

# Specific Requirements

Andy Charlton

Presenter: Islam Abdallah

NEY NMA Course

# Specific Requirements

**What are specific requirements?**



# 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

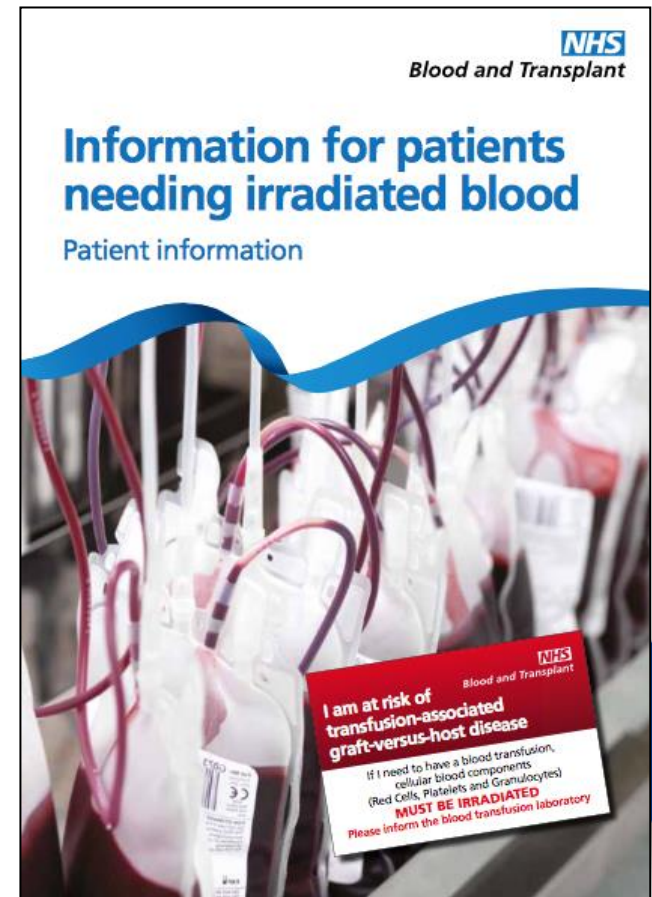
# Why are Specific Requirements important?

- Prevention of transfusion associated Graft versus host disease  
IRRADIATION
- Prevention of CMV infection or reactivation  
CMV NEGATIVE
- Prevention of red cell antibody production  
PHENOTYPE MATCHED
- Increase platelet increments post transfusion  
HLA/HPA SELECTED
- Prevent anaphylactic reactions  
WASHED

# Irradiation



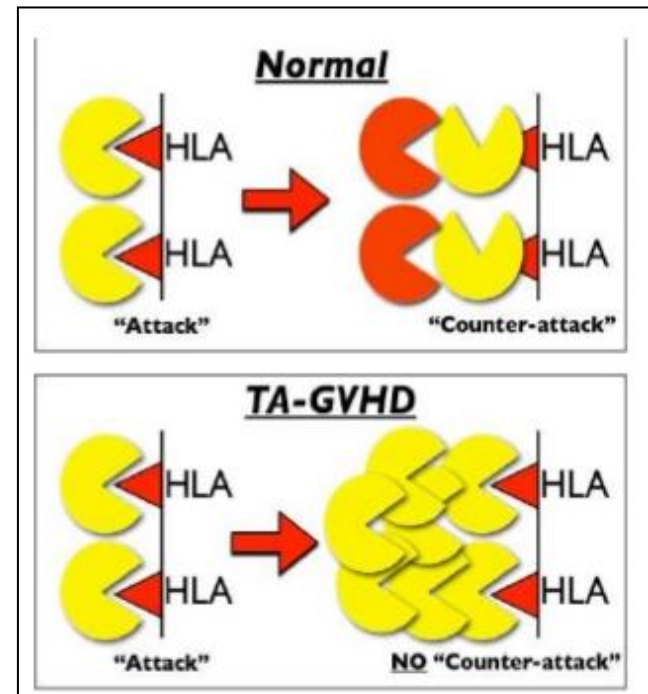
- Gamma or X-ray irradiation
- Usually in NHSBT centres
- Patient may know



