

# A Stitch in Time Saves Nine



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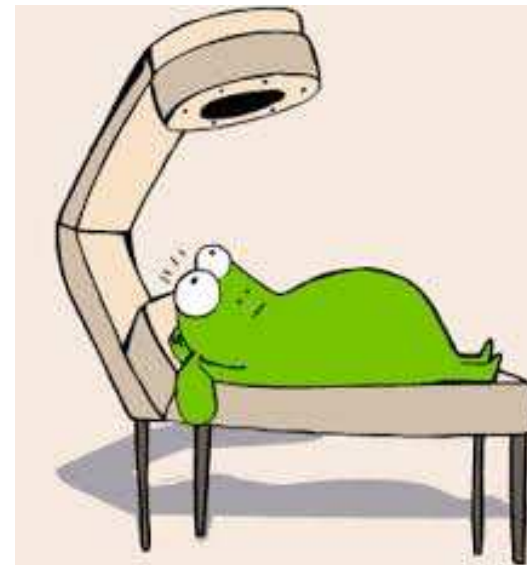
# A Case Study ...?



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**Irradiation** is the process by which an object is exposed to radiation. The exposure can originate from various sources, including natural sources



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# Irradiated Blood Products

- White cells are filtered out of donated blood before it is stored (leucodepletion)
- **Irradiation of donated blood** damages the DNA of any remaining lymphocytes to prevent them engrafting and proliferating in a recipient's bone marrow
- TA-GvHD is a rare but fatal complication of transfusion. The disease occurs when untreated lymphocytes from donated blood engraft in a recipient's bone marrow. These donor lymphocytes proliferate and damage target organs
- Typically the condition presents 10-14 days after transfusion with rash, pancytopenia and abnormal liver function but can take 30 days to develop
- There is a longer time between transfusion and presentation in neonates
- Mortality rate of TA-GvHD approaches 100%

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# Which patients need irradiated products?

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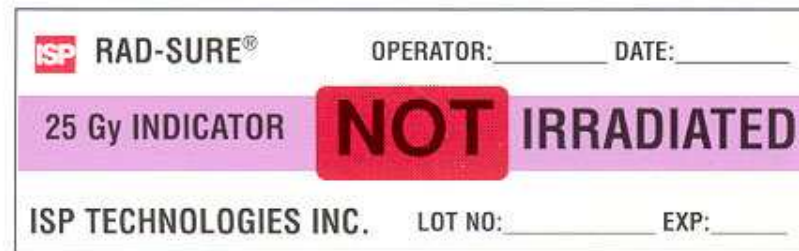
- Patients with certain conditions e.g. Hodgkins Lymphoma or undergoing bone marrow & stem cell transplants, Di George syndrome
- Patients treated with -
  - Purine analogue drugs like Fludarabine, Bendamustine, Cladribine, Pentostatin & Clofarabine
  - Alemtuzumab
- Patients receiving Anti-Thymocyte Globulin

BCSH Guidelines on the Use of Irradiated Blood Components 2010

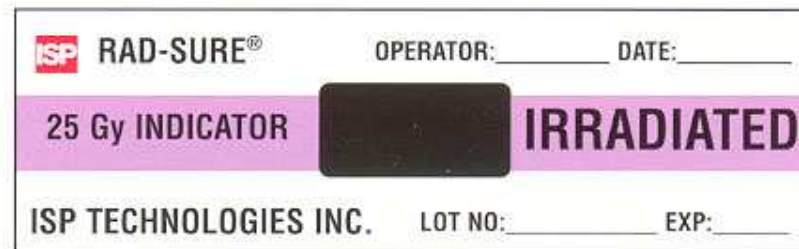
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# To Be (irradiated) or Not To Be (irradiated)? That Is The Question! (apologies to Will)



**BEFORE IRRADIATION**



**AFTER IRRADIATION @ 25 Gy**

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## **2015 Systematic review of TA-GvHD over 50 years/26 countries /348 cases (Kopolovic at al.) states -**

- Significant reduction in risk of TA-GvHD after implementation of pre-storage leucodepletion (LD)
- 23 case suggest LD alone is inadequate to prevent TA-GvHD in all instances
- LD techniques not up to modern standards in more than 10 cases and pre-storage LD only ascertained in 2 cases
- Conclusion – that historical LD techniques which were not up to todays pre-storage LD were probably responsible for the few cases of TA-GvHD which occurred even though LD was in place

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- In 2014 the **UK Haemovigilance Agency SHOT** (Serious Hazards of Transfusion) stated “most common requirement not met is failure to provide irradiated cellular components to those at risk”

Since 2005 1100 reported cases of patients NOT receiving irradiated products

TA-GvHD always rare and number of irradiated omissions still too small to provide reassurance, therefore irradiation still indicated for at risk groups

- 2010 British Society for Haematology **BSH guidelines** state the need for certain patients to receive irradiated blood

Guidelines due for review 2013 but BSH task force in 2012 addendum to say being reviewed and guidelines still to be followed

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# So the jury is out...



