

SPECIALTY TRAINING CURRICULUM

FOR

HAEMATOLOGY

MAY 2007

Joint Royal Colleges of Physicians Training Board

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1 SCOPE AND RATIONALE

Clinical haematology in the UK encompasses both clinical and laboratory aspects of the specialty. The purpose of this curriculum is to train a specialist in clinical haematology or paediatric clinical haematology. It describes the competencies [knowledge, skills and attitudes] required to achieve a certificate of completion of training [CCT] and to be registered on the specialist register as a clinical haematologist. It describes the learning methods and assessment methods to be employed. The CCT specialist will be able to work as a consultant specialist within the National Health Service and will have the competencies required to do so, as well as to develop further special interest expertise if required.

This curriculum describes specialist training in clinical haematology. This commences after completion of core training (core medical training (CMT) or acute care common stem (medicine) ACCS(M) competencies.

The duration of specialist training will be around 5 years. The minimum length of training in haematology in the countries of the European Union is 3 years [European Directive 93/16] but the median training period for the specialty in practice is 2 years in internal medicine and 4 years in haematology [survey data from the European Haematology Association]. However there is considerable variation between countries in the relative clinical and pathology laboratory responsibilities of clinical haematologists. In the UK specialists in haematology are both clinicians involved in direct patient care and haematology pathology laboratory practitioners, therefore specialist training covers both components, including training in transfusion medicine. The SAC has advised that training from ST1 will usually be completed in 7 years in full time training

Training will be undertaken in haematology training posts which:

- i) include core and special interest haematology, including haematological oncology, transplantation, paediatric haematology, haemostasis and thrombosis and blood transfusion practice
- ii) allow the trainee exposure to the broad range of diseases of the blood and bone marrow, both primary and secondary to other systemic disease
- iii) permit haematology training in a range of different settings including an academic environment, a District General Hospital, and Paediatric Haematology and Blood Transfusion Units

Specialist training may be extended to accommodate less than full time training.

Trainees who wish to acquire extensive research competencies, in addition to those specified in the generic element of the curriculum, may undertake a research project as an ideal way of obtaining those competencies, all options can be considered including taking time out of programme to complete a specified project or research degree. Time out of programme needs prospective approval from the SAC and the support of the Postgraduate Dean. Funding will need to be identified for the duration of the research period. A maximum period of 3 years out of programme is allowed. Competencies relevant to the specialist and generic curricula gained during the research period can count towards training; additionally clinical experience can be counted but in both cases must be prospectively approved by the SAC.

The syllabic content of the curriculum and teaching and learning methods were determined by the Specialty Advisory Committee in Haematology, which includes clinical and academic haematologists with representatives for Blood Transfusion Medicine and Paediatric Haematology, as well as a Haematology Trainee. Clinical Trainers have input through an annual meeting between the Specialty Advisory Committee and Regional Specialty Advisors.

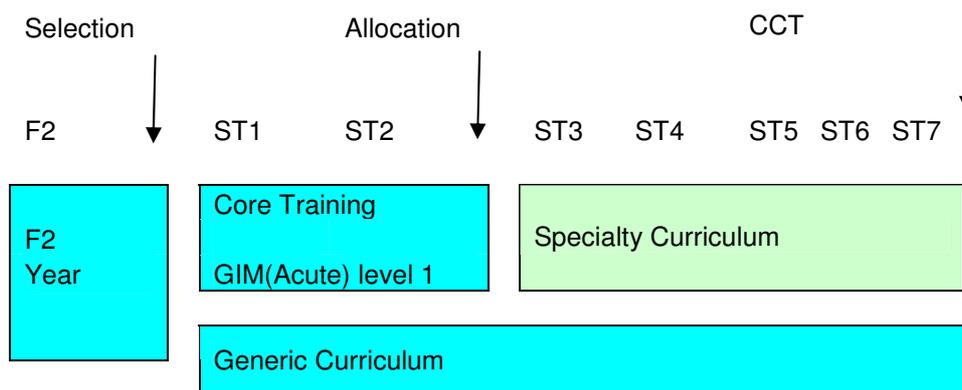
In summary the curriculum describes the knowledge, skills and attitudes needed to enable the specialist to assess and manage patients with abnormal blood counts and tests of blood coagulation and haemostasis and diseases of the blood and bone marrow. In addition it describes the modes of assessment, formative and summative, required to ensure competencies have been achieved.

Generic Curriculum

This specialty curriculum is complementary to the generic curriculum which applies to all 28 physicianly specialities. The generic curriculum follows the headings of good medical practice and runs through from core training to CCT (see fig 1). Trainees should read and understand both their specialty curriculum and the generic curriculum. Both curricula should be seen as integrated so that generic competencies are acquired at all stages of specialty training. Some generic components are also further expanded and deepened for some specialties (eg palliative medicine). When planning specialty programmes, deaneries and trainers should ensure that both specialty and generic competencies can be acquired and assessed.

Fig.1

Diagrammatic representation of specialty and generic curricula with GIM (acute) level 1 curriculum



2 MODEL OF LEARNING

Trainees should identify their learning needs and learn by personal experience and reflecting and building upon those experiences. They should be involved in planning their education and training and should regularly evaluate the effectiveness of their learning experiences.

Trainers and trainees need to appreciate the need for a high quality learning environment. This is achieved through the efforts of both trainees and trainers. Trainees must recognise the central role of learning by experience, self-directed learning and learning from peers as well as senior colleagues and that formal educational sessions and specialist courses have a useful but supplementary role, only. They must appreciate the need to seek guidance and to play an active role in group discussions. Trainers should recognise the need for supervision and guidance and should cultivate an atmosphere in which discussion is welcomed and questions are encouraged. They should be aware of the training opportunities inherent in most aspects of their daily work, including ward rounds, clinics, audit and administration, and that training should be enjoyable for both trainee and trainer. Above all trainers and trainees should adopt a positive attitude to training.

Learning opportunities include:

Experiential learning

This takes place in clinics, on wards, at group and multidisciplinary team meetings, in the diagnostic laboratories and blood bank.

Placements within the diagnostic laboratories and blood bank provide essential opportunities for concentrated practice in blood and bone marrow morphological interpretation and data interpretation and experience of analytical methodologies, quality assurance procedures and laboratory management.

