


# Is Rh Negative Necessary?

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# Transfusion of Red Blood Cells

- ABO and RhD are the only antigen typing routinely completed before transfusion.
  - ABO: When A and B antigen (AG) positive RBC transfused to recipients lacking AG result in life-threatening acute hemolytic transfusion reactions.
  - RhD :(excluding ABO) is the strongest AG for red cell alloantibody formation.

# Prevalence of RhD neg Phenotype

- White- 15-17%
- Black- 3-5%
- Asian- <0.1%

# Typical expose to RhD AG

- RhD- mother carrying RhD+ fetus during pregnancy
- Transfusion:
  - RBC: high incident
  - PLT: much lower
  - FFP: very rare

# Incident of alloimmunization of RhD with RBC

- Historically reported as 80 to 85%.
- Recent studies show variation based on patient population:
  - 0% in small group of HIV & liver transplant
  - 19% hematologic malignancy
  - .06% hemorrhagic trauma
  - 22% immune competent critically ill in ER or OR

# Prevent RhD sensitivity in perfect world.

1. Every recipient that need transfusion would be typed and all RhD- patients receive RhD- blood components.
2. All RhD- pregnant women receive ante and postpartum Rhlg.

# Real world

- Limited supply of RhD- products, always a challenge for CBC.
- Remember that only about 7% of the population is O-. Conservation of O- RBCs is very necessary.

## CBC recommendation for emergency transfusion with unknown blood type.

- Use 2-4 O- RBCs for female patients under 50 years of age. Switch to O+ RBCs if greater than 4 units are needed.
- For females of greater than 50 years of age and all males, start with 2 O- RBCs and switch to O+ if more are needed.
- **As soon as possible** switch to type specific.



## **CBC recommendation for emergency transfusion with known blood type (no anti-D).**

- If the patient is Rh- (O, A, B,) issue up to 4 type specific Rh- units. Then switch to type specific Rh+ (O, A, B) RBCs. Consider switching sooner if patient is a female greater than 50 years of age or a male.
- Reminder: AB patients can receive type A RBCs. Use the above guidelines for switching from A- to A+ RBCs.

# Alloimmunization RhD due to transfusion of RhD+ PLTs

- RhD is exclusively located on RBC.
- Ongoing debate if RhD- PLTs are necessary.
  - Concerns of residual RBC and RBC microparticles.
- SDPLT have RBC in them (0.1-32.5 mL).

# Sensitivity rate due to PLT transfusion

- Recent study of 1,041 RhD- patients receive RhD+ PLTs
  - 1.9% Immunocompetent
  - 6% Hematologic
  - 12.9% Oncology
    - Hematologic and Oncology higher due to multiple transfusions.

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Have you ever seen someone develop Anti-D  
after receiving RhD+ SDPLTs?

# Case Study- Initial admission 12/15/12

- Male 78 age
- Symptoms: Heart block, acute pulmonary edema and acute renal failure.
- Pre- surgical lab results:
  - H/H : 9.1 / 27
  - PLT-150
- Surgery-Right heart catheterization and implantation of a pace maker.

# Post Surgry

- Post surgery lab:
  - H/H: 7.3 / 21.9
  - PLT: 57
- Based on Hemo consult of pancytopenia, Orders for 2 PC and 1 PLT.
- Patient typed as A- with negative antibody screen.
- Patient received 2 A- PC and 1 O+ PLT.

# Readmission 1/11/13

- Male 78 age
- Symptoms: Non specific chest pain and abdominal pain.
- Lab results:
  - H/H : 8.8 / 26.7
  - PLT- 112
- During stay request for T&C PC

# Blood Bank Work-up 1/23/13

- Typed A- and positive AB screen (2+ both cells).
- We had no antibody history at RMC & had not been transfused since previous admission.
- Antibody work-up identified Anti-D with negative auto.
- After investigation: found history of Anti- D and –C in 2009.



# What re-stimulation of Anti-D?

- Patient did receive Rh- blood but received Rh+ PLT.
  - RMC practice of selecting PLTS: Type specific if possible. Do not ask for Rh- PLT or recommend Rhlg.
- Re-stimulation anti-D due to Rh+ SDPLT.
  - ?? Who recommends giving Rhlg if you give RhD+ PLT?

# CBC Yearly Collection of SDPLT (2012)

- Total number of SDPLT donors: 2,752
- Total number of SDPLT procedure: 12,848
- Total number of SDPLT products:

19,818

How many are RhD-???

# Total numbers:

**A- Donors: 205 Procedures: 968 Products: 1,408**  
**O- Donors: 70 Procedures: 274 Products: 411**  
**B- Donors: 49 Procedures: 193 Products: 288**  
**AB- Donors: 33 Procedures: 183 Products: 250**

- **What % of the donor pool for SDPLTs Rh-? 13%**
- **What % of SDPLTs collected are Rh-? 12%**

## Recommendation:

- Give RhD- RBC to RhD- patients (especial women of childbearing age).
- Give RhD- RBC to people with existing anti-D
- Give RhD- PLT if possible & recommend IV Rhlg to those that get RhD+ PLTs (especial women of childbearing age).