

Haematology

User Handbook

North Kent Pathology Service

and the Pathology Directorate of

Timely, accurate results, providing effective care. Dartford and Gravesham NHS Trust

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# GENERAL INFORMATION

There are two interdependent related Haematology services:

1. Clinical Haematology (Adult Medicine Directorate)

Consultant Haematologists manage patients via outpatient clinics and as inpatients.

1. Laboratory Haematology (Pathology Directorate)

Diagnostic laboratory work supports the clinical service with diagnosis and analysis, with Consultant Haematologists having clinical responsibility for the laboratory service.

Diagnostic laboratory work is undertaken by Biomedical Scientists (BMS) and Healthcare Scientific Support Workers (HSSW).

Darent Valley Hospital Haematology Department comprises three main sections:

* Automated Haematology for haematology and coagulation investigations.
* Specialist Haematology which includes PHE antenatal haemaglobinopathy screening service and peripheral blood morphology.
* Specialist Coagulation which includes thrombophilia analysis.

Medway Maritime Haematology Department Provides Automated Haematology, Coagulation and peripheral blood morphology.

The Haematology department participates in National External Quality Assessment Schemes (NEQAS) for all tests wherever possible.

The main (Hub) laboratory is located on the third floor, East Wing of Darent Valley Hospital.

The sister (Spoke) laboratory is located on the fourth floor, red zone of Medway Maritime Hospital.

All doors to the Pathology Department are locked at all times. Entry is for authorised personnel only. All other personnel must report to Pathology Reception.

## LOCATION

The Haematology department operates on two sites:

|  |  |
| --- | --- |
| **Haematology Department**  Darent Valley Hospital  Darenth Wood Road  Dartford  DA2 8DA | **Haematology Department**  Medway Maritime Hospital  Windmill Road  Gillingham  ME7 5NY |

## OPENING HOURS

### Routine Working Hours

The department opening hours for each location can be seen below:

**Darent Valley Hospital**

|  |  |  |
| --- | --- | --- |
| Pathology  Reception | Central Specimen Reception | Haematology Laboratory |
| Monday - Friday | Monday - Friday | Monday – Friday |
| 09:00 – 17:00 | 09:00 – 17:00 | 09:00 – 17:00 |

**Medway Maritime Hospital**

|  |  |  |
| --- | --- | --- |
| Pathology  Reception | Central Specimen Reception | Haematology Laboratory |
| Monday - Friday | Monday - Friday | Monday – Friday |
| 09:00 – 17:00 | 09:00 – 17:00 | 09:00 – 17:00 |

### Out of Hours Service

The Haematology Department operates an out of hours Service on both sites for the acute service users outside of the routine working hours stated above for urgent samples and clinical advice.

**Out of Hours Service**

|  |  |  |
| --- | --- | --- |
| Week Days | Weekends | Bank Holidays |
| 17:00 – 09:00 | Continual Out of Hours cover | Continual Out of Hours cover |

## DEPARTMENTAL KEY PERSONNEL

### Pathology Management

|  |  |  |
| --- | --- | --- |
|  | Secretary / PA | Direct Line |
| Associate Director of Operations | (01322) 428488 | (01322) 428499 |
| Clinical Director |  |  |
| Business Operations Manager |  | (01322) 428490 |
| Pathology Quality and Governance Manager |  | (01322) 428476 |
| Scientific Lead/Head of Department |  | (01322) 428480 |

