

Final Hemoglobin – A Proposed Metric for Understanding the “Transfusion Trigger”

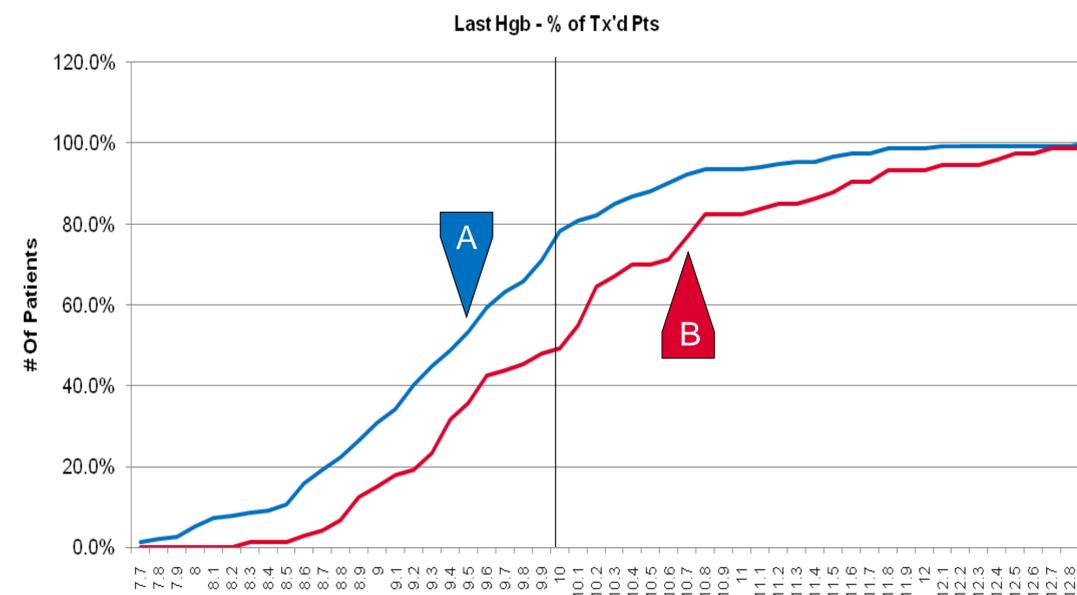
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Background

While patient-specific transfusion decisions are favored over the use of a universal “transfusion trigger,” guidelines typically utilize the adoption of a trigger hemoglobin value for the majority of clinical situations. To enhance quality improvement in transfusion medicine and better understand transfusion decisions, we evaluated a novel metric — “final hemoglobin.”

The ideal way to determine the hemoglobin value that led to a decision to transfuse red blood cells would be to record the last available hemoglobin prior to the transfusion order. However, this information may not provide meaningful information since clinicians are unlikely to wait for the hemoglobin result when transfusing patients with active blood loss (such as during surgery or following trauma). Also, in light of continuing blood loss as well as replacement by asanguinous fluids, salvaged blood, predonated blood, medications, and allogeneic transfusion, any single hemoglobin value does not necessarily represent the steady-state clinical reality. Similarly, retrospectively evaluating the lowest recorded hemoglobin value as a surrogate measure of the transfusion trigger would suffer from similar shortcomings.

	(n)	% transfused allogeneic RBC (n)	Transfused Patients Only			
			% Final Hgb ≤ 8 g/dL (n)	% Final Hgb ≤ 9 g/dL (n)	% Final Hgb ≤ 10 g/dL (n)	% Final Hgb > 10 g/dL (n)
A	445	34% (152)	5% (8)	31% (47)	78% (119)	22% (33)
B	173	42% (72)	0% (0)	15% (11)	50% (36)	50% (36)



Conclusion

Final hemoglobin is a useful metric to understand transfusion triggers. Since improved transfusion practice is multifactorial, further study is needed to determine whether lowering the final hemoglobin in transfused patients will in fact reduce transfusion rates and improve outcomes.

Methods

We postulated that evaluation of the last recorded hemoglobin prior to patient discharge for those patients who received a transfusion would be a useful way to reliably infer whether patients were properly transfused. Since this value is typically obtained shortly before discharge, it is unlikely to be affected by additional transfusion, fluid shifts, or hemodynamic instability.

To understand the value of the proposed metric, we compared the final hemoglobin of 618 patients following total hip or knee replacement surgery at two hospitals during October, November, and December 2009.

Results

As shown in the table, Hospital A’s allogeneic transfusion rate (34%) is lower than that of Hospital B (42%). The final hemoglobin metric reveals that the lower rate was achieved (at least in part) by adopting a lower hemoglobin trigger for RBC transfusion since Hospital A’s transfused patients were discharged with lower final hemoglobin values than transfused patients at Hospital B. “Over transfusion” in Hospital B is suggested by the fact that half of their transfused patients were discharged with a final hemoglobin > 10g/dL.