NHS
Blood and Transplant

Specific Requirements

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NEY NMA Course March 24

AIMS

Specific requirements your patients have for transfusion and how this is managed

Learning Outcomes

- Classify which patients require:
  - Irradiated components
  - CMV negative components
  - Washed / resuspended components
  - (Phenotype selected components)
  - HLA or HPA selected components
  - HbS Negative
  - Other specifications
- Describe the risks of not requesting special requirements

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Can you match the requirement to the indication?

- Prevention of transfusion associated Graft versus host disease
- Prevention of CMV infection or reactivation
- Avoidance of antibody-related haemolysis
- Increase platelet increments post transfusion
- Prevent anaphylactic reactions

- CMV negative
- HLA/HPA selected
- Phenotype matched
- Washed
- Irradiated

Why are Specific Requirements important?

- Prevention of transfusion associated Graft versus host disease

  IRRADIATED

- Prevention of CMV infection or reactivation

  CMV NEGATIVE

- Avoidance of antibody-related haemolysis

  PHENOTYPE MATCHED

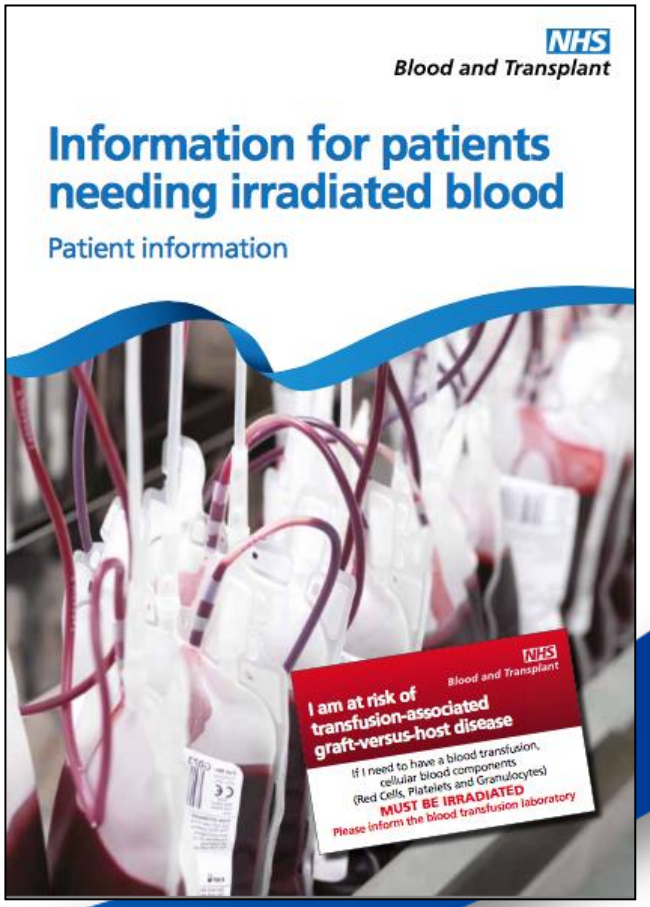
- Increase platelet increments post transfusion