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# but meanwhile...back in BHT

- Patient was first bled for a group and save in February. Diagnosis written in full, Hodgkin's Lymphoma (HL). Chance by laboratory to add flag to patients record missed
- In May 2 samples (our new patient) taken in CCHU one for group and save and one for 2 unit cross-match for the following day. Diagnosis on both forms was abbreviated as HL. The x-match form did not indicate any special requirements
- Cross-match sample was booked in with clinical details of anaemia with lab number S12724
- Group & save sample booked in with lab number S12725
- Irradiated blood was indicated on the transfusion script. Consultant called Blood Bank to confirm this

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- The Biomedical Scientist (BMS) was informed that this patient required irradiated blood
- An ‘irradiated required’ flag was added to the LAST NUMBERED sample which was the group and save but flags are only effective for any subsequent samples
- Another BMS issued 2 units on the X-match sample which was the sample WITHOUT the flag
- The need for irradiated blood was not noticed until the second unit was checked at the bedside
- Under a Duty of Candour policy the patient was informed of our error
- After 30 day of worrying and several visits for observations the patient showed no signs of disease

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There had been 2 previous  
related incidents

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- In March non- irradiated blood was issued on a patient with an irradiated flag on their laboratory record
- The laboratory IT system produced a warning box indicating two mis-matches between the patient's requirements and what was being issued
- One of the mis-matches was allowable and the blood was accepted without the second mis-match being read
- Bedside checks on the first unit alerted nursing staff to the non-irradiated blood as the script indicated the need for irradiated products

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- Around the same time a known patient with no special requirements was prescribed Fludarabine as part a new treatment regime for AML by the consultant. Blood Bank was not informed but the transfusion prescription indicated irradiated products
- 2 unit x-match was requested on the group and save already in the lab
- The need for irradiated blood was not noticed until the second unit was checked at the bedside
- Duty of Candour was followed

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# Trust Policy

- The **request form** should state if the patient has any special requirements such as the need for irradiated products or for Cytomegalovirus (CMV) negative or Hepatitis E Virus (HEV) negative products
- The **transfusion prescription** should specify if the patient has any special requirements
- The unit of blood product must comply with any special requirements at the bedside check

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# Laboratory Policy

- Laboratory staff should be able to recognise indications for special requirements and act accordingly
- Clinical details should be entered into the laboratory system accurately
- Laboratory staff must be aware that some patients may have more than one special requirement
- The issuing BMS must read all alerts

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# Actions

- Doctor to inform laboratory of any special requirements at diagnosis and change of treatment. A prompt now appears on Aria
- A redesigned check list for new haematology patients with a prompt about special requirements
- Ensure patient information and special requirements cards are given

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- Diagnosis/clinical details on request forms to be written in full
- Training sessions for all staff directly involved in the prescription, issue and administration of blood products
- Our electronic requesting system now has a mandatory question about special requirements when requesting a group and save

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# Re-designed Prescription Chart (currently undergoing review)

## Adult Prescription, Observation Chart and Care Plan for the Transfusion of Blood and/or Blood Products

Affix Patient Identification Label

Irradiated Yes ☐ No ☐

HEV negative Yes ☐ No ☐

**Pregnant women will require CMV negative products**

**Diagnosis** \_\_\_\_\_ **Hb** \_\_\_\_\_ **Date of Hb** \_\_\_\_\_ **Patient Information given** \_\_\_\_\_

If there has been a previous transfusion reaction or in the event of a reaction consider giving the following prior to or at the time of the transfusion.  
Chlorphenamine 10 – 20 mg IV and Hydrocortisone 100mg IV.

Furosemide 20mg may be given orally with 2 or more units of blood/blood products  
Refer to the Transfusion Policy No. 312.

Prescribe and record administration of the above on the pharmacy prescription chart.

Match details on ID band with verbal confirmation of the patient's name & D.O.B, prescription chart and blood tag

**CHECK**

- unit integrity
- expiry date
- unit number against tag
- group compatibility
- special requirements

Date of Transfusion	Infusion rate	Name of blood/blood product	Doctor's signature	Consent form Completed (Medical/Obstetric or Surgical)	Start time of unit	Blood unit no. sticker	Volume of unit infused	Administrator's name (please print)	Stop time of unit

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# Future Aims

- Work with pharmacy on a system to notify the laboratory when certain drugs are prescribed
- We are going to adapt the form designed by The London Regional Transfusion Committee for use by prescribers to notify the laboratory

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# Other Special Requirements

HEV negative blood

CMV negative blood

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So it's goodbye from me and it's  
goodbye from her – goodbye!



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