

Haematology & Blood Transfusion User Handbook University Hospitals Bristol



Please note this User guide is intended for Hospital and all other users. Links contained within may only function within the Trust intranet, if unavailable and copies are required, please contact the Laboratory

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General Information

Location

The Haematology and Blood Transfusion laboratory is located at Level 8 Queens Building Marlborough Street, Bristol BS2 8HW. Samples are sent from the main hospital to specimen reception via the 'Pod' system or via porters lodge. Further information for sample transport is available on the Trust webpage [Transport of Specimens](#).

MAIN SWITCHBOARD: 0117 923 0000

Contact Numbers and Working Hours

Key Contacts		
Clinical Lead	Dr Andrew Stewart	Andrew.Stewart@nhs.net
Head of Service	Elizabeth Worsam	Elizabeth.Worsam@UHBW.nhs.uk 0117 342 2575 Mon-Fri 09:00-17:30
Deputy Head of Service	Mark Nicholas	Mark.Nicholas@UHBW.nhs.uk 0117 342 2595
Training Officer	Donna Connolly	Donna.Connolly@UHBW.nhs.uk
Quality Manager	Natalia Casey	Natalia.Casey@UHBW.nhs.uk
Routine Haematology & Coagulation		
Reception/helpdesk	0117 342 3080	Monday-Friday 09:00-17:30
Haematology Routine	0117 342 2708	Monday-Friday 08:00-20:00
Coagulation Routine	0117 342 2598	Monday-Friday 08:00-20:00
Haematology Lead	Alex MacPhie	0117 342 2708
Coagulation Lead (Specialised Coagulation)	Chris Doherty	0117 342 2598
Blood Transfusion		
Blood Transfusion Laboratory	0117 342 2579 or 0117 342 2529	Monday-Friday 08:00-20:00
Blood Transfusion Lead	Steve White	0117 342 2579
Blood Transfusion Practitioner	Soo Cooke	0117 342 7709 Bleep 3572
Blood Bank Consultant	Dr Tom Latham	Contact via switchboard
Specialist Registrars (09:00-17:00 Monday-Friday)		
Haematology Laboratory SpR	Bleep 2445	
Haemostasis Laboratory SpR	Bleep 2677	
On-call Haematology Registrar (Outside of routine hours)	Contact via switchboard	

Out-of-Hours Service (after hours Monday-Friday, Saturday/Sunday & Bank holidays)

The Haematology Laboratory provides a 7 day/24hr restricted service outside of routine hours. A Biomedical scientist can be contacted via the relevant Routine Haematology, Routine Coagulation and Blood Transfusion Laboratory extension number until 20:00 Mon-Friday (see above). Outside of these times (20:00-08:00 Mon-Fri, all day Saturday/Sunday) the BMS must be contacted via the extension 0117 342 2579 or 22579 if within the hospital.

The following services are available out of routine working hours:

- Full Blood Count (FBC), Erythrocyte Sedimentation Rate (ESR), urgent Blood film examination, including malaria screen.
- Clotting screen (PT/APTT), Fibrinogen, D-Dimers, Anti-Xa levels, Thrombin clotting times. Factor assays and Antithrombin 3 are available but require authorisation from as a minimum, Haematology SpR.
- Group and Antibody Screen (Urgent) and Crossmatch.
- Urgent Pre-op sickle screening.

Contact the laboratory on ext 22579 to discuss any urgent requests for any services that are not usually available outside of routine working hours.

Clinical advice

During routine working hours (Monday-Friday 09:00-17:00), please contact the relevant Specialist registrar via the bleep system. For clinical advice outside of these hours contact the Haematology Registrar via switchboard.

MAJOR HAEMORRHAGE PROCEDURE

The major haemorrhage procedure is designed to provide blood products in the minimum time to the site of a major haemorrhage.

Major haemorrhage is considered as any situation where immediate delivery of blood is required for a patient with rapid blood loss. All clinical and laboratory staff can activate the procedure if immediate emergency delivery of blood is deemed necessary.

The procedure is activated with one phone call. Calls will be recorded as routine.

1. Call 2222 "I would like to trigger the major haemorrhage procedure in location x extension xxxx".
2. Switchboard will trigger the major haemorrhage protocol via speech bleep.
3. Transfusion laboratory will call you back on the extension provided. Provide patient identification details (name, trust ID, age, weight (if child), if anything other than red cells are required, clinicians name).

For further information refer to the Trust Major Haemorrhage Procedure, link underneath.

<http://www.avon.nhs.uk/dms/download.aspx?did=13398>

Completion of the Request form

Please use the appropriate request form for the tests required.