Every clinical contact provides a learning opportunity. Patient contacts include ward rounds, hospital referrals, outpatient consultations [both new and follow-up patients] and referrals made through the diagnostic laboratory. Clinical contacts provide a focus for critical reading and self-directed learning, especially early in training. An essential part of this type of experiential learning is follow up of patients and observation of the evolution of clinical problems. Follow up of patients with haematological issues identified in the diagnostic laboratory also represents an essential learning opportunity.

Cases and diagnostic procedures are discussed with a clinical trainer in order to increase knowledge and improve diagnostic and clinical management skills, including appropriate use of further investigations. Increasingly, trainees learn to make independent diagnostic decisions and plans for investigation and management, but only consistent with their level of experience and training and with the maintenance of patient safety. Throughout training these decisions are reviewed by trainers who provide a level of supervision and guidance commensurate with the stage of training.

Observation of, and interaction with colleagues provides learning opportunities. This includes clinical haematologists, clinicians in other disciplines such as histopathologists, radiologists and paediatricians and also diagnostic laboratory scientists and managers.

Personal study

Personal study includes reading around clinical problems and preparing presentations as well as wider reading. Use is made of specialty and general journals, reviews, standard texts and computer-accessible materials.

Review of past examination papers and mock examinations may be of some value as guides to further study but comprises only a small proportion of total personal study time.

Individual teaching

Review of individual cases in clinics and as ward referrals and review of diagnostic material is usually one-to-one with a trainer.

Review of selected case records, discharge summaries, blood film, bone marrow and other diagnostic material reports, and clinic and referral letters may be performed on an individual basis also.

Feedback following formative assessments [mini-CEX, DOPS and multisource feedback], and from summative assessments if available, is on an individual basis.

Small group learning

This includes participation in audit meetings and journal clubs, morphology meetings and case presentations at clinical meetings and critical incident analysis.

Learning opportunities are provided by trainee-led, supervised problem-based sessions, data interpretation sessions and small group bedside teaching.

Courses

Local and external courses serve as supplementary learning opportunities. They may include special interest courses in blood transfusion medicine, haemostasis and thrombosis, haematological morphology and others.

National general and special interest haematology conferences often include high quality educational sessions. Attendance at one such meeting each year is a reasonable expectation.

Teaching others

Teaching medical undergraduates, junior colleagues in other specialties, diagnostic laboratory scientists and other health professionals provides learning opportunities to the specialty trainee. Attendance at a teacher training course is recommended and is a requirement prior to undertaking teaching of undergraduates in some medical schools.

Teaching of peers takes place in supervised, problem-based, small group sessions

Presenting at clinical meetings offers opportunity for in depth background reading as well as practice of critical thinking and communication skills. Provision of constructive feedback by trainers is an important learning opportunity.

Research and critical appraisal

Participation in journal club meetings, with feedback, represents an opportunity for in-depth study, development of critical appraisal skills and practice of presentational skills.

Involvement in research assists in the development of critical appraisal skills and the development of critical thinking. Both are prerequisites for effective clinical practice.

Audit and protocol development and laboratory quality assurance

Participation in audit is a prerequisite for effective clinical practice and trainee involvement represents a useful learning opportunity. Contribution to a minimum of two audits during training would be a reasonable expectation.

Supervised contribution to the development or revision of clinical protocols and laboratory standard operating procedures is essential experience, as is supervised interpretation of internal and external laboratory quality assurance data.

3 LEARNING EXPERIENCES

The aim of this curriculum is to enable the trainee to acquire the skills and knowledge to provide a clinical and laboratory haematology service as an independent practitioner. The objectives are that, on completion of the educational programme, the trainee will have acquired:

- ◆ Knowledge and understanding of haematological laboratory practice.
- ◆ Skills in the diagnostic techniques required in the practice of haematology.
- ◆ Knowledge and understanding of diseases of the blood and bone marrow at a level which permits safe and holistic management of patients as an independent practitioner.
- ◆ Knowledge of specialist areas within haematology such as paediatric haematology and blood transfusion sufficient for general haematology practice.
- ◆ The communication skills required for the practice of clinical haematology.
- ◆ Management skills required for the running of a diagnostic haematology laboratory.
- ◆ Knowledge and understanding of audit and team working, which underpin haematology practice.
- ◆ An understanding of the role of research in improvements in clinical practice, and the need for continuing professional development for the maintenance of standards of practice.

The learning experiences underpinning the training are indicated in the syllabus [content of learning]:

- A) Observation of, assisting and discussion with Senior Medical Staff. Small group teaching.
- B) Task specific on the job training.
- C) Observation of laboratory methods.
- D) Discussion with diagnostic laboratory staff.
- E) Practical diagnostic laboratory work.
- F) Personal study.
- G) Appropriate postgraduate education courses.

- H) Tailored clinical experience.
- I) Laboratory and clinical multidisciplinary team meetings.
- J) Participation in audit.
- K) Participation in Journal Clubs, involvement in research projects and presentations.

These appear on the tabulated curriculum to indicate learning methods against specific topics.

Throughout training the trainee is expected to assume responsibility for self-assessment and reflection, continuing self-directed learning and maintenance of competence and to utilise all reasonable opportunities for gaining relevant clinical experience.

4 CONTENT OF LEARNING

Because of the requirement for training in special interest areas [transfusion medicine, haematological oncology and transplantation, haemostasis and thrombosis, paediatric haematology] as well as general haematology and haematology laboratory practice, the curriculum has a modular design, in two phases.

The first phase, of around two years, is directed towards acquiring a broad general experience in haematology under supervision with both formal and informal teaching. The first 3 to 4 months of this phase is aimed to give the trainee sufficient understanding of laboratory haematology to safely offer advice on the interpretation of results, under supervision.

In the second phase the trainee will acquire a greater independence in clinical and laboratory practice. There should be some scope for pursuing sub-specialisation within haematology. Direct experience in research is also encouraged but is not obligatory. A period of greater than one year in full-time research will generally lengthen the total duration of training. During training a period of time will be spent in a District General Hospital; the duration will vary and should be at least six months but would not usually exceed two years. Training in the DGH environment may take place at any stage but the training received will be geared to the level of the trainee's previous experience.

