essential for Transfusion
Sex	Essential	
Date of collection (time for some tests)	Essential	Essential
Location for the report to be sent	Essential	
Name of requesting clinician	Essential	
Contact number of the requestor	Desirable	
Tests required	Essential	
Relevant clinical information	Desirable	
Specimen site	Essential	Essential – for some tests
Referring clinician and contact details (especially important for Immunology Specimens) (also see table on page 7 of the Specimen Acceptance Policy (QUS043) if this is updated)		

Exceptions to the above apply.
Specimens from sexual health clinics MUST be labelled with:

- **ID number**
- **Date of Birth**

Blood transfusion samples require three points of identification, in addition to the full name (first and surname) and date of birth. As from 30th January 2012, **the third identifier must be the NHS number** or the district number where the NHS number is unknown.

Specimens will be accepted for analysis provided:

- The patient is identified on the request form.
- The specimen is identified.
- The specimen can be matched against the request form.
- The specimen is appropriate (i.e. correct blood tube, swab type, expiry date etc.)
- The investigation required is clearly indicated on the request form.
- The requesting source, to which the analysis report is to be sent is clearly identified.
- The specimen label is handwritten.

Precious samples
A sample that cannot be repeated due to start of treatment or a one-off test such as a biopsy sample or from a particularly difficult patient to bleed. Where these are accepted, we will make a comment on the report. In some cases, sample collectors may be required to come to the lab to amend any incorrect or missing details.

Samples with Unknown/No location stated.

It is the responsibility of the requestor, to clearly state the location on the request form of where the final report should be sent. Non-precious samples will be discarded if they are not correctly labelled.

ORDER OF BLOOD DRAW

Recommended order of blood draw can be found in appendix A.
Ensure blood is gently inverted minimum of 5 times after sample has been collected.

TRANSPORTATION OF SPECIMENS

Please ensure that:

- The container is properly closed and is not externally contaminated by the specimen.
- The container is placed in an individual transparent plastic transport bag with Biohazard motif as soon as it has been labelled.
- The transport bag is sealed by means of the integral sealing strip.
- Request forms need to be placed in the side pouch of biohazard bags and not in with the sample.
- For large specimens e.g. 24 hour urine specimens the containers may be enclosed in individual plastic sacks. The request form is attached to the specimen in such a way that it is not contaminated by urine, and both are placed in the plastic sack. Suitable sacks may be obtained from the laboratory front office.
- Multiple Specimens must be transported in the secure transport boxes provided.
- When transporting a small number of specimens (e.g. via taxi or district nurses etc.), we would advise that the specimens should be contained in a suitable, clean robust sealed container which is either single use or can be easily cleaned by the transporter who also ensures that it is secured satisfactorily during transit.
- One patient per bag. DO NOT put multiple samples and forms in one bag.

COMMUNICATIONS AND TRANSPORT

GP practices are now receiving fully compliant encrypted messaging. We are happy to discuss any issues about electronic results transfer. If you require any information, please contact the Pathology IT Manager or his deputy.

The courier/transport system is continually being improved. If you experience problems or would like to discuss improvements our Pathology Operational Lead would like to hear from you.

URGENT SAMPLES FROM GP SURGERIES

Identification of urgent samples in the transport boxes would help to identify these samples sooner. Please place these samples in a large envelope marked urgent then the laboratory can give these samples priority.

DATA PROTECTION

Pathology abides with the Trust policy for Data Protection of personal information. Every measure will be taken to ensure confidentiality. Should a breach occur, a full investigation will be carried out. The trust has a formal and informal complaints process. Personal health information will not be disclosed without the patients consent, except in exceptional circumstances, for example where there would be a serious risk to public health if information is not disclosed.

FACTORS AFFECTING THE VALIDITY OF RESULTS

Insufficient sample volume
- Insufficient samples may have unsuitable blood:anticoagulant ratio.
- Insufficient volume of specimen to carry out the test.

Inappropriate anticoagulant
- Using wrong type of specimen container
- Decanting blood from one container to another!

Delay in transporting specimen to pathology
- Degeneration of specimens
- Small time window for some tests - Infertility needs to be analysed within 1 hour.

Incorrect transportation of specimen
- Does it require insulating?
- Does it need transporting on ice?

Timing of specimen
- Timing of specimen in relation to test required is crucial for a reliable result.
- Diurnal variation e.g. Cortisol

Haemolysis
- Difficult venepuncture
- Rough handling of specimen once taken!
- Extremes of temperature

Extreme of temperature
- Leaving specimens exposed to heat e.g. radiator
- Storing specimens at the correct temperature – does it need refrigerating?

Treatment
- Antibiotics

Compliance with instructions
- Has the patient fasted or avoided particular foods as instructed?

Prompt fixation
- Histology specimens need to be placed straight into adequate amounts of formalin.

Taken from a drip arm
- Dilution /contamination affects results.

For any further advice on this subject please contact the relevant department directly.

BLOOD SCIENCES – BIOCHEMISTRY SECTION

The Biochemistry Department is a UKAS accredited medical laboratory No. 9594
The laboratory has been assessed by UKAS (United Kingdom Accreditation Service) to ISO 15189:2012. The schedules of accredited tests can be found on the UKAS website.
www.ukas.com

Introduction

The department offers an analytical and interpretative service for a large range of biochemical tests. Most of the analytical work is automated and most of the tests are performed each day. The more esoteric and newer tests may not be listed: please call the lab prior to sending a non-listed test if you have any queries.

The department provides support and management for the Trusts Point of care Testing service (POCT). There is a full-time POCT Co-Ordinator. Please see the POCT Guidelines and the POCT microsite for further information on POCT devices in use.

The majority of the tests offered are listed on the following pages, together with reference ranges, frequency of analysis and required sample volumes. Some tests are not performed in the laboratory at Stepping Hill Hospital, but are referred, by us, to other laboratories. These results will be reported in the normal way, with the referral laboratory being identified.

Specimens

The usual specimen type for most tests is serum and the container to be used in most cases is the one with an ochre (yellow) top. This tube contains a gel to assist separation, but no anti-coagulant. If multiple tests/profiles are required, this will usually be able to be done on one full specimen tube (i.e. 7ml blood). Where a different tube is required, this is also shown in the following tables. The common tests for which a different tube is required are glucose, HbA_1C, PTH & Blood Gases.

Additional tests

Specimens are stored for 5 days, and it is possible to request additional tests on a previously submitted sample.

All requests for additional tests to be done on samples we have already received will require a fully completed additional request form. This form should be sent down to pathology, without an accompanying sample, and it must be stated that this is a request for additional tests by clearly writing on the form **"add-on"**. This will allow us to better identify that these are extra tests which are required. From GP practices or wards located outside SHH additional tests can be requested over the phone. If the sample is >3days old, we suggest a phone call too to ensure the sample is still suitable. The lab staff will note on specimen note pad where the addition tests have been requested from and by whom.

In some circumstances we will initiate additional tests from the laboratory, e.g. free T3 in a possible hyperthyroidism, electrophoresis if the total protein is very high, other hormones to rule out possible hypopituitarism.

Result Reporting and Enquiries

- All biochemistry results are archived in our Telepath Laboratory Information system. Printed reports are produced and issued regularly each day.

- Lab results also reported to Advantis.
- All results are also reported to the Trust Web Results System, which can be accessed from the Trust Intranet.
- Requests from GP's are also reported electronically directly into Practice Systems.
- When information is not available from these sources, telephone enquiries can be made to extension 5626.

Advice and Guidance on use of Biochemical Tests.

Information relating to use of some tests is contained in this guide in the subsequent pages. Discussion of results in individual patients or any aspect of the biochemistry service is welcome. The number for clinical advice is 0161 419 4919, or you may contact one of the consultants directly.

The POCT clinical lead on the POCT committee is Dr Sharman Harris who is contactable on 0161 419 5621.

Timeframe for Receipt of Samples

Samples should be sent to the laboratory promptly. 24-hour urine collections for Biochemistry requests should be received within 3 days of collection.

Contact details

Mr Steven McCann, Consultant Clinical Biochemist, 0161 419 5619
Dr Sharman Harris, consultant Clinical Biochemist, 0161 419 5621
Mr Parmesher Singh, Technical Head of Biochemistry, 0161 419 5630
Dr Rosemary Earnshaw, Senior Biochemist 0161 419 4490
Ms Shahina Begum, Point of Care co-ordinator 0161 419 5628

Telephone Action Limits

In line with the Royal College Guidelines very abnormal results of certain tests will be phoned if they are new results and out of the limits as shown in the table below. It is the responsibility of the requesting Doctor to ensure that requested tests are reviewed in their clinical context.

Analyte	Units	Below	Above
Albumin (if new)	g/L	15	
ALT*1	U/L	-	600
ALT*2	U/L		>500
Ammonia	umol/L		50
AST*1	U/L	-	800
New AKI 2 and 3 in each episode			
Bile Acid	umol/L	-	39
Calcium corrected	mmol/L	1.8	3
Carbamazepine	mg/L	-	25
Cortisol	nmol/L	100* (Will appear in validation)	
Creatinine	umol/L	-	354 (>150 if <16yrs)
CRP*2	mg/L	-	300
Digoxin	ug/L	0.5	2.0
Glucose	mmol/L	2.6	15 if <16yrs new presentation 25 if >15yrs new representation 30 if known DM
Lactate	mmol/L		>3mmol/L
Lipase	U/L		265
Lithium	mmol/L	-	1.5
Magnesium	mmol/L	0.4	-
Phenobarbitone	mg/L	-	70
Phenytoin	mg/L	-	25
Phosphate	mmol/L	0.3	-
Potassium (plasma)	mmol/L	3	5.9
Potassium (S) <16yrs	mmol/L	3	6.0
Potassium (S) >16yrs	mmol/L	3	6.4
Sodium	mmol/L	120	150
Sodium <16yrs	mmol/L	130	150
Theophylline	mg/L	-	25
Total CK*1	U/L	-	5000
Triglyceride*1	mmol/l	-	20
hs -Troponin I	ng/L	-	Male >58** Female >40**
Urea	mmol/L	-	30 (>10 if <16yrs)
Vancomycin	mg/L	-	20
Xanthochromia	N/A	N/A	Positive result

*1 – Indicates that these results are only phoned on non-inpatients

*2 – Indicates that these results are only phoned on non-inpatients < 16 yrs.

** - **CONTACTING ABOUT ABNORMAL RESULTS**

Any abnormal Troponin received from GP or Outpatients should be phoned to the requesting team.

Cortisol:
Results of <100 should be referred to a Biochemist. During core hours this should be done verbally, and the sample forwarded from Profile listing to Endo Listing using “F” reFer and entering the “Endo”. Out of hours, phone the on-call consultant except if sample has been taken between 10pm and 2am or the request form mentions a Dexamethasone suppression test (overnight, low dose or high dose).

(check CHSMI027 for updates)

Test Profiles

Many of these profiles are performed and reported each day, although some, notably endocrinology tests, are only reported Monday to Friday.

The minimum sample volume required for each profile is 1.5ml, except blood gases which requires 2ml. Multiple profiles can usually be performed on one single tube of the correct type.

Profile	Tests included	Notes
U/E	sodium, potassium, urea, creatinine	Estimated GFR is also reported in patients over 18. However it is not validated for use in acute renal failure, pregnancy, oedematous states, muscle wasting, amputees and malnourished people.
E	sodium, potassium, & creatinine	GP electrolyte profile urea is only available on GP samples if specifically requested
Liver profile	bilirubin, protein, albumin, ALP, ALT, GGT,	
LFP	bilirubin, protein, albumin, ALP, ALT	Liver profile without GGT. GGT is only available on GP samples if specifically requested
Bone profile	Calcium, phosphate, albumin, adjusted calcium, ALP	
CAP	Calcium, albumin, adjusted calcium, ALP	Calcium profile for GP samples without Phosphate. Phosphate is available if specifically requested.
Thyroid function tests	TSH, free T4	Identify if already on treatment for thyroid disease
Lipid profile	Cholesterol, HDL-C, Triglyceride, LDL (calculated)	Fasting sample preferred
Immunoglobulins	IgG, IgA, IgM	
Complement	C3, C4	
Gonadotropins	LH, FSH	
Iron studies	Iron, Transferrin, TF saturation	
Blood gases	pH, PCO_2, PO_2, Std Bicarbonate, Base Excess	In a heparinised syringe. Remove needle and replace with special cap. Telephone laboratory before taking the sample.

More information about individual tests can be found on the following pages, including reference values.