Form and sample labelling criteria

Unlabelled or Inadequately labelled Request Forms

Where an unlabelled or inadequately labelled request form is received with a labelled specimen, the patient information may be taken from the specimen and written on the request form. The location of the patient should be identified and contacted in order to ascertain the test(s) required and any additional information necessary for completion.

Unlabelled or Inadequately Labelled Specimens

LABORATORY STAFF MUST NOT ALTER OR COMPLETE SPECIMEN LABELLING

These specimens will be booked in as per the accompanying request form. The unlabelled or inadequately labelled specimen **MUST** be rejected. The rejected specimen cannot be returned to the person who took the specimen under any circumstances.

Request Form and Specimen Labelling Incompatibility

Where the request form and specimen are labelled differently the requesting clinician or ward will be informed and a repeat specimen requested. The specimen and request form **MUST** be discarded.

Specimen and form labelling criteria for Haematology and Clinical Biochemistry (except Blood Transfusion specimens and requests see below). For [examples of request forms](#), click on the link

Essential information for specimen	Desirable information for specimen
Surname	
First name or Initial	Signature of the person labelling the tube
Date of birth or patient Identification (hospital, NHS, accident and emergency or major incident number)	Specimen collection date

Essential specimen information from unconscious patient

Identified as unconscious (name unknown)
Gender
Unique hospital registration number

Desirable specimen information from unconscious patient

Signature of the person labelling the tube
Specimen collection date

Essential information for request form

Surname
First name
Date of birth or Patient Identification (hospital, NHS, accident and emergency or major incident number)
Gender
Patient's location and destination for report
Patient's consultant, GP or name of requesting practitioner
Investigation(s) required
Date and time specimen collected

Desirable information for request form

Clinical information including relevant medication
Patient's address including postcode.
Practitioner's contact number (extension or bleep number)

Completion of the Request Form (Blood Transfusion)

Confirmation of ABO blood group with a previous sample is required before issue of group-specific red cells. A second sample will therefore be required for first time patients with no historical blood group on the transfusion laboratory information system.

If red cells are requested for a patient who has no historical transfusion record, the requester will be asked to send a second sample to check ABO blood group. The report on ICE will state "This is the first grouping record for this patient. Group O red cells will be available in an emergency situation".

Group O red cells will be provided until a second sample has been received.

(a) Venepuncture:

- (i) Positive identification of the patient must be made prior to venepuncture.
- (ii) Samples should be taken and labelled from one patient at a time to minimise the risk of mislabelling.

(b) Sample Labelling:

- (i) After taking the sample, the tube must be labelled immediately by the person who has taken the sample, next to the patient.
- (ii) Sample tubes must not be pre-labelled.

- (iii) Patient demographic labels must not be used for sample labelling as these are more likely to result in inadequate patient identification.
- (iv) The label of sample tubes must be hand-written with the following minimum patient identification:

- (A) Surname.
- (B) First name.
- (C) Date of birth.
- (D) Patient identification number – Hospital or NHS number.
- (E) Signature of person taking the sample.

(v) In addition the tube label should also include:
(A) Date & time the sample was collected.

(vi) Samples from unconscious patients must be identified as such and the following details must be written on the tube:

- (A) Gender.
- (B) Patient registration number - Hospital or NHS number.
- (C) Signature of the person taking the sample.

(vii) In addition the tube label should also include:
(A) Date & time the sample was collected.

(c) If inadequately completed request forms, inadequately labelled samples and discrepancies between the information provided on the request form and sample are received:

(i) The hospital blood transfusion laboratory will contact the person who has taken the sample and explain the nature of the discrepancy or inadequacy. The laboratory staff will not process samples or requests that do not comply with Trust policy.

(ii) If one or more of the patient identifiers are not provided on the sample in a life-threatening situation, group O blood will be issued until a correctly labelled sample is provided. If the patient is a female under 51 years of age, O RhD & K negative blood should be issued.

(d) Blood Transfusion Laboratory patient records:

(i) Duplicate patient records must be avoided in the hospital blood transfusion laboratory otherwise essential transfusion requirements may be overlooked.

(ii) The hospital blood transfusion laboratory must verify the patient's ABO and RhD group against previous records for the patient and any discrepancy should be resolved before blood or blood components are issued.

For full guidance see the Blood and Blood Component Transfusion Policy, link below.