The training period will begin with a formal introduction to laboratory aspects of haematology and an introduction to the presentation and management of haematological disorders. Following the induction period the trainee will receive instruction and practical experience in further aspects of haematology both laboratory and clinical. During the second year the trainee will continue to broaden experience and understanding of common blood disorders and their management, including disorders of haemostasis and blood coagulation, and experience and understanding of blood transfusion medicine. During this period a formal blood transfusion course of four weeks would be appropriate.

Second phase, after around two years – the trainee entering the second part of the training programme will have a sound theoretical and practical knowledge of haematological practice but will not have had a great deal of individual responsibility in applying that knowledge. The second phase of the training is thus devoted to acquiring self-sufficiency in the speciality during this period. The trainee will be expected to gain specific experience in blood transfusion, paediatric haematology, haematological stem cell transplantation and haemostasis and thrombosis. Programme Directors, Educational Supervisors and Trainers must ensure that there are opportunities to develop the essential competencies in all of these

areas. In relation to haemostasis and thrombosis and blood transfusion medicine this should not be restricted to placement in specialist units – the trainee should be involved routinely in the management of transfusion, bleeding and thrombosis during most placements. If desired, the trainee may extend the period of time spent in sub-speciality training. Depending upon local case mix, secondment to units in other training programmes may be advisable, for example for training in the diagnosis and management of haemoglobinopathies. Research training will generally take place in this second phase

Research

Trainees following a clinical academic training path will be awarded an academic training number and will generally compete for a Research Council or Charity-funded Training Fellowship within the first two years of haematology training. Successful applicants will generally undertake research training, out of programme, for the award of a University Higher Degree, usually PhD. They will then re-enter clinical training. Those who are unsuccessful in competition for funding will continue in clinical training.

Trainees following the standard curriculum also benefit from experience in research where opportunities are available. Some will choose to submit work for the award of an MD degree. Time out of programme needs prospective approval from the SAC and the support of the Postgraduate Dean. Funding will need to be identified for the duration of the research period and a maximum of 3 years out of programme is allowed.

Introductory Training

(First 3-4 months)

A formal period of instruction takes place at the beginning of specialist training to provide an introduction to laboratory aspects of haematology.

By the end of this period the trainee would be expected to:

- ◆ Have gained an understanding of laboratory practice including Health & Safety and Quality Control.
- ◆ Have sufficient understanding of haematology to offer basic advice on the interpretation of laboratory results.
- ◆ Have a sufficient knowledge of laboratory techniques to underpin clinical laboratory practice.
- ◆ Have a basic knowledge of the presentation and management of the common haematological disorders.
- ◆ Have knowledge of risk management issues as they apply to laboratory and clinical haematology.

Objective - To achieve sufficient understanding of laboratory haematology to offer advice on the interpretation of results under supervision

Knowledge	Skills	Attitudes	Learning Methods
<p>Explain the use of automated blood counters</p> <p>Explain the principles behind automated counters</p>	<p>Interprets results generated</p>	<p>Exhibits close rapport and understanding with laboratory staff</p>	<p>A C D</p>
<p>Outline making and staining of peripheral blood films and setting up and use of the light microscope</p> <p>Describe the use of different stains</p>	<p>Analyses and interprets blood films and differential white cell count</p> <p>Recognises malignant haematological disorders, red cell abnormalities & malarial parasites</p>	<p>Participates in liaison between laboratory and clinical staff</p>	<p>A D E F</p>
<p>Describe the methods for obtaining bone marrow aspirate and trephine biopsies</p>	<p>Performs procedure with supervision</p> <p>Prepares slides and trephine roll preparations</p>		<p>ABD E F</p>

Introduction to Haematology (2)

Knowledge	Skills	Attitudes	Learning Methods
Outline basic Blood Transfusion techniques (manual and automated)	Performs and interprets:- Blood grouping Cross matching Direct antiglobulin test Kleihauer test Interprets clinically significant antibodies	Relates blood transfusion laboratory practice to patient care Participates in liaison between laboratory and clinical staff	ABCDE
Describe the techniques for coagulation testing including automation of coagulation tests and thrombophilia tests Outline current methods for automated coagulation testing	Performs and interprets PT, INR, APPT, Thrombin time, Fibrinogen assay and FDPs Interprets thrombophilia testing results	Applies laboratory results to patient care	ABCDE
Define the presentation and management of common haematological disorders	Recognises in the laboratory and advises on the initial management of common anaemias, acute and chronic leukaemia, myeloma and lymphomas	Works as part of the clinical team in the management of these disorders	AHI

Laboratory Haematology

Objective - To be competent in the management of the haematology laboratory

Knowledge	Skills	Attitudes	Learning Methods
Identify normal and abnormal peripheral blood films including those flagged as abnormal by MLSO or automated counter	Accurately reports red cell and platelet abnormalities. Recognises acute and chronic leukaemia and malarial parasites on blood films	Relates laboratory findings to clinical picture	ABCDEF
Describe the indications for and technique of performing bone marrow aspirate and trephine biopsies	Performs technique competently Accurately reports results	Treats patients with respect and dignity. Consults to obtain appropriate advice in reporting findings	ABCEH
Define the indications for use of cytochemical staining, immunophenotyping and cytogenetics as applied to blood and bone marrow samples	Interprets results	Relates laboratory results to patient care	ABCEF

Laboratory haematology (2)

Knowledge	Skills	Attitudes	Learning Methods
Describe lymph node histology and classification of lymphomas	<p>Interprets the classification of Hodgkin and non Hodgkin lymphomas particularly the WHO classification</p> <p>Applies knowledge of histological classification to patient management</p>	Consults with the histopathologist on diagnosis	ACFI
Identify CSF cytological appearances	<p>Performs lumbar puncture competently and obtains CSF for cytopsin preparation</p> <p>Interprets presence of malignant cells in CSF</p>	Relates laboratory results to patient care	ACF
Explain the principles of laboratory management	<p>Demonstrates familiarity with:</p> <ul style="list-style-type: none"> ◆ Quality control including NEQAS schemes ◆ Commercially available laboratory computer systems ◆ Staff performance management and appraisals 	Establishes rapport and understanding with laboratory staff	ADGI

CLINICAL HAEMATOLOGY

OBJECTIVES

By the end of the educational programme trainees would be expected to manage the following, under supervision:-

