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Welcome to *Patient Safety E-lerts*, a special report reviewing various issues affecting patient safety. We welcome your comments; please send them to patientsafety@ecri.org or visit www.ecri.org/PSO.

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Prevent "Bad Blood":
Avoid Unnecessary Waste

Approximately 41,000 units of blood are required in hospitals every day[1]. ECRI Institute PSO has seen many events in which blood or a blood product must be discarded because it has been improperly stored after being dispensed from the blood bank. In several of these events, the blood is kept at a temperature that is too high and the blood becomes unusable. In others, lack of coordination between ordering the blood and prepping the patient result in a delay in transfusion, and in yet others, too much blood is taken possession of at once, and if not stored properly, the excess is wasted.

Waste (and seasonal blood shortages) can impact the operations of the hospital; decreasing blood product waste saved one organization $800,000 over four years.[2]

Therefore, in non-emergent situations, blood and blood products should be dispensed in single units, even when multiple units are ordered, and stored within the receiving department for as little time as possible before transfusion into the patient.

If a large quantity is required (e.g., massive transfusion protocol), blood should be dispensed in validated temperature-controlled coolers. AABB also offers guidelines that should be reviewed, incorporated into organization policy, and enforced for the

Key Contributing Factors

- Management/organization: Lack of clear policies and enforcement
- Team coordination: Communication gaps
- Operating environment: Willingness to allow workarounds
- Workflow: Complex care coordination

Key Recommendations

1. Develop policies for managing non-emergent, low-volume transfusions. As often as possible, dispense only the amount of blood or blood product that can be transfused in a realistic timeframe, even if more is ordered. The remainder should stay in the blood bank until the patient requires it. Ensure that transfusion begins immediately upon receipt of the blood or blood product.
2. Develop policies for emergent massive transfusion protocols that require the use of validated temperature-controlled coolers to avoid unnecessary waste.
3. Ensure that a multidisciplinary blood waste review team receives regular reports of blood wastage and associated costs to be compared to organization goals. The team's data and recommendations should be

proper long- and short-term storage, preparation, and use of each blood product.[3]

Organization leadership should convene a team consisting of department heads, blood bank representatives, physician leaders, anesthesiology, hematology, and nursing to examine organization blood wastage statistics[4], proactively review blood dispensation procedures, clarify or update any steps of the blood ordering process as needed, and train staff to prevent unnecessary blood waste.

reported to a sponsoring leadership group for review and approval.
4. Seek staff input regarding blood ordering procedures to identify and prevent potential workarounds.
5. Perform root cause analyses on blood storage events or proactive analysis to identify prevention strategies. Communicate the findings of these analyses to organization and staff leaders.
6. Compare blood bank protocols and organizational policies with AABB's standards[3].

Reporting to ECRI Institute PSO

ECRI Institute PSO analyzes the reports submitted by its member organizations and collaborating PSOs to identify safety concerns and trends. We share our findings about a particular hazard and lessons learned with participating organizations in our *Patient Safety E-Lert*. ECRI Institute PSO encourages its participating organizations to continue to submit their reports under the legal protection of the PSO to promote such learning. Visit your PSO portal to see an archive of previous issues of *Patient Safety E-Lert*.

Take Home Point

When multiple units of blood or blood product are ordered, ensure that subsequent units are stored in an adequate, temperature-controlled environment—optimally, the blood bank—until they are needed. If they are not, they should be returned immediately to the blood bank to prevent waste, which risks delay in or lack of supply for transfusion, because the blood product is notable to be transfused when it is needed. Units of blood should be dispensed singly as often as possible, and storage outside of the blood bank should be kept to a minimum. Consider reviewing the organization's blood ordering, usage, and waste history, and seek staff input regarding ordering procedures to identify any workarounds that need to be addressed.

References

[1] AABB. National Blood Collection and Utilization Report. 2011. http://www.aabb.org/programs/biovigilance/nbcus/Pages/default.aspx.

[2] Heitmiller ES, Hill RB et al. Blood wastage reduction using Lean Sigma methodology. *Transfusion*. 2010 Sep;50(9)1887-96.

[3] AABB. Circular of information for the use of human blood and blood components. 2009 Dec. http://www.aabb.org/resources/bct/Pages/aabb_coi.aspx.

[4] Novis D. Renner, S. et al (2002) Quality Indicators of Blood Utilization, Archives of Pathology and Laboratory Medicine. Vol. 126, No. 2, pp 150-156.

Medical Director's Note

Because blood and blood products have such a short shelf life, the time between when blood is taken possession of and when it is transfused into the patient should be as minimal as possible. The issue of blood storage in the patient care unit, after it has been dispensed from the blood bank, is one that we have seen frequently in event reports but read little about in the literature. Therefore, ECRI Institute PSO recommends that hospitals review their blood ordering procedures and take steps to close the gap between when blood or a blood product is ordered and when it is transfused into the patient. To discuss your blood storage concerns, please contact us at (610) 825-6000 or patientsafety@ecri.org and we will forward your questions to our experts.

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