<http://www.avon.nhs.uk/dms/download.aspx?did=23321>

Making a complaint to the Laboratory

While we endeavour to provide a quality service we may not always meet your expectations. If you have any concerns please contact the relevant section leads for the individual departments, clinical lead for laboratory medicine or head of service. If your concerns cannot be resolved, issues can be escalated via the patients' complaints and support team on 0117 342 3604 or email pals@UHBW.nhs.uk. Alternatively DATIX incidents can be instigated on the Trust intranet.

Protection of Personal Information

Laboratory medicine conforms to the current trust information governance standards. Our computer systems are appropriately managed to secure data and our paper records are secure and disposed of appropriately. If you would like any further information please contact the head of service Liz Worsam.

Sample Transport to the Laboratory




Refer to the Policy located on the Trust website/intranet "[Transport of Specimens to the Laboratory Policy](#)".



Special Handling Requirements

Please see 'Notes' section in the tests tables below or contact the laboratory for information regarding special handling requirements.

Vacutainer™ & Specimen Container Guide

For all Immunology or SIHMDS (Flow cytometry/Molecular Biology) see respective user guides

Becton Dickinson Vacutainer™ or specimen container	Ordering Information	Tests/Screens
	EDTA 4ml adult 1.3ml paed 500µl neonate	FBC, ESR, Reticulocyte count, Blood film, Malaria screen, G6PD assay, PK assay, Plasma viscosity, Haemoglobinopathy screen, Haemoglobin A1c, rapid sickle screen, Zinc protoporphyrin, Heinz bodies, Haemoglobin H preparation, Kleihauer, DAT, Prothrombin gene mutation & Factor V Leiden.
	EDTA BLOOD TRANSFUSION ONLY 6ml adult 1.3ml paed 500µl neonate	<p>Blood Transfusion Group & save (including antibody screen*, Crossmatch*, Kleihauer, DAT.</p> <p>*Sample identification for Group & save or crossmatch MUST be handwritten and have the correct 4 points of ID plus the signature of the person taking the sample.</p>
<p>Note underfilled samples are unsuitable for testing</p> 	SODIUM CITRATE 4.5ml adult 1.3ml paed 650µl neonate	<p>Clotting screen (PT/APTT), Fibrinogen, D-Dimers, Low molecular weight heparins (LMW/Xa).</p> <p>These tubes MUST be filled to the correct 4.5ml (adult), 1.3ml (paed), 650µl* (neonate) mark on the side of the tube: underfilled or overfilled samples are unsuitable for testing.</p> <p>Citrated Platelet Count – notify Haematology laboratory staff that the sample is en route: it must not be centrifuged.</p> <p>Specialist Haemostasis tests must be authorised by a Haematology/Haemostasis SpR/Consultant See the Haemostasis section below for the samples required for specialist Haemostasis tests.</p> <p>*650µl neonate tubes are issued from the Coagulation laboratory. Contact ext22708 if required.</p>

	<p>SST 3.5ml adult 600µl neonate/paed</p>	<p>Anticardiolipin antibodies (antiphospholipid antibodies)</p> <p>All Immunology* screening (AIP,HEP2, ENA, DNA, CCP, IFA, ANCA, SHA)</p> <p>*See Immunology user guide</p>
	<p>PLAIN UNIVERSAL CONTAINER 20ml bottle</p>	<p>Fluid cell counts (Pleural/Peritoneal ONLY) – CAN also be performed on 4ml EDTA of fluid.</p> <p>CSF – Cerebro Spinal Fluid cell counts. This test is ONLY performed for Haematology/Oncology patients.</p> <p>CSF samples must be sent to the haematology laboratory immediately after collection as ideally need to be processed within 2 hours.</p> <p>Haemosiderin – Fresh urine required in 20ml container.</p>

Haematology – Test information

Level 8 Queens Building, Marlborough Street, Bristol Royal Infirmary, Bristol BS2 8HW
 0117 342 2708 Haematology ext 22579 (out of hours).

Please note that time limit for additional tests are dependent on sample availability as general retention time for haematology EDTA samples is 48-72hrs

Please contact the laboratory for any reference ranges if not listed below, all relevant ranges can be found on patient reports and/or ICE system.