1. Anaemias
2. Acute leukaemias
3. Chronic leukaemias
4. Paraproteinaemias
5. Lymphoproliferative disorders
6. Congenital coagulation disorders
7. Thrombophilia
8. Anticoagulation management
9. Acquired bleeding disorders
10. Platelet disorders
11. Haemoglobinopathies
12. Bone marrow failure syndromes
13. Myeloproliferative disorders

Anaemia

Objective - Competence in the diagnosis and management of patients presenting with anaemia

Knowledge	Skills	Attitudes	Learning Methods
Describe the pathophysiology of anaemia	Interprets the various causes of anaemia including:- <ul style="list-style-type: none">◆ Iron deficiency◆ Megaloblastic anaemia◆ Congenital and acquired haemolytic anaemia◆ Haemoglobinopathies◆ Anaemia of chronic disorders		ACEFG
Define the haematological, biochemical and radiological techniques required for the investigation of anaemia	On the basis of history, examination and laboratory results, formulates an appropriate management and treatment plan Communicates the diagnosis and investigation to the patient and their relatives	Exhibits empathy	ACDH
Identify the underlying causes of anaemia		Consults colleagues in other relevant specialties appropriately	AHI

Acute Leukaemia

Objective - Competence in the diagnosis and management of patients with acute leukaemia

Knowledge	Skills	Attitudes	Learning Methods
Describe the presentation, diagnosis and classification of acute leukaemia in adults and children	Interprets presenting features and conducts history and examination competently Uses appropriate laboratory investigations to establish diagnosis Formulates a management plan and offers full explanation to patient	Exhibits awareness of impact of diagnosis on patient and his/her family Displays empathy in communicating the diagnosis	ABEFHI
Define the principles of chemotherapy regimens: mode of action, side effects and interactions of agents used in the management of acute leukaemia.	Prescribes and administers complex chemotherapy regimens appropriately Safely performs lumbar punctures & administers intrathecal chemotherapy. Communicates planned treatment clearly to the patient		AFHI
Justify the use of trial protocols and importance of multicentre trials in acute leukaemia Define entry criteria Explain ethical considerations of informed consent	Performs collection of entry and follow up data	Recognises the need to provide full explanation of trial entry and informed consent after full discussion with patient and relatives, as appropriate	AFHI

Acute Leukaemia (2)

Knowledge	Skills	Attitudes	Learning Methods
Describe the use of supportive care in management of acute leukaemia	Practices appropriate use of: <ul style="list-style-type: none"> ◆ Bloodproducts, including special requirements ◆ Antibiotic regimens ◆ Central lines ◆ Antiemetics in patient management	Recognises the importance of supportive care for successful patient outcomes	AFHI
Define the indications for autologous and allogeneic haemopoietic stem cell transplantation in the management of acute leukaemia	Assesses suitability for stem cell transplantation Successfully manages patients undergoing stem cell transplantation Identifies complications of stem cell transplantation including post transplant viral syndromes and graft versus host disease Explains use of transplantation and its limitations to patient and family clearly		AFHI

Chronic Leukaemia

Objective - Competence in the diagnosis and management of patients with chronic leukaemia

Knowledge	Skills	Attitudes	Learning Methods
Describe the presentation, natural history, molecular biology and pathogenesis of chronic leukaemia Explain the classification and staging of chronic leukaemia	Interprets presenting features and conducts history and examination competently Demonstrates appropriate use of laboratory investigations to establish diagnosis		AFHI
Describe the therapeutic agents in the treatment of chronic leukaemia including their mode of action and side effects	Formulates a management plan and offers full explanation to patient	Exhibits empathy in discussing the diagnosis	AFHI
Explain the use of trial protocols and importance of multicentre trials in chronic leukaemia	Demonstrates understanding of entry criteria and ethical considerations of informed consent Performs collection of entry and follow up data Provides full explanation of trial entry Obtains informed consent after full discussion with patient, and relatives as appropriate		AFHI
Indications for autologous and allogeneic haemopoietic stem cell transplantation in the management of chronic leukaemia	Formulates management plan and offers full explanation to patient	Explains use of transplantation and its limitations to patient and family	AFHI
Describe the management of short and long term complications of chronic leukaemias	Contributes to the work of a multi-disciplinary team in managing complications	Recognises the impact of chronic disease on the patient and family Recognises the importance of team-working	ABHI

Myeloma

Objective – Competence in the diagnosis and management of patients with myeloma

Knowledge	Skills	Attitudes	Learning Methods
<p>Describe the classification, natural history and molecular biology of myeloma</p> <p>Explain the presentation and staging</p>	<p>Interprets presenting features and conducts history and examination competently</p> <p>Selects appropriate laboratory investigations to establish diagnosis and stage of disease</p>		AFHI
<p>Describe the treatment regimens and trial protocols in the management of myeloma</p>	<p>Formulates a management plan and offers full explanation to patient</p>	<p>Exhibits empathy in discussing diagnosis and treatment with patient and family</p>	AFHI
<p>Identify the indications for intensive chemotherapy and haemopoietic progenitor cell transplantation in the management of myeloma</p>	<p>Evaluates suitability for stem cell transplantation</p> <p>Successfully manages patients undergoing stem cell transplantation</p> <p>Recognises complications of stem cell transplantation including post transplant viral syndromes and graft versus host disease</p> <p>Communicates effectively the use of transplantation and its limitations to patient and family</p>		AFHI

Lymphoma

Objective - Competence in the diagnosis and management of patients with Hodgkin and non-Hodgkin lymphoma