Individual Tests and Reference ranges

(please contact the laboratory about tests not listed)

				Adult Ref Range			Frequency if not daily
Test	**In profile**	**Sample**	**Units**	**Lower**	**Upper**	**notes**	**M- Mon, T-Tues, W-Wed, Th-Thurs, F-Fri. R- refer**
AFP		Serum	U/L	0	7	Only test if ?Germ cell tumour or known cirrhosis or liver mass	M,Th
Alanine aminotransferase (ALT)	Liver	Serum	U/L	0 0	45 33	Male female	
Albumin	Liver, bone	Serum	g/L	38	51		
Alkaline phosphatase (ALP)	Liver, bone	Serum	IU/L	20	130	adult range <18 yrs - see report	
Alpha 1 antitrypsin		Serum	g/L	0.8	2.0		W
Ammonia		EDTA Plasma	umol/L	10	50	Contact laboratory beforehand	
ANA		Serum	N/A			The SHH lab tests ANA requests and reports negative samples only. All potentially positive samples are referred to immunology at MFT	R pos
Aspartate aminotransferase (AST)		Serum	U/L	5 5	44 33	Male female	
B12		Serum	ng/L	160	820	all results will have an interpretative comment	
Base Excess	Blood gases	Blood	mmol/L	-3.0	3.0		
Bicarbonate	Serum or blood gas	Serum	mmol/L	22	29	Stable in serum for 6 hours	
Bile Acids		Serum	umol/L	0	14	Assay in pregnancy only	
Bilirubin (total)	Liver	Serum	umol/L	1	21	not neonatal	
Ca125		Serum	kU/L	0	35	See Tumour marker guidelines	
Ca15-3		Serum	kU/L	0	30	See Tumour marker guidelines	R
Ca19-9		Serum	kU/L	0	35	See Tumour marker guidelines	R
Caeruloplasmin		Serum	g/L	0.15 0.16	0.30 0.45	Male Female	R
Calprotectin		Faeces	ug/g	<50			
Carbamazepine		Serum	mg/L			See Therapeutic Drug guidelines	

Test	In profile	Sample	Units	Adult Ref Range Lower	Adult Ref Range Upper	notes	Frequency if not daily M- Mon, T-Tues, W-Wed, Th-Thurs, F-Fri. R- refer
Carboxy Hb		Li hep blood	%			See report	
CEA		Serum	µg/L	0	5	See Tumour marker guidelines	
Chloride		Serum	mmol/L	95	108	Only available by arrangement	
Cholesterol (total)	Lipid	Serum	mmol/L			target value is < 4.0 in patients at high CVD risk	
Complement C3	Complement	Serum	g/L	0.7	1.8		
Complement C4	Complement	Serum	g/L	0.12	0.66		
Conjugated Bilirubin		Serum	umol/L				
Copper		Plasma	umol/L	13	24	Use special trace element bottle (blue top)	R
Adjusted calcium	Bone	Serum	mmol/L	2.20	2.60	Calculated result (requires albumin)	
Cortisol (Urine)		24h Urine	nmol/24h	0	165		R
C-Reactive Protein (CRP)		Serum	mg/L	Up to .	10		
Creatine kinase (CK)		Serum	U/L	0 0	170 190	Female Male	
Creatinine	U/E	Serum	umol/L	45 55	100 120	Female Male	
Creatinine – (enzymatic method)		Serum plasma	umol/L			primarily used for paediatrics or where interference noted in standard creatinine. Reference ranges for paediatrics are stated on the report.	
Ciclosporin (Cyclosporin A)		EDTA Blood				See Therapeutic Drug guidelines	R
Digoxin		Serum	ug/L			See Therapeutic drug guidelines. sample > 6 hours post dose	
Ferritin		Serum	ug/L	10 22	291 322	Female Male	
FIT		Faeces	ug/g	<7			
Folate		Serum	ug/L	 3.4 <3.4	>5.4 5.4	Normal indeterminate deficient	
FSH	Gonadotropins	Serum	U/L			Interpretation see below	
Gamma glutamyl transferase (GGT)	Liver	Serum	U/L	12 9	64 36	male (adult) female (adult)	

Test	In profile	Sample	Units	Adult Ref Range Lower	Adult Ref Range Upper	notes	Frequency if not daily M- Mon, T-Tues, W-Wed, Th-Thurs, F-Fri. R- refer
Globulin	Liver, bone	Serum	g/L	18	35	Calculated result	
Glucose		Plasma	mmol/L	3.3	6	Fasting	
Growth hormone		Serum	ug/L	0	8	Random levels of limit use	R
Haptoglobin		Serum	g/L	0.4 0.5	1.6 2.0	Female Male	R R
HbA1c		EDTA Blood	mmol/mol			Monitoring patients or screening in appropriate adults	
HCG		Serum	U/L	0 0	10 4	Female Male	
HDL cholesterol	Lipid	Serum	mmol/L	>1.2 >1.0		Female Male	
IgA	Immunoglobulins	Serum	g/L	0.8	4.0	Adults Paed ranges available	
IgG	Immunoglobulins	Serum	g/L	6	16	Adults Paed ranges available	
IgM	Immunoglobulins	Serum	g/L	0.5	2.0	Adults Paed ranges available	
Intrinsic factor antibodies		Serum					R
Iron	Iron studies	Serum	umol/L	11 14	29 31	Female Male	
Lactate		Plasma	mmol/L	0.5	2.2		
Lactate dehydrogenase (LDH)		Serum	U/L	200	550		
LDL cholesterol	Lipid	Serum	mmol/L			Calculated result. Target <2.0 in patients at high CVD risk	
LH	Gonadotropins	Serum	U/L			Interpretation see below	
Lipase		Serum	U/L	12	53		
Lithium (age 65+) (age <65)		Serum	mmol/L	0.4 0.4	0.8 1.0	See Therapeutic Drug guidelines	
Magnesium		Serum	mmol/L	0.70	1.0		
Microalbumin							
Osmolality		Serum	mmol/Kg	275	295		
Parathyroid hormone (PTH)		EDTA Plasma	ng/L	18	80		M,Th
NT-proBNP		Serum and plasma (lithium	ng/L		<300 <400	Acute ward Non acute ward	

				Adult Ref Range			Frequency if not daily
Test	**In profile**	**Sample**	**Units**	**Lower**	**Upper**	**notes**	**M- Mon, T-Tues, W-Wed, Th-Thurs, F-Fri. R- refer**
		heparin & EDTA)					
PCO2	Blood gases	Blood	kPa	4.5	6.0		
pH	Blood gases	Blood		7.36	7.44		
Phenobarbitone		Serum	mg/L			See Therapeutic Drug guidelines	R
Phenytoin		Serum	mg/L			See Therapeutic Drug guidelines	
Phosphate	Bone	Serum	mmol/L	0.8	1.50	Adults Paed ranges available	
PO2	Blood gases	Blood	kPa	10.0	15.0		
Potassium	U/E	Serum	mmol/L	3.5	5.3		
Prolactin		Serum	U/L	59 40	619 375	Female Male high results screened for macroprolactin	
Protein (total)	Liver, bone	Serum	g/L	60	80		
Protein electrophoresis		Serum				(Please allow up to a week for report)	
PSA		Serum	ug/L		<3.0 <4.0 <5.0	<60yr 60-70yrs >70yrs Age related ref values, but See Tumour marker guidance	
Rheumatoid Factor		Serum	IU/mL		<14		
Sex hormone binding globulin (SHBG)		Serum	nmol/L			(range see report)	
Sodium	U/E	Serum	mmol/L	133	146		
Std Bicarbonate	Blood gases	Blood	mmol/L	21.9	27.0		
FT4	TFT	Serum	nmol/L	9	22		
FT3		Serum	pmol/L	3.5	6.5	Reflex testing by lab	
Teicoplanin		Serum				see report for interpretation. Predose levels preferred.	
Testosterone (male)		Serum	nmol/L	8.4	28.7	Male	
Testosterone (female)		Serum	nmol/L			Female (range see report)	
Theophylline		Serum	mg/L			See Therapeutic Drug guidelines	
TPO antibodies		Serum	IU/L		>60		M

				Adult Ref Range			Frequency if not daily
Test	**In profile**	**Sample**	**Units**	**Lower**	**Upper**	**notes**	**M- Mon, T-Tues, W-Wed, Th- Thurs, F- Fri. R- refer**
Transferrin	Iron studies	Serum	g/L	2.52	4.29		
Transferrin% saturation	Iron studies	Serum	%	20	50	Calculated	
Triglycerides	Lipid	Serum	mmol/L	0.3	1.8		
Troponin I (TNIH)		Serum	ng/L	0 0	40 58	Females Males That a consistent sample type is advocated by the laboratory and that samples are stable at room temperature for <4h	
TSH	Thyroid	Serum	mU/L	0.1	4.0	Adults Paed ranges available	
TTG		Serum	Cu	<30		Send all results >30 CU in Age >15 for EMA. if there is no previous for confirmation to the referral lab	
Urate		Serum	umol/L	140 200	360 430	Female (pre menopause) Male	
Urea	U/E	Serum	mmol/L	2.5	7.8		
Valproate		Serum	umol/L			See Therapeutic Drug guidelines	
Vitamin D		Serum				Please see the report for the reference interval. Please note that Vit D reference intervals are much debated.	
Zinc		Serum	umol/L	10	21	Use special trace element bottle (blue top)	R

Turnaround Times: (Please note: these are stated maximum times)

Tests which are performed on a daily basis are reported within 24hrs.
Tests which are performed on batched analysis will be run in the next day's batch and reported within 24hrs with the exception of protein electrophoresis which may take up to a week.
Tests which are referred are dispatched to the referring laboratory usually on the day after receipt at Stepping Hill Hospital.

Urgent

Tests requiring urgent analysis will be reported within 1 hour of receipt into the laboratory

Please note: Urgent samples should not be mixed with routine samples and clearly labelled as such.

Referred Tests

Many tests are referred to other laboratories for analysis. Sample volumes are usually factored into the electronic requesting software such that additional samples will be prompted for if needed. If required please contact us for sample volume and turnaround time of send away tests. Most results should be back within 1 to 4 weeks.

Gonadotropins Reference values

	LH	FSH	
Male (13-70 years)	1.5-9.3	1.4-18.1 U/L	
Female			
Follicular phase	1.9-12.5	2.5–10.2	U/L
Mid-cycle peak	8.7– 6.3	3.4–33.4	U/L
Luteal phase	0.5-16.9	1.5-9.7	U/L
Post-menopausal	15.9-54.0	23.0-116.3	U/L

Lipids

Lipid results should be interpreted with other CV risk factors. For primary prevention, the Joint Societies Risk Prediction Charts should be used. For secondary prevention (and patients with diabetes), the suggested targets are:

Total cholesterol	< 4.0	mmol/L
LDL cholesterol	< 2.0	mmol/L
HDL cholesterol	>1.0	mmol/L

Tumour Markers

Most guidelines recommend that tumour markers should only be used once a conclusive diagnosis of malignant disease has been achieved. In those circumstances marker assays are applied to monitor response to treatment, identify potential recurrence and as a prognostic indicator. They do not, currently have a role in screening or diagnosis. The rationale for this is that although elevated tumour marker concentrations are often associated with the presence of cancer, they may also be raised in a number of benign conditions and low results do not exclude malignancy. However, this is clearly a developing area and they may also have a place in diagnosis in specific circumstances.

AFP, CEA, CA125 are performed at Stepping Hill daily.

CA19-9 and CA15-3 are referred to other laboratories and all requests will be reviewed by consultant staff. These will only be performed if considered relevant in the context of the clinical information provided.

Developing use of tumour markers in an investigation or care pathway should be discussed with biochemistry consultants.

CSF analysis for suspected subarachnoid haemorrhage (SAH)

The investigation of CSF for xanthochromia must only be performed after a negative CT scan.

The lumbar puncture must be done greater than 12 hours and less than 10 days after the presumed SAH to prevent false negative results; the time of the LP relative to that of the possible SAH should be on the form.

Call the laboratory on 4048 prior to the CSF collection to alert lab staff of the impending sample and to obtain a suitable box to protect the sample from light. Label samples carefully with draw order number (1-4), patients' name, DOB, ward, date and time. The CSF samples must be collected sequentially. The sample for xanthochromia could be the 3rd or 4th specimen collected – as long as they are clear enough and should be at least 1 ml.

The sample must not be transported by the pneumatic tube system but must reach the laboratory within 30 mins of collection.

A simultaneous blood sample must be taken for bilirubin and total protein estimation is required for full interpretation which will be on the final report.

For the investigation of meningitis, a CSF sample should also be taken into a glucose specimen bottle and serum glucose also measured.

Serum 5-HIAA

Urine 5HIAA has been replaced by serum 5HIAA. Patients requiring this test should be fasted overnight and avoid eating walnuts for 24 hours prior to having blood taken.

Immunology Tests

Most immunology requests are referred by Biochemistry to the Department of Immunology at Manchester Royal Infirmary, or other appropriate laboratory.

TEST DESCRIPTION	SAMPLE TYPE	TURNROUND TIME
Anti-nuclear factor, ANA	Ochre top bottle	Performed in Blood Sciences screened positives will be sent to MRI for confirmation
Thyroid Antibodies	Ochre top bottle	Performed in Biochemistry
Anti-Mitochondrial Antibodies	Ochre top bottle	Sent away
Smooth Muscle Antibodies	Ochre top bottle	Sent away
Parietal Cell Antibodies	Ochre top bottle	Sent away
IgE and specific IgE tests	Ochre top bottle	Sent away – Allergy is a clinical diagnosis. The blood tests have a poor sensitivity and specificity and are not always required. A scattergun approach to allergy test is not recommended.
TTG	Ochre top bottle	Performed in Biochemistry. Screened positives will be sent to MRI for confirmation

For advice on appropriate requesting please speak with one of Stepping Hills consultants.

NB ensure all specimens are labelled and have full clinical details to ensure optimal testing of specimens.

Ante-natal Serology

The biochemistry section carries out screening this low risk group (HIV, Syphilis, HepB) and refers any sample for confirmation to the Virology department at Manchester Royal Infirmary. If more information is required, please contact the laboratory.

Synacthen Test

Synacthen Test is performed to assess adrenal function.
Protocol:
Take 5 ml clotted blood as baseline sample.
Give i.m. tetracosactrin 250 ug.
Take 5 ml clotted blood at 30 mins.
Measure serum cortisol on both samples

NB In some patients a baseline ACTH sample (EDTA plasma) and a 60 min cortisol sample may be required – usually only for ? pituitary disease requested by Endocrinologists

Normal response: cortisol should rise by > 200 nmol/l to in excess of 446 nmol/l in the 30-minute sample.

For information about other dynamic function test please contact the laboratory.

Antibiotic Assays

Gentamicin and Vancomycin is measured by Biochemistry at Stepping Hill, other antibiotic measurements are referred to other laboratories.

Antibiotic Regime	Level Required / Times	Required Therapeutic Range
Gentamicin – Once daily therapy	**Pre dose level required** – Take level immediately before giving 2nd dose.	**Pre-dose level** – Less than 1mg/l For levels between 1-2 mg/l close monitoring is required.
Gentamin – Twice daily therapy	**Pre dose level required** -Take level immediately before giving 3rd or 4th dose	**Pre-dose level** - Less than 1mg/l
Vancomycin	**Pre dose level required** - Take level immediately before giving 3rd or 4th dose	**Pre-dose level** -Target range 10.0-15.0mg/l. For some serious deep seated infections (eg MRSA bacteraemia, endocarditis) target range is 15 – 20mg/l

For advice about antibiotic concentrations please contact the Medical Microbiologist on (0161 419 4695).

Therapeutic Drug Monitoring

Measurement of the concentration of a therapeutic drug in serum/plasma can serve as a useful aid in patient management. The aim of this analytical service is to help physicians tailor drug therapy to individual needs so that the beneficial effects of drugs are optimised, and toxicity is minimised. Measurement of drug levels may be of value in assessment of compliance, therapeutic control, and confirmation of clinical toxicity. Individual drug pharmacokinetics may be influenced by many factors.