Haematology – Test information: Section Lead: Mark Nicholas

Haematology Tel: 0117 342 2708

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Blood Film	EDTA (can be performed on same sample as FBC)	Not applicable	Delay in receiving sample Sample not kept at room temperature	Send sample ASAP to the laboratory as prolonged storage affects cell morphology. Please give clinical details/reason for the request.	Service for clinically urgent requests	Within 24hrs	24hrs
Citrated Platelet Count (performed for platelet clumping in EDTA)	Sodium Citrate	150-400 x10 ⁹ /l	Clot in sample Platelet aggregation in citrate	Please indicate clearly on the request form that the sample is for a citrated platelet count. Notify Haematology ex22708 that sample is en route: sample must not be centrifuged. Sample must be filled to correct filling line	Service for clinically urgent requests	Within 24hrs	24hrs
CSF Cell Count (Cerebrospinal Fluid)	CSF in 20ml sterile container	Not applicable	Sample not delivered as soon as they have been taken.	500µl minimum volume required for CSF cell count & cytospin. Only performed on Haematology/Oncology patients. Telephone Haematology if required on other patient groups	Service for clinically urgent requests	4hours	24hrs (further TAT if flow cytometry required)

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Cytospin (Cerebrospinal Fluid)	CSF in 20ml sterile container	Not applicable	Sample not delivered as soon as they have been taken.	500µl minimum volume required for CSF cell count & cytospin. Only performed on Haematology/Oncology patients. Telephone Haematology if required on other patient groups	Service for clinically urgent requests	4hours	24hrs
ESR Erythrocyte Sedimentation Rate	EDTA (can be performed on same sample as FBC)	M: 17-50<10mm/hr 51-60<12mm/hr 61-70<14mm/hr >70 <30mm/hr F: 17-50<12mm/hr 51-60<19mm/hr 61-70<20mm/hr >70<35mm/hr	Clot in sample Insufficient sample Delay in receiving sample	>1ml of EDTA blood is required to perform ESR	Service for clinically urgent requests	Within 24hrs	24hrs
Fluid Cell Count (e.g Pleural, Peritoneal)	Fluid taken into 20ml sterile container or 4ml EDTA	Not applicable	Delay in receiving sample.	ONLY Pleural, peritoneal (ascetic) and peritoneal dialysis specimens can be processed. ONLY total nucleated and red cell count are available. Any other counts need to be discussed with Microbiology (contact via switchboard)	Service for clinically urgent requests	4hours	24hrs

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Full Blood Count	EDTA	Adult WBC: 4-11 x10 ⁹ /l Neutrophils: 1.5-8 x10 ⁹ /l Haemoglobin: 120-150g/l (F) 130-170 g/l (M) MCV: 83-100 fl Platelets: 150-400 x10 ⁹ /l Full ranges on POD	Clotted sample. Insufficient sample. Lipaemic, icteric, haemolysed samples. Delayed sample receipt.	Adult samples >1ml of blood required. Paediatric/neonate >500µl of blood required.	Service for clinically urgent requests	Within 24hrs	24hrs
G6PD (Glucose-6-Phosphate Dehydrogenase Assay)	EDTA (can be performed on same sample as FBC)	4.6-13.5 U/gHb Values for new-borns maybe somewhat higher (up to 150%)	Copper & sulphate ions decrease G6PD activity. Certain drugs interfere with circulating levels. Clotted sample.	Reticulocytes have increased G6PDH levels than mature red cells. NOT recommended that assays be performed after severe haemolytic crisis due to falsely elevated levels.	Not available	6 days (if stored at 4°C)	3 working days
Haemoglobin A1c (HbA1c)	EDTA (can be performed on same sample as FBC)	20-42 mmol/mol	Unstable haemoglobins e.g. Hb Raleigh. Reduced red cell lifespan – e.g. HbSS, HbCC, HbSC.	Retrospective indicator of mean plasma glucose concentration during the last 6-8 weeks. Does not detect hypoglycaemic episodes and falsely low results may be found with haemolytic disease.	Not available	7 days	3 working days

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Haemoglobin H Stain	EDTA(can be performed on same sample as FBC)	Not applicable	Age of sample.	Fresh EDTA required – test cannot be performed on samples over 24hrs. Test performed as part of haemoglobinopathy screen.	Not available	Within 24hrs	3 working days
Haemoglobinopathy screen and DNA analysis	EDTA (can be performed on same sample as FBC)	Normal: HbA ₂ <4% HbF <1% Normal red cell indices MCH≥27pg Hb ≥80g/L	Severe iron deficiency can reduce HbA ₂ levels. Clotted sample.	Laboratory will process all requests but note that with patients under 1 year of age – unable to exclude α/β thalassaemia, repeat suggested after 1 year of age. Results may be misleading if patient transfused within the last 4 months. *DNA – sendaway performed at Oxford University Hospital ⁸	Not available	7 days (if stored at 4°C)	3 working days
Hemosiderin (Urinary)	Urine (fresh) in 20 ml sterile container	Not applicable	Age of sample.	Fresh early morning urine required.	Not available	12hrs	24hrs
Heinz Bodies Stain	EDTA(can be performed on same sample as FBC)	Not applicable	Age of sample.	Fresh EDTA required – test cannot be performed on samples over 24hrs	Not available	Within 24hrs	24hrs