Knowledge	Skills	Attitudes	Learning Methods
<p>Describe the natural history, classification and molecular biology of Hodgkin and non Hodgkin lymphoma</p> <p>Describe the presentation and define the staging criteria</p>	<p>Interprets the presenting features and conducts history and examination competently</p> <p>Selects appropriate laboratory and radiological investigations to establish diagnosis and stage of disease</p>		AFHI
<p>Outline the histological classification of lymphomas particularly the WHO classification</p>	<p>Practises competent diagnosis of lymphoma on trephine biopsy</p> <p>Demonstrates working knowledge of lymph node histology</p>	<p>Recognises importance of histology in patient management</p>	AEFGI
<p>Describe the chemotherapy treatment regimens and explain the place of radiotherapy and trial protocols in the management of lymphoma</p>	<p>Formulates a management plan and offers full explanation to patient</p>	<p>Exhibits empathy in discussing diagnosis and treatment with patient and family</p>	AFHI
<p>Define the indications for intensive chemotherapy and haemopoietic progenitor cell transplantation in the management of lymphoma</p>	<p>Evaluates suitability for stem cell transplantation</p> <p>Successfully manages patients undergoing stem cell transplantation</p> <p>Recognises complications of stem cell transplantation including post transplant viral syndromes and graft versus host disease</p> <p>Communicates effectively the use of transplantation and its limitations to patient and family</p>		AFHI

Congenital Coagulation Disorders

Objective - Competence in the management of patients with congenital coagulation disorders

Knowledge	Skills	Attitudes	Learning Methods
Describe coagulation and the coagulation pathway including control mechanisms and fibrinolysis		Relates theoretical knowledge to patient management	ACDEF
Describe the natural history, presentation and complications of congenital coagulation disorders including Haemophilia A, Haemophilia B and Von Willebrand Disease Outline the features of the less common congenital coagulation disorders Explain the role of the clinical history in assessment of the bleeding patient	Demonstrates competence in taking the history and conducting an examination of the patient. Formulates an appropriate management plan. Demonstrates competence in genetic counselling	Exhibits empathy in managing the disorder and its complications. Recognises the impact of the condition on the patient and family.	AFHI
Identify and explain the diagnostic methods used in assessment of coagulation disorders including specific factor assays	Interprets results of laboratory assays accurately	Relates laboratory results to clinical practice	ACDEF
Outline the use of molecular biological techniques to identify genetic disorders	Discusses the role of these techniques in pre-natal and family testing		ACDEF
Describe the types of coagulation factor concentrates including their safety profiles	Advises appropriately on prophylaxis and treatment of congenital coagulation disorders		ABFGHI

Thrombophilia

Objective - Competence in the diagnosis and management of patients with thrombophilic disorders

Knowledge	Skills	Attitudes	Learning Methods
Describe coagulation inhibitors and the fibrinolytic pathway Explain the epidemiology and molecular basis of thrombophilia		Relates theoretical knowledge to patient management	ACDEF
Explain the pathogenesis of thrombosis in arteries, veins and the microcirculation Identify the risk factors for thrombosis Describe the natural history, presentation and complications of thrombophilia, including both inherited and acquired disorders	Demonstrates appropriate use of clinical and laboratory methods to reach a diagnosis Demonstrates competence in the treatment and prophylaxis of thrombophilic conditions Demonstrates competence in genetic counselling		AFHI
Explain the techniques for the measurement of Protein C, Protein S, ATIII, APCR and Lupus Anticoagulant. Outline the molecular techniques used in diagnosis of heritable thrombophilia	Interprets and applies laboratory results to patient management		ACDEF
Define the effect of pregnancy , oral contraceptive pill use and hormone replacement therapy in thrombophilia	Successfully manages pregnancy in affected individuals	Contributes to multidisciplinary team-working	HI

Anticoagulation

Objective - Safe management of patients requiring anticoagulation

Knowledge	Skills	Attitudes	Learning Methods
Describe the mechanisms of action and define the indications for the use of heparin, oral anticoagulants and platelet inhibitors Describe the indications and methods for thromboprophylaxis, both pharmacological and non-pharmacological	Practices safe and effective initiation of anticoagulant therapy and thromboprophylaxis Interprets and evaluates monitoring of anticoagulation and advises appropriately		AFHI
Outline the range of models of anticoagulant control including computerised dosing methods and the use of the multi-professional team in delivering anticoagulant services	Performs appropriate follow up of patients receiving anticoagulants	Consults with other relevant specialists appropriately	ABDHI
Explain the side effects of anticoagulants	Advises appropriately on the management of over-anticoagulation Advises appropriately on the diagnosis and management of heparin induced thrombocytopenia	Contributes to multi-disciplinary team-working	HI

Acquired Bleeding Disorders

Objective - Competence in the diagnosis and management of patients with acquired bleeding disorders

Knowledge	Skills	Attitudes	Learning Methods

<p>Describe the pathogenesis and mechanisms of acquired bleeding disorders including :-</p> <ul style="list-style-type: none"> ◆ DIC ◆ Massive transfusion ◆ Renal & hepatic disease ◆ Obstetric complications ◆ Coagulation factor inhibitors <p>Explain the role of the clinical history in the assessment of the bleeding patient</p>	<p>Selects and evaluates laboratory results correctly Formulates an appropriate plan in the management of these disorders</p>		<p>ACEFHI</p>
<p>Describe the pharmaceuticals and blood products available for the management of excessive bleeding, their indications and side-effects</p>	<p>Communicates effectively with colleagues on the appropriate use of blood products including coagulation factors</p>	<p>Contributes to multidisciplinary team-working</p>	<p>AHI</p>

Platelet disorders

Objective - Competence in the diagnosis and management of congenital and acquired platelet disorders

Knowledge	Skills	Attitudes	Learning Methods
Outline platelet structure and function Define platelet and vessel wall interaction Describe congenital and acquired qualitative platelet disorders		Relates theoretical knowledge to patient management	AFG
Explain the measurement of platelet numbers by automated counters Describe platelet function tests, their uses and limitations	Selects and evaluates investigations correctly and formulates an appropriate management plan		ACDEHI
Outline the mechanisms of action of pharmacological platelet inhibitors	Communicates appropriate clinical advice on the use of antiplatelet agents	Contributes to multi-disciplinary team-working	AFH

Haemoglobinopathies

Objective - Competence in the diagnosis and management of patients with haemoglobinopathies

Knowledge	Skills	Attitudes	Learning Methods
Outline the molecular basis of abnormal haemoglobins and thalassaemia syndromes	Demonstrates competence in genetic counselling		AF
Describe the natural history, epidemiology, presentation and complications of thalassaemias, sickle cell disease and other haemoglobin abnormalities.	Applies clinical and laboratory methods to reach a diagnosis and formulate an appropriate management plan. Practices use of appropriate support eg pain relief and blood transfusion in the management of patients with haemoglobin disorders	Exhibits understanding of the impact of haemoglobin disorders on the patient and their family	ACDHI
Explain the laboratory methods used in the screening and diagnosis of abnormal haemoglobins	Communicates effectively to hospital teams and general practitioners on antenatal diagnosis and family testing	Contributes to multidisciplinary team-working	ACDEH