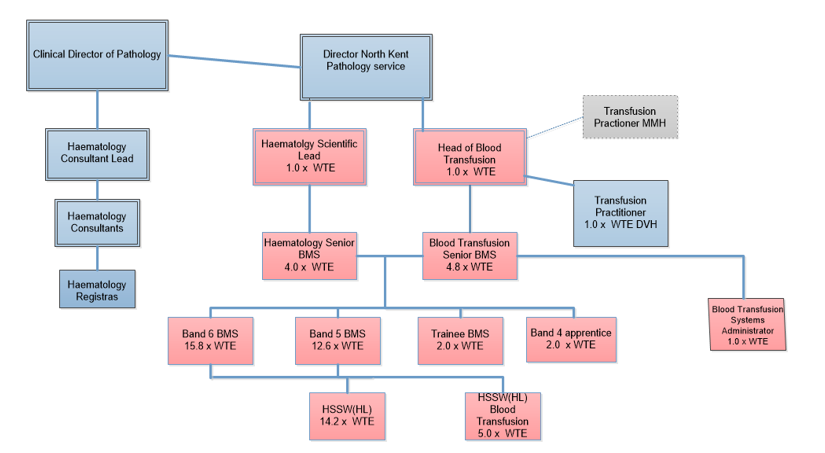
### Darent Valley Hospital Consultants

|  |  |
| --- | --- |
|  | Secretary / PA |
| Dr Joy Gilani – *Consultant Haematologist* | (01322) 428507 |
| Dr Vijay Dhanapal – *Consultant Haematologist* | (01322) 428507 |
| Dr Kawai Yip – *Consultant Haematologist* | (01322) 428507 |
| Dr Natalie Heeney – *Consultant Haematologist* | (01322) 428507 |
| Dr Lian Wea Chia– *Consultant Haematologist* | (01322) 428507 |

### Medway Maritime Hospital Consultants and Specialty Doctors

|  |  |
| --- | --- |
|  | Secretary / PA |
| Dr Maadh Aldouri – *Consultant Haematologist* | 01634 97(6178) |
| Dr Winifred French – Locum *Consultant Haematologist* | 01634 97(5665) |
| Dr Sarah Arnott – *Consultant Haematologist* | 01634 97(5665) |
| Dr Nahia Osman– *Consultant Haematologist* | 01634 97(5665) |
| Dr Himali Mendis – *Consultant Haematologist* | 01634 97(6178) |

## ORGANISATIONAL CHART



## LABORATORY VISITS

A successful pathology service depends on the quality of the relationship it has with its Users and so the Department welcomes visits to meet the staff.

To make an appointment please contact the Haematology Scientific Lead on (01322) 428480.

All visitors to Pathology must report to Pathology Reception where they will be met by the reception staff who will inform laboratory personnel of their arrival. All visitors must sign in the visitors’ book on arrival and departure from the department and will be issued with a visitor’s badge which must be returned when they leave.

## INFORMATION GOVERNANCE

Receipt of a recognised test request assumes that the patient has agreed that the test may be carried out, together with any follow-on tests required, and that information may be shared with healthcare professionals and statutory bodies as required. In accordance with legal requirements the department adheres to the Data Protection Act 1998 for all patient information and follows the guidelines laid out by the Royal College of Pathologists for the retention and disposal of laboratory records and specimens (5th edition 2015). Further information on this topic is available from the department upon request.

## COMPLAINTS

Complaints regarding the service must be made in the first instance to any of the personnel listed on page 5. If you feel the need to take any matter further a written complaint must be made to Complaints Manager, Darent Valley Hospital or via email to dgn-tr.complaints-dvh@nhs.net.

# SAMPLE COLLECTION

## REQUESTING TESTS

A Trust Order Comms system at Darent Valley Hospital has been developed for pathology requesting along with an equivalent system for GP practices. Where Order Comms is available, it must, be used for all Haematology requests, where possible.

The information on all request forms and accompanying specimen bottles must correspond and minimum acceptance criteria are set out in **2.6 Sample Labelling**.

Each section of the request form must be completed, including patient’s details, clinical summary section must include relevant patient information e.g. warfarin therapy and foreign travel.

The sections regarding the Requester and person taking the blood samples must be signed and dated. Incomplete forms may cause delays in availability of results as samples may be delayed or not processed.

All samples not meeting these criteria will be rejected and discarded.

If further Haematology tests are required on a sample already received by the laboratory the requestor must contact the laboratory and the test be requested verbally to be followed by a further request form to confirm this request. If further samples are required, the requestor will be informed at the time of receipt. Additional tests can usually only be accepted on the same day as the original sample collection.

## URGENT REQUESTS

If a request is clinically urgent, please contact the laboratory and give the appropriate information to ensure priority is afforded. The samples must be clearly marked as urgent and kept separately from other samples being delivered at the same time.

Out of hours’ tests must only be those required for the immediate care of the patient. The out of hour’s service is available to acute care only.

## VENOUS BLOOD COLLECTION

An evacuated blood collection system is used to collect venous blood samples within the Trust by trained individuals. For Vacuette Sample bottle information and draw order, please see Appendix iii

*If taking blood using a syringe and needle* ***DO NOT*** *transfer the blood into a vacutainer by using the vacuum to draw the blood into the bottle as this can haemolyse the sample.*

Additional information can be found in the Primary Sample Collection and Handling Procedure available on the Darent Valley Hospital Staff Intranet and external internet pages.