Toxic effects for some drugs may be observed at the upper limit of therapeutic levels. To assist interpretation, time of sampling relative to the dose should be specified.

The following drug measurements are performed in the department at Stepping Hill. Other drug measurements (below) are referred to other laboratories. Please refer to the table below for sampling times.

Please note, from April 2007, in line with National Recommendations, therapeutic drugs (except lithium) are reported in mass units, eg mg/L

Therapeutic Drugs

Target ranges are for guidance only, and results must be interpreted in relation to the clinical assessment of the patient

Drug	Target Range	Units	Half life in hours	Sampling Time	Days to Steady state
Carbamazepine	4.0 – 12.0	mg/L	12	pre-dose	2 – 6
Ciclosporin (Cyclosporin A)	See below	ug/L	2 – 6	pre-dose	2 -3
Digoxin	0.5-1.0	ug/L	36 - 48	At least 6hrs post-dose	5 - 7
Lamotrigine	3.0 – 15.0	mg/L	20 - 30	pre-dose	4 - 15
Lithium	0.4 – 0.8 (65+) 0.4 - 1.0 (<65)	mmol/l	18 - 36	pre-dose (12hr post-dose)	3 - 7
Phenobarbitone	10.0 – 40.0	mg/L	96	pre-dose	10 - 25
Phenytoin	5.0 -20.0	mg/L	7 – 42	pre-dose	7 - 35
Theophylline	10.0 – 20.0	mg/L	3 -13	pre-dose (or see below)	2 -3
Oral dosing - pre and/or 2 - 4 hrs post dose infusion - sampling at least 2 hrs into a 24hr infusion					
Valproate	Target range not recommended	mg/L	8 – 20	pre-dose	2 - 4

Ciclosporin (Cyclosporin A) and Tacrolimus are analysed at South Manchester University Hospital

Ciclosporin (Cyclosporin A)
Sample - 5 ml EDTA, 12 hours post dose
Therapeutic range - guideline only:

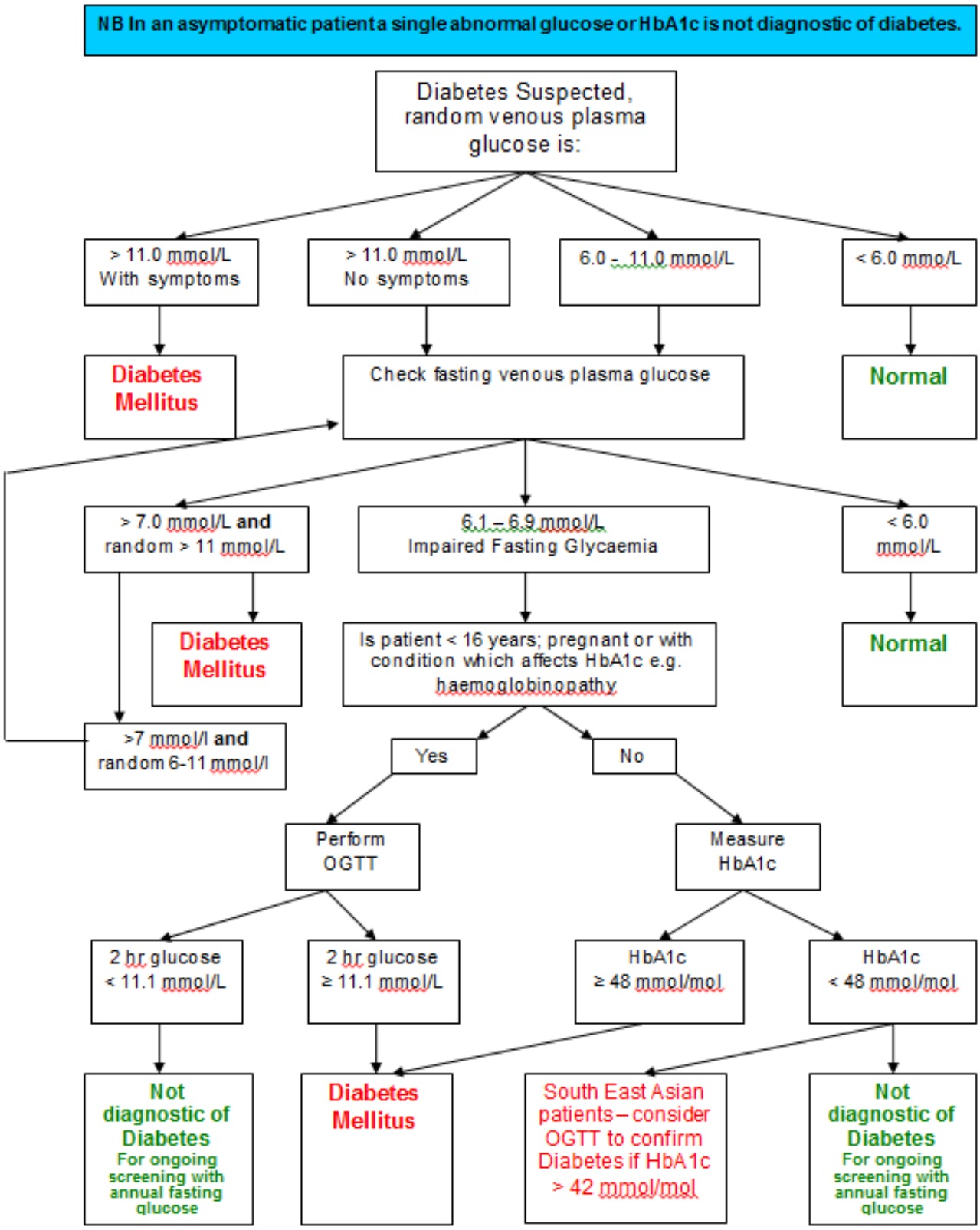
Cardiac transplant:	early period	-	200 – 400 ug/L
	after 3-6 months	-	100 – 200 ug/L
Renal transplant:			75 – 150 ug/L

Tacrolimus (FK506)
Sample – 5 ml EDTA, pre-dose

Renal transplant:	4 - 33 hrs	10 - 20 ug/l
Auto-immune disease:		5 - 15 ug/l

Pre-dose (trough) samples values >20 may be associated with nephrotoxicity, glucose intolerance etc.

Diagnosis of Diabetes



We have almost stopped getting GTT requests from Primary care.

HbA1c, fasting glucose and random glucose can all be used for the diagnosis of diabetes mellitus. In the case of a symptomatic patient only a single abnormal result is required for a diagnosis of diabetes. In an asymptomatic patient 2 abnormal results are required. Pre-diabetes should be managed with lifestyle advice, control of other cardiovascular risk factors and an annual follow-up. HbA1c has proved to be the most popular test as there is no need to fast – however please remember this cannot be used in children to screen for diabetes.

Interpretation	**Fasting plasma glucose mmol/L**		**2 hour glucose mmol/L**	**Random plasma glucose mmol/L**	**HbA1c mmol/mol (%)**
Normal	≤ 6.0		< 7.8	< 11.1	< 42 mmol/mol
Impaired fasting glucose (IFG)	6.1 – 6.9	**and**	< 7.8	-	-
Impaired glucose tolerance (IGT)	< 7.0	**and**	7.8 - 11.0	-	-
Pre-diabetes	-		-	-	42–47 mmol/mol
Diabetes mellitus (DM)	≥ 7.0		≥ 11.1	≥ 11.1	≥ 48 mmol/mol

Hba1c should not be used to screen for diabetes in the following cases:

- Children and young adults <18 years
- Pregnancy
- Symptoms suggesting Type 1 diabetes (any age)
- Patients with anaemia – HbA1c should not be used if haemoglobin under 10 g/dL

There are other scenarios when HbA1c cannot be used for diagnosis. Please contact one of the biochemistry consultants to discuss as needed.

Timed urine samples

Bottles are available from pathology. In most cases no preservative is needed. An instruction sheet for patients (see next page) will be included. Please ensure that a request form is inserted into the pocket attached to the bottle. There is a 'How to collect a 24-hour urine sample' patient information leaflet available separately as document on the pathology website (Laboratory reference DOC1424).

Creatinine Clearance

This test requires a timed urine collection and a serum sample ideally taken within 24 hrs of the urine collection. A 24 hour urine sample is preferred otherwise please provide the collection time period and urine volume; Ideally the samples should be sent to the lab together.

24 hr Urine Metadrenalines - plasma metadrenalines

Samples for plasma metadrenalines must be sent to pathology immediately to allow the samples to be spun and the plasma frozen in less than 1 hour from collection of the sample. Testing the blood first is the preferred test. Where sample collection and delivery to the laboratory within the required time scale is not feasible then the 24 hour urine test can be carried out.

How to collect a Urine Sample

See How to Guide on the Intranet DOC1475 for men (v1.1 stated below)

For Men:

- Wash your hands.
- Pull back the foreskin and clean the skin surrounding the urethra with soap and water, and dry area. Disinfectants should not be used for cleansing prior to specimen collection as they will be irritant or painful.
- Direct the first part of the stream into the toilet.
- Collect the middle part of the stream in either the specimen collection cup or clean old cup or bowl.
- Pass the end part of the stream into the toilet. For men unable to control their stream of urine, start passing urine and once the flow of urine has begun, quickly pop the collection cup or pot into the flow to collect the specimen. Secure the top of the container tightly and wash your hands.

For Ladies:

- Direct the first part of the stream into the toilet.
- Collect the middle part of the stream in either the specimen collection cup or clean old cup or bowl.
- Pass the end part of the stream into the toilet. Secure the top of the container tightly and wash your hands.

How to collect a Faecal sample

See How to Guide on the Intranet DOC1479 (v1.1 stated below)

In the toilet use an old disposable carton or several sheets of newspaper to pass your motion into. Alternatively cling film put around the inside of the toilet bowl will suffice. Use the spatula or spoon incorporated in the container to scoop enough material to fill a third of the specimen container. However, if this is not possible, obtain as much as is possible. Please note formed (i.e. solid) samples are not analysed, so if the stool is a mixture of liquid and solid parts please do not just send the solid bits. Secure the top of this container tightly. Discard the rest of the motion down the toilet and then place the carton or newspaper in a plastic bag, tie securely and dispose of straight into the dustbin. Wash your hands.

Faecal Immunochemical testing

This is routinely available from primary care on patients who are being referred under the 2WW for colorectal cancer or if the patient is deemed at low risk for colorectal cancer to help decide to make a referral as per NICE DG30.

BLOOD SCIENCE – HAEMATOLOGY SECTION

The Haematology Department has suspended UKAS accredited medical laboratory No. 9594
The laboratory has been assessed by UKAS (United Kingdom Accreditation Service) to ISO 15189:2012. The schedules of accredited tests can be found on the UKAS website
www.ukas.com
Haematologylab@stockport.nhs.uk

Introduction

The Haematology department comprises of three areas: Routine Haematology & Coagulation, Anticoagulation and Blood Transfusion.

The routine Haematology & Coagulation section offers an analytical and advisory service for a large range of haematological tests and the interpretation of results. Much of the analytical work is automated and most of the tests are performed each day.

The anticoagulation section monitors the approximately 1320 (31/03/2023) anticoagulant patients prescribed Warfarin or Sinthrome monitored by Anticoagulant Team within the Stockport and High Peak communities.

The Blood transfusion section offers routine antenatal screening, anti-D prophylaxis, routine blood group and antibody screening and a comprehensive blood and blood product service.

The repertoire of the department is evidenced on the following pages, together with reference ranges, frequency of analysis and required sample volumes. Some tests are not performed in the laboratory at Stepping Hill Hospital, but are referred by us, to other laboratories. These results will be reported in the normal way, but the analysing laboratory will be identified.

Specimens

The usual specimen type for most tests is whole blood and the container to be used in most cases, is the one with a purple top. This tube contains the anti-coagulant EDTA. If multiple tests/profiles are required, this can usually be done on one full specimen tube (i.e. 4ml blood). Where a different tube is required, this is also shown in the following tables. The common tests for which a different tube is required are: ESR (black top), Coagulation (blue top), Blood Transfusion (Pink top).

Paediatric specimens

The following specimen bottles are available for routine hematology testing.

1.3 ml EDTA (lilac top) : required for routine haematology tests (e.g FBC) as well as PTH and some specialist biochemistry. NOT SUITABLE for trace metal analysis.

1.3 ml Sodium Citrate (blue top): used within haematology for coagulation tests.
It is imperative any specimen collected for coagulation testing is filled to the 'fill level' level indicated on the bottle.

Transportation of specimens

Samples should be transported as per current guidelines i.e. non-refrigerated at ambient temperature (15–22°C) in as short a time as possible. Ideally, to afford the greatest sample integrity testing for routine coagulation tests such as PT, APTT and D-Dimer should be accomplished as quickly as possible; within 4 hours of collection (ideally within 1 hour), although allowable tolerances may be greater than this. However, APTT testing for unfractionated heparin monitoring must be processed within 1 hour due to the potential for heparin neutralization by platelet releasates. FBC's are only stable for 24 hours. Extremes of temperature (i.e., refrigerated or high temperature) should be avoided. Delays in transport may affect in particular the labile factors (FV, FVIII), leading to prolonged clotting times and in vitro loss of factor activity. More complex tests such as factor assay/thrombophilia testing should be processed by centrifugation and the plasma frozen until required.

Additional tests

In Haematology specimens are stored for up to three days and it may be possible to request additional tests on a previously submitted sample. Usually this should only be done when the timing of the specimen in relation to a clinical event is relevant. It would be preferable to take another sample in most circumstances.

Coagulation samples are only viable for 4hrs but are stored for 48hrs.

In the Blood Bank samples are stored for 6 days.

Thrombophilia screen must be received in the lab within 4 hours from collection time. Please note thrombophilia testing is screened for appropriateness of test request and will be rejected if criteria are not followed. See https://labmedservices.stockport.nhs.uk under blood sciences/clinical guidelines for further information.

Patients on anticoagulant therapy are not tested for thrombophilia screen.

Result Reporting and Enquiries

All haematology results are archived in our Telepath Laboratory Information system. Printed reports are produced and issued regularly each day to appropriate areas.
All results are also reported to the Trust Web Results System, which can be accessed from the Trust Intranet.
Requests from GP's are also reported electronically directly into Practice Systems.