  HLA/HPA SELECTED

- Prevent anaphylactic reactions

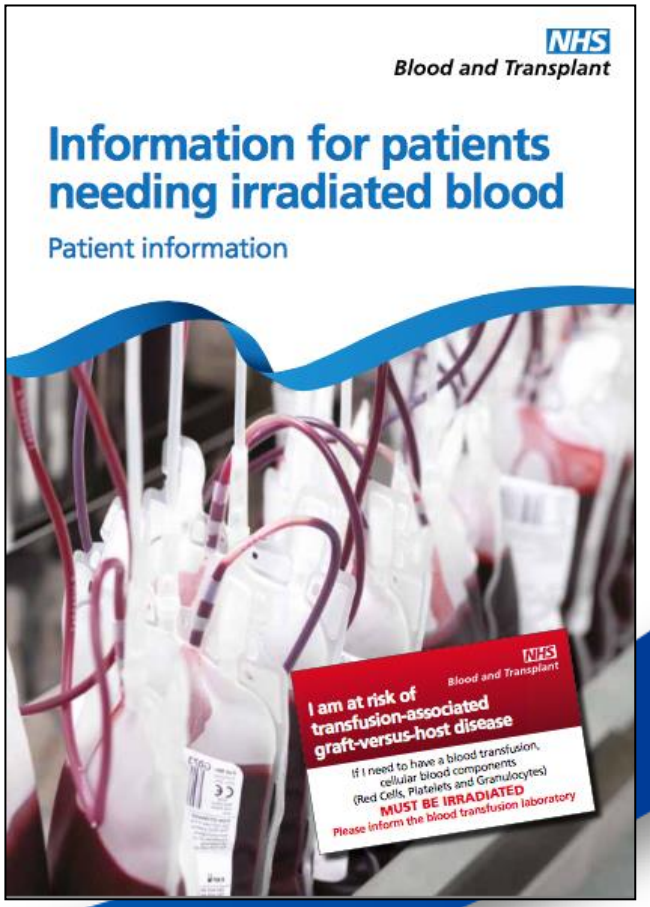
  WASHED

Irradiation



- Gamma or X-ray irradiation
- Usually in NHSBT centres
- Patient may know

Irradiation

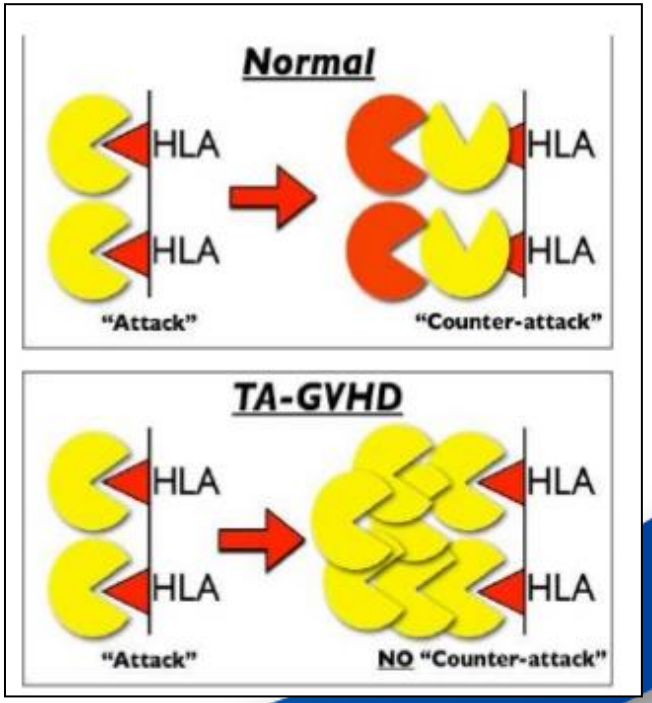


- Who?

Transfusion associated GvHD

Bbguy.com

- Immunosuppressed patients
  - Drugs
  - Diseases
  - Procedures
- Most are haem-oncology



Indications for Irradiation

- Drugs
  - Fludarabine (lifelong)
  - Other purine analogues / antagonists (lifelong)
  - Campath* (lifelong)
  - ATG* (lifelong)
- Diseases
  - Hodgkins Lymphoma
  - Severe T-lymphocyte deficiency syndromes
  - Di George – depends**
- Procedures
  - Stem cell transplants
    - Auto – 7d pre-collection to 3 months (6 mos if TBI)
    - Allo – from conditioning until lymphocytes >1.0 and off IS, no GvHD
  - CAR-T (as autos)
  - IUT
  - Neonatal transfusions if previous IUT
  - Directed donations

