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Quality Review of Irradiated Cellular Blood Product Orders

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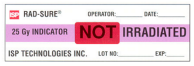
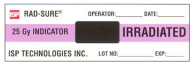
Background

Transfusion-associated graft-versus-host disease (TA-GVHD) is an immunological response between a donor's transfused T cells and the recipient's immune defense. The risk of TA-GVHD increases with relatively large transfusions of lymphocytes (e.g. transfusion in infants or granulocyte transfusion) or immunocompromised individuals. The risk of TA-GVHD is mitigated by irradiating cellular blood components to prevent donor T lymphocyte proliferation.

Irradiation of cellular blood components is managed differently amongst institutions. Factors to consider in the irradiation process include technologist time. Technologists prepare and perform irradiation of the cellular blood products. This can be a labor intensive process. Cost is another factor that includes the cost of the irradiation indicators that are placed on the units and the labor in providing this service. Irradiation also shortens the shelf life of the cellular blood component to 28 days. If the shelf life was less than 28 days then irradiation does not extend the shelf life to 28 days (e.g. shelf life 14 days, post-irradiation remains 14 days). At Thomas Jefferson University Hospital, the Blood Bank irradiates blood products only upon request, then reviews the initial orders to determine if irradiation is indeed indicated. The decision whether irradiation is appropriate is determined by having medical coverage review the requests.



BEFORE IRRADIATION



AFTER IRRADIATION @ 25 Gy

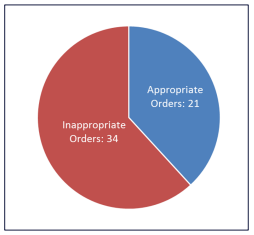
Objective

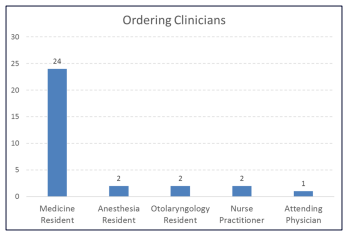
Our goal is to educate house staff on the indications for irradiated blood products. We hope to reduce the number of inappropriate irradiation orders to less than 50% of the total orders for irradiated blood products and to be followed up over time.

Review of Inappropriate Orders

Irradiated blood product orders flagged for medical coverage review from July 2016 to March 2017 revealed 34 of the 55 orders were inappropriate. For each incorrect order, clinician name, clinician service, hospital unit, transfusion indications, and reason for irradiation were recorded. The inappropriate orders were submitted by 31 clinicians (24 medicine residents, two anesthesia residents, two otolaryngology residents, two nurse practitioners, and one attending physician). Three clinicians submitted two inappropriate irradiation orders. The clinicians ordered the irradiated cellular blood products because the patient had a history of cancer or was on immunosuppressive therapy. Some clinicians accidentally requested irradiated cellular blood products.

Between March 1, 2017 and May 1, 2017, two orders for irradiated cellular blood products were flagged for medical coverage review. In one of those requests, irradiated cellular blood products were not indicated.





Interventions to Decrease Inappropriate Orders

Two interventions were undertaken to decrease the number of inappropriate irradiation orders.

A polite and professional email was sent to the clinicians who submitted the inappropriate irradiation orders from July 2016 to March 2017. The email informed the clinician that they submitted an inappropriate irradiation order, provided them with a table of irradiation blood product indications, and additional resources. This email was sent on February 27, 2017.

Dear Colleague,

We are contacting you as part of a quality improvement project to reduce the number of inappropriately ordered irradiated blood products. During the past year, you have submitted a request for irradiated blood products when it was not indicated.

We would like to take this opportunity to share some information with you on the indications for irradiated blood products. Below is a table of indications for irradiated blood products. We have also attached a more comprehensive set of guidelines from the British Committee for Standards in Haematology Blood Transfusion Task Force, and an article detailing the changes that occur as a result of the irradiation process.

Indication for irradiation of cellular blood components for the prevention of transfusion-associated graft-versus-host disease
Absolute indications
Patients with congenital cellular immune deficiency
Neonates born to families with previous birth of an offspring with a known or suspected form of inherited immunodeficiency
Allogeneic or autologous hematopoietic stem cell recipients
Hodgkin's disease
Granulocyte transfusions
Intrauterine transfusions (IUT)
Transfusions to neonates who have received IUT
Transfusions from biologic relatives
Probable indications
Premature neonates weighing <1200 g
Hematologic malignancies other than Hodgkin lymphoma treated with cytotoxic agents
HLA-matched and/or crossmatch-compatible platelet concentrate transfusions
Patients receiving high-dose chemotherapy, radiation therapy, and/or aggressive immunotherapy, including all patients receiving fludarabine or other purine analogs

Mintz, Paul D. *Transfusion Therapy: Clinical Principles and Practice.* Bethesda, MD: AABB Press, 2011. Print.

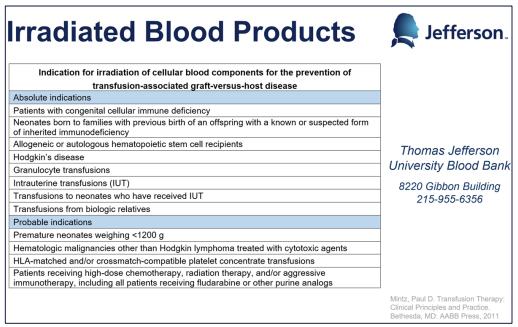
Please feel free to contact us if you would like additional information or have any questions.

Sincerely,

Vandi Ly, MD, Blood Bank/Transfusion Medicine Fellow

Matt Grzywinski, SKMC Class of 2019

A pocket card was also created. The card contained a table of indications for irradiated cellular blood products and contact information for the Jefferson Blood Bank to encourage collaboration between house staff and the Blood Bank. The card will be distributed on June 13, 2017 to Internal Medicine house staff.



Discussion

Next Steps

- Dr. Julie Karp, Associate Director of the Thomas Jefferson University Blood Bank, will give an educational lecture to the Department of Medicine residents on blood products (including irradiated cellular blood products) on June 13, 2017
- Irradiated cellular blood product orders will be reviewed to determine if the number of inappropriate orders decrease over time.

Possible Further Interventions

- Email all Jefferson residents informing them of the indications for irradiated cellular blood products.
- Email Jefferson faculty informing them of the indications for irradiated cellular blood products.
- Present the findings of this research and the indications for irradiated cellular blood products to Jefferson residents at seminars, conferences, or meetings.

Limitations

- Only the clinician who submitted the inappropriate irradiation order was contacted, not the entire care team.
- The preliminary post-intervention data may not be representative since residents gain experience during the year.
- Only one year of inappropriate orders were reviewed.

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Acknowledgements

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