

Tiny Bubbles Big Troubles: One Center's Solution to Eliminating Air Bubbles in the Return Line in Patients Weighing Less Than 16kg

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BACKGROUND

- Air bubbles from outgassing coalesced in the blood warmer tubing forming large air bubbles
- Air bubbles were found in 14 patients weighing less than 16 kg undergoing apheresis procedures
- Air bubble formed downstream from Optia's return line air detector
- Diligent operators discovered air bubbles prior to reaching the patient



Procedure	Red Cell Prime	Albumin Prime
CMNC	11	
TPE	2	
RCE		1

METHODS

- Retrospective Quality and Safety Reporting System reports reviewed from June 2023-June 2024
- Children's Hospital Apheresis Center consulted with Terumo and other pediatric apheresis centers to develop an action plan

RESULTS

- In 11 procedures, air was manually removed prior to reaching the patient
- 3 procedures were aborted to prevent air from reaching patient
- All connections were securely tightened, the luer connection from the return line to the blood warmer tubing was not higher than 20 inches above the return access
- **Corrective actions**
 - Warm RBC unit used to prime circuit to room temperature by placing unit in ambient air for 1 hour
 - Blood prime rate 25 mL/min
 - Wrap blood warmer tubing around warmer 2-3 times
 - Place blood warmer parallel to the patient
 - Transitioned to horizontal SpectraTHERM blood warmer 04/2024



IMPLICATIONS

- Large coalesced air bubbles present a life-threatening situation during apheresis procedures
- Currently, there are no safety alarms to alert the operator of air in the blood warmer tubing
- Corrective measures were necessary for patient safety

CONCLUSIONS

- Since implementing corrective measures, there have been no reports of large coalesced air bubbles in the blood warmer tubing
- Operators continue to vigilantly monitor blood warmer tubing for coalesced air
- The addition of an air detector monitor on the blood warmer tubing would be a beneficial safety device