*Not for SOT conditioning or rejection, or MS

**Check out the 2020 BSH Guidelines

Irradiation

- Who doesn't need it?
  - Top ups for neonates / infants
  - HIV / AIDS
  - Routine cardiac patients
  - Chemo patients generally (except those drugs mentioned)

- Who's responsibility?
  - Lab notification form to be completed by treating team
  - Indication identified by prescribed of blood product

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Irradiation

- What needs irradiating?
  - YES:
    - Red cells
    - Platelets
    - Granulocytes
  - NO:
    - Plasma
    - Cryoprecipitate
    - PCC / clotting factors
    - IVIg / albumin

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CMV Negative

- Type of herpes virus
- 50-60% of population have been exposed to virus without symptoms and therefore CMV positive
- Transmission of CMV in blood components can lead to a primary infection or reactivation
- Risk reduced by universal leucodepletion of blood components

CMV Negative

- SaBTO Position Statement (2012) changed the recommended indications
- Provide CMV neg red cells and platelets for:
  - Fetal or neonatal transfusions to 28d post EDD
  - Pregnant patients (except in delivery)
  - Granulocytes to CMV neg allo recipients
- **Must be weighed against risk of delayed transfusion**
- Infections should be reported to SHOT/SABRE

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CMV Negative applies to which blood components?

Cellular Components

Phenotyped Red Cells

- Antigen matched
- Helps prevents development of antibodies
- Helps prevents transfusion reactions
- Different levels of matching depending on patient type
- Takes time…

- Usually decided by lab

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Who requires phenotyped blood?

- Patients with red cell antibodies – to prevent a transfusion reaction
- Sickle cell disease and thalassaemias – to reduce the risk of alloantibody production
- Sometimes patients who can't get crossmatched blood for technical reasons (eg certain treatments used in myeloma which interfere with antibody screening methods)

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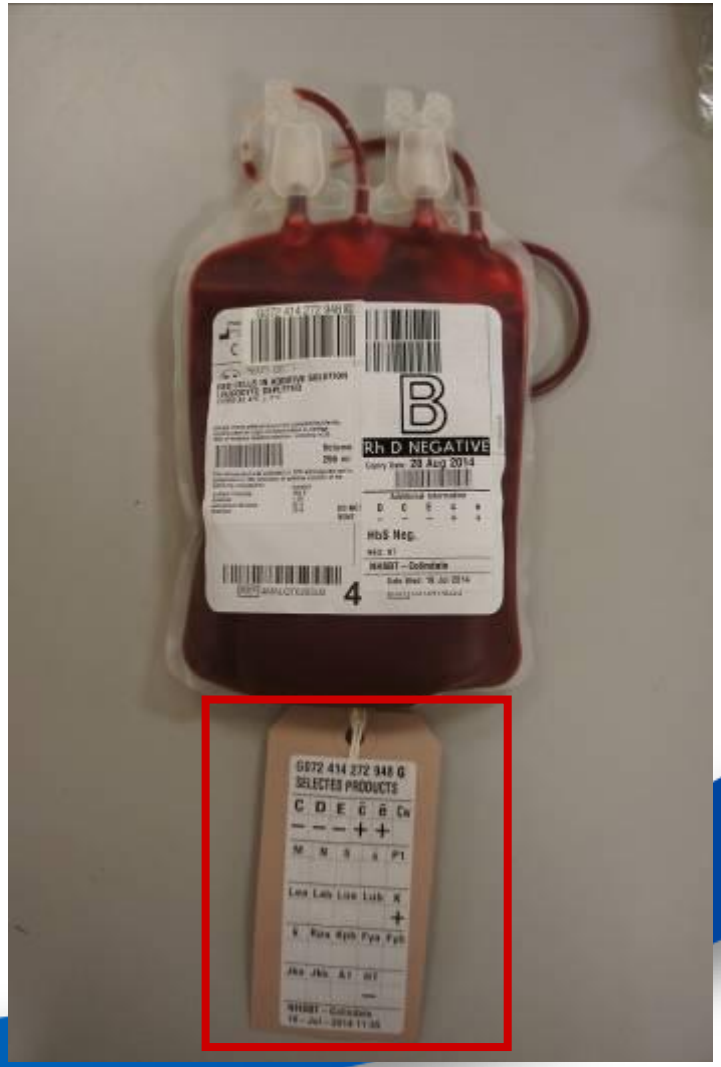
Where to find this information on a red cell unit?