## POTENTIALLY INFECTIOUS AND HIGH RISK SAMPLES

All samples, but particularly those from patients suspected of having certain blood borne and other infectious diseases constitute a hazard to portering and laboratory staff handling them.

Staff are reminded to consider all samples as potentially high risk and therefore must wear gloves when handling blood, body fluids and tissue samples.

If a patient is in a particularly high risk group (e.g. viral haemorrhagic fever, SARS, anthrax), the laboratory must be contacted for further advice prior to the sample being collected and sent to the laboratory.

The Haematology laboratory can only accept and process samples up to Category 2 risk rating.

## SAMPLE VOLUME AND APPROPRIATE CONTAINERS

Please refer to Section 4 for volumes and type of vacutainer to use. (Note the list is not exhaustive of all haematological referral assays available, for rarer tests please contact the laboratory directly).

Additionally:

* For immunosuppressive drug levels:

Date/time of last dose and date/time of sample collection MUST be given. Samples from requests without this information may be discarded.

## SAMPLE LABELLING

Sample bottles **must not** be pre labelled before blood is drawn.

All samples and request forms, if used, must have the following patient information:

* Patient surname
* Patient first name
* Patient date of birth
* Patient NHS number (if patient has one) or Hospital (PAS) registration number
* Date and time of sampling
* Location (Ward, GP name with address)
* Signature of person taking the sample
* For PHE Sickle Cell and Thalassaemia Screening request a fully completed Foetal origin questionnaire (FOQ) must be received at the same time as the sample either electronically or paper.

(This is auditable proof of location and phlebotomist i.e. the use of order comms trace the member of staff who printed the labels which in Trust policy is the person who takes the blood and details the location the sample was taken. For non-order comm requests, the initials of the staff member who took the blood must be on the sample alongside the location).

NHS numbers or Hospital (PAS) numbers must always be used when available, as this aids successful allocation and maintenance of a single patient file on the laboratory computer system, which in turn aids effective and speedy result retrieval for users.

Positive patient identification is **essential** and in-patients must, additionally, have their wristbands checked before blood is drawn.

Samples received without full patient I.D. may be discarded and the appropriate doctor/ward informed via the electronic reporting system.

Further information can be found in the Sample Acceptance and Rejection Policy located on the Darent Valley Hospital Staff Intranet and External Internet sites.

General Information

Printed labels for application to patient samples are automatically generated when using Order Comms. Other printed labels may be used on haematology samples and request forms, providing they contain the appropriate information and are in the correct format. Check with the Laboratory before introducing printed labels to ascertain their suitability.

Labels must be placed lengthways along the tube, it is also positioned in such a way as the laboratory can assess the sample quality in the windowed area, not around it as this interferes with the operation of centrifuges and analysers. Samples with incorrectly placed labels may be rejected.

All sample containers must be properly closed and packed in a dedicated sample bag, with the request form in the attached unsealed pouch. A new request form is required for ‘add on’ tests.

## SAMPLE REJECTION

As a matter of quality assurance and good risk management any sample arriving in the laboratory unlabelled will be discarded. The requesting doctor will be informed via the electronic reporting system when possible (if all samples are unlabelled, a report cannot be made as the patient identity is completely obscure).

Samples may also be rejected for the following reasons:

1. The sample is insufficient for testing
2. The sample labelling requirements (see section 2.6) are not met
3. The sample is haemolysed /clotted (for EDTA investigations)
4. The sample is underfilled or overfilled (for Citrate investigations)
5. The sample is too old to process for particular assays
6. The incorrect specimen type is sent to the laboratory
7. There is any doubt over the specimen origin.
8. Coagulation samples received more than 8 hours after collection.
9. Incomplete or missing FOQ.

# TRANSPORTATION OF PATHOLOGY SAMPLES



## SENDING SAMPLES TO THE LABORATORY

Samples for the Blood Transfusion Department can be sent to the laboratory in one of three ways:

* By Pneumatic Air Tube delivery
* By the Hospital Portering Service
* By Courier Service

### Pneumatic Air Tube Delivery

There are a variety of locations throughout the Hospital that have the facility to send suitable Pathology samples to the laboratory using the Pneumatic Air Tube delivery system. These include:

|  |  |
| --- | --- |
| * Phlebotomy Outpatients, * Accident and Emergency * Intensive Care Unit * Delivery Suite * Rosewood Ward | * Antenatal * Redwood Ward * Cherry Ward * Pine Therapy Unit |

The pneumatic air tube system is operated by Serco. When unavailable, samples must be sent via portering services and the Serco Help Desk contacted on 8888 to report pneumatic tube failure. All sample containers must be properly sealed; samples must be in individual sample bags with corresponding request form.