Bone marrow failure syndromes

Objective - Competence in the diagnosis and management of patients with bone marrow failure

Knowledge	Skills	Attitudes	Learning Methods
Describe the aetiology, natural history and classification of pancytopenia including:- Aplastic anaemia Myelodysplastic syndromes	Selects and evaluates clinical and laboratory methods to reach a diagnosis and formulate an appropriate management plan	Exhibits empathy in delivering a clear explanation of disorder and its long term management to the patient and family	AEFHI
Explain the use of blood product support and define the complications of long term transfusion	Practices appropriate use of blood transfusion and iron chelation regimens		AFHI
Describe the indications for use of chemotherapy, immunosuppression and haemopoietic progenitor cell transplant in the management of marrow failure syndromes	Practices appropriate management		AFHI

Myeloproliferative disorders

Objective - Competence in the diagnosis and management of patients with myeloproliferative disorders

Knowledge	Skills	Attitudes	Learning Methods
<p>Describe the pathophysiology and classification of myeloproliferative disorders</p> <p>Outline the diagnostic methods including isotopic evaluation of red cell mass and evolving molecular methods</p>	<p>Selects and evaluates clinical and laboratory methods to achieve a diagnosis and formulate an appropriate management plan</p>		<p>AEFHI</p>
<p>Describe the therapeutic options, their indications and side-effects, including :- Venesection Chemotherapy Other pharmaceuticals Supportive therapies</p>	<p>Performs therapeutic venesection competently</p>		<p>AH</p>

Haematology relating to other medical specialities

Objective - Competence in advising on haematological problems arising in medical and surgical patients

Knowledge	Skills	Attitudes	Learning Methods
<p>Outline the impact of systemic disease on the blood and bone marrow Identify the role of the haematologist in management of:-</p> <ul style="list-style-type: none">◆ Massive transfusion◆ Multi-organ failure◆ Haemostatic problems in pregnancy◆ Abnormalities of blood and bone marrow in the neonate	<p>Evaluates laboratory results in these clinical situations and provides appropriate and timely advice Communicates clearly with colleagues in other specialities</p>	<p>Contributes to multidisciplinary team-working</p>	<p>ABCEFHH</p>

General aspects of haematology

Objective - Development of the communication and other generic skills required for the practice of clinical and laboratory haematology

Knowledge	Skills	Attitudes	Learning Methods
<p>Explain the value of good communication and the essential skills required Justify the requirement for accurate and contemporaneous record keeping</p>	<p>Elicits and records an accurate history Records accurately clinical findings, differential diagnosis and a management plan Communicates the diagnosis clearly to patients and their relatives Explains the treatment required and its side effects Demonstrates an ability to break bad news clearly and empathically including the communication of a terminal prognosis Communicates clearly with colleagues in primary and secondary care via clinic letters, letters of referral and discharge documents</p>	<p>Recognises the impact of disease on the patient and their family Recognises the importance of good communication in the practice of haematology Contributes to multidisciplinary team-working</p>	<p>ABGHI</p>
<p>Describe essential practical skills</p>	<p>Performs insertion, removal and care of central venous lines safely and appropriately Practices appropriate use of antibiotic regimens for treatment and prophylaxis in the immunosuppressed patient Practises appropriate use and interpretation of imaging and radio-isotope methods in haematology</p>		<p>ABFHI</p>
<p>Describe the principles of clinical audit including the audit cycle Explain the critical appraisal of research data</p>	<p>Participates in audit Evaluates research data and/or publications in scientific journals</p>	<p>Recognises the benefit of audit to clinical care Recognises the role of research in medical advances</p>	<p>J K</p>

TRAINING IN SPECIAL INTEREST HAEMATOLOGY

Blood Transfusion

The trainee will need to acquire a basic knowledge of blood transfusion practice to be able to provide advice in transfusion related matters to clinical colleagues and provide laboratory staff with clinical advice. The trainee wishing to pursue a career in blood transfusion may spend a significant period of training in the special interest area after acquiring basic haematology training

Blood Transfusion

Objective - To acquire sufficient knowledge of blood transfusion practice to provide safe advice to clinical colleagues in a general hospital

Knowledge	Skills	Attitudes	Learning Methods
Outline the principles of blood transfusion laboratory practice including :- <ul style="list-style-type: none"> ◆ Blood grouping ◆ Identification of allo and auto antibodies ◆ Crossmatching techniques ◆ Automation in blood transfusion ◆ Use of computers in blood transfusion 	Interprets blood transfusion laboratory results to an adequate standard	Liaises between laboratory and clinical staff	ACDEFGH
Describe the basic principles of donor selection and the preparation of blood components including:- <ul style="list-style-type: none"> ◆ Donor safety ◆ Preparation of blood components, including for paediatric/neonatal use ◆ Donation testing ◆ Role of Quality System 		Recognises the hazards of transfusion of blood products	AGH
Describe the principles of clinical blood transfusion practice including :- <ul style="list-style-type: none"> ◆ Hazards of blood transfusion ◆ Appropriate use of blood products ◆ Special requirements ◆ Alternatives to blood and blood products ◆ Exchange transfusion and plasma exchange therapy ◆ SHOT and SABRE reporting ◆ The role of the Hospital Transfusion committee ◆ Organisation of the laboratory and relevant transfusion legislation 	Practices the appropriate use of blood and blood products Manages complications of blood transfusion appropriately Gives appropriate advice in patients with allo or auto antibodies, including in pregnancy Advises appropriately on the indications for exchange transfusion and plasma exchange		ABDEFGH

Paediatric Haematology

Trainees should receive instruction in and gain practical experience of disorders of blood and bone marrow in children.

The training programme will usually require specific secondment to a paediatric haematology unit. Those wishing to pursue a career in paediatric haematology and who have completed general medical training in paediatrics will normally spend around 2 years of their specialty training in haematology in a specialist paediatric centre. Those wishing to pursue a career in paediatric haematology whose training in general medicine was in adult practice will be required to train in general paediatrics for around one year, in addition to around 5 years in specialty training, including 2 years in paediatric haematology.

