



# e-Network Forum

## CALIFORNIA BLOOD BANK SOCIETY

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### ***Hyperbilirubinemia after transfusing 'older' red cell units to very small neonates***

**A transfusion medicine physician in Colorado** reports that his hospital routinely uses group O Rh negative, CMV-negative AS-5 red cells for their NICU transfusions. The age of these red cells varies over the full (42-day) allowable storage period for the blood product. The inquiring physician recently transfused two very small premies (~800 grams) with small volume red cell aliquots that were within two days of their expiration dates (so that the red cells were considered 'old'). Neither aliquot of red cells was irradiated. Both neonates had appropriate rises in hemoglobin levels but experienced a significant spike in their serum bilirubin levels to 14 and 19 mg/dL respectively. Both subsequently underwent **exchange transfusions**. The inquiring colleague wonders if others have experienced similar events? Do others limit the use of "older units" in these tiny babies?

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The following responses have been received.

1. **A retired pediatric hematologist in Palo Alto** suspects this might have resulted from free hemoglobin in the red cell product, and wonders whether any pink discoloration was observed in the bag's supernate at the time of issue, or in the tube segment. In such immature neonates, it doesn't take much free hemoglobin load to overwhelm their limited ability to metabolize and excrete the catabolized bilirubin.

**ADDENDA** August 3, 2003

2. **A colleague in Saudi Arabia** reports that regarding neonatal/pre-term baby transfusions: The standard at his hospital in Riyadh is for RBCs to be **less than 10 days old**, leukocyte-reduced by filtration in the blood bank laboratory, Group O Rh Negative, and irradiated immediately prior to issue.

**ADDENDA** August 4, 2003

3. **A colleague in Virginia** comments that he finds this case very interesting, and that it touches on several fine points of practice variation in the transfusion medicine world. He queries the colleague who submitted the case to provide the "full scoop" of baby/mother ABO types, volume(s) transfused, location/method of infusion (umbilical vein, atrial catheter), other clinical conditions that may have contributed to the hyperbilirubinemia?

**Their policies** for transfusing neonates are as follows:

- **begin** neonates who need RBC transfusions on units <10 days old. Keep the neonate assigned to the **same** unit of RBCs for "top-off" transfusions **until the unit outdates**.
- use **ONLY** RBC units **<10 days old** for ECMO, surgical bleeding, exchange transfusion, or other large volume transfusions
- **irradiate** all cellular products for all neonates
- use **CPDA-1** red cells for neonates.

**ADDENDA** August 18, 2003

4. In response to some of the above questions, the **Colorado physician** who submitted this query adds the following information:
  - as far as he knows, there was no hemolysis in the blood products before transfusion (they do a visual check of each product before it is released for transfusion)
  - Baby A received 13 mL of RBC's through an umbilical catheter. She is group A Rh negative and received group O Rh negative, CMV negative, 40 day old RBC's. Bilirubin went from 5 to 19.7 mg/dL
  - Baby B received 12 mL, also via an umbilical catheter. She is group O Rh negative. Bilirubin went from 2.5 to 14.7 mg/dL and she was not exchanged.
  - Both babies have maintained relatively stable bilirubin levels since this incident.

- They did change their policy to limit their RBCs to 21 days old for neonatal transfusions.

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**Posted:** August 1, 2003

**Addenda:** Aug. 3, 4 & 18, 2003