The pneumatic air tube system is for transport of pathology samples only. The sample(s) must be secured in the air tube carrier pod.

* The pneumatic air tube system must NOT be used for:
* Blood components including used blood/FFP/platelets etc.
* Histology specimens
* Blood culture bottles
* Known high risk samples (e.g. viral haemorrhagic fever cases) or suspected emerging diseases
* Blood gas samples
* Ad hoc documentation.

Instructions for use of the system are located at pneumatic tube stations.

### Hospital Portering Service

In all other areas of the hospital, samples are sent to Pathology via portering services. All sample containers must be properly sealed; samples must be in individual sample bags with corresponding request form.

### Courier Service

Samples from local GP surgeries and from Queen Mary’s Hospital (QMH) are collected by Courier and delivered to the Pathology Department.

## SAMPLE SPILLAGES AND LEAKS

Sample bags containing leaking containers will be discarded and rejected on via a report on the LIMS. If the leak has contaminated the inside of the air tube carrier, the carrier will be taken out of service and decontaminated appropriately by Pathology staff.

If a leak has contaminated the outside of the air tube carrier, the air tube system will be closed down by Serco in order that a decontamination procedure may be carried out.

All areas with an air tube station will be notified by Serco to ensure other arrangements for sample transportation can be put in place.

Once the decontamination process is complete and the air tube system is working, users will be notified by Serco.

## SAMPLE REFERRAL

Samples for referral to another hospital must always be sent via the Pathology Laboratory. This will ensure correct packaging to meet regulatory requirements and provide an audit trail for each sample.