Paediatric Haematology

Objective –Competence, to the level of a general haematologist, in the diagnosis and management of common haematological disorders in childhood

Knowledge	Skills	Attitudes	Learning Methods
<p>Describe the laboratory practice required to handle small samples</p> <p>Outline the need for age-related normal values</p> <p>Describe the appearances of the blood and bone marrow in neonates, infants and children</p> <p>Describe the pathophysiology diagnosis and management of neonatal anaemia, coagulation disorders, haemorrhagic disease of the newborn and haemolytic disease of the newborn</p> <p>Identify the haematological manifestations of paediatric diseases including solid tumours</p> <p>Describe the haematological investigation of non-accidental injury</p>	<p>Analyses and interprets results generated</p> <p>Analyses and interprets blood films and bone marrow smears</p> <p>Evaluates and manages these disorders appropriately in conjunction with paediatrician colleagues</p> <p>Advises appropriately on the prophylaxis and management of haemolytic disease of the newborn</p>	<p>Recognises the need for consultation</p> <p>Contributes to multidisciplinary team-working</p> <p>Shows an understanding of the knowledge base of paediatricians, including oncologists</p>	<p>ACDEFGHI</p>
<p>Describe the aetiology, classification and prognosis of childhood leukaemia, myeloproliferative disorders and myelodysplastic syndromes</p> <p>Outline the principles of chemotherapy and justify entry into clinical trials. (See relevant section of general curriculum)</p> <p>Outline the importance of long term follow up for late effects of chemotherapy and SCT in children</p>	<p>Demonstrates use of clinical and laboratory skills to make a diagnosis and formulate an appropriate management plan, including palliative care.</p>	<p>Exhibits empathy and clear communication in discussions of diagnosis, treatment and prognosis with the patient if appropriate and his/her parents</p>	<p>AFGHI</p>

<p>Describe the pathophysiology, diagnosis and management in childhood of:</p> <ul style="list-style-type: none"> ◆ Haemoglobinopathies including <ul style="list-style-type: none"> ◆ Identification of high risk sickle disease ◆ Principles of population screening ◆ Congenital and acquired thrombocytopenias ◆ Congenital and acquired coagulopathies ◆ Congenital and acquired thrombotic states ◆ Inherited & acquired anaemias, ◆ Disorders of leucocytes including <ul style="list-style-type: none"> ◆ Neutropenia; lymphopenia ◆ Abnormal function ◆ Immune deficiency <p>(See relevant section of general curriculum)</p>	<p>Performs bone marrow aspiration safely on infants and children</p> <p>Performs lumbar puncture safely on infants and children</p> <p>Demonstrates appropriate use of genetic investigation of haematological disorders</p> <p>Demonstrates an understanding of inherited disease and investigation of the family</p> <p>Demonstrates an understanding of the transfusion requirements of neonates and children with occasional or continued need and the long term side effects</p>	<p>Recognises the need for genetic counselling and consent for testing</p> <p>Recognises the importance of care networks for congenital disease</p> <p>Recognises the need for transitional care medicine</p> <p>Recognises when to refer to a paediatric haematologist</p>	<p>ABDFGH</p>
<p>Describe the pathophysiology, diagnosis and management in childhood of:</p> <p>Inherited and acquired bone marrow failure syndromes including haemophagocytic syndromes</p> <p>Paediatric aspects of stem cell transplantation</p>	<p>Communicates effectively the use of transplantation and its limitations to the patient where appropriate and family</p>		<p>ABF</p>

5 SUPERVISION, FEEDBACK AND ASSESSMENT

Each haematology scheme will have a Programme Director. They will ensure that individual programmes permit the full range of training opportunities required for the achievement of competencies. They will structure and co-ordinate rotations in liaison with the Postgraduate Deans. They will be responsible for the tailoring of programmes to specific individual requirements based on results of formative assessments and feedback from appraisals and in-training assessments.

Training under the supervision of several trainers, in two or more different centres with a broad range of learning opportunities is strongly encouraged. All elements of work must be supervised but the level of supervision required will vary with the stage of the curriculum, the experience of the trainee and their personal development. There must be the opportunity to discuss all inpatients, outpatients, referrals and laboratory data interpretation, if required, at all stages of training.

Upon enrolment each trainee will receive a copy of the Curriculum and the Training Record. Results of formative assessments will be recorded in a trainee's Training Record, as will a summary of the feedback given. A correctly maintained and up to date Training Record will be used as evidence for satisfactory progress. This will be supplemented by a trainer's report for each placement.

Each trainee must have a nominated Educational Supervisor. Different Educational Supervisors may be nominated for separate sections of the training scheme. The Educational Supervisors will undertake appraisals and assist in co-ordination of assessments. Appraisals should be carried out at the start, mid-point and end of each discrete section of the training rotation and there should be a minimum of three appraisals each year. The first appraisal on each occasion should include the formulation of a learning agreement.

It will be the responsibility of the trainee to ensure that assessments are timetabled according to a schedule agreed in advance with the Educational Supervisor. In general, if results are satisfactory, multi-source feedback should be obtained on a minimum of two occasions, at the end of the first year and after around 4 years. DOPS should be carried out once for each relevant procedure, repeated if necessary until performance is deemed satisfactory. At least one mini-CEX should be recorded in each clinical placement. Some trainees may benefit from more frequent formative assessments. There should also be continuous informal feedback from systematic observation of performance.

The results of assessments will be collated by the trainee and presented at the annual review of in-training assessments. The RITA panel will review the evidence to determine whether progress is satisfactory. The panel may choose to specify types of evidence to be collected for future RITAs.

Summative assessment will be knowledge based:

The examination for membership of a Royal College of Physicians or equivalent.

The examination for membership of the Royal College of Pathologists.

The MRCPPath examination in haematology has been revised and will consist of:

Part 1: An assessment of knowledge and clinical and laboratory judgement comprising 2 examination papers~Paper 1 [4 essays] and Paper 2 [125 multi-choice questions in best from five or extended matching question format]

Part 2: Assessment of core clinical and laboratory skills [data interpretation and clinical judgement] in haematological morphology, haemostasis and thrombosis and transfusion medicine] and a structured oral examination.

