

# FACTSHEET

## Irradiated Blood Components Information for Healthcare Professionals

### What are irradiated blood components?

Irradiated blood components are cellular blood components which have been exposed to irradiation to inactivate lymphocytes (a type of white blood cell).

### How will I know if the components have been irradiated?

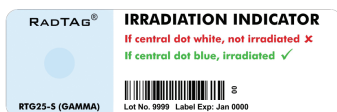
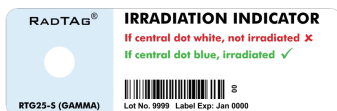
NHS Blood and Transplant (NHSBT) currently use both gamma irradiators and X-ray irradiators. The only visual difference between the components is the type of RADTAG label to confirm successful irradiation.

### There are two types of RADTAG label for irradiated components:

#### Gamma irradiated

and

#### X-Ray irradiated



The label is attached to the blood component prior to the irradiation process. If you can see the white dot in the centre of the blue square – **do not use** and return to the Hospital Transfusion Laboratory.

## Who needs to receive irradiated blood components?

- Patients receiving transfusions from:
  - a first degree relative (parent, child or sibling) or
  - second degree relative (grandparent, grandchild, uncle, aunt, nephew, niece or half sibling)
- Patients receiving a granulocyte transfusion
- Patients receiving Human Leucocyte Antigen (HLA) selected components
- Patients receiving purine analogues (e.g. fludarabine, cladribine, deoxycoformicin): probably safer to use them indefinitely. For newer purine analogues and related drugs, such as bendamustine, irradiated components should be given until further data is available
- All intrauterine transfusions (IUT)
- Neonates receiving red cell or platelet transfusions:
  - where there has been a previous IUT (irradiated components should be given until six months after the expected delivery date) or
  - if the donation is from a first or second degree relative
- Neonatal exchange transfusions (ET):
  - if there has been a previous IUT or
  - if the donation comes from a first or second degree relative
- For other neonatal ET, irradiation is recommended providing that irradiation does not cause clinically significant delay in transfusion
- Patients with Hodgkin's Lymphoma, at any stage of the disease (for life)
- Patients receiving allogeneic haemopoietic stem cell (HSC) grafts, from the start of conditioning therapy and while the patient remains on Graft-versus-Host Disease (GvHD) prophylaxis (usually six months post transplant). If chronic GvHD is present or the patient is taking immunosuppressants, continue irradiated blood components indefinitely
- Allogeneic HSC donors being transfused seven days prior to or during the harvest of their HSC
- Patients who will have autologous HSC graft:
  - Any transfusion seven days prior to and during the bone marrow/stem cell harvest
  - Any transfusion from the start of conditioning chemo-radiotherapy until three months post-transplant (six months if total body irradiation was used)
- Patients with aplastic anaemia receiving immuno suppressive therapy with anti-thymocyte globulin (ATG) and/or alemtuzumab (anti-CD52)

- Patients with known or suspected T-cell immunodeficiency, such as DiGeorge syndrome, the blood should be transfused within 24 hours of irradiation
- Patients who are receiving/received alemtuzumab for solid organ transplantation (for life)
- Evidence is currently under review for patients receiving T-cell depleted agents such as alemtuzamab for non-haematological indications including multiple sclerosis and vasculitis. It is prudent to offer irradiated components to these patients.

## **Why is it important these patients receive irradiated blood components?**

Irradiating blood components prevents the donor white cells replicating and mounting an immune response against a vulnerable patient causing transfusion-associated-graft-versus-host disease (TA-GvHD).

## **Who should you inform if your patient requires irradiated blood components?**

In order to prevent the risk of TA-GvHD, please inform the hospital transfusion laboratory, any hospital that might share the care of the patient, nursing staff and most importantly of all, the patient themselves of the need for irradiated blood components. A patient information leaflet, 'Information for patients needing irradiated blood', which includes an alert card for patients is available free of charge via <https://hospital.nhsbtleaflets.co.uk> and can be used in conjunction with this factsheet to inform the patient.

## **Which blood components need to be irradiated?**

Only cellular blood components (red cells, platelets and granulocytes) need to be irradiated. Fresh Frozen Plasma (FFP), cryoprecipitate, frozen washed red cells and fractionated plasma products do not need to be irradiated as the lymphocytes will not, or are extremely unlikely to survive the freezing/fractionation process.

## **Are there any specific requirements for irradiation of blood components?**

- Red cells used in intrauterine or exchange transfusion must be less than five days old when irradiated and transfused within 24 hours of irradiation to ensure optimal red cell function and minimise the risk from free potassium
- Red cells for other patient groups need to be less than 14 days old when irradiated and will expire 14 days after irradiation

- Where a patient is at risk from hyperkalaemia, red cells should be transfused within 24 hours of irradiation (or specialist washed cells can be provided) as the potassium level in irradiated units is approximately twice that of non-irradiated components
- Washed red cells that are irradiated will expire at 23:59 hrs on the day following irradiation and will have a maximum shelf-life of 48 hours
- Platelets can be irradiated at any stage and stored up to their normal shelf life
- Granulocytes should be irradiated as soon as possible after production and used with minimum delay.

The NHSBT patient information leaflet *Information for patients needing irradiated blood* is available from your Hospital Transfusion Practitioner.

Further supplies of this factsheet can be ordered via <https://hospital.nhsbtleaflets.co.uk>.

For further information please consult your Hospitals Blood Transfusion Policy or contact a member of your Hospital Transfusion Team.

NHSBT is a Special Health Authority within the NHS, and provides the blood that patients receive.

The information in this factsheet has been sourced from NHSBT transfusion experts.

NHSBT Customer Services Patient Blood Management Practitioner Team does not accept any legal liability for errors or omissions.

#### References:

1. British Committee for Standards in Haematology Blood Transfusion Task Force (2012) Addendum to the Guidelines on the use of irradiated blood components, [www.b-s-h.org.uk](http://www.b-s-h.org.uk)
2. *Guidelines for the Blood Transfusion Services in the United Kingdom*. 8th Edition, TSO
3. Learoyd P, *An Introduction to Blood Group Serology and Transfusion*, 3rd Edition, Leeds Blood Centre
4. New, H.V et al, and the British Committee for Standards in Haematology (2016), Guidelines on transfusion for fetuses, neonates and older children. *Br J Haematol*, 175: 784-828
5. Norfolk D (Ed), *Handbook of Transfusion Medicine*. 5th Edition, TSO
6. Treleavan, J et al, Guidelines on the use of irradiated blood components prepared by the British Committee for Standards in Haematology blood transfusion taskforce. *British Journal of Haematology*, 152:35-51