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Plasma Viscosity (PV)	EDTA (can be performed on same sample as FBC)	1.5-1.72 mPa/s	None known	*Send away test – Performed at RUH Bath ¹	Not available	7 days (if stored at room temp)	3 weeks for report (SEND-AWAY)
Pyruvate Kinase Assay	EDTA (can be performed on same sample as FBC)	11-19 IU/g Hb	Age of sample Clotted sample	*Send away test – Performed at King’s College Hospital, London ²	Not available	72hrs (if stored at RT)	3 weeks for report (SEND-AWAY)
Malaria Screen	EDTA (can be performed on same sample as FBC)	Not applicable	Age of sample	URGENT REQUESTS: Contact Haematology where rapid test can be used alongside priority thick & thin blood film analysis. Please fill all clinical information when prompted when submitting ICE request. All positives are sent to London School of Hygiene & Tropical medicine ³ for confirmation.	Service for clinically urgent requests	Within 24hrs	24hrs (note all POSITIVE’s confirmed at LSHTM)

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Rapid Sickie Screen	EDTA (can be performed on same sample as FBC)	Not applicable	Erythrocytosis, hyperglobunaemia, leucocytosis, lipaemia – can give false positives. Children<6months can give false negatives. Recent blood transfusion can give false positive/negatives.	If Pre-op and URGENTLY required, contact the laboratory. Sickie screen performed alongside full haemoglobinopathy screen for all requests.	Service for clinically urgent requests	7 days (if stored at 4°C)	72hrs
Reticulocyte Count (Retic)	EDTA (can be performed on same sample as FBC)	>18 years 50-100 x10 ⁹ L	Clotted sample. Insufficient sample. Lipaemic, icteric, haemolysed samples. Delayed sample receipt.	Adult samples >1ml of blood required. Paediatric/neonate >500µl of blood required. Reticulocyte count performed alongside FBC.	Service for clinically urgent requests	Within 24hrs	24hrs
Zinc Protoporphyrin (ZPP)	EDTA (can be performed on same sample as FBC)	Borderline 70 -90 µmol/mol haem Iron Deficient 90 -120 µmol/mol haem Severe Iron Def >120	Haemolysed samples. Abnormally elevated bilirubin will create positive interference due to its spectral qualities.		Not available	Within 48hrs at RT Within 7 days (if stored at 4°C)	24hrs

		μmol/mol haem				
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Haematology Referral Hospitals

<p>1.Royal United Hospitals Bath NHS Foundation Trust Combe Park Bath BA1 3NG Main switchboard: 01225 428331 Haematology: 01225 824240</p>	<p>2. Red Cell Centre - Protein Laboratory 020 3299 2455 kch-tr.redcelllab@nhs.net c/o Central Specimen Reception Blood Sciences Laboratory Ground Floor Bessemer Wing King's College Hospital Denmark Hill London SE5 9RS</p>	<p>3.PHE Malaria Reference Laboratory Faculty of Infectious & Tropical Diseases London School of Hygiene & Tropical Medicine Keppel Street London WC1E 7HT Laboratory:020 7927 2427</p>	<p>9.Department of Laboratory Haematology, Level 4 Oxford Radcliffe Hospital Oxford University Hospitals NHS Trust Headley way Headington OX3 9DU 01865 572769</p>
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Haemostasis Routine Test Information Section Lead: Chris Reilly-Stitt

Coagulation Tel: 0117 342 2708

- Citrated samples must be adequately filled to the correct marked line (4.5ml adult/1.3ml paed/650µl neonate). Tests cannot be performed on under filled, overfilled, or clotted samples.
- Grossly lipaemic samples may require manual testing and a delay in results.
- Neonatal blood tubes are available upon request, primarily for St.Michaels NICU. Telephone the laboratory on ext22708 during routine hours if required. Please note due to the nature of the sample volume, clotting tests may be limited or unavailable if plasma levels are too low.
- Include clinical details on the request form/ICE order e.g. 'patient on anticoagulation (warfarin/heparin etc.)' or 'post-op sample'; to facilitate appropriate testing and interpretation of results.
- Send request form (if used) and sample to the laboratory as quickly as possible. Any critically urgent requests telephone the laboratory on ext22708 routine hours and ext225279 out of hours.
- Abnormal results that require further laboratory testing may result in delayed reporting.
- Antithrombin 3 is available to be performed as a routine test providing it has been approved by the Clinical Haemostasis team – this is a Haemostasis registrar bleep 2677 during routine hours (Mon-Fri 09:00-17:00). Out of hours requires minimum Haematology SpR agreement with Haemostasis on call Consultant, contact Haematology registrar via switchboard.
- The laboratory provides the testing for the UHBristol Pharmacy dosed Warfarin patients. For enquiries about doses for these patients contact the Pharmacy helpline on 0117 342 3874 during routine hours (Mon-Fri 09:00-17:00).