When information is not available from these sources telephone enquiries can be made to extension 5626.

Advice and Guidance on use of Haematology Tests.

Information relating to use of some tests is contained in this guide in the subsequent pages. Discussion of results in individual patients or any aspect of the haematology service is welcome. Please contact one of the consultant staff.

Contact details

Dr Montaser Haj, Consultant Haematologist, 0161 419 7721
Dr Sayee Chirputkar, Consultant Haematologist, 0161 419 7722
Dr Srivasavi Dukka, Consultant Haematologist 0161 419 7723

Raisa Zaman Blood Bank Manager and Technical Head of Haematology 0161 419 4478
Brendan Devine – Blood Transfusion Practitioner 0161 419 5708

Telephone Action Limits.

Results of certain very abnormal tests will be telephoned if they are new results and out with the limits as shown in the table below. It is the responsibility of the requesting Doctor to ensure that requested tests are reviewed in their clinical context.

TO BE PHONED TO WARD/CONSULTANT/MASTERCALLED AS APPROPRIATE	
Test or Observation	**Critical Result**
Neutropenia on new presentation	<0.5 x 10^9/L *****
Leucocytosis on new presentation	>50.0 10^9/L *****
Thrombocytopenia on new presentation	<30 x 10^9/L **†** *****
Thrombocytosis on new presentation	>1000 x 10^9/L *****
Neonatal Haemoglobin at birth	<100 g/L*
Anaemia (unexplained) on new presentation	<70 g/L (microcytic or macrocytic) *****
High Haemoglobin with unknown cause or no previous history	>190 g/L or Hct>550 *****
Blood film	Any new significant feature e.g. haemolysis (spherocytes), plasma cells, blasts (including ?APL- ie promyelomcytes, acute leukaemia,) or red cell fragments in the presence of low platelets (as ?TTP) **†** *****
ESR (for Temporal Arteritis)	See location and clinical details *
Malaria or other parasite	Positive *
Sickle Haemoglobin Screen	If marked 'Urgent'
Prothrombin Time/INR (not on Warfarin) on new presentation	>25.0 secs / >2.5 *
INR (on Warfarin) on new presentation	>5 * >6.5 requires urgent medical review
APTT ratio (non-heparinised) on new presentation	>3.0
APTT (heparinised) on new presentation	>5.0
Fibrinogenaemia on new presentation	<1.0 g/L *

*****Unless consistent with previous results.

Please be aware any concerns with any features on film or abnormal results <u>during core-hours</u> please feel free to contact the Haematology consultant for advice if necessary.

† Call these results to the on-call Haematology Consultant irrespective of what time of day it is as they are classified as critical.

If any major concerns about any other abnormal results OOH then do contact the Haematology consultant.

Sample Types and Frequency of Analysis

TEST DESCRIPTION	SAMPLE TYPE	FREQUENCY OF ANALYSIS
ROUTINE HAEMATOLOGY		Performed at SHH unless otherwise stated
Full Blood Count (inc blood film, reticulocytes, IM screen, G6PD screen and Malaria screen as required)	EDTA (purple top)	Daily
ESR	ESR (black top)	Daily
Haemoglobinopathy Screen (inc Sickle cell screen)	EDTA (purple top)	Twice weekly
PNH screen	EDTA (purple top)	Sent Mon-Thurs to Leeds
Plasma Viscosity	EDTA (purple top)	Sent daily to UHSM
COAGULATION		Performed at SHH unless otherwise stated
PT / INR	Citrate (blue top)	Daily
APTT	Citrate (blue top)	Daily
D-Dimer	Citrate (blue top)	Daily
Clauss Fibrinogen	Citrate (blue top)	Daily
Thrombin time	Citrate (blue top)	Sent daily to MRI coagulation. 1 week turnaround
Thrombophilia / Lupus screen	4 x Citrate (blue top) 1 x Serum (ochre)	2-4 weekly
FVL/PGM	2 x EDTA (purple top)	SHH and part goes Mon – Thurs to Royal Devon and Exetor Genetics
Clotting Factor Assays	2 x Citrate (blue top)	Sent daily to MRI
BLOOD BANK		Performed at SHH unless otherwise stated
Crossmatch	EDTA (pink top)	On Request
Ante-natal Screen (group and antibody screen)	EDTA (pink top)	Daily
Kleihauer	EDTA (pink top)	Daily
Direct Coombs Test	EDTA (purple top)	Daily
HLA	EDTA (purple top)	Referred to NBTS

Sample volume for blue top / sodium citrate must be filled to the top line.

HLA B27

Requests only permitted on the advice of a Consultant Rheumatologist. The patient must have symptoms of ankylosing spondylitis. HLA-B27 is NOT a diagnostic test. It is found in 10% of the population and more commonly in AS. As HLA is genetically determined it is a once only test.

HLA DQ2/DQ8

Testing is very rarely required and is only allowed if agreed by a Consultant Biochemist and a medical specialist in coeliac disease. Lack of HLA DQ2/DQ8 cannot be used to exclude CD as cases do occur without this genotype. It is also present in about 20% of the population so cannot be used to confirm CD. As HLA is genetically determined it is a once only test.

Haematology Normal Ranges (Adults)

	MALE	FEMALE
WBC	3.7 - 11.0 x 10^9/l	3.7 - 11.0 x 10^9/l
Neutrophils	1.7 - 7.5 x 10^9/l	1.7 - 7.5 x 10^9/l
Lymphocytes	1.0 - 4.5 x 10^9/l	1.0 - 4.5 x 10^9/l
Monocytes	0.2- 1.1 x 10^9/l	0.2 - 1.1 x 10^9/l
Eosinophils	0.0 - 0.6 x 10^9/l	0.0 - 0.6 x 10^9/l
Basophils	0.0 - 0.1 x 10^9/l	0.0 - 0.1 x 10^9/l
Platelets	150 - 450 x 10^9/l	150 - 450 x 10^9/l
RBCs	4.5 - 6.5 x 10^{12}/l	3.8 - 5.8 x 10^{12}/l
Haemoglobin	130 – 180 g/l	115 – 165 g/l
Hct	0.40 – 0.54 l/l	0.37 - 0.47 l/l
MCV	76 – 100 fl	76 – 100 fl
MCH	27 – 32 pg	27 - 32 pg
ESR	Age variable (quoted with results)	Age variable (quoted with results)
Plasma viscosity	1.50-1.72 cp	1.50-1.72 cp
Reticulocytes %	Range given within result	Range given within result
Reticulocytes absolute	Range given within result	Range given within result
Hb A2	2.2 – 3.3%	2.2 - 3.3%
Hb F	0.0 – 1.0%	0.0 – 1.0%
Prothrombin Time	9.4 – 12.5 secs	9.4 – 12.5 secs
APTT	25.1 – 36.5 secs	25.1 – 36.5 secs
D-Dimer	0-460 µg/l	0-460 µg/l
Clauss Fibrinogen	1.9 –4.5 g/l	1.9 – 4.5 g/l
Thrombin time	9.5 secs	15.5 secs
Factor Assays	Range given within result	Range given within result
Lupus screen	Negative, Equivocal or Positive	

Thrombophilia screen consists of:	
Antithrombin III	83 - 118 iu/dl
Protein C functional	67 - 138 iu/dl
Protein S free antigen	62 – 145 iu/dl

Paediatric ranges available on request. Please note all ranges quoted on report form are age and sex related.

Haematology Turnaround Times

Test	Urgent	Routine
FBC	1 hour	4 hours
PT/INR	1 hour	4 hours
APTT	1 hour	4 hours
D-Dimer	1 hour	4 hours
Malaria Screen	2 hours	24 hours
IM screen	N/A	12 hours
ESR	1 hour	12 hours
Blood Film	1 hour	24 hours
Thrombophilia Screen	Not available	2-4 weeks
Lupus Screen	Not available	2-4 weeks
Coagulation Factors/Assays	Not available	1 week
Factor V Leiden	Not available	42 Days
Cytogenetics	Not available	2 - 4 weeks
Bone Marrow aspiration	4 hours	1 week
Sickle	2 hours	5 days
HPLC	Not available	5 days

The department will endeavour to better these times whenever possible – please note times are from receipt of sample only and NOT from when the sample was taken.

Please note: Urgent samples should not be mixed with routine samples and clearly labelled as such.

For the Not available tests in the urgent column should these be required in < 24 hours then the requestor should contact the haematology lab prior to sending the samples for advice.

BLOOD SCIENCE – HAEMATOLOGY - ANTICOAGULANTS

Indications for Oral Anticoagulation (OA)

MEDICAL CONDITION	TARGET INR	COMMENT
Pulmonary embolus	2.5	Continue OA for at least 3 months
Proximal DVT	2.5	Continue OA for at least 3 months
Calf DVT (non-surgical patients)	2.5	Continue OA for minimum 6 week[1]
Calf DVT (post-operative patients)	2.5	Continue OA for 6 weeks[1]
Recurrent VTE off therapy	2.5	? Duration of OA treatment
Recurrent VTE on therapy	3.5	? life-long OA treatment
Non-rheumatic AF	2.5	Life-long OA treatment[2]
AF (rheumatic, CHD, thyroid)	2.5	Life-long OA treatment
Cardioversion	3.0	OA 3 wks prior to and 4 wks after termination of AF
Valvular heart disease without AF	-	OA not indicated other than rheumatic mitral valve disease
Mural thrombosis	2.5	Continue OA for 3 months
Cardiomyopathy	2.5	Life-long OA treatment
Mechanical heart valve	3.5	Life-long OA treatment
Bioprosthetic heart valve	2.5	Continue OA for 3-6 months[3]
Ischaemic stroke without AF	-	OA treatment not indicated[4]
Retinal vessel occlusion	-	OA treatment not indicated
Peripheral arterial occlusion/grafts[5]	3.5	? Duration of OA treatment
Coronary artery thrombosis	-	OA treatment not indicated
Coronary artery graft thrombosis	-	OA treatment not indicated
Coronary angioplasty/stents	-	OA treatment not indicated
Inherited thrombophilia	2.5	? Duration of OA treatment[6]
Antiphospholipid syndrome (DVT/PE)	2.5	? Duration of OA treatment
Antiphospholipid syndrome (arterial)	2.5	? Duration of OA treatment

[1] continued treatment should be considered if risk factors are persistent (e.g. cancer, thrombophilia)
[2] alternative treatment (aspirin alone) can be considered for low risk patients (<65 yrs, no other risk factors or PMH)
[3] continued treatment should be considered if other risk factors are present (e.g. AF, PMH, intracardiac thrombus)
[4] given the clear risk reduction with aspirin, warfarin should not be given as first line therapy unless there is a potential cardiac source of embolism
[5] aspirin may be as effective and safer (trials ongoing)
[6] recommendations on duration of treatment will vary with number and type of genetic defects, PMH and FH

Guidelines on oral anticoagulation with warfarin – fourth edition 2011
https://b-s-h.org.uk/guidelines/guidelines/oral-anticoagulation-with-warfarin-4th-edition/

APPENDIX 1 – Shared Care Arrangements

STOCKPORT NHS FOUNDATION TRUST
STOCKPORT PRIMARY CARE TRUST
DERBYSHIRE COUNTY PCT

SHARED CARE ARRANGEMENTS FOR THE INITIATION AND MAINTENANCE OF ORAL VITAMIN K ANTAGONIST ANTICOAGULATION

Patient's vitamin K antagonist anticoagulation therapy is managed by the Anticoagulation Department after initiation of therapy has taken place or they are referred for initiation by other health care professionals. Other health care professional teams continue to have responsibilities throughout.

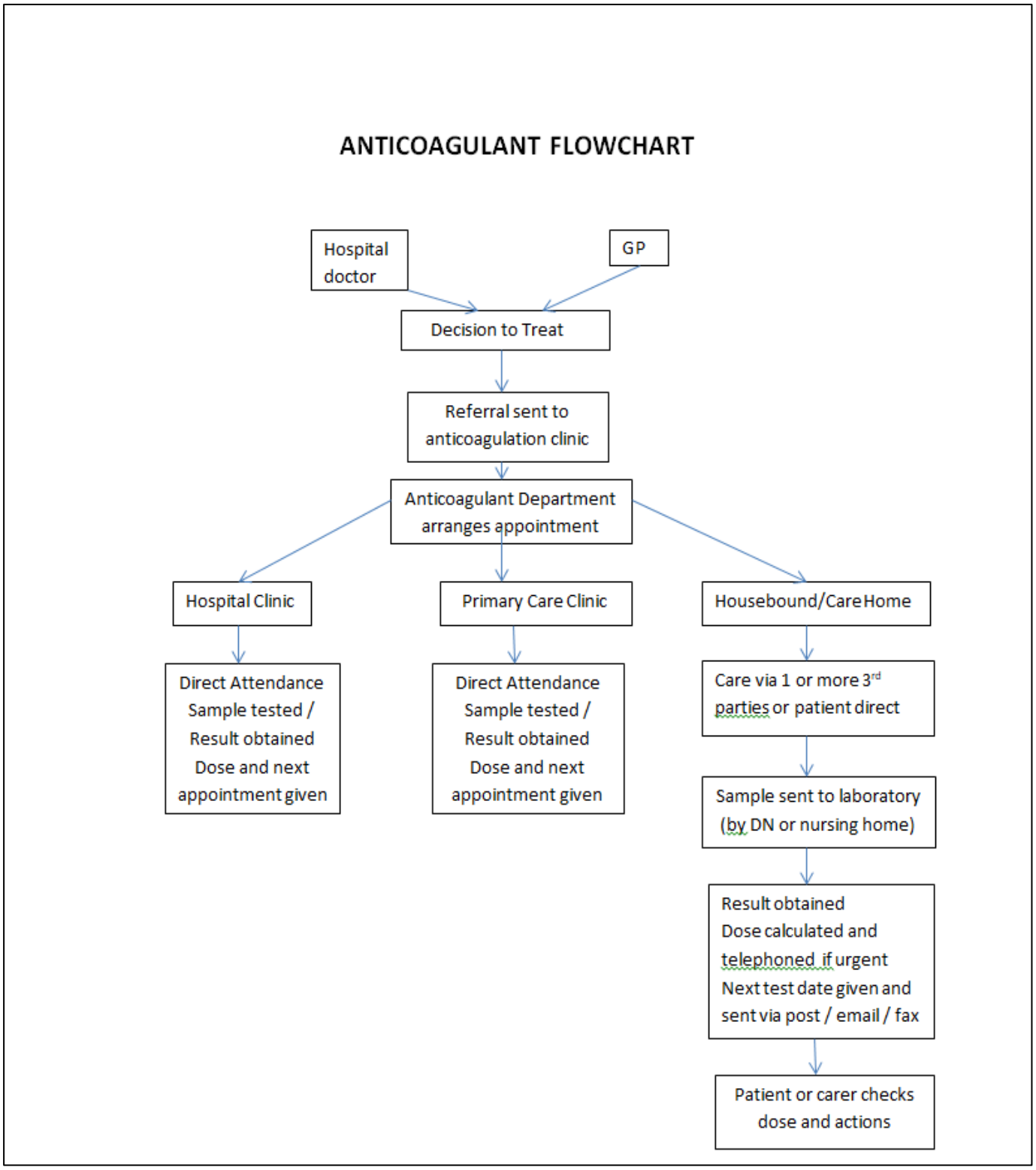
Please contact the anticoagulant department if further information is required.