# TEST REPERTOIRE

## HAEMATOLOGY TESTS

| **Test Name** | **Sample Type and stability** | **Reference Range** | **Turn Around Time** | **Comments** | **UKAS**  **Accredited** |
| --- | --- | --- | --- | --- | --- |
| BCR-ABL | 4ml EDTA bottle x4  (Cap Colour – **Lavender**) | None applicable | 14 working days | Referral Laboratory is Viapath | Referral lab |
| Blood Film | 4ml EDTA bottle  (Cap Colour – **Lavender**) | None applicable | 3 working days | \* Can use FBC sample  This can only be added on up to one day from taking the FBC sample | Yes |
| Bone marrow  investigation | Bone Marrow Slides | None applicable | 21 days | By arrangement with Haematologist  Referral Laboratory is Viapath | Referral lab |
| Cell Markers | Bone Marrow in Medium | None applicable | 21 days | By arrangement with Haematologist  Referral Laboratory is Viapath | Referral lab |
| Cytogenetics/  Chromosome Studies | 4ml Lithium Heparin Bottle  (Cap Colour – **Dark Green**) | None applicable | 10 working days | Referral Laboratory is Viapath  Results are returned directly to requestor | Referral lab |
| Full Blood Count | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | Refer to Appendix i | Inpatient: 4 hours  GP/outpatient: 24 hours | **Note**: for Antenatal booking bloods a red top 4 ml EDTA is to be used | Yes |
| Erythropoietin | 6ml plain bottle  (Cap Colour – **Gold**) | 5-25u/l | 14 working days | Referral Laboratory is Viapath | Referral lab |
| ESR | 4ml EDTA bottle **minimum volume 2ml** required for this test  (Cap Colour – **Lavender**)  **24 Hours post collection** | Refer to Appendix i | 24 hours | \* Can use FBC sample  This can only be added on the same day as taking the FBC sample. A minimum of 2ml is required for this test. | Yes |
| Fragile X | 4ml EDTA bottle  (Cap Colour – **Lavender**) | None applicable | 10 working days | Referral Laboratory is Viapath  Results are returned directly to requestor | Referral lab |
| G6PD  (Glucose 6 Phosphate  Dehydrogenase) | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | 6.8-20.6 iu/gHB | 14 working days | Referral Laboratory is Viapath  Please note that this test is affected if a transfusion was given within the last 3 months. | Referral lab |
| Haemaglobinopathy Screening | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | Hb F: < 1% for adults, could be higher for children up to 1-year-old.  Hb A2: 2.2 – 3.5 | 3 working days | \* Can use FBC sample.  Test is used for antenatal Haemaglobinopathy screening programme, please ensure Family Origin Questionnaire is completed when sending for this reason.  **Note** that for Antenatal booking bloods only a red top 4 ml EDTA is to be used  This can only be added on up to two days from taking the FBC sample  **Note** that this test is affected if a transfusion was given within the last 3 months. | Yes |
| Haemoglobin Electrophoresis Confirmation | 4ml EDTA bottle  (Cap Colour – **Lavender**) | None applicable | 14 working days | Referral Laboratory is Viapath | Referral lab |
| Haptoglobin | 6ml plain bottle  (Cap Colour – **Gold**) | 0.8-2.2 g/L | 14 working days | Referral laboratory is Viapath | Referral lab |
| MyeloNeoplasms Panel | 4ml EDTA bottle x2  (Cap Colour – **Lavender**)  **24 Hours post collection** | None applicable | 14 working days | Referral Laboratory is Viapath | Referral lab |
| Karyotyping | 4ml Lithium Heparin Bottle  (Cap Colour – **Dark Green**)  **24 Hours post collection** | None applicable | 21 days | Provided by Integrated service between Guy’s regional genetics centre from Guy’s and St Thomas’ NHS Trust and Viapath  Results are returned directly to requestor | Referral lab |
| Malaria antigen test | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | None applicable | 24 hours | \* Can use FBC sample  All positive results are telephoned same day where possible.  Please give countries visited, recent malaria prophylaxis and contact number where possible  This can only be added on up to one day from taking the FBC sample | Yes |
| Malarial parasites  (film investigation) | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | None applicable | 48 hours | \* Can use FBC sample  All positive results are telephoned same day where possible.  Please give countries visited, recent malaria prophylaxis and contact number where possible  If required, the referral laboratory used is University College London Hospital  This can only be added on up to one day from taking the FBC sample | Yes |
| Monospot  (Glandular Fever) | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | None applicable | 3 working days | Can use FBC sample | No |
| Paroxysmal Nocturnal Haemoglobinuria (PNH) | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | None applicable | 14 working days | Referral laboratory is Viapath | Referral lab |
| Pyruvate Kinase | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | 11.0-19.0IU/g HB | 14 working days | Referral laboratory is Viapath  Please note that this test is affected by transfusion within the last 3 months | Referral lab |
| Reticulocytes | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | Refer to appendix i | 24 hours | \* Can use FBC sample  This can only be added on up to two days from taking the FBC sample | Yes |
| Sickle cell screen | 4ml EDTA bottle  (Cap Colour – **Lavender**)  **24 Hours post collection** | None applicable | 3 working days | \* Can use FBC sample  Sickle Cell Screen available in 20 minutes in urgent cases.  Please discuss with laboratory before sending sample if urgent. | Yes |

