

Haematology Curriculum for Higher Medical Training

Blood Transfusion Training Guidance

Introduction:

This guidance aims to support haematology trainees to learn blood transfusion in the hospital setting. It can also be used by clinical and educational supervisors responsible for blood transfusion training, laboratory managers, biomedical scientists and transfusion practitioners contributing to trainees' transfusion education. The document should be read in conjunction with the Haematology Curriculum for Higher Medical Training (<https://www.jrcptb.org.uk/documents/draft-2021-haematology-curriculum>).

In line with the Haematology Curriculum recommendations, trainees should aim to obtain comprehensive knowledge and experience of different topics across all areas of practice. They should be able to recognise and address clinical, laboratory, quality, and management elements of transfusion medicine.

Trainees should seek and be offered opportunities for personal involvement in transfusion practice (with appropriate supervision for the level of training) and be able to demonstrate progress in knowledge, skills and competencies aiming to work independently towards the end of training.

In the hospital setting, transfusion training can be offered from a multi-professional team including clinicians with transfusion expertise, biomedical scientists, and transfusion practitioners. Hospitals should ensure appropriate introduction of trainees to the transfusion team as well as familiarisation with relevant transfusion hospital policies and SOPs. It is also advisable for trainees to remain up to date with recommendations and guidance issued from Serious Hazards of Transfusion (SHOT) (<https://www.shotuk.org/>), The Joint United Kingdom (UK) Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee (JPAC) (<https://www.transfusionsguidelines.org/>) and British Society for Haematology (BSH) (<https://b-s-h.org.uk/guidelines/>)

Opportunity for experience:

The table suggests settings where trainees should seek out learning opportunities in each topic. Topics below are mapped to specialty capabilities in practice (CiPs). A small number of topics may only be covered in courses (such as those provided by the UK blood services). In some instances, courses can cover specific and highly specialised aspects of a topic while the overall experience is obtained in the hospital.

BASIC TRANSFUSION PRINCIPLES

| Topic | Opportunity for experience (mapped to capabilities in practice) | | | |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------|---------------------------------------|-----------------------------------------------|
| | Laboratory | Liaison/ Emergency/ Palliative care | Inpatient/ Outpatient/ Day unit | Specialist training at centres/ courses |
| Blood donor selection criteria and donor safety | | | | X |
| Component processing and testing including microbiology | | | | X |
| Validity of pre-transfusion specimen and pre-analytical issues | X | X | X | |
| Patient identification and correct labelling of samples | X | X | X | |
| ABO and D typing | X | | | |
| Interpreting anomalous ABO / D results | X | | | X |
| Antibody screening and identification | X | | | |
| Crossmatching | X | | | |
| LIMS*: integrity, setting and monitoring, interaction with hospital wide IT system | X | | | |
| Electronic and remote issue of blood components | X | | | |
| Blood component recall | X | X | | X |

* Laboratory information management system

USE OF BLOOD COMPONENTS

| Topic | Opportunity for experience (mapped to capabilities in practice) | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------|---------------------------------------|-----------------------------------------------|
| | Laboratory | Liaison/ Emergency/ Palliative care | Inpatient/ Outpatient/ Day unit | Specialist training at centres/ courses |
| Storage conditions, shelf life, indications and contraindications, transfusion triggers, timescale for availability of component, for the following: | | | | |
| Red cells (standard, frozen, neonatal/IUT) | X | X | X | X (manufacturing aspects) |
| Blood components/ products: Fresh frozen plasma/ solvent detergent treated plasma Platelets Cryoprecipitate Granulocytes IV immunoglobulin Albumin | X | X | X | X (manufacturing aspects) |
| Special requirements (e.g. irradiation, CMV neg, washed) | X | X | X | X (manufacturing aspects) |
| Prioritisation of suitable components when the ideal is unavailable | X | X | | X |
| Specification of neonatal and paediatric components and indications for use | X | X | | X |

IMMUNOHAEMATOLOGY AND CLINICAL APPLICATION

| Topic | Opportunity for experience (mapped to capabilities in practice) | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------|---------------------------------------|-----------------------------------------------|
| | Laboratory | Liaison/ Emergency/ Palliative care | Inpatient/ Outpatient/ Day unit | Specialist training at centres/ courses |
| Knowledge of major blood group systems and relevance to transfusion/ pregnancy: ABO, Rh, Kell, Duffy, Kidd, MNS | X | | | X |
| Red cell phenotyping and genotyping | X | X | | X |
| Positive antibody screen with review of additional testing and involvement of reference centre | X | X | | X |
| Selection of suitable serologically safe and suitable components | X | X | | X |
| Emergency blood provision to patients with red cell antibodies | X | X | | |
| How to source 'rare' units when blood not readily available | X | X | X | X |
| DAT testing and interpretation | X | X | X | |
| Antibody identification for patients with autoantibodies including adsorption | X | | | X |
| Investigation and management of AIHA | X | X | X | |
| Serological criteria for selection of red cells for transfusion in patients with sickle cell disease and other transfusion-dependent anaemias (e.g. thalassaemia, MDS) | X | | X | |
| Transfusion in haemato-oncology patients including immunological complications of HSCT | X | | X | |
| Selection of blood components for ABO mismatched HSCT and solid organ transplant | X | X | X | |
| Principles of HLA matching in bone marrow transplantation | | | X* If available | X |
| Antibody testing in pregnancy including titration and quantitation | X | X | | X |
| Management of antibodies in pregnancy/ HDFN | | X | | |
| FMH testing – Kleihauer/ flow cytometry | X* (if available) | X | | X |