The Anticoagulant Clinic can be contacted via the following
Phone 0161 419 5624
Email anticoag@stockport.nhs.uk

For out of hours advice patients should contact their GP surgery; ring 111 or for emergency treatment they should attend the Accident and Emergency department.

APPENDIX 2 - Anticoagulation Flow Chart

ANTICOAGULANT FLOWCHART



SEE INDIVIDUAL SECTIONS FOR RESPONSIBILITIES

APPENDIX 3 - Protocol for the Management of Outpatients with Prolonged INR Secondary to Anticoagulant Therapy

The following protocols are based on the British Committee of Standards in Haematology Guidelines but take into account that the Anticoagulant clinic is a monitoring clinic staffed by Biomedical Scientists and an Anticoagulant Nurse Specialist.

The BCSH guidelines and those given in the BNF, state that the use of Vitamin K for patients with an INR > 8.0 should only be considered for those with additional risk factors for bleeding (stated below) however, it is not feasible for clinic staff to assess whether any of these risk factors apply to patients in the community.

Given there is good evidence in the literature that the risk of bleeding significantly increases with an increasing INR, we aim to ensure that haemorrhagic complications are kept to a minimum by recommending that Vitamin K is given to all patient's with an INR >8. We are confident this policy will not put patients at risk of excessive anticoagulant reversal and at the same time simplifies the process for patients in the primary care setting.

High Risk Factors*

Age >70 years
Previous GI bleeding
Previous anticoagulant-related bleeding
Cerebrovascular disease
Hypertension
Alcoholism
Liver disease
Thrombocytopenia
Recent surgery
Receiving anti-platelet drugs e.g. NSAIDS

Major Bleeding

There are no generally accepted definitions of what constitutes a major bleeding episode.

Acceptable criteria for are as follows (Makris 2001):

- Intracranial
- Retro-peritoneal
- Intra-ocular (excluding conjunctival)
- Muscle haematoma with compartment syndrome

If there is evidence of any of the above, or if there is doubt concerning the possibility of major bleeding occurring, the patient will require referral to hospital as an emergency. This will include patients in whom bleeding is present even if the INR is within the therapeutic range. In these situations **rapid and complete reversal of anticoagulation may be indicated** and specialist intervention is indicated.

APPENDIX 4 - Protocol For Use For GP Coagulation Samples Received

Patients with no/minor bleeding

INR above range but <5.0

No bleeding	temporarily discontinue and/or reduce dose
Minor bleeding	temporarily discontinue then reduce dose. If high risk* retest within 7 days. Advise to see GP.

INR > 5.0 but < 8.0

No bleeding	Target 2.5	temporarily discontinue then retest within 7 days.
No bleeding	Target >3.5	temporarily discontinue reduce dose, retest within 7 days.
Minor bleeding	Target 2.5	temporarily discontinue, administer 1mg Orakay, retest within 3 days. Inform GP.
Minor bleeding	Target>3.5	temporarily discontinue ,administer 1mg Orakay, retest within 3 days. Inform GP.
INR >8.0 <15.0		temporarily discontinue, administer 1-3mg Oral Orakay, retest next working day. Inform GP, if greater than 11. GP to advise patient to attend casualty.
INR>15 <20.0		temporarily discontinue, administer 3-5mg Orakay, retest next day. GP to advise patient to attend casualty.
INR >20.0		temporarily discontinue, Administer 5mg Orakay. GP to advise patient to attend casualty.
Also consider 2mg Orakay if		already taken today's dose. if patient has greatly overdosed.

APPENDIX 5 - Vitamin K Preparations

The following preparations are available:-

- Konakion MM Paediatric 2mg in 0.2ml. Dose measured by dropper. Licensed product, but not licensed for patients with high INR.

- OraKay 1mg Capsules - A capsule containing liquid vit K preparation, snip end off capsule and consume contents.

Administration of Vitamin K

- Hospital – a patient group direction is available for administration in the clinic.

- Primary care

  Working hours
  – a FP10 prescription may be dispensed from
  - ✓ Lloyds Pharmacy, Wellington Road South (0161-480-3371) open till 6pm.
  - ✓ Any other Community Pharmacy – (note supplies may be obtained from Lloyds Pharmacy or Main Pharmacy, Stepping Hill Hospital)
  - ✓ Minor Injury Unit -Buxton Cottage Hospital
  - ✓ Hospital Pharmacy (in an emergency) up to 6pm on 5652 and after on call pharmacist via switch.

  Outside Working Hours
  - an emergency supply will be kept at the Mastercall and Lloyds Pharmacy (which is open until 10.00 p.m.)

Vitamin K Protocol for use in hospital run clinics only.

This protocol allows for the use of Konakion Injection given orally.
Administration of Oral Vitamin K.

INR	ORAL VIT K	ACTION WITH RESPECT TO VKA
High for patie 5.0	NONE if no bleeding	Determine cause. Omit VKA dependant on INR level above target. Lower dose of VKA. 10 -20% for warfarin. Check INR within 7 days. If minor bleeding refer to GP
>5.0 but <8.0	NONE if no bleeding	Determine cause. Omit VKA dependant on INR level above target. Restart at lower dose. Check INR within 7 days. Use clinical judgement of scenario to determine if repeat INR needed sooner. Minor bleeding administer 1mg Vitamin K. Retest next working day.
8 - <10	1mg Consider 2mg if patient has taken todays dose or significantly overdosed	Determine cause. Omit VKA until back in therapeutic range. Check INR next working day. Consider involving out of hours services e.g. District Nurses MSDEC. If bleeding, refer to MSDEC.
10- <12	2mg	Determine cause. Omit VKA until back in therapeutic range. Check INR next working day. Consider involving out of hours services e.g. District Nurses MSDEC. If bleeding or INR >11 then contact MSDEC for visit
12 -<16	3mg	Determine cause. Omit VKA until back in therapeutic range. Check INR next working day. Consider involving out of hours services e.g. District Nurses MSDEC. Contact MSDEC for visit
16- <18	4mg	Determine cause. Omit VKA until back in therapeutic range. Check INR next working day. Consider involving out of hours services e.g. District Nurses MSDEC. Contact MSDEC for visit
>18	5mg	Determine cause. Omit VKA until back in therapeutic range. Check INR next working day. Consider involving out of hours services e.g. District Nurses MSDEC. Contact MSDEC for visit

If patient's clinical status is compromised due to SERIOUS BLEEDING, advise to attend MSDEC or ED for assessment and management.

For INR > 11.0 attend MSDEC (ED out of hours), or order emergency ambulance.

APPENDIX 6 - GP Letter for Vitamin K Recommendation

Stepping Hill Hospital
Poplar Grove
Stockport
SK2 7JE

Tel (0161) 419 5624

ANTICOAGULANT CLINIC

DIRECTORATE OF PATHOLOGY
DEPARTMENT OF HAEMATOLOGY

DR S CHIRPUTKAR
CONSULTANT HAEMATOLOGIST

date

* URGENT ATTENTION REQUIRED *
* VITAMIN K RECOMMENDATION *

Dear Dr ……..

RE:-

This patient's INR is elevated. Current INR =
As per protocol*, we therefore advise that this patient receives ……..…mg Vitamin K today.
Vitamin K is available as Orakay capsules and can be obtained from:

Lloyds Pharmacy tel: 0161 480 3371.

Please do not hesitate to contact the Anticoagulation Department
9.00 a.m. – 5.30 p.m. Mon to Fri on 0161 419 5624, or on-call clinical haematologist via hospital via hospital switchboard at other times if any further advice / information is needed.

Yours sincerely

_____
Anticoagulant Clinic

* The protocol for 'Shared Care Arrangements for the Initiation and Maintenance of Oral Anticoagulation', can be viewed on the Intranet and is also included in the Pathology Guide.

BLOOD SCIENCES - HAEMATOLOGY - BLOOD BANK

Blood Grouping and Crossmatching

Positive patient ID is essential when taking samples for blood transfusion. The Serious Hazards of Transfusion organisation has noted that many serious transfusion incidents are due to poor patient identification. In compliance with BCSH guidelines for pre transfusion compatibility procedures in blood transfusion laboratories 2012 the laboratory operates a 2 sample policy for the issue of non-group O red cells to patients who we do not have any previous blood group history.

In emergency situations where no history exists and the 2nd "safety" sample has not arrived in the laboratory then only group O red cells will be issued until the second "safety" sample has been received and the blood group confirmed. The "Safety" sample **MUST** not be taken at the same time as the initial group and save sample and should be taken by a different member of staff.

The following procedure must always be followed:

- Whenever possible the patient should be asked to verbally provide their full name and date of birth before a sample is taken.
- This information should be checked against the request card.
- Only one patient should be bled at a time.
- The sample tube must be labelled by the person taking the sample.
- Tubes must not be pre-labelled.
- The tube must be labelled next to the patient.
- The sample tube must be hand written

The sample tube must be labelled with:

- The patient's full name.
- Patient's date of birth
- Patient's NHS number.
- For antenatal patients the alternative ID is the patients address will be accepted
- Signature of person taking the sample.

All details on the form and sample must match exactly

HLA investigations

For HLA Investigations contact Blood Bank for special form. Bottles now EDTA (pink) or 2 x FBC bottles. Requests are only acceptable: Monday – Thursday of any week.

Platelet investigations

Discuss with the laboratory.

NBS Labelling Criteria

Tests affected by this include:

- HLA typing including HLA B27
- Antenatal group and antibodies being sent to NBS
- Platelet immunology
- White cell immunology

ALL DETAILS MUST BE HAND-WRITTEN ON THE SAMPLE

Minimum details required:

- ✓ Name – Surname/family name and first name(s) in full
- ✓ Date of Birth – not age or year of birth
- ✓ NHS number
  or Address
  or hospital registration number
- ✓ Date sample taken
- ✓ Tube signed by person taking the sample

All information must be on both sample and request form and must correlate between sample and form

Failure to comply with these labelling standards may result in the sample being rejected by the NBS and a consequent delay in testing

These requirements are an addition to those already set out in the (Trust Labelling policy) Specimen Acceptance Policy.

Blood Groups for Other Reasons

Blood group requests for non-transfusion reasons e.g. Fertility treatment, going travelling, etc. is treated as private blood groups and will be charged either directly to the patient or via the surgery at the relevant cost. Please inform us reason for request and who to invoice on the request form.

Factor 8

The Clinician should call Stepping Hill Pathology, who will direct the call to MRI ‘s consultant if they haven’t spoken to them already MRI usually give advice and MRI must make the call to Manchester haemophilia centre to request the dosage and drug.
Manchester haemophilia centre deliver factor 8 to Stepping Hill’s Bloodbank.
Stepping Hill Bloodbank accept a paper request for the Factor 8 concentrate but only act as a receipt, storage, and issue bench.
- Stepping Hill Pathology receive Factor 8 and issue the drug. Storage is usually between 2-8C in a fridge.

BLOOD TRANSFUSION Turnaround times

Type of Request	ROUTINE	URGENT
Group and save samples*	Within 24 hrs	**1 hr**
Blood product requests*	4 hrs and/or if requested time exceeds 4 hrs then products will be ready for date/time requested.	**45 mins** - full crossmatch
		15 mins - group specific un-crossmatched blood (providing a current blood group sample is available and authorised)
		Available Immediately - Emergency O Rh NEGATIVE blood (from Theatre Phase 1 fridge/Delivery suite/ Lab Issue fridge as appropriate) The requesting Medic should be informed of the associated risks with un-crossmatched blood and Emergency O Rh D NEGATIVE units.
Platelets *(not stocked on-site) (Sample < 6 days)	2-4hrs (on named patient based)	**1 hr** (If requested during Major Haemorrhage pack 1/2 ONLY - NBTS must be contacted immediately and the platelets ordered by 'blue light')
FFP (Sample < 6 days)	45 mins (within receipt of request form)	**45 mins** (retrospective request form requested / MHP pack)
PCC (No sample required)	15 mins (within receipt of request form and Haem Consultant authorisation)	**15 mins** (within receipt of request form) OR Alternatively available in HASU and AE location immediately. *Replaced on a like-for-like basis, cannot be replaced without the return of completed Emergency EU tags*.
Albumin (No sample required)	2hrs (within receipt of request form)	**10 mins**
Anti-D (sample required)	2hrs (within receipt of request form)	**10 mins**

****may exceed 24hrs if there are special requirements for Blood products (e.g. for patients with red cell / HLA antibodies). If this is likely to result in a delay in provision of blood/products then the requesting medic MUST be informed immediately***.

MICROBIOLOGY

The Microbiology Department is a UKAS accredited medical laboratory No. 9592
The laboratory has been assessed by UKAS (United Kingdom Accreditation Service) to ISO 15189:2012. The schedules of accredited tests can be found on the UKAS website www.ukas.com

For more details and advice on how to take, store and send specimens see Pathology internet site at https://labmedservices.stockport.nhs.uk

Introduction

The Microbiology Department provides a high-quality service to the hospital site and the GP practices. It offers a wide range of microbiology and mycology diagnostic investigations, clinical and therapeutic advice and supports the infection prevention and control service.

