

Blood transfusion

Special requirements

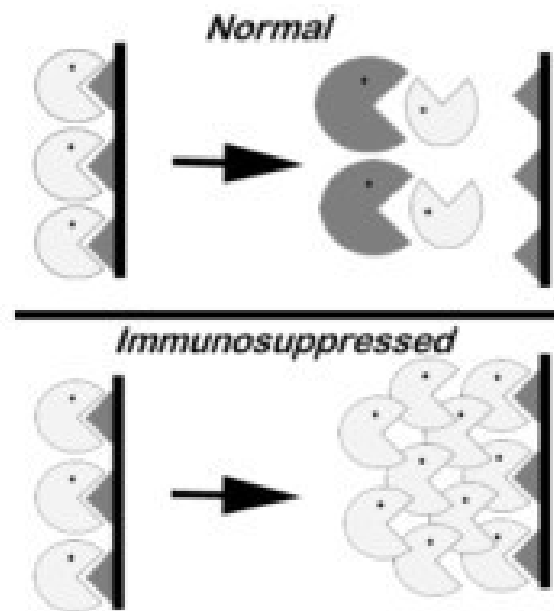
Special Requirements

- Irradiated blood
- CMV negative products
- Neonatal selection
- Extended phenotyped blood
- Washed cells
- IgA negative products

Irradiated blood



Used to prevent transfusion associated graft versus host disease (TAGVHD) by killing lymphocytes in donor blood and platelets



Manifestations



Which products need to be irradiated

- YES

- Red cells
- Platelets

- NO

- FFP
- Cryoprecipitate
- PCC/factor etc
- IVIG
- Albumin

Indications for irradiated blood

- Hodgkins Lymphoma (lifelong)
- Purine analogue recipients (lifelong)
fludarabine, cladribine, pentostatin, clofarabine,
bendamustine
- Campath* (lifelong) – used to treat CLL but also solid organ transplant recipients
- Rabbit ATG
- Donations from family members
- HLA matched products
- Intrauterine transfusions
- Neonatal exchange transfusions (if time allows)
- T lymphocyte deficiency syndromes (eg Di George syndrome)

Indications to irradiate blood Stem cell transplants -

- Autologous transplant recipients
7 days prior to harvest, then from conditioning until 3 months post transplant
- Auto patients receiving Total Body Irradiation to 6 months post transplant
- Allogeneic transplant recipients
From conditioning until 6 months post transplant
- Bone marrow donors for seven days prior to donation

Why not irradiate all blood?

- Red cells become leaky after irradiation
K⁺ and free haemoglobin levels in the fluid increase.
- Therefore irradiated red cells can't be stored for as long as usual.
- Must be less than 14 days old and then only stored for a maximum of 14 days, compared to usual red cell storage life of 35 days increasing wastage
- Expensive

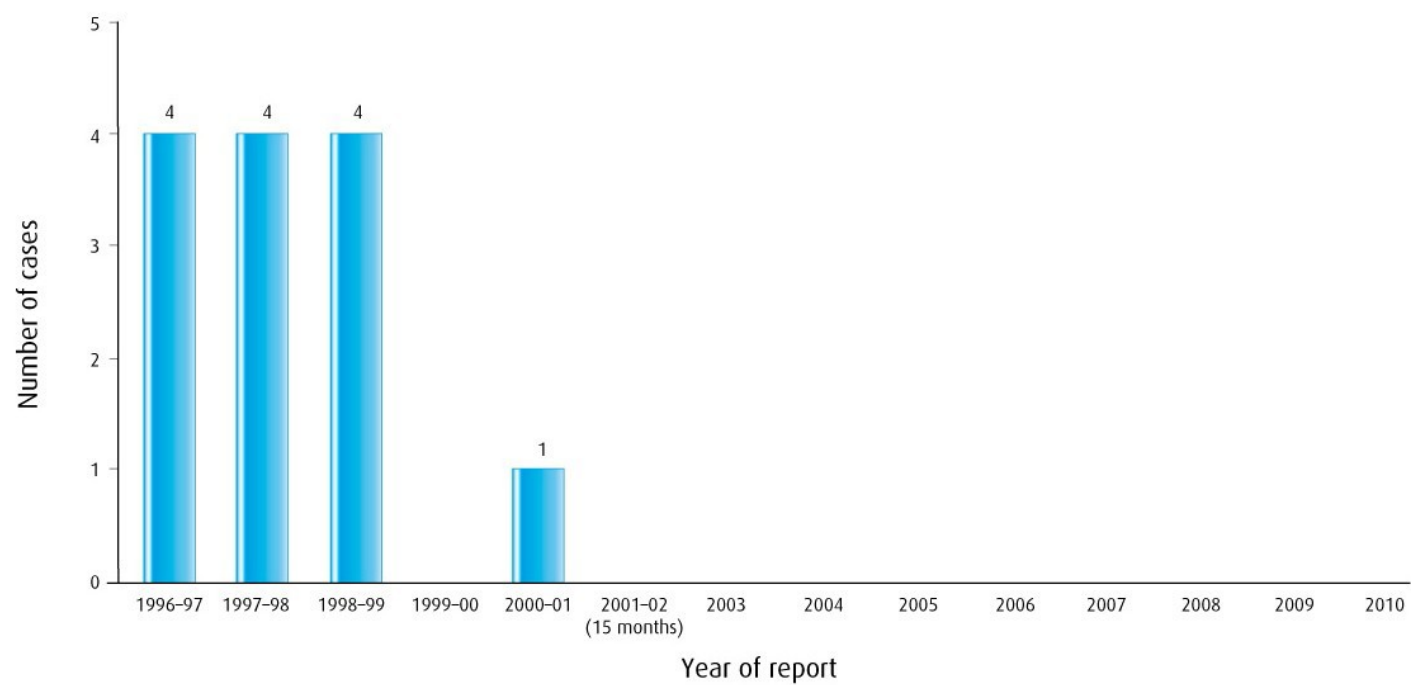
Who is responsible for ensuring blood irradiated?