Phenotype Case Study

- A child with sickle cell disease received 2 units of red cells that were compatible but not phenotyped matched, and a further 2 units 6 years later, again not phenotype matched.
- Six months later following a further request it was noted that the patient had developed anti-C.
- Further testing identified the patient as C-negative (R0r=cDe/cde) and that she had initially been transfused a C-positive unit.
- The BMS had failed to follow the standard operating procedure (SOP) to have a phenotype performed in the first instance prior to red cell issue

SHOT report 2014

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Why does this matter?

- More difficult to cross match blood in the future as would need to be C negative
- Implications for pregnancy
- More likely to develop further antibodies

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HLA/HPA Platelets

- Selected platelets to patients HLA/HPA type
- Most commonly used for patients that have poor response to platelet transfusions due to antibodies
- Should be used for patients with inherited platelet defects i.e. Glanzmanns Thrombasthenia
- Neonatal alloimmune thrombocytopenia – antibodies from mothers circulation bind to babies platelets and remove from circulation
- Single donor (apheresis) rather than pooled components

Washed Components

- Indicated for patients with recurrent or severe allergic or febrile reactions to red cells
- Severely IgA-deficient patients with anti-IgA antibodies and previous reactions, for whom red cells from an IgA deficient donor are not available

Other requirements

- HbS negative in sickle cell patients
- ‘Young’ red cells in exchanges
- Octaplas for TTP PEx

Which requirements need prescribing?

- All of them!
- Don’t rely solely on the laboratory – the authoriser also has responsibility for this
- If there is any concern discuss with the transfusion team/on call haematologist

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Risk of incorrect special requirements

- Irradiation and CMV negative requirements should be included as part of the written instruction of blood components
- Increase in ‘specific requirements not met’ reports:
  - SHOT Report 2018: 194 cases
  - SHOT Report 2019: **259** cases
- The most common clinical error is that irradiated blood was not requested (81.4%)

Risk of delayed transfusion

- Risks of not meeting special requirements can almost always be outweighed by clinical urgency in certain circumstances
  - Major haemorrhage
  - Profound anaemia with clinical concern
  - Urgent / emergency surgery

- Often some sort of compromise will be found by the lab
- Never let a patient die waiting for special requirements to be fulfilled

SHOT Recommendation
Incorrect Blood Component Transfused

- All professional staff participating in transfusion must perform independent and careful checks.
- A simple 5-point aide memoire at the final step would remind staff to check for the correct patient identifiers, and the prescription for the correct component and confirmation of specific requirements

Patient Involvement & Shared Care

- Inform the patient of special requirements
  - Antibody cards given to patients with red cell antibodies
  - Irradiated leaflet and card to patients who need irradiated blood components
- If patient transferred, the clinical and laboratory team at referral hospital must be informed

Case 1

- 34-year-old sickle cell patient is admitted to A&E with painful crisis.
- 28/40 pregnant
- She requires oxygen, fluids and IV morphine
- Hb comes back at 38g/L with a baseline of 70g/L
- She is reviewed by the haematologist who suggests giving 2u of red cells.

- What should you ask for?

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  - HbS negative
  - CMV negative

Case 2

- 68 year old man admitted to A&E with sepsis
- Background: CLL, HTN, OA
- Wife attends with him and says he is getting IV chemotherapy on the day unit at the nearby teaching hospital
- Not sure what – 2 drips every month
- FBC: WCC 0.9, neuts 0.2, Plts 9, Hb 65

- Would you give blood products? If so what special requirements might be required?

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  - Irradiated

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