The department is committed to service development, especially in the laboratory aspects of mandatory surveillance and for detection and reporting of antibiotic resistance. It participates in National External Quality Assurance schemes and provides a high standard of clinical and technical training both for laboratory and other health care workers.

Samples for routine virology and serology are referred to Manchester Medical Microbiology Partnership; other more specialist investigations are sent to specialist referral laboratories which can be found in the referral laboratory register in Q pulse QUI007. Results will either be reported on the referral laboratory stationery or will be reported by us in the normal way with the analysing laboratory identified. (Sample referral Using xlab MISPT053 available to help in the lab).
Samples for routine Chlamydia / Neisseria Gonorrhoea PCR testing and TB culture screening are referred and performed in the Virology and Microbiology Departments at the Manchester Medical Microbiology Partnership at Manchester Foundation Trust (MFT)
A small number of TB samples are referred to the Mycobacterium Reference Laboratory at PHE Birmingham for more specialized TB culture and sensitivity testing.
Samples requiring confirmation testing are referred to the National Reference Laboratory HPE Colindale London (e.g. mumps PCR can be referred to Colindale if a clinical diagnosis is required)

The department offers a routine laboratory screening service for male infertility investigation: however for clinical advice, including interpretation of abnormal semen analysis results, the Clinical lead for Andrology is Dr Madhu Rao. Dr Rao is based at the Department of Histopathology. Royal Oldham Hospital, Rochdale Road, Oldham, OL1 2 JH. Dr Rao's contact details can be obtained through the Microbiology Department at Stepping Hill
The following pages give a brief overview of the service offered and some answers to the most commonly asked questions. The most common investigations are listed with the specimen type required, storage conditions, etc. If in doubt please phone us.

If a test you require is not included in our investigations below please ring the laboratory for further clinical and technical advice.

Turnaround times

Results of microscopy will be available shortly after receipt of specimens in the laboratory if you phone to request this.

Negative culture reports will be out at 24/72 hours. Important positive cultures, eg blood cultures, will be phoned as soon as they become positive, often within 24 hours, and a written report will be out at 48/72 hours. See following Microbiology investigation charts.

Labelling Guidelines

Pathology now operates a very specific labelling criteria, which states that there must be at least 3 of the following identifiers on both the sample and form: (The department accepts samples with 3 patient identifiers, one of which must be the surname.)

- Full name (ie forename and surname)
- Date of Birth
- NHS number or Hospital ID number

High Risk Specimens

Specimens from patients suspected of having a Viral Hemorrhagic Fever are always HIGH RISK contact the Consultant Microbiologist before any specimens are collected and sent to the laboratory. The department has a specific policy for dealing with these specimens

Specimens from patients suspected as having a high risk infection must contain sufficient clinical details on the request form to convey information on the suspected hazard to the pathology staff

High risk groups include patients suspected of suffering from the following infections

HIV infection
Hepatitis B
Hepatitis C
E.coli O157
Mycobacterium tuberculosis (TB)
Salmonella typhi (Typhoid fever)
All other Hazard Group 3 and 4 organisms (Advisory Committee on Dangerous Pathogens)
Patients who have had recent foreign travel with unexplained high pyrexia
COVID testing information contact the laboratory on 5617

All samples considered high risk must be labelled as such and must not be put in the POD system.

Pneumatic Air Tube System

The following specimens MUST not be transported via the air tube system:

CSF's and respiratory specimens
Specimens from patients suspected as having a Viral Haemorrhagic Fever (VHF)
COVID samples
High risk samples
Any precious samples such as Joint Fluid's, Asitic Fluids, Peritoneal Fluid's Pericardial Fluid's or any sample that is nonrepeatable.
Any out of hours oncall urgent samples these must be hand delivered using the Portering system.

All other specimens including blood cultures can be transported via the air tube system

Microbiology Investigations

- Provisional results may be available if you contact the laboratory during working hours.
- Urgent requests or significant microscopy/ culture results etc. will be telephoned.
- Turn round times do not include the transport time from collection of sample to receipt of sample in the microbiology laboratory.

INVESTIGATION	SPECIMEN TYPE	TRANSPORT	DELIVERY TIME	REQUEST FORM	STORAGE TEMP	TURNROUND TIME TO FINAL RESULT (working days) [1]
Ascitic fluids	Aspirate	Sterile container	ASAP	Electronic order/Standard laboratory form	Room temperature	48-120 hrs
Aspirates (frank pus) [2]	Aspirate/pus	Sterile pot	ASAP	Electronic order /Standard laboratory form	4^{O} C	48-120 hrs
Bacteraemia	Venous blood	Bactec Lytic Anaerobic bottle - purple, Bactec Plus Aerobic Bottle - Blue. Bactec peds plus (paediatrics) -pink.	ASAP	Electronic order/Standard laboratory form	Room temperature	Negative Interim result 48hrs adults 36hrs paediatrics Final negative/ Positive Result 6 days
Chest infection	Sputum	Sterile 60ml pot	24 hrs	Electronic order/Standard laboratory form	4^{O} C	48 hrs-7 days
Chlamydial Infection see note below [3]	Endocervical and male Urethral/ Vaginal and eye swabs Urine Rectal swabs	Roche cobas Dual swab kit [3] Roche cobas urine collection kit	24 hrs	Electronic order/Standard laboratory form	2 to 30 ^{O} C	7 days [7]
Cystitis	Urine	Sterile 10ml container	48 hrs	Electronic order /Standard laboratory form	4^{O} C	24-72 hrs
Faeces - microscopy and culture/ parasites	Faeces	Blue container with spoon	72 hrs	Electronic order/Standard	4^{O} C	96 hrs

INVESTIGATION	SPECIMEN TYPE	TRANSPORT	DELIVERY TIME	REQUEST FORM	STORAGE TEMP	TURNROUND TIME TO FINAL RESULT (working days) [1]
				laboratory form		
Diarrhoea ?CDT	Faeces	Blue container with spoon	ASAP	Electronic order/Standard laboratory form	4^{O} C	Within 24 hrs of receipt of sample in laboratory. Testing done 7 days per week
Schistosomiasis	Terminal urine over 24hrs/ urine between 10am – 2pm	Non-boric acid urine container	24 hours	Electronic order/Standard laboratory form	Room temperature	24-48 hours
threadworm	rectal swab	Rectal saline swab	24 hours	Electronic order/Standard laboratory form	Room temperature	24-48 hours
Fungal Infection	Nail clippings/Skin scrapings/Plucked hairs	Special 'Dermapaks' available from lab also sterile universal or pot	48 hrs	Electronic order/Standard laboratory form	Room temperature	Micro up to 1 week Culture 2-3 weeks
Joint Fluids	Aspirate	Sterile container	ASAP	Electronic order/Standard laboratory form	Room temperature	48-120 hours
Opthalmic specimens	Corneal scrape, vitreous/ aqueous fluid	Sterile container	ASAP	Electronic order/Standard laboratory form	Room temperature	10 days
SARS-CoV-2	Naso-pharyngeal swab	Place swab in VTM – double bag	ASAP	Electronic order/Standard laboratory form	Room temperature	Urgent – 4 hours Routine – 24hours
Screening swabs – MRSA, CPE and VRE	MRSA – nose, susceptible sites, urine VRE/CPE – rectal swab/ faeces sample VRE only – urine can be sent but is not the preferred sample type	Bacterial transport medium for swabs Sterile 10ml container for urine sample Blue container with spoon for faeces	ASAP	Electronic/Standard laboratory form	4^{O} C	MRSA – 48hrs VRE/CPE -72 hrs

INVESTIGATION	SPECIMEN TYPE	TRANSPORT	DELIVERY TIME	REQUEST FORM	STORAGE TEMP	TURNROUND TIME TO FINAL RESULT (working days) [1]
Semen analysis Infertility	Semen	Collection pack is available from the laboratory – contains a 'how to collect' leaflet , request form and directions to laboratory and a **container with blue label** is now required which needs additional information such as length of abstinence, time of collection etc.	Within 50 minutes of ejaculation	Standard laboratory form	Keep sample container between 20C and 27C and maintain this after taking the sample during transport (Samples will only be examined : Mon-Fri 9-5 by appointment only)	1 week
Semen analysis post vasectomy	Semen	Collection pack is available from the laboratory – contains a 'how to collect' leaflet, request form and directions to laboratory and a **container with blue label** is now required which needs additional information such as length of abstinence, time of collection etc.	Within 50 minutes of ejaculation	Standard laboratory form	Keep sample container between 20C and 27C and maintain this after taking the sample during transport (Samples will only be examined : Mon-Fri 9-5 by appointment only)	1 day
Streptococcus pneumoniae Urinary antigen test Legionella urinary antigen test	Urine	Sterile 10ml urine container	ASAP	Electronic order/Standard laboratory form	Room temperature if to be tested within 24 hours otherwise store at 2-8 0C	Within 4 hrs for in patients on receipt of clinical details
Tuberculosis	Sputum x 3 EMU x 3 – contact the lab for details of collection required and for special container	Sterile pot – special large urine container	48 hrs	Electronic order/Standard laboratory form	4^{o} C	Microscopy one working day(positive smears phoned as an urgency) Culture 8 weeks Performed at the TB lab at MRI

INVESTIGATION	SPECIMEN TYPE	TRANSPORT	DELIVERY TIME	REQUEST FORM	STORAGE TEMP	TURNROUND TIME TO FINAL RESULT (working days) [1]
Vaginal discharge bacterial vaginosis, TV, yeast,	HVS	Bacterial transport medium	48 hrs	Electronic/Standard laboratory form	4º C	48-96 hrs
Vaginal discharge PID, Post-op, Post-partum (same as Chlamydia Infection sample and STD investigations)	Endocervical/Urethral swab/HVS	Bacterial transport medium	ASAP	Electronic/Standard laboratory form	4º C	48-96 hrs
Group B Streptococcus screen (GBS) [7]	LVS-Rectal specimen can be sent as one swab, collect vaginal specimen first Or two separate swabs	Bacterial transport medium	ASAP	Electronic/Standard laboratory form	4º C	72 hrs
Viral studies Vesicular fluid	Swab	Viral PCR medium	48 hrs	Virology	4º C	120 hrs [4]
Viral studies Swab from lesion	Swab	Viral PCR medium	48 hrs	Virology	4º C	120 hrs [4]
Viral studies Hepatitis	4 mls clotted blood	Ochre top bottle	72 hrs	Virology	4º C	120 hrs [4]
Viral studies HIV [5]	4 mls clotted blood	Ochre top bottle	72 hrs	Virology	4º C	120 hrs [4]
Viral studies Other serology	4 mls clotted blood	Ochre top bottle	72 hrs	Virology	4º C	120 hrs [4]
Extra Viral studies Respiratory viruses including Influenza	Plain swab	Viral PCR medium or in sterile container	48 hrs	Virology	4º C	24 hrs
Wound, Lesions, ENT, wound exudates	Specimens should be collected before antibiotics are given. Use aseptic technique. The deepest part of the wound should be sampled.	Charcoal Aimes transport media	As soon as possible	Electronic/Standard laboratory form	4º C	48-96 hrs

INVESTIGATION	SPECIMEN TYPE	TRANSPORT	DELIVERY TIME	REQUEST FORM	STORAGE TEMP	TURNROUND TIME TO FINAL RESULT (working days) [1]
						
Pus	Pus is possible should be collected into sterile CE marked container	Charcoal Aimes transport media	As soon as possible	Electronic/Standard laboratory form	4^{O} C	7 days
CSF	Cerebrospinal fluid	Sterile containers	ASAP	Electronic/Standard laboratory form	Room Temp	96 hours

[1] Should the results be required URGENTLY, please contact Microbiology on 0161 419 5616/5617. Calls and enquiries are not taken daily between 9.00 and 10.30am on extension 5616. Callers to this extension will hear contact numbers to use if your enquiry is urgent during this period. If an urgent result is required please contact the reception result line.

The request form should also provide a contact number so that information can be given to the correct department/person. This also helps when a significant positive result is found or when samples are processed out of hours.

[2] Please send as much fluid or pus as possible to the laboratory (this is always preferable to sending a swab). If needed, any pus or fluid is required in a separate universal for a gram stain.

[3] Chlamydia kits are available from pathology. Roche Cobas Collection kits. Two kits available PCR Media Urine Collection Kit and PCR Media Swabs Collection Kit See below for details on collection. Please do not send specimens in Aptima collection kits as these are not able to be tested and will be rejected

NB All Chlamydia requests are also always tested for the presence of Neisseria gonnorhoea; if there is a reason not to test for GC please contact the laboratory who will try to make alternative arrangements to refer to another laboratory.

[4] Virology samples sent to MFT for testing. Results may be available on the same day if the laboratory is pre-warned 0161 419 5616/5617. ****Please speak to consultant microbiologist for any monkeypox testing before sending a sample to the laboratory****

[5] Facilities for pre and post HIV test counselling are available (at home or in the surgery, if needed) if the doctor does not feel able to offer this him/herself. Contact Choices on 0161 426 9630

[6] NB: Swabs must be taken such that back wall of naso pharynx reached – please discuss if necessary.

[7] GBS screen swabs are collected from pregnant women at 35 -37 weeks or 3-5 weeks prior to the anticipated delivery, if they had a Group B Streptococcus positive result in a previous pregnancy – this is an enriched culture method specifically for Group B Streptococci – the result will only state whether GBS are isolated or not isolated . All positives will be telephoned to the requestor at weekends GP positive results will be telephoned to ANC or maternity triage. Maternal low vaginal and anorectal swabs. Maternal high vaginal swabs should not be collected as these have a lower sensitivity.

'Swab' should be clarified as swab placed in viral transport media to avoid confusion with charcoal swabs which are stated as such.

Blood Culture - Specimen collection

Prior to use, the user should examine the vials for evidence of damage or deterioration. Vials that are cracked or leaking, or display turbidity, contamination, or discoloration (darkening) should not be used. The specimen must be collected using aseptic techniques and the recommended volume of blood is 8-10ml. The inoculated BD BACTEC vial should be transported to the laboratory as quickly as possible. Blood culture samples MUST include clinical details and that the following clinical details are associated with high risk samples and must be stated on the request form:

Anthrax?
Tannery, vet or abattoir worker
IV Drug Abuser
Foreign Travel
Eschars or black dry sores
PUO
Brucellosis,
Undulent fever?
Mediterranean fever?
Farm worker
Vetinary worker
Abattoir worker
Consumption of untreated milk /cheese
PUO
Glanders disease?
Melloidosis?
Travel to South East Asia e.g Thailand and Vietnam
Association with horses /donkeys
Rice Farmer
PUO or sudden onset of sepsis
Tularaemia?

