Electronic Clinical Decision Support for Blood Product Ordering Reduces Unnecessary Transfusion but May Induce Alert Fatigue

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Background: Blood product utilization is an increasing concern for hospital systems attempting to reduce transfusion-associated risks. One strategy to optimize utilization is to employ clinical decision support in the form of alerts to clinicians ordering blood products. We investigated whether such an alert could alter physician behavior so that unnecessary transfusions could be prevented.

Methods: This was a retrospective, observational study over the course of 7 months, limited to the adult general medicine wards at our institution. Each time a unit of packed red blood cells (pRBCs) was ordered via the hospital’s electronic ordering system and the patient’s most recent hemoglobin on record was greater than 8.0 g/dL, an interruptive alert was activated. The alert consisted of three components: the patient’s most recent hemoglobin value on record, a statement of best practices in transfusion, and a prompt the physician must acknowledge before the order for pRBCs can be placed. Physicians also had the option of not proceeding with the order. Data were collected on alert activations, including how often physicians acknowledged the alert and proceeded with the order, whether patients were actually transfused within 24 hours, and whether transfusions were appropriately justified.

Results: Over 7 months, 406 unique patient/alert encounters occurred, of which 290 (71%) involved only 1 alert activation and 116 (29%) involved multiple activations within a 6-hour timespan (range 2-9 activations). Of the 406 patient/alert encounters, 244 (60%) of the corresponding patients did not receive a transfusion within 24 hours despite the fact that 204 (84%) of those alerts were acknowledged and pRBCs were still ordered. In 80 encounters, the physician provided a hemoglobin target as part of the acknowledgement, 36 (45%) of which corresponded to patients who were subsequently transfused. Of these 36 patients, 33 (92%) had proper justification, either by the patient’s most recent hemoglobin result being below the target value or there being clinically justifiable grounds for transfusion.

Conclusions: Evidence suggests that alerts prevented some unnecessary transfusions. However, there was also evidence of alert fatigue, given the number of repeated activations on the same patient. In many instances, blood was still ordered despite an alert, but never transfused. When blood was