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Antithrombin 3 (AT3)	Sodium citrate	0.8-1.26 IU/ml	Delayed receipt of sample	*Available outside of thrombophilia screening on agreement with minimum Haematology SpR but may require Haemostasis Consultant on call approval – both contactable via switchboard	Service for clinically urgent requests*	Within 24hrs	2 weeks (unless clinically agreed)
Anti-Xa assay For the monitoring of Low Molecular Weight Heparin (LMW)	Sodium citrate	Once daily regime: 0.8-1.6 IU/ml Twice daily regime:0.5-1.1 IU/ml	Delayed receipt of sample	Please state the anticoagulation of the patient. Common LMW's – Clexane, Enoxaparin	Service for clinically urgent requests	Within 24hrs	12hrs
Anti-Xa used in the monitoring of Unfractionated Heparin (UFH)	Sodium citrate	0.35-0.7 IU/ml	Delayed receipt of sample	Please state the anticoagulation of the patient.	Service for clinically urgent requests	Within 24hrs	12hrs

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Clotting Screen (PT/APTT – Prothrombin Time, Activated Partial Thromboplastin Time)	Sodium citrate	PT: 9.5-12.0secs APTT: 23.0-32.0secs	Anticoagulation Delayed receipt of sample Grossly lipaemic samples	Heparin & Warfarin therapy affects results and determines appropriate testing please state that the patient is on Heparin and/or Warfarin on the request form.	Service for clinically urgent requests	Within 24hrs	6 hrs
D-Dimers (DDV)	Sodium citrate (can be added to Clotting screen sample)	Normal cut off <500ng/ml (FEU)			Service for clinically urgent requests	Within 24hrs	6hrs
Fibrinogen - Clauss (FIB)	Sodium citrate (can be added to Clotting screen sample)	Normal: 1.5-4.0g/L	Grossly lipaemic samples		Service for clinically urgent requests	Within 24hrs	6hrs
Heparin (unfractionated) Monitoring (HEP, APTTR)	Sodium citrate	Therapeutic range: 2.0-3.0 (APTT ratio)	Grossly lipaemic samples Other anticoagulation		Service for clinically urgent requests	Within 24hrs	1hr

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Thrombin Clotting Time (TCT)	Sodium citrate	Normal: 15.4-17.5 secs	Delayed receipt of sample	Test is used in combination with protamine to check for the presence of heparin within a sample.	Service for clinically urgent requests	Within 24hrs	6 hrs
Warfarin Monitoring (INR)	Sodium citrate	Ranges – are determined on an individual basis as decided by clinical decision. Contact the Laboratory for further information.	Delayed receipt of sample	Please inform of anticoagulation on request form.	Service for clinically urgent requests	Within 24hrs	6 hrs

Specialist Haemostasis Tests Section Lead: Chris Reilly-Stitt

Coagulation Tel: 0117 342 2708

All the further specialist Haemostasis tests are vetted and approved by Haemostasis Consultants – if urgent tests/screens are required during routine hours, 09:00-17:00 Mon-Fri, these will need approval from the clinical Haemostasis Team (Haemostasis SpR bleep 2677) or Haem registrar with on call Consultant consent for any urgent out of hours requests (contact via switchboard).

Haemophilia and thrombophilia screens involve multiple tests and so as a minimum for adults' 2x 4.5ml citrate samples are required (ideally 4x 4.5ml bottles). Thrombophilia screens also require a 4ml EDTA to perform molecular testing, Factor V Leiden and Prothrombin gene mutation. Please discuss with the Coagulation laboratory (ext22708) staff if necessary, to ensure adequate samples are collected, especially in paediatric cases.

Individual factor assays are available during routine if agreed by the haemostasis team (bleep 2677 haemostasis SpR) and can be arranged out of hours in a clinical emergency by contacting the haematology registrar who will liaise with the on call Haemostasis Consultant.