Foreign travel to N.America or Russia
Tick or animal exposure in these regions

TB?
AFB?
Psoas abscess?
Cold abscess?
Spinal/brain infection?
Discitis
Night sweats
Bloodstained sputum
Cough lasting longer than 2 weeks
Unexplained weight loss.

Enteric Fever?
Typhoid?
Typhus?
Foreign travel, notably Pakistan, India, Bangladesh
Headache and
sustained fever (39°C to 40°C)
rash of flat, rose-coloured spots
Sepsis?
Dysentery?
Shigelosis?

Fungal Infections

Send skin scrapings/nail clippings/plucked hairs in special 'Dermapak' sachets available from the lab or a sterile universal container. For diagnosis of systemic fungal infections – please discuss with the Microbiologist.

Positive results will usually be available in seven days, negative results in about 10 days.

Genital Tract Infections

Simple vaginal discharge	Send HVS (for T.vaginalis/yeast/bacterial vaginosis) in a charcoal transport medium
?GC Infection	Send endocervical and/or urethral pharyngeal, rectal swabs as appropriate to lab ASAP
?Chlamydia Infection/? GC infection	Send endocervical/urethral swabs/urine sample in the special kits for Chlamydia/GC PCR. Use the Roche PCR urine or media collection kits, supplies are available from pathology. NB: RUClear collection kits are also Roche cobas system and must be ordered from MRI and forms from the RUClear office.
?Pelvic Inflammatory Disease	Send HVS, endocervical and urethral swabs for bacterial culture PLUS endocervical and/or urethral swab and/or urine/vaginal swabs for Chlamydia detection.
?HIV	See Viral studies in table above.

Obviously the assistance of the Genito-urinary Physician may be useful here, especially for tracing and treating contacts of patients found positive.

TB infection

This infection must not be forgotten, especially in patients with troublesome chest infections who are not getting better. Send sputa x 3 (NB must be good quality) and state clearly on the form ?TB. (NB sputa are <u>not</u> automatically screened for TB – you need to request this clearly on the form).

If non-pulmonary TB is a possibility please discuss with the Consultant Microbiologist and send three early morning specimens of urine and state clearly on the form ?TB. Other specimens, ie pleural fluid/CSF, may be sent if warranted. State clearly on the form ?TB and discuss with the Microbiologist. NB the Mantoux test may be useful in some of these patients, please discuss with the Chest Physician and/or Respiratory Nurse Specialist (419 5062).

Urgent ZN slides can be requested but will be performed by the TB lab at MRI. Urgent ZN requests are only performed Monday-Friday.
Positive cultures will be phoned as they come up. Written negative reports are sent out in 8 weeks.

Viral Infections

Use special virology forms. For virology forms for GPs who don't have access to intranet/ TQUEST you can down load from the internet using
http://intranet.stockport.nhs.uk/Business/Intranet/Documents/default.aspx?tl=null&v=virology

Please ensure comprehensive clinical information is detailed on the request form especially date of onset of illness, contact with illness and date of contact, recent travel, and recent antiviral/antibiotic medication. If you are unsure how to fill in the request form advice may be sought from the microbiology laboratory. Alternatively give comprehensive details of symptoms or the clinical problem on the form and request the laboratory to test as felt appropriate by themselves.

Respiratory illness	NPA, throat swab and nose swab
Vesicular rash	Vesicular fluid or lesion swab and paired sera
?Measles/?Mumps	Throat swab/urine/serum
?Glandular fever	Throat swab and urine. (+ FBC for Monospot test, Haematology)
PUO/viral meningitis	Throat swab, urine, faeces and paired sera. For viral meningitis an EDTA blood or CSF may be tested by PCR
Gastro-enteritis	Faeces
Hepatitis	4 mls clotted blood (ochre)
HIV	4 mls clotted blood (ochre)

Faeces	Blue faeces container (not rectal swab)
Urine	An early morning specimen in an ordinary universal container
NPA	Naso-pharyngeal aspirate in a vacuum trap, send to the lab ASAP.

All swabs for Virology investigations must be sent in viral transport media NOT charcoal transport media. Please contact the department if viral transport media is required.

The Virology Department at Manchester University Foundation Trust offer a repertoire of rapid detection tests, which may be undertaken by PCR on EDTA blood (lavender top) .Please discuss with Consultant Microbiologist if advice is required on test selection

Test
Adenovirus PCR
Bk/JC PCR
CMV Viral load
Hepatitis B Viral load
Hepatitis B resistance type
Hepatitis C Viral Load
Hepatitis C genotype
Hepatitis D Delta PCR
HIV RNA viral load
Measles virus PCR
Parvovirus B19 PCR
Respiratory virus PCR
VZV PCR
Toxoplasma PCR
Meningococcal/Pneumococcal PCR

Acanthamoeba

Acanthamoeba from ocular specimens (corneal scrape and contact lens cases/ fluids). a sterile universal is to be added to each corneal scrape kit issue. If the sample is a corneal scrape then a needle or scalpel blade is used to take the sample and inoculate the routine culture plates /Gram stain slide. If Acanthameoba investigations are required then a second scalpel or needle is used to take a further scrape and this is placed in the universal (labelled). The sample will need to be returned to Microbiology promptly within normal hours where the needle will be washed and the fluid referred to the reference lab (London School of Hygiene and Tropical Medicine) for culture and PCR for Acanthamoeba. Turnaround time of 7 days**.**

Chlamydia trachomatis /Neisseria gonorrhoeae NAAT Collection Information

Specimens should be collected and handled following the recommended guidelines on the collection packs:

Male and female urine specimens
Male and female urines must be collected in a sterile container and transferred to the cobas® PCR media tube within 24 hours of collection. After transfer, specimens can then be stored at 2-30^{0}C for up to 3 months prior to testing.
Urine specimens must fill the cobas® PCR media tube between the 2 black urine fill lines (shown below). If the amount of urine is above or below these lines the specimen will not be tested by the laboratory

Urine specimen with 2 black urine fill lines

Vaginal, throat and anorectal specimens
Only the larger woven polyester swab (shown below) included in the cobas® PCR Dual Swab Collection Kit should be used to collect vaginal, rectal and throat specimens. Specimens may be stored in cobas® PCR media at 2-30^{0}C for up to 3 months**.**

Woven polyester swab used to collect vaginal, throat and anorectal specimens

Endocervical specimens

The larger woven polyester swab (shown above) included in the cobas® PCR Dual Swab Collection Kit should be used first to remove any cervical secretions followed by the smaller flocked swab (shown below) to collect the endocervical specimen Discard the larger woven swab after cleaning DO NOT put both swabs into the collection tube

Flocked swab used to collect endocervical specimens

MRSA

The standard screen for MRSA investigations is a nose swab plus any other susceptible sites where the skin's integrity has been breached such as pressure sores, catheter sites etc. Negative results will be available after 48 hours with positive results available after 72 hours.

Advice and details of referral laboratories on other less frequently performed Microbiology tests can be obtained from the Microbiology Department on 0161 419 5616/5617

'How to' leaflets are available on these and many other procedures are available on the Intranet.eg Blood Culture collection. Visit www.Stockport.nhs.uk and go to **Pathology** and follow the hyperlink to **Infection prevention** and the 'how to' leaflets. These are also available on the web site https://labmedservices.stockport.nhs.uk

CPE screens

Please follow the IP protocol for risk assessing patients that require screening.
A rectal swab or faecal sample is required and please request 'CPE screen' when ordering electronically.
Remember: Specimens before antibiotics … and … 'urgent' is a spoken word!

Joint Fluids for Microbiology

Test	**Reason**	**Sample Required**
Routine Culture	Pre injection of steroids	Sterile pot

Remember – joint fluids will only be processed out of hours if septic arthritis is thought to be a **real** possibility, ie not 'just in case' or 'routine'. The on call Microbiology BMS should be contacted via switchboard

Sputum for Microbiology (including TB microscopy and culture)

An early morning specimen on three consecutive days (not three specimens all taken on the same day IF ?TB) obtained by a deep cough, before eating, drinking or cleaning the teeth is required.

The patient must be instructed to provide sputum and not saliva or nasal secretion. The sputum should be placed in a dry container, securely capped, which should reach the laboratory before mid-day.

Urines for Microbiology

Older children –

Collect a midstream sample by getting the child to start passing urine into the toilet, get them to stop and catch the next bit into any clean single use container, e.g. foil baking tray, Verna care – it doesn't need to be 'sterile'. Get them to finish passing urine and decant the sample into a urine container. Try not to touch top of bottle.

Younger children –

For a tiny baby – leave its nappy off whilst feeding, hold baby over clean container (as above) for a CLEAN CATCH urine sample.

If younger child is potty trained – place a clean container inside potty and obtain a 'clean' sample and transfer to urine container.

Pad Urines have replaced nappy urines for young babies and toddlers not yet potty trained. Pads are available through NHS Hospital supplies or from SHH pathology reception along with instructions for their use.

Send urine samples to lab ASAP – refrigerate overnight if unavoidable and mark the form 'pad' or 'clean catch' as appropriate.

Urinary Schistosomiasis

In urinary schistosomiasis, very few ova are present in the urine. The number of ova in the urine varies throughout the day, being highest in urine obtained between 10am and 2pm. In patients with haematuria, eggs may be found trapped in the blood and mucus in the terminal portion of the urine specimen. It is therefore preferable to obtain total urine collected over the time period between 10am and 2pm. Alternatively, a 24hr collection of terminal samples of urine may be helpful. Sterile containers without boric acid must be used.

Ideally, a minimum volume of 10mL is required.

CELLULAR PATHOLOGY

HTA approved
The Cellular Pathology Department has been approved UKAS accredited medical laboratory No. 9593

The laboratory has been assessed by UKAS (United Kingdom Accreditation Service) to ISO 15189:2012. The schedules of accredited tests can be found on the UKAS website www.ukas.com

Most histology specimens are processed within the department at Stepping Hill with the exception of ophthalmic specimens.

The Histology department is open from 08:00 to 17:20 Monday to Friday.

Reporting is carried out by the following Consultant Pathologists:

Consultant Pathologist	**Contact Number**
Dr Shailesh Agrawal	0161 419 4963
Dr Richard Hale	0161 419 5615
Dr Umi Hatimy	0161 419 5607
Dr Preethi Joseph	0161 419 5605
Dr Rajagopal Saravana	0161 419 4495
Dr Gavin Udall	0161 419 4809
Dr Mugtaba Dafalla	0161 419 5600
Dr Yen Low	0161 419 4459
Dr Raveen Koghar	0161 419 4809
Dr Laxmi Radhakrishnan	0161 419 5600

We provide a high quality, comprehensive histology service to G.P`s and Hospital Departments, from routine testing and frozen sections to immunohistochemistry and special stains.

The department operates to national standards and is fully HTA approved and awaiting ISO recommendation. To ensure the quality of our work we are involved in the UKNEQAS external quality control schemes for Cellular Pathology Technique (routine H/E staining and special stains) and Immunohistochemistry as well as the HTEQA QRS quality reporting scheme for quality of tissue fixation/processing. The department also participates in an inter-laboratory comparison scheme.

Histology reports will not only provide distinction between benign, malignant and inflammatory conditions, but they can identify individual tumour cells, their origin and in some cases prognostic features which enable the most effective type of treatment to be offered.

CELLULAR PATHOLOGY - HISTOLOGY

HTA approved
ISO15189:2012 accredited

Using the Service

Preparing a Histology Specimen:

All samples for Histological assessment must be fixed in formalin immediately following removal.

For GP`s: Pre-filled specimen containers are supplied by the trust and delivered by trust drivers. For Theatres: Pre-filled specimen pots and larger empty buckets are available either from the cellular pathology department or delivered via porters on the theatre trolley.

It is essential that the correct request form is used and completed clearly and in its entirety. Unacceptable specimens will be delayed.

See the trust`s *Specimen Acceptance Guidelines* for more detailed information.

Getting the Specimen to the Lab:

As formalin is a hazardous substance (Safety Data Sheet), care must be taken during transport of specimens.

**For GP`s**: Transport is usually via trust drivers. Most GP`s will have one or maybe two pick-ups per day. Expected times for pick-ups can be obtained from Pathology Reception (0161) 419 5626.

For Theatres: Via theatre trolley or porters.

See the trust`s *Specimen Transport Policy* for more detailed information.

Factors known to affect performance of the examination or interpretation of the results:

Histology Samples		
Factor	**Cause**	**Solution**
Delay in placing the specimen in formalin	Deterioration of cells leading to difficulty interpreting cellular changes and impact on any subsequent immunohistochemistry and a possible impact on diagnosis	Place specimens in formalin as soon as possible
Inadequate volume of formalin to fix the specimen		Ensure the volume of formalin is enough to cover the specimen adequately
Delay transporting the specimen to pathology		Ensure the specimen is promptly transported to Pathology
Refrigerating specimens		Ensure the specimens are stored at room temperature

Histology Investigations:

Test	Samples Required	Biological Reference Range	Special Precautions: Interfering Factors and Limitations
Routine Histopathology Examination	Tissue in 10% formalin	N/A	60ml pre filled containers for use in clinics, GP's and theatres, available on request from Pathology. For larger specimens bigger containers can be requested from Pathology, or theatres. The container must be large enough to fix the specimen adequately.
Frozen Sections	Send sample unfixed in a fully labelled dry container	N/A	**Note- If the patient is Danger of Infection- this procedure is inappropriate.** Frozen sections are not available outside the normal working hours. Please arrange with the laboratory in advance of a frozen section being taken, to ensure there are staff available. If the frozen section is cancelled or delayed please inform Cellular Pathology immediately.
Foetus/Placenta/POC	Tissue in 10% formalin	N/A	All Foetus and POC samples must be accompanied by a consent/refusal form to Histological examination and a cremation form.

Receiving Reports:

Generally the results of a routine biopsy will be available after seven days. Diagnostically difficult cases may take considerably longer, although a provisional report is available from the Pathologist in these cases.