## HAEMOSTASIS TESTS

| **Test Name** | **Sample Type and stability** | **Reference Range** | **Turn Around Time** | **Comments** | **UKAS**  **Accredited** |
| --- | --- | --- | --- | --- | --- |
| Antiphospholipid Screen | 6ml plain bottle  (Cap Colour – **Gold**) | ACA IgG & IgM <20 GP Lu  Anti B2Gly1 IgG & IgM <20 U/ml | 3 weeks | Anti Cardiolipin antibodies (IgG +IgM)  B2Glycoprotein1 antibodies (IgG+IgM) | No |
| Antithrombin III | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **4 Hours post collection** | 85 – 130 iu/dl | 14-21 days |  | Yes |
| Anti Xa | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **1 Hour post collection** | 0.4 - 0.7 (UFH)  0.5 - 1.0 (LMWH)  0.8 - 1.2 (fondaparinux) | 3 working days | For Low Molecular Weight Heparin  Monitoring. Sample must be taken 3-4 hours post dose and arrive within 1 hour of collection. Samples received outside these times will be rejected. | No |
| APTT | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **4 Hours post collection** | Refer to Appendix i | 4 hours | Used to monitor heparin  Please state if patient is on anticoagulants | Yes |
| Bethesda assay | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  6ml plain bottle  (Cap Colour – **Gold**)  **4 Hours post collection** | Not detected  NBU/ML | 21 working days | Referral Laboratory is either:   * Viapath * Kent and Canterbury | Referral lab |
| Clotting Screen | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **4 Hours post collection** | Refer to Appendix i | 4 hours | Includes:  PT/INR, APTT/APTT ratio, Q-fibrinogen. | Yes |
| D-Dimers | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **4 Hours post collection** | Refer to Appendix i | 4 hours | An audit form is required for D-Dimer tests for suspected venous thromboembolism at Darent Valley Hospital.  This test is not advisable in some clinical situations as misleading results may be seen e.g. during pregnancy or for patients currently taking anticoagulants.  D-Dimer tests have not been commissioned by primary care. | Yes |
| Derived Fibrinogen | 3.5ml citrate bottle  (Cap Colour – **Light** Blue) | Refer to Appendix i | 4 hours |  | Yes |
| Factor Assays  (II, V, VII, VIII, IX, X, XI, XII) | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **4 Hours post collection** | FII 50 - 150 IU/dl  FV 50 - 150 IU/dl  FVII 50 – 150 IU/dl  FVIII 50 – 150 IU/dl  FIX 50 – 150 IU/dl  FX 50 – 150 IU/dl  FXI 57.9 - 118.5 IU/dl  FXII 50 - 150 IU/dl  FXIII 50 - 150 IU/dl | 3-4 weeks | Only available after advice/referral from Haematology Consultant.  Referral Laboratory is either:   * Viapath * Kent and Canterbury   **Note:** send one sample per factor assay | Referral lab |
| ADAMTS-13 | 3.5ml citrate bottle  (Cap Colour – **Light** Blue) | 60-146 IU/dl | 3 Days | Only available after advice/referral from Haematology Consultant and on completion of correct request form.  Referral Lab is HSL | Referral lab |
| Factor V Leiden Prothrombin G20210A mutation | 4ml EDTA bottle  (Cap Colour – **Lavender**) | None applicable | 21 working days | Referral laboratory is Viapath | Referral lab |
| Free Protein S | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **4 Hours post collection** | 61 – 133% | 6 Weeks | **Note:** cannot be performed on patients taking oral anticoagulants | Yes |
| Heparin Induced Thrombocytopenia  (HIT Screen) | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  6ml plain bottle  (Cap Colour – **Gold**)  **4 Hours post collection** | Negative | 21 working days | Referral Laboratory is either:   * Viapath * Kent and Canterbury | Referral lab |
| Inhibitor Screen | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **4 Hours post collection** | Not detected  BU/ML | 14-21 days | Referral Laboratory is either:   * Viapath * Kent and Canterbury | Referral lab |
| Lupus Anticoagulant | 3.5ml citrate bottle x2  (Cap Colour – **Light** Blue)  **4 Hours post collection** | dRVVT screen 0.85 – 1.17  dRVVT confirm 0.90 – 1.10  dRVVT mixing test screen 0.90 – 1.07  dRVVT mixing test confirm 0.98 – 1.10 Ratio | 14-21 days | **Note:** cannot be performed on patients taking oral anticoagulants | Yes |
| Prothrombin Time + INR | 3.5ml citrate bottle  (Cap Colour – **Light** Blue) | Refer to Appendix i | 4 hours | Used to monitor warfarin.  Please state if patient is on anticoagulants | Yes |
| Protein C | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **4 Hours post collection** | 70 – 140 iu/dL | 6 Weeks | **Note:** cannot be performed on patients taking oral anticoagulants | Yes |
| Q-Fibrinogen | 3.5ml citrate bottle  (Cap Colour – **Light** Blue)  **4 Hours post collection** | Refer to Appendix i | 4 hours | This is done only if the derived fibrinogen is <1.5g/L. | Yes |
| Thrombophilia Screen | 3.5ml citrate bottle x3  (Cap Colour – **Light** Blue)  6ml plain bottle  (Cap Colour – **Gold**)  **4 Hours post collection** | Refer to individual tests | 6 Weeks | Includes:  Free Protein S, Protein C and Antithrombin | Yes |
| Von Willebrands Screen | 3.5ml citrate bottle x2  (Cap Colour – **Light** Blue)  **4 Hours post collection** | VWFAG: 50 – 160 iu/dL  VWF: 50 – 200 iu/dL | 6 Weeks | Referral Laboratory is either:   * Viapath * Kent and Canterbury   Includes:  Von Willebrand activity, antigen,  Collagen binding assay | Referral lab |

## HAEMOSTASIS TESTING CONSIDERATIONS

### Thrombophilia Studies

Requests for these tests must be discussed with a Consultant Haematologist, prior to submission of specimens in order for appropriate testing to be instigated, as well as clinical follow up where necessary.