- Citrated samples must be adequately filled to respective mark lines (4.5ml/1.3ml/650µl).
- Tests cannot be performed on under filled, overfilled or clotted samples.
- For any specialist tests it is critical to include the relevant clinical information on the request as this is required for Consultant approval.
- Send the completed request form and sample to the laboratory as quickly as possible for processing.
- For urgent requests, contact the Laboratory on ext 22708 (routine hours) ext 22579 (out of hours).

Some of the individual Factor/screen tests are available with discussion with the laboratory e.g. Protein C/S and Antithrombin 3. Any queries about specialist Coagulation tests please contact the laboratory.

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
ADAMST-13	Sodium citrate	Normal 40-130%	Delay in receipt of sample	Consultant approval unless known patient.	Not available	Within 24hrs	2 weeks
Apixaban	Sodium citrate	Not established, contact Haemostasis consultant for advice	Delay in receipt of sample		Not available	Within 24hrs	72hrs
Bethesda Assay (F8C Inhibitor) (F9C Inhibitor)	Sodium citrate 2 x 4.5ml	Not applicable, contact Haemostasis consultant for advice	Delay in receipt of sample		Not available	Within 24hrs	2 weeks
Dabigatran	Sodium citrate	Not established, contact Haemostasis consultant for advice	Delay in receipt of sample		Not available	Within 24hrs	72hrs
Edoxaban	Sodium citrate	Not established, contact Haemostasis consultant for advice	Delay in receipt of sample		Not available	Within 24hrs	72hrs
Factor Assays F2, F5, F7, F8, F9, F10, F11, F12, F13	Sodium citrate 2 x 4.5ml	All factors except F11 Normal: 0.5-2.0 IU/ml F11 Normal: 0.7-2.0 IU/ml	Anticoagulation: Warfarin/Heparin Delay in receipt of sample	*Urgent tests require Haemostasis Consultant approval. For Pre/Post factor samples please keep in separate bags and mark on sample tubes which are the Pre/Post	Service for clinically urgent requests*	Contact the Laboratory	2 weeks

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Factor 8/9 specialist tests: F8 Bovine F8/9 Chromogenic F8 Refacto	Sodium citrate 2 x 4.5ml	Normal: 50-200% 0.5-2.0 IU/ml	Delay in receipt of sample Anticoagulants especially Heparin	All require Consultant approval Sticker required for Refacto testing	Not available	Contact the Laboratory	2 weeks
Lupus Anticoagulant/ Screen (Antiphospholipid antibodies)	Sodium citrate 2 x 4.5ml SST 1 x 3.5ml	Contact the Laboratory	Anticoagulant therapy	If screen for antiphospholipid/lupus Then send SST sample also for Anticardiolipin antibody testing.	Not available	Within 24 hours	2 weeks
Platelet Aggregation Studies	Sodium citrate 6 x 4.5ml	Contact the Laboratory	Aspirin affects platelet aggregation Delayed receipt of samples	Test is only organised with Haemostasis Consultants as requires specific planning. Samples must be kept at room temperature and taken immediately to the Laboratory	Not available	Not applicable	2 weeks
Rabbit Brain Thromboplastin	Sodium citrate	Ranges – are determined on an individual basis as decided by clinical decision. Contact the Laboratory for further information.	Delayed receipt of sample		Service for clinically urgent requests	Within 24hrs	72hrs

	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Rivaroxaban	Sodium citrate	Not established, contact Haemostasis consultant for advice	Delay in receipt of sample		Not available	Within 24hrs	72hrs
Reptilase	Sodium citrate	Normal: 16-22secs	Delay in receipt of sample		Not available	Within 24hrs	72hrs
Thrombophilia Screen Antithrombin 3 Protein C activity, Free Protein S, Lupus Anticoagulant, Cardiolipin Antibodies,	Sodium citrate 4 x 4.5ml EDTA 1 x 4ml SST 1 x 3.5ml	Contact the laboratory	Delay in receipt of sample Warfarin & Heparin (Anticoagulant therapy)	Note the tests can be requested individually if specific measuring is required. All screens are vetted by the Haemostasis Consultants, contact prior to venesection to ensure test completion. *Protein C/S can be arranged if Urgent clinical need, with Haemostasis Consultant approval	Service for clinically urgent requests*	Not applicable	2 weeks
Von Willebrands Screen VW Antigen VW Antibody (Ricof) F8	Sodium citrate 2 x 4.5ml	Normal: 0.5-2.0 IU/ml Normal: 0.5-2.0 IU/ml Normal: 0.5-2.0IU/ml	Delay in receipt of sample Heparin therapy (F8)	Can be performed individually or as part of a Haemophilia screen.	Service for clinically urgent requests	Within 24hrs	2 weeks