- Communication is a big problem
- Consultant/SpR
- Pathologist
- Pharmacist
- Blood bank
- Transplant centres
- Prescribers
- Nurse
- Patient?

Good news

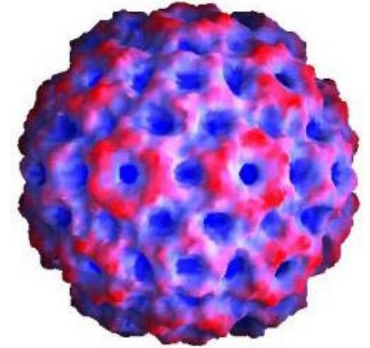
- Universal leucodepletion was introduced in
- 1999.
- No cases of TaGVHD have been reported since 2001 (and only once since leucodepletion began)
- 686 cases of errors related to irradiated products reported to SHOT over this time.
- Leucodepletion may be enough to make blood is
- safe, but no-one is sure so we can't forget irradiation!

Figure 17
Number of cases of TA-GvHD reported to SHOT each year



CMV negative products

- Cytomegalovirus is a herpes virus
- Usually mild viral illness
- Dangerous to the immunosuppressed, unborn babies and neonates
- Once a person has had CMV their blood remains potentially infectious for life
- Virus found in white cells and plasma
- In UK 50-60% adults CMV +ve



CMV

- Leucodepletion has significantly reduced risk of developing CMV infection from transfusion but not 100% effective
- SaBTO have produced a new position statement (2012)

Indications for CMV negative products (RBC + platelets)

- Intrauterine Tx
- Neonates up to 28days post EDD
- Pregnant women regardless of CMV status (except in emergencies)
- Granulocyte components (rarely used)

No longer requiring CMV –ve components

- Stem cell transplant recipients (auto and allo)
- Solid organ transplant recipients
- Immunodeficient patients including HIV

Neonates

- CMV –ve
- Irradiate if exchange transfusion / intrauterine Tx or if suspected immunodeficiency
- Blood from both mother and infant should be used for Xmatch - red cells selected should be compatible with mother and baby

Neonates – platelet requirements

- Neonates have higher incidence of bleeding and are at increased risk of intracranial bleeding
- Suggested threshold – $20 \times 10^9/l$ if term but higher if premature / small or additional coagulopathy
- Threshold $30 \times 10^9/l$ for neonatal alloimmune thrombocytopenia as may be an additional functional defect. – need HPA compatible platelets

Neonates FFP

- Use virus inactivated plasma
methylene blue or solvent detergent
- FFP should be of non UK origin

Extended phenotyped blood

- Patients who are likely to require life long transfusion are likely to develop antibodies over time
- The more antibodies present the more difficult it is to find compatible blood

- In addition women who are pregnant may develop antibodies which can then cross the placenta and damage the fetus
- Eg antiD, anti Kell

Indications for fully phenotyped blood

- Thalassaemia
- Sickle cell anaemia
- Other congenital anaemias
- Severe aplastic anaemia
- Elective transfusion in pregnancy

Phenotyped blood

- Match for CDE and cde
- Kell
- Consider also matching for Fya and Jka

Other rare requirements

- IgA negative products
 - For IgA deficient patients with antibodies against IgA
 - IgA antibodies can cause severe reactions to blood products

Washed RBC/platelets

- Indicated for severe recurrent allergic reactions
 ie anaphylaxis
 or severe urticaria
not prevented by antihistamines and steroids
- Can also be used for patients with antiIgA Ab when IgA –ve components not available

Washed RBC and platelets

- Washing is time consuming
- Causes loss of 10-20% RBC
- 33% platelets

Special Requirements

- So whenever prescribing blood review the patients history and consider if any special requirements needed
- Patients may carry alert cards eg for irradiated blood but often do not
- Responsibility is with the requesters and prescribers!