| | | | | |
|---------------------------------------------------------|---|---|---|---|
| Anti-D usage for prevention of sensitisation | X | X | | |
| Use of free fetal DNA testing | X | X | | X |
| Platelet immunology: HLA and HNA | | | | X |
| Investigation and management of platelet refractoriness | X | X | X | X |
| Investigation and management of NAIT | X | X | | X |

CLINICAL TRANSFUSION PRACTICE

| Topic | Opportunity for experience (mapped to capabilities in practice) | | | |
|----------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------|---------------------------------|-----------------------------------------|
| | Laboratory | Liaison/ Emergency/ Palliative care | Inpatient/ Outpatient/ Day unit | Specialist training at centres/ courses |
| Patient information and consent for transfusion | | X | X | |
| Awareness of NICE guideline NG24 | | X | X | |
| Patient blood management and alternatives to transfusion | | X | X | |
| Patients refusing blood transfusion | | X | X | |
| Transfusion in palliative care | | X | | |
| Stem cell harvest and principles | | | X | |
| Principles of manual and automated red cell exchange | | X | X | |
| Therapeutic apheresis | | X | | |

TRANSFUSION EMERGENCIES

| Topic | Opportunity for experience (mapped to capabilities in practice) | | | |
|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------|---------------------------------|-----------------------------------------|
| | Laboratory | Liaison/ Emergency/ Palliative care | Inpatient/ Outpatient/ Day unit | Specialist training at centres/ courses |
| Management of major haemorrhage (including trauma, obstetric, medical bleeding) | | X | | |
| Avoidance and management of main hazards of transfusion: | | | | |
| Incorrect blood component transfused | X | X | X | |
| Haemolytic transfusion reactions | X | X | | |
| Febrile non-haemolytic/ allergic reactions | | X | X | |
| Transfusion related acute lung injury (TRALI) and Transfusion associated graft versus host disease including investigations | | X | X | X |

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|------------------------------------------------------------------|---|---|--|---|
| Transfusion related circulatory overload | | X | | |
| Transfusion transmitted infections | | X | | X |
| PTP, other SHOT categories | | | | X |
| Review of recent cases reported to SHOT/SABRE from your hospital | X | X | | |

REGULATORY/ MANAGEMENT ASPECTS OF TRANSFUSION

| Topic | Opportunity for experience (mapped to capabilities in practice) | | | |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------|---------------------------------|-----------------------------------------|
| | Laboratory | Liaison/ Emergency/ Palliative care | Inpatient/ Outpatient/ Day unit | Specialist training at centres/ courses |
| Role of MHRA and BSQR including compliance reports | X | | | |
| UKAS - standards and accreditation | X | | | |
| Clinical leadership of the transfusion laboratory | X | | | |
| Principles of quality management and change control | X | | | |
| NEQAS including review of local reports | X | | | |
| Validation/ verification of recently acquired equipment | X | | | |
| Introduction/ modification of lab SOP | X | | | |
| Incident investigation, root cause analysis and CAPA | X | | | |
| Haemovigilance – SHOT/ SABRE | X | X | | |
| Risk assessment and identification of mitigations | X | | | |
| Attend meetings of the hospital transfusion team (HTT)/ hospital transfusion committee (HTC) | X | | | |
| Key performance indicators: Usage, Wastage, Traceability | X | | | |
| Contribute to blood transfusion audit (local or national) | X | | | |
| Major incident plan (including response to IT/infrastructural failure) | X | X | | |
| Emergency blood management plan (in cases of shortage) | X | X | | X |

Additional Resources:

Blood Consultative Committee

<https://www.gov.uk/government/groups/blood-consultative-committee>

Transfusion Medicine SAC, Royal College of Pathologists

<https://www.rcpath.org/profession/committees/transfusion-medicine.html>

Blood Safety and Quality Regulations 2005 (as amended)

<https://www.health-ni.gov.uk/articles/blood-safety-and-quality-regulations-2005-amended>

UK NEQAS Haematology and Transfusion

<https://www.ukneqash.org/bt1p.php>

Blood transfusion: patient consent

<https://www.gov.uk/government/publications/blood-transfusion-patient-consent>

Education | British Society for Haematology

<https://b-s-h.org.uk/education/>

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