# Transfusion associated GvHD



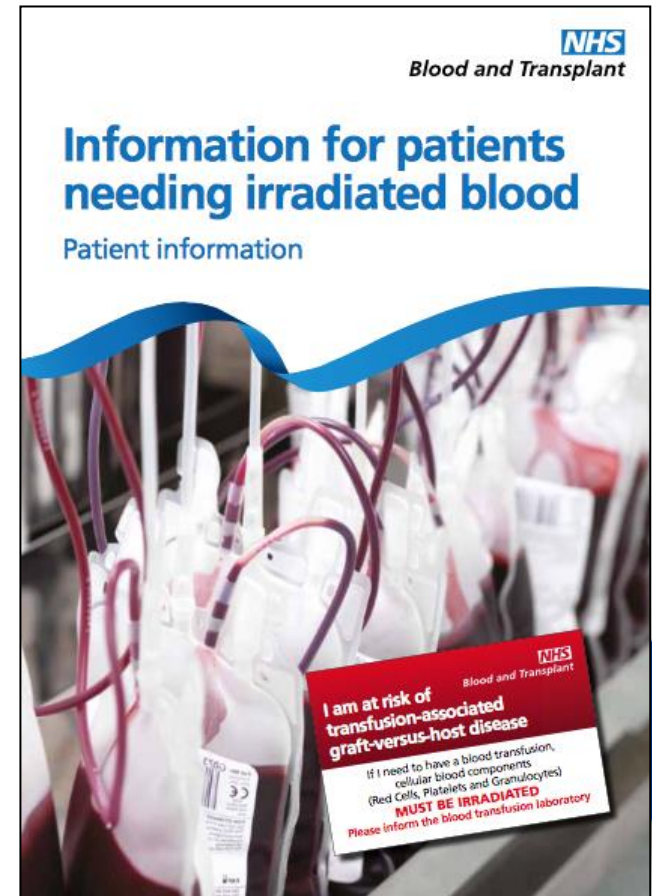
Bbguy.com



# Irradiation



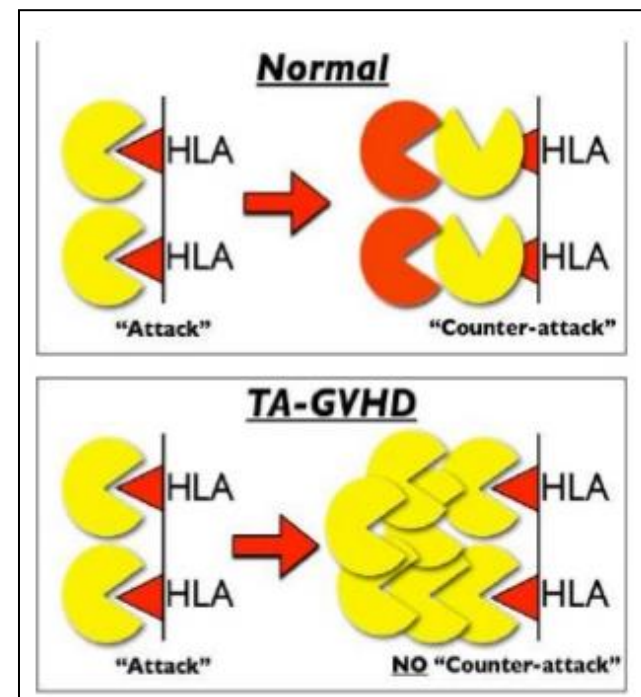
- Who?



# 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 new 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)
  - Whose responsibility?
- 

# Irradiation



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

# 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
- 

# 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

# CMV Negative applies to which blood components?



Cellular Components

# CMV Case Study


- A pregnant woman (gestation 19 weeks) was having a liver transplant.
- The red cells requested and transfused were not CMV negative because the blood transfusion laboratory was unaware the patient was pregnant.
- The requestor did not select CMV negative or indicate that the patient was currently pregnant on the request form.
- This was discovered when documented on the second request form after the initial red cells had already been administered.
- There was no historical record in the transfusion laboratory for this patient.

# Phenotyped Red Cells

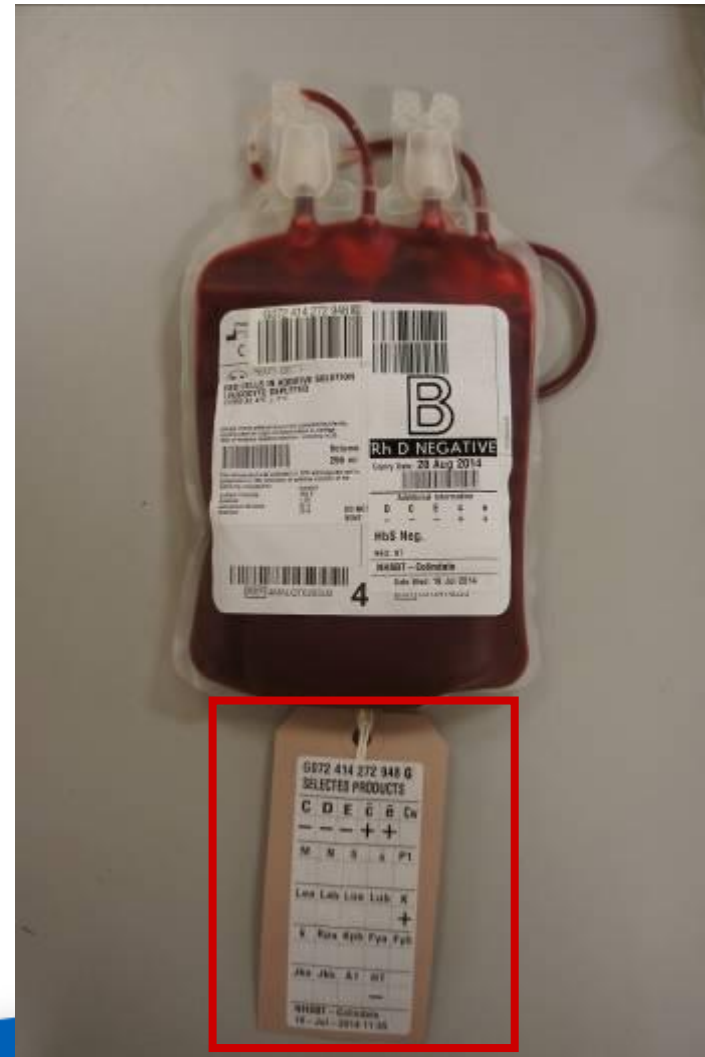
- Antigen matched
- Helps prevents development of antibodies
- Helps prevents transfusion reactions
- Different levels of matching depending on patient type
- Usually decided by lab



# 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
  - It can be considered in other chronic transfusion patients (bone marrow failure / MDS mainly)
- 

# 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


# 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)

# 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

# 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?
  - CMV Negative
  - HbS 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 drip chemo on the day unit at a teaching hospital in a neighbouring city
- \* 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 you ask for?
  - \* Irradiation

# 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