Specialist Haemostasis Send away Tests:

Test	Specimen type	Reference Ranges	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Heparin Induced Thrombocytopenia (HIT) Screen	SST 6ml clotted blood	Score... Associated with Score 6-8 High probability HIT Score 4-5 Intermediate Score 0-3 Low probability HIT	Delay in sample receipt	Send away test to NHSBT Filton ⁴ Routine transports to NHSBT daily, test ONLY performed daily Mon-Fri.	Not available	Not applicable	3 working days
Lupus Anticoagulant Extended Screen	Sodium citrate 2 x 4.5ml	Contact Laboratory	Delay in sample receipt	Send away test to UCLH ⁵	Not available	Not applicable	2

Referral Hospitals

<p>4.H&I Diagnostic Specimens NHSBT Filton 500 North Bristol Park Northway Bristol BS34 7QH Tel: 0117 921 7372</p>	<p>5.Haemostasis Laboratory UCLH 2nd Floor 60 Whitfield Street London W1T 4EU Tel: 0203 447 8545</p>
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Blood Transfusion Test Information: Section Lead: Steve White

Blood Bank Tel: 0117 342 2579

MAJOR HAEMORRHAGE procedure see page 4 of this guide

- Samples and form MUST contain full and correct patient identification i.e. handwritten forename, surname, date of birth and hospital number – requests without these details will not be accepted. Fill out special product requirement e.g. Irradiated/CMV and state the reason.
- The sample MUST be signed by the taker of the blood.
- Please provide Requestor, Ward location and bleep (extension) number for enquiries.
- Please refer to the Blood Component Transfusion Policy for full details see link below

<http://nww.avon.nhs.uk/dms/download.aspx?did=23321>

Test	Specimen type	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Cross match	EDTA 6ml (Pink top) 1.3ml Paed 500µl Neonate	Incorrectly labelled, insufficient, unsigned, clotted samples will be rejected	Primary samples from previously ungrouped patients can only receive Group O Blood until confirmatory sample received. Blood product orders can be requested on the Blood Transfusion form or by telephoning Blood Bank ext 22579. *For patients with antibodies, provision time may be significantly longer.	Service for clinically urgent requests	Up to 7 days dependent upon sample validity. Not transfused patient sample valid 7 days If transfused within 90 days or pregnant, sample validity 72hrs	Routine Crossmatch 2hrs* Telephone the laboratory if Blood urgently required

Test	Specimen type	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Direct Antiglobulin Test (DAT)	EDTA (can be performed on FBC sample) 6ml (Pink top) 1.3ml Paed 500µl Neonate		Can be added on to existing Group & Save or Haematology FBC sample	Service for clinically urgent requests	7 days	24hrs
Group & Save		Incorrectly labelled, insufficient, unsigned, clotted samples will be rejected	To add a blood product request, telephone blood bank on ext 22579 (see Blood Product ordering below)	Service for clinically urgent requests	Up to 7 days dependent upon sample validity. Not transfused patient sample valid 7 days If transfused within 90 days or pregnant, sample validity 72hrs	24hrs
Kleihauer	EDTA	Delay in receipt of sample	Samples should be taken minimum 30-45mins POST sensitising/delivery event	Service for clinically urgent requests	Dependent on indication – telephone the laboratory	72hrs

Blood Transfusion Referrals

Test	Specimen type	Key factors affecting tests	Notes	Out of hours service	Time limit for add on tests from time of venesection	Turn-around time from receipt of sample
Reference serology Antibody Quantification (AntiD/c), AlloAb investigation Compatibility testing Quantification of FMH Extended RBC Phenotype	EDTA 6ml (Pink top) more may be required		Send away referral to RCI NHSBT Filton ⁶ Further samples may be required depending on tests to be undertaken – Laboratory will phone if needed.	Service for clinically urgent requests	Blood Transfusion Laboratory referral	Dependent on tests required 5-7 working days
HLA Testing HLA Typing & HLA Antibody testing	6ml EDTA + 6ml SST (clotted)		Send away referral to H&I NHSBT Filton ⁷	Not available	Not applicable – fresh samples required	5-7 working days

6.RCI NHSBT Filton 500 North Bristol Park Northway Bristol BS34 7QH Tel: 0117 921 7380	7. H&I Diagnostic Specimens NHSBT Filton 500 North Bristol Park Northway Bristol BS34 7QH Tel: 0117 921 7372
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