Specimens requiring a second opinion or further tests are commonly sent to pathology labs including The Leeds Teaching Hospitals (esp. HMDS - Haematological Malignancy Diagnostic Service) University Hospitals of South Manchester (esp. Her-2 reporting on breast cases), MRI (esp. Corneal Biopsies), The Christie Hospital (esp. ALK/ROS1 tests), Salford Royal Hospital, Source Bioscience (Gastric Her-2), St. Marys Hospital (for genetic tests)

Clinical advice may be sought from either the laboratory staff or the pathologists/registrars. Specialties can be found on the meet the team page and relevant contact numbers on the contacts page.

**For GP`s**: Results are transmitted electronically and delivered via the GP Link. Paper copies are still sent to some GP`s where this service is unavailable.

For Trust Users: Results are transmitted electronically and delivered via Ward Link.

All users can contact the department in cases where reports are required that are not available electronically. Turn round time is about 10 days.

CELLULAR PATHOLOGY - CYTOLOGY

HTA approved
ISO15189:2012 accredited

The Cytology department offers high quality non-gynae cytology services to GP practices and the SHH site. The department participates in a accredited External Quality Assurance schemes for non-gynae cytology. All gynae cytology samples for Stockport and Manchester are now dealt with directly by Central Manchester University Trust.

Non Gynae Cytology : Using the Service

All Non Gynae Cytology samples are processed between the hours of 08:00 and 15:30 Monday to Friday.

Cytology Sample Collection:

It is important to transport the samples quickly and safely to the laboratory. Pathology has a transport policy available.

Golden rules include:

Ensure there is adequate volume of specimen for the test.
The specimen is in the correct container with the lid tightened.
The specimen is accompanied with the correct request form labelled CYTOLOGY.
Check the labelled demographics on the specimen pot match the request form (see the Trust's Specimen Acceptance Policy).
Prepared slides are labelled with HB pencil showing full name and unit number/date of birth. Label prepared slide "AD" for air dried or "F" for spray fixed slides.
The glass slides are transported to pathology in a white plastic slide carrier.
The sample is put into a sealable biohazard bag section and the request form in the front clear pocket.

Factors known to affect performance of the examination or interpretation of the results:

Cytology Samples		
Factor	**Cause**	**Solution**
Delay transporting the specimen to the laboratory Delay in placing the specimen in formalin	Deterioration of cells leading to difficulty interpreting cellular changes and impact on any subsequent immunohistochemistry and a possible impact on diagnosis	Ensure the specimen is promptly transported to Pathology
Unfixed samples stored at room temperature		Ensure unfixed specimens are stored in a refrigerator

How Much and Which Sample Container Do I Use?

Serous Fluids: 25 ml pleural, ascitic, pericardial and peritoneal washings put into a plain plastic universal bottle. If there is a delay in delivery to pathology the sample may be kept in a fridge at 4°C.

Joint Fluids: Joint fluids for crystal examination should not be shared with Microbiology; we like the sample in paediatric lithium heparin bottles without any beads in the bottom.
?Septic/?Gout (If ?gout / pseudogout please state on form 'crystal analysis required' and send separate form and sample to any microbiology also required.

All Cyst: Urine and Hydrocele Fluids. Ovarian Cyst Fluids, CSF:
Put into plain 25ml universal bottles. Voided urines are best mid-morning and at least 25ml is required. Industrial urine collection pots are available from the Cytology department.

Sputum: Put into clear flat bottom pots with screw topped lids. An early morning sample is best before taking breakfast.

Bronchial: Washings Samples are received in the trap they were collected into at the clinic. Ensure the lids are screwed on tight and the tubes seal closed. Place the traps firmly in the inserts within the dedicated plastic transport box. Cytology shares the sample with Microbiology and all request forms are sent together. Bronchial biopsies with cytology are received in Cytology initially for correlation.

Bronchial Brushings and Bile Duct Brushings: The laboratory provides 25ml universal bottles containing 5ml of CytoLyt® transport medium. The bottle carries a COSHH hazard warning label as it contains methanol. Thoroughly rinse the brushes into the clear CytoLyt® fluid. Do not send the brushes as they are sharps.
CSF: Put into a plain 25ml universal container and transport to the laboratory to be prepared immediately as the cells degenerate rapidly. Contact the laboratory to inform the sample is on its way.

Breast FNA Samples: The laboratory provides 25ml universal bottles containing 5ml of CytoLyt® transport medium. The bottle carries a COSHH hazard warning label as it contains methanol. Thoroughly rinse the brushes into the clear CytoLyt® fluid.

FNA of Neck, Salivary Glands and Thyroid: A kit is provided by the laboratory consisting of glass slides for one direct `air` dried slide and one direct spread `wet` fixed slide. Also in the kit is the spray fixative Cytofixx® for the wet fixed slide, transport boxes and 25ml universal bottles containing transport medium CytoLyt® in which the residual material in the needle is rinsed. A standard operation procedure for performing the FNA is available with the kit. Aim to provide an even monolayer of spread material on the slides.

Getting the Specimen to the Lab:

**For GP`s:** Transport is usually via trust drivers. Most GP`s will have one or maybe two pick-ups per day. Expected times for pick-ups can be obtained from Pathology Reception (0161) 419 5626.

For Clinics: Hospital porters will deliver clinic samples to pathology.

See the trust`s Specimen Transport Policy for more detailed information.

Receiving Reports:

Trust Users - The electronic results will be transmitted and available for view on the Ward Link.

For GP's - also have GP Link where they can view results.

Paper copies are sent daily to the originator of the request or consultant secretaries for all Cytology tests for inclusion in patient notes.

CELLULAR PATHOLOGY - THE MORTUARY

HTA approved
ISO15189:2012 accredited

The Mortuary at Stepping Hill Hospital has the capacity to hold 124 bodies. Approximately 2500 deceased patients pass through the mortuary per year; around 750 of these will require a Coroner's Post Mortem. Although the mortuary accommodates mainly hospital deceased patients, a number of bodies are received from the Stockport community.
We have a small team consisting of an Anatomical Pathology Technician Team Leader and 2 Anatomical Pathology Technicians. Our Post Mortem service is now carried out by Tameside Acute Hospitals NHS Trust.
The Bereavement Services Team work under the management of the Cellular Pathology within Clinical Support Services Divisional Group.
We run a 24 hour on-call system to ensure that a qualified APT is always available whenever the department is closed. This service is mainly to receive bodies from the community, however also to accommodate bereaved relatives for viewings from both the community and hospital, only if this is not feasible during working hours, as well as assisting the police for formal identifications.
Further information regarding the bereavement services can be found http://intranet.stockport.nhs.uk/business/intranet/microsites/ViewSite.aspx?siteid=285

The Mortuary is open between:
Monday – Friday 08:00 – 16:30

Contact numbers;

Office Hours **0161 419 5222**
Out of hours (via switchboard) **0161 483 1010**

(Please ask switchboard to put you through to the on-call Mortuary Technician)

Mortuary : Other Information

- Stepping Hill`s Hospital Bereavement Service can be contacted on (0161) 419 5034.
- Links:
- The Association of Anatomical Pathology Technology (AAPT) is the recognised professional body for anatomical pathology technologists employed in hospital and public mortuaries across the United Kingdom.

Further information regarding Coroner`s can be found at Stockport MBC.

Appendix A – Vacuette Selection Chart

VACUETTE® SELECTION CHART

NHS Stockport NHS Foundation Trust

Blood Cultures should be taken first (aerobic followed by anaerobic)

Then fill tubes in the following order

	Item Number	Volume	Cap Colour	Cap Ring Colour	Tube Type	Tests	Special Instructions
1st	454327	3.5ml	Blue	Black	Trisodium Citrate	PT, INR, APTT, Fibrinogen, D Dimer, Thrombophilia Screens (x4) Plus 1 Ochre Lupus Screens (x2) Plus 1 Ochre	Must be filled to the line
2nd	456018	5ml	Ochre	Ochre	Clotting Accelerator and Separation Gel	Routine Chemistry, Hormones, Drugs, Viral Studies (Micro), B12, Folate, Ferritin, Copper, Zinc	
3rd	454084	4ml	Green	Black	Li Heparin Gel	Plasma U&E, Ketones, Cytogentics	
4th	454086	3ml	Lavender	Black	EDTA	FBC, IM, Hb Variants, Sickle Cell, Reticulocytes, Malarial Parasites, PTH, Lead, BNP, TPMT, Renin, Aldosterone, Metadrenalin, Chromium, Cobalt, ACTH	
5th	454022	3ml	Red	Black	EDTA	HbA1C	
6th	454085	2ml	Grey	White	NaF/ EDTA	Glucose, Alcohol, Lactate	
7th	729093	1.6ml	Black	Black	Trisodium Citrate for ESR	ESR	Tube should only half fill
8th	456061	6ml	Pink	White	EDTA for Cross-match	Blood Group, Antibody Screen, Cross-match	One sample for all
9th	456080	6ml	Royal Blue	Black	Sodium Heparin Trace Elements	Some rare trace metals	

Recommended order of draw for routine coagulation - if no blood culture is required, then: Coagulation, Serum, Heparin, EDTA, Glucose, followed by all the other tubes with additives. For speciality coagulation testing, if no blood culture is required please use a discard tube prior to the above order of draw. These are guidelines only. Always follow your facility's protocol.

HOW TO STORE SAMPLES

Samples from Primary Care:

Ideally all samples should reach the lab promptly and ideal timings do depend on each test.
The laboratory is accessible 24/7 please use routine transport but additional drops can be made directly to the lab.
For urgent or non-routine samples please contact the appropriate laboratory.
The person asking for the test is responsible for following it up in a timely fashion.
Please double check all samples and forms are appropriately labelled with all details completed.

Blood Sciences

Common tests which CANNOT be left overnight include Potassium, FBC, AP, APPT, ESR, B12/Folate, NT-pBNP, ALT, AST, LDH, Phosphate and PTH.
It is bad for most tests not to be received the same day as any sample deterioration with time will cause increasing interference. It is also bad for turnaround time.

Microbiology

Sample type	Storage requirements
Urines, swabs, faeces, sputum, TB	Overnight at 4ºC
Chlamydia – in multicollect transport tube	2-30ºC for up to 14 days
Semen samples for infertility – use collection kits which includes instructions. Semen samples for post - vasectomy	By appointment only: received within 1 hour of collection between 8.30-11.30am. Must be received in lab within 3 hours of collection
Microbiology and Virology Bloods	Overnight only at 4ºC

Cytology - Serous Fluids

Any samples such as sputum, pus, cyst fluid or discharges for **non-gynae** cytology examination should be put into a plain universal bottle. If delayed getting to the lab, keep at 4°C.

Histology

Following fixation in 10% neutral buffered formalin, histology specimens can be stored indefinitely although prolonged fixation may hamper further investigations. Fixed specimens do not require refrigeration.
If 10% neutral buffered formalin is not available the specimen may be placed in normal saline and stored in a fridge until transport is available, if saline is not available the specimen can be stored dry in the fridge. If the specimen is placed in saline this should be stated clearly on the request form.

Any delay in formalin fixation will cause deterioration of the specimen so transport at the earliest opportunity is vital.

USEFUL TELEPHONE NUMBERS

For direct lines please dial 0161 419 followed by the appropriate number.

GENERAL		
Pathology Operational Lead	Mr Mark Gordon	11 4676
Pathology Quality Manager	Ms Lynne Wareing	11 5610
IT Manager	Mr Richard Smethurst	11 4901
Deputy IT Manager	Mr Adam King	11 4986
Pathology Projects Manager	Mrs Margaret Drury	
Results Line / General Enquiries – Reception		5626 / 4675
BLOOD SCIENCE (Biochem/Haematology)		
Consultant Clinical Biochemist	Dr Sharman Harris	11 3679
Consultant Clinical Biochemist / Clinical Lead	Mr Steven McCann	11 3677
Consultant Haematologist	Dr Montaser Haj	11 7721
Consultant Haematologist / Clinical Lead	Dr Sayee Chirputkar	11 7722
Consultant Haematologist	Dr Srivasavi Dukka	11 7723
Technical Head of Biochemistry	Mr Parmesher Singh	5630
Technical Head of Haematology / Blood Bank Manager	Ms Raisa Zaman	4478
Senior Biochemist	Dr Rosemary Earnshaw	11 3676
Blood Transfusion Practitioner	Mr Brendan Devine	5708
Point of Care Co-ordinator	Ms Shahina Begum	5628
Biochemistry - clinical enquiries		4919
Biochemistry - technical enquiries		4048
Haematology Laboratory - enquiries		5614
Blood Transfusion Laboratory - enquiries		5612
Anticoagulation enquiries		5624
CELLULAR PATHOLOGY		
Consultant Histopathologist / Clinical Lead of Dept.	Dr Shailesh Agrawal	11 3651
Consultant Histopathologist	vacant	11 3650
Consultant Histopathologist	Dr Umi Hatimy	11 3656
Consultant Histopathologist	Dr Preethi Joseph	11 3657
Consultant Histopathologist	Dr Rajagopal Saravana	11 3655
Consultant Histopathologist	Dr Gavin Udall	11 3654
Consultant Histopathologist	Dr Mugtaba Dafalla	11 3652
Consultant Histopathologist	Dr Yen Low	11 3658
Consultant Histopathologist	Dr Raveen Koghar	11 3653
Consultant Histopathologist	Dr Laxmi Radhakrishnan	11 3659
Technical Head of Department	Ms Rachel Rank	5623
Histology Laboratory – enquiries		5223
Cytology Technical Enquiries		4674
Cellular Pathology General Enquiries		4358
Mortuary		5222
Coroners Liaison Officer	Mrs Rita Wilkinson	0161 856 9677
MICROBIOLOGY		
Consultant Microbiologist	Dr Dominic Scarr	5603
Consultant Microbiologist	vacant	4489
Consultant Microbiologist / Clinical Lead	Dr Barzo Faris	4673
Consultant Microbiologist	Dr Sajjad Mirza	4987
Microbiology Clinical Advice (out of hours call switch)		11 4695
Technical Head of Microbiology	Mrs Sadie Macmaster	5601
Microbiology Laboratory - enquiries		5617 / 4476
Virology Results (MRI)		0161 276 8854