Generally trainees will attempt Part 1 after 18 months of training, and will be eligible to attempt Part 2 after a minimum of 12 months after success in the Part 1 examination.

6 MANAGING CURRICULUM IMPLEMENTATION

The curriculum is available on the JRCPTB website and will be issued to all trainees on enrolment. Programme Directors and Educational Supervisors will ensure that trainers are familiar with the curriculum and use it as a blueprint for training. Trainers will ensure that trainees have a good appreciation of the curriculum and this will be explored as part of RITA assessments.

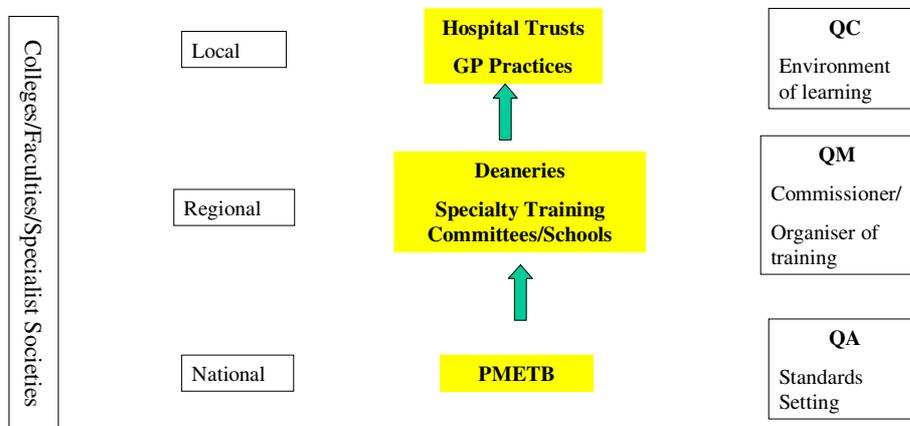
The Programme Director will oversee the availability of special interest experience within posts in rotations and will plan individual placements to ensure that all relevant knowledge and skills can be attained.

The curriculum covers the full range of knowledge and skills required for achievement of a CCT in clinical haematology. Appraisal will identify individual training needs. The RITA process will assist in the identification of any deficiency in experience. Assessment will identify any deficiency in competence relative to the stage of training. The Programme Director, with assistance from Educational Supervisors, will arrange for deficiencies to be rectified in other parts of the rotation. The RITA procedure will act as an additional process for the identification and correction of deficiencies. It is expected that trainees will take personal responsibility for ensuring that deficiencies are identified and reported.

Programme Directors, along with Regional Specialty Advisors, Deaneries, Educational Supervisors and trainees will together ensure local delivery of the curriculum.

Deaneries are responsible for quality management, PMETB will quality assure the deaneries and educational providers are responsible for local quality control, to be managed by the deaneries. The role of the Colleges in quality management remains important and will be delivered in partnership with the deaneries. The College role is one of quality review of deanery processes and this will take place within the SACs on a regular basis.

The Organisation and Quality Assurance of PG Training



7 CURRICULUM REVIEW AND UPDATING

The specialty curriculum, along with the core medical training, acute medicine and generic curricula will be reviewed regularly. The curricula should be regarded as living documents and the SAC will ensure that it will respond swiftly to new developments. In addition the curriculum in haematology will be subject to 3 yearly formal review within the SAC. This will be informed by curriculum evaluation and monitoring. The SAC will have available to it the trainees' questionnaire (PMETB to provide) plus specialty specific questionnaires, reports from other sources such as educational supervisors, programme directors, specialty deans, other contacts such as at PYAs which SAC members attend, service providers and patients.

Trainee involvement in curriculum review will be facilitated through the involvement of trainees in local faculties of education and through informal feedback during appraisal, RITA, College meetings

The SAC will respond rapidly to changes in health service delivery. Regular review will ensure the coming together of all the stakeholders needed to deliver an up to date modern specialty curriculum. The curriculum will indicate the last date of formal review monitoring and document revision.

Curriculum revision needs to be informed by a review of how the trained CCT specialist performs within the National Health Service. There are two aspects to this:

1 Specific to the person

Was the trained specialist able to carry out the duties of the consultant post they were appointed to, ie did they have the requisite skills, knowledge and attitudes required for the post, did the possession of a CCT in that specialty meet the requirements of the person specification?

2 Specific to the role

Did the specialty competencies meet the requirements of the service, i.e. was the design of the specialist fit for purpose?

8 EQUALITY AND DIVERSITY

The Royal Colleges of Physicians will comply, and ensure compliance, with the requirements of relevant legislation, such as the:

- Human Rights Act 1998
- Race Relations (Amendment) Act 2000;
- Disability Discrimination Act 1995 (Amendment) 2004 and Special Educational Needs and Disabilities Act 2001
- Data Protection Acts 1984 and 1998

The JRCPTB believes that equality of opportunity is fundamental to the many and varied ways in which individuals become involved with the Colleges, either as members of staff and Officers, as advisers from the medical profession, as members of the Colleges' professional bodies or as doctors in training and examination candidates. Accordingly, it warmly welcomes contributors and applicants from as diverse a population as possible, and actively seeks to recruit people to all its activities regardless of race, religion, ethnic origin, disability, age, gender or sexual orientation.

Deanery quality assurance will ensure that each training programme complies with the equality and diversity standards in postgraduate medical training as set by PMETB.

Compliance with anti-discriminatory practice will be assured through:

- Monitoring of recruitment processes
- Ensuring all College representatives and Programme Directors have attended appropriate training sessions prior to appointment or within 12 months of taking up post
- Ensuring trainees have an appropriate, confidential and supportive route to report examples of inappropriate behaviour of a discriminatory nature
- Monitoring of College examinations
- Ensuring all assessments discriminate on objective and appropriate criteria and do not unfairly disadvantage trainees because of gender, ethnicity, sexual orientation or disability (other than that which would make it impossible to practise safely as a physician). All efforts shall be made to ensure the participation of people with a disability in training.

Statutory Responsibilities

The Royal Colleges of Physicians will comply, and ensure compliance, with the requirements of legislation, such as the:

- Human Rights Act 1998
- Freedom of Information Act 2001
- Data Protection Acts 1984 and 1998