**Where Consultant advice has not been sought prior to submission of specimens for thrombophilia testing, the Laboratory may reject the request and refer the user to Clinical Haematology Consultant.**

Investigation of miscarriages: specialist testing is recommended after 3 miscarriages and samples are to be taken 3 months after the event, not while the patient is in hospital following miscarriage. Tests to include clotting screen, fib, lupus anticoagulant, anticardiolipin antibodies and B2Glycoprotein.

**Please note: Protein C, Protein S and Lupus Anticoagulant test are not available for patients on oral anticoagulants.**

### Appropriate Timing of Sample Collection

Pro-thrombotic testing is best performed when the coagulation system is in a steady-state, and is best avoided:

* In an acute thrombotic state
* During anticoagulant treatment
* During pregnancy or the puerperium
* When taking oestrogen containing contraceptive pills or hormone replacement therapy.

There will be occasional situations where testing during the above is beneficial, but these must be discussed with Haematology medical staff to ensure that the interpretation made and advice given is valid.

# CONSULTANT CLINICS AND ADVICE

The following clinics are held at Darent Valley Hospital. Further information can be found on the Trust website [www.dvh.nhs.uk](http://www.dvh.nhs.uk) and [www.medway.nhs.uk](http://www.medway.nhs.uk) and the DVH Trust intranet site ADAGIO.

* Anticoagulant Clinics (DVH only)
* Haematology Clinics
* Thrombophilia Clinic

Haematology Consultants, Transfusion Specialist Practitioner and Registrar are happy to discuss and advise on clinical matters with a patient’s medical/ surgical staff and General Practitioners. They are contactable via switchboard at either site.

The Nurse Practitioner for anticoagulation can only give advice on Darent Valley Hospital patients.

# APPENDICES

## Appendix i – Reference Ranges and Critical Values

**Haematological Values for Normal Adults (expressed as a mean ± 2SD (95% range)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Assay** | **Gender and/or Age** | | **Reference Range** |
| White blood cell (WBC) count | Men and women | | 4.0 - 10.0 x109/L |
| Haemoglobin (Hb) | Men | | 150 ± 20 g/L |
| Women | | 135 ± 15 g/L |
| Red blood cell count | Men | | 5.0 ± 0.5 x 1012/L |
| Women | | 4.3 ± 0.5 x 1012/L |
| Haematocrit (Hct) or Packed cell volume(PCV) | Men | | 0.45 ± 0.05 L/L |
| Women | | 0.41 ± 0.05 L/L |
| Mean Cell Volume (MCV) | Men and women | | 92 ± 9 fL |
| Mean Cell Haemoglobin (MCH) | Men and women | | 29.5 ± 2.5 pg |
| Mean cell haemoglobin concentration (MCHC) | Men and women | | 330 ± 15 g/L |
| Red cell distribution width (RDW)  as a coefficient of variation (CV) | Men and women | | 12.8 ± 1.2% |
| Platelet (PLT) count (x109/L) | Men and women | | 280 ± 130 x109/L |
| Reticulocyte count (x109/L) | Men and women | | 50 - 100 x 109/L |
| Differential white cell count | Neutrophils | | 2.0 – 7.0 x 109/l |
| Lymphocytes | | 1.0 – 3.0 x 109/l |
| Monocytes | | 0.2 – 1.0 x 109/l |
| Eosinophils | | 0.02 – 0.5 x 109/l |
| Basophils | | 0.02 – 0.1 x 109/l |
| Erythrocyte sedimentation rate (ESR)  (mm in 1 hour at 20 ± 3°C) | Men | 17 – 50 yrs. | ≤ 10 |
| 51 – 60 yrs. | ≤ 12 |
| 61 – 70 yrs. | ≤ 14 |
| > 70 yrs. | ≤ 30 |
| Women | 17 – 50 yrs. | ≤ 12 |
| 51 – 60 yrs. | ≤ 19 |
| 61 – 70 yrs. | ≤ 20 |
| > 70 yrs. | ≤ 35 |

