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Background

Patient blood management (PBM) to prevent mis-utilization of group O RBCs is a main tenant of blood centers and transfusion services.

In October 2020, our free-standing children's hospital transfusion service's laboratory information system (LIS) was harmonized to standardize practice across a six-hospital healthcare system.

A standard operating procedure combining the special requirements of group O RBCs, irradiation, and leukoreduction for neonatal patients <120 days old was set as a global default. Consequently, all neonatal patients were switched from receiving ABO-type specific and/or type compatible RBCs to receiving group O RBC products only.

This investigative team hypothesized that the SOP change in Group O RBC transfusion to all neonates undergoing CDH repair with and without ECMO support would result in a misutilization of group O RBCs in recipients who are group A and could easily receive group A RBCs.

Study Design/Methods

Group O RBC unit transfusion data was evaluated in Group A neonatal CDH repair patients < 120 days old with and without ECMO support.

Transfusion data was collected and analyzed from Oct 2020-Dec 2022.

In order to calculate the volume of O RBCs transfused to group A CDH repair neonates, and translate that to units, one AS-3 RBC unit was assumed to be 320 ml.

The total volume of group O RBCs transfused to non-group O CDH repair neonates was calculated to help estimate the number of group O full RBC units transfused.

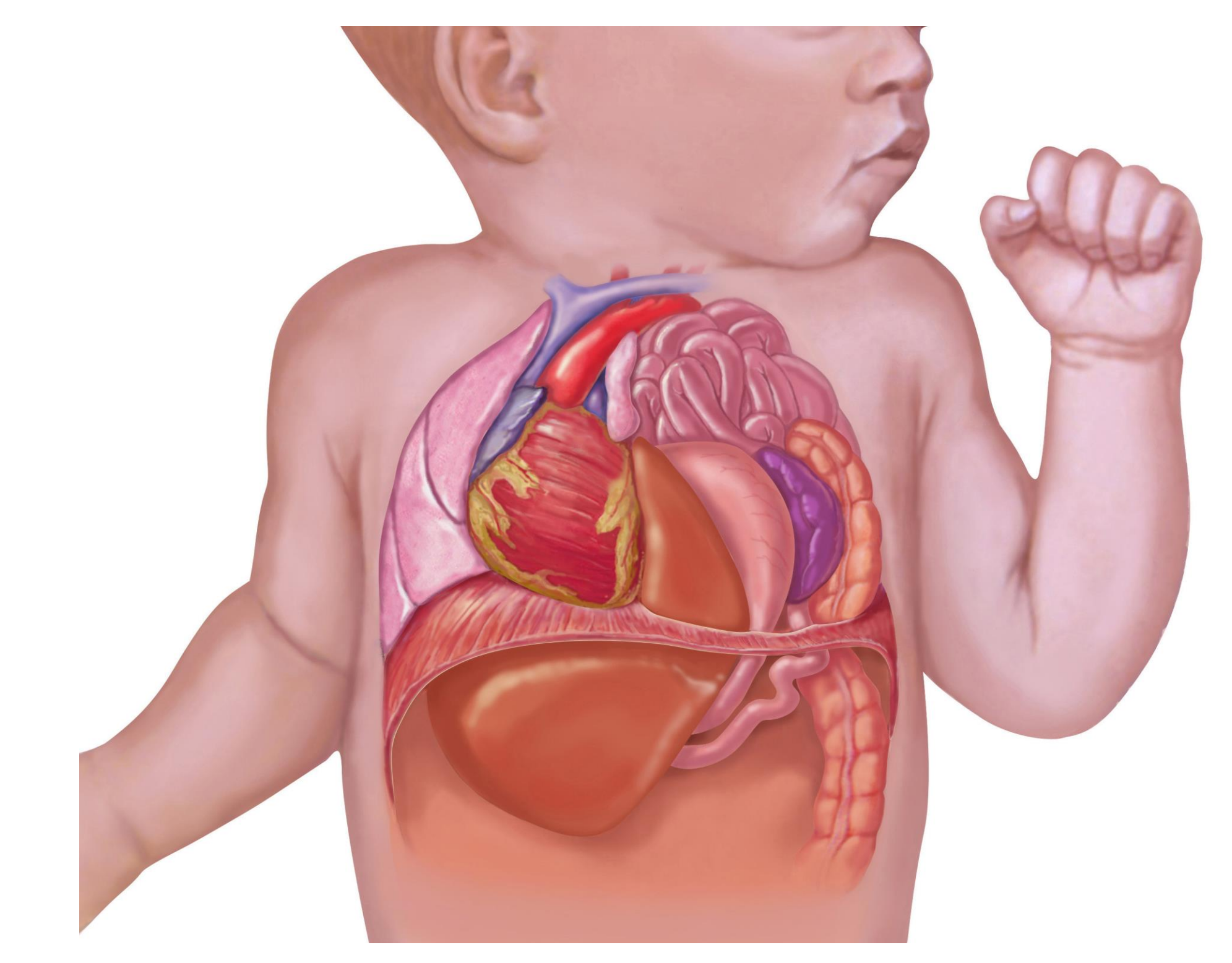
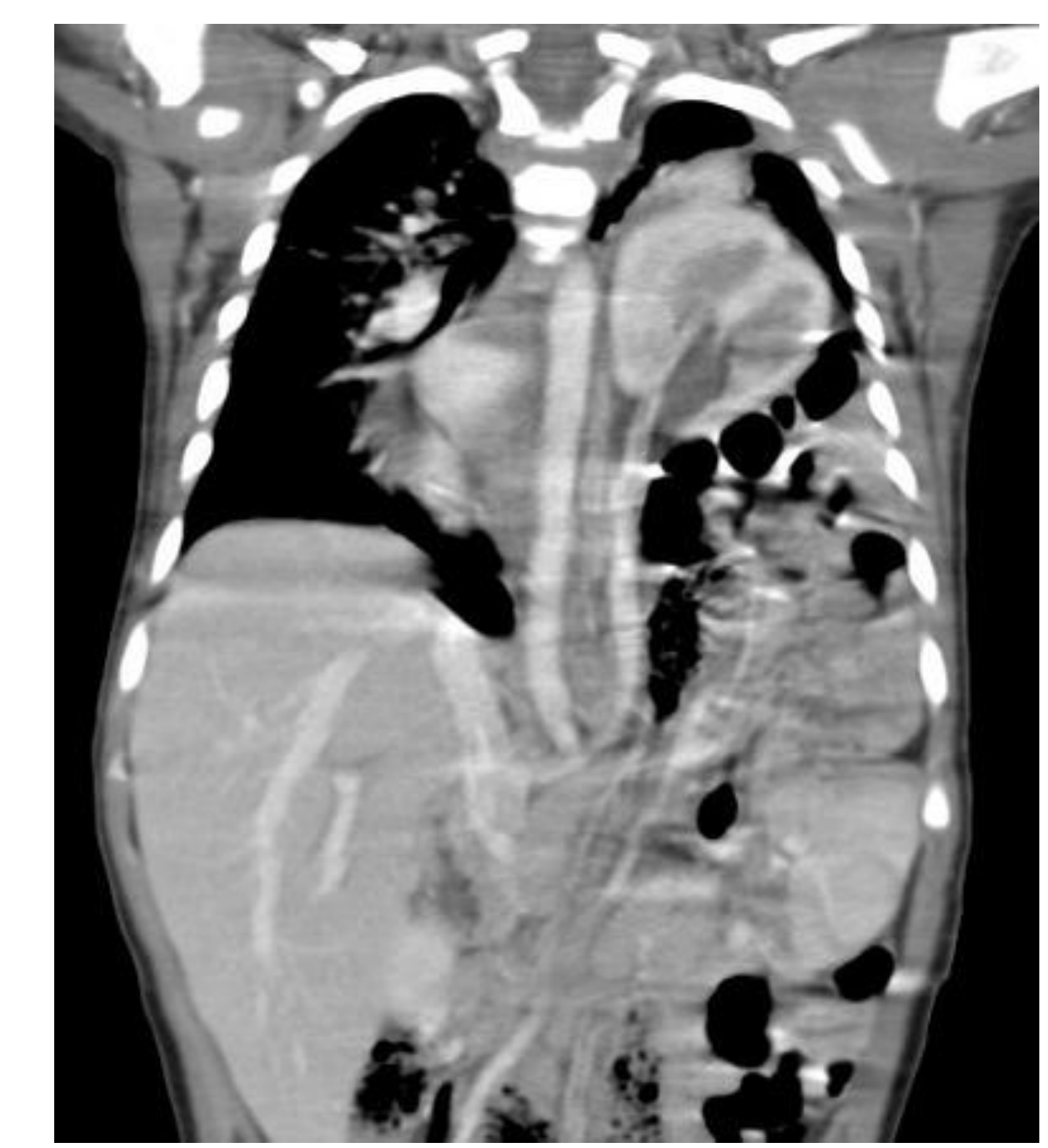
The total volume of O RBCs not transfused (wasted) after preparation for all CDH repair patients was estimated.

Results

- Over 2 years: N=166 CDH repair patients, with 33%, N=55 placed on ECMO.
- N=67 CDH repair patients were group A and of those 43% required ECMO.
- Total volume of group O RBCs transfused to non-group O CDH repair patients was ≈122.6 group O RBC units.
- 83.7 units of group O RBCs were transfused to group A CDH repair patients. This consisted of 37.4% group O transfusions to group A CDH repair patients.

| | | |
|-----|----|-------|
| O- | 15 | 9% |
| O+ | 62 | 37.3% |
| A- | 7 | 4.2% |
| A+ | 60 | 36.1% |
| B+ | 14 | 8.4% |
| B- | 3 | 1.8% |
| AB- | 0 | 0.0% |
| AB+ | 4 | 2.4% |

Figure 1. CDH repair patient blood types and number of patients/blood type.



Conclusion

- Transfusing group O RBC units to group A neonates requiring CDH repair with or without ECMO leads to mis-utilization of group O RBC resources.
- Group A patients can utilize group A RBCs, which are readily available, and is a prudent PBM strategy.
- A re-evaluation of protocols that require group O RBCs be transfused to all neonates < 120 days is needed.