**Haematological reference ranges for children (expressed as a mean ± 2SD (95% range)**

(Dacie & Lewis 12th edition)

|  |  |  |  |
| --- | --- | --- | --- |
| **Assay** | **1 Year** | **2-6 Years** | **6-12 Years** |
| Haemoglobin (Hb) (g/L) | 126 ± 15 | 125 ± 15 | 135 ± 20 |
| Red blood cell count (x1012/L) | 4.5 ± 0.6 | 4.6 ± 0.6 | 4.6 ± 0.6 |
| Haematocrit (Hct) or Packed cell volume(PCV) (L/L) | 0.34 ± 0.04 | 0.37 ± 0.03 | 0.40 ± 0.05 |
| Mean Cell Volume (MCV) (fl) | 78 ± 6 | 81 ± 6 | 86 ± 6 |
| Mean Cell Haemoglobin (MCH) (pg) | 27 ± 2 | 27 ± 3 | 29 ± 4 |
| Mean cell haemoglobin concentration (MCHC) (g/L) | 340 ± 20 | 340 ± 30 | 340 ± 30 |
| Reticulocyte count (x109/L) | 30 – 100 | 30 – 100 | 30 - 100 |
| Platelet (PLT) count (x109/L) | 200 – 550 | 200 – 490 | 170 - 450 |
|  |  |  |  |
| White blood cell (WBC) count (x109/L) | 11 ± 5 | 10 ± 5 | 9 ± 4 |
| Neutrophils (x109/L) | 1.0 – 7.0 | 1.5 – 8.0 | 2.0 – 8.0 |
| Lymphocytes (x109/L) | 3.5 – 11.0 | 6.0 – 9.0 | 1.0 – 5.0 |
| Monocytes (x109/L) | 0.2 – 1.0 | 0.2 – 1.0 | 0.2 – 1.0 |
| Eosinophils (x109/L) | 01. – 1.0 | 0.1 – 1.0 | 0.1 – 1.0 |

**Biological Reference Intervals for coagulation tests:**

|  |  |  |
| --- | --- | --- |
| **Reference ranges provided by Werfen to be used with IL TOP analyser.** | | |
| Prothrombin Time (PT) | Men and women | 9.4 – 12.5 secs |
| International Normalised Ratio (INR) | Men and women | 0.8 – 1.2 |
| Activated Partial-thromboplastin time (APTT) | Men and women | 25.1– 36.5 secs |
| Activated Partial-thromboplastin Ratio (APTR) | Men and women | 0.9 – 1.2 |
| Derived Fibrinogen | Men and women | 2.8-4.7 g/l |
| Quantitative Fibrinogen (Replaces Clauss) | Men and women | 1.92 – 3.98 g/l |
| The cut off for Venous Thrombotic Episode (VTE) is a D-Dimer level | | 243 ng/ml |

**Newborn and neonatal reference ranges are available attached to the electronic reports.**

***References: Dacie & Lewis 12th edition***

**Critical Values**

These values must be acted on immediately and phoned through to the requesting clinician/ ward or Consultant Haematologist if unexplained first time patients.

|  |  |
| --- | --- |
| * WBC total <.1.0 or >40.0 x109/L | * Haemoglobin <70 or >180 g/L |
| * Neutrophils <0.5 x109/L | * Platelets <50 x109/L |

The below coagulation results must be telephoned to the ward on each occasion that they occur:

* ALL INR results above 5.0
* ALL APTTR results above 3.0.
* ALL fibrinogen results less than 1.0 g/L

## Appendix ii – Factors affecting sample quality and interpretation of results

|  |
| --- |
| **Causes of misleading results relating to sample collection** |
| * Physical activity (including fast walking) within 20 minutes * Smoking * Stress * Dehydration * Drugs or dietary supplement administration within 8 hours * Time (diurnal variance) * Posture (lying, standing or sitting) * Haemoconcentration from prolonged tourniquet pressure * Excessive negative pressure when using syringe * Incorrect tube type * Capillary or venous blood * Insufficient or excess anticoagulant * Inadequate mixing of sample * Inadequate sample storage conditions (temperature) * Delay in transit to the laboratory |
| **Factors which may affect laboratory results** |
| * Sample quality (under filled, over filled, clotted including fibrin clots) * Labile properties of assayed components * Interference (lipaemia, icteria, haemolysis) * Centrifugation * Interactions with anticoagulants (eg platelet clumping in EDTA) * Pregnancy |
| It may be necessary under certain circumstances for the laboratory to request  a repeat sample for confirmation of abnormal or equivocal results |

***References: Dacie & Lewis 12th edition***

## Vacuette selection chart which details information about sample bottles. Appendix iii – Vacuette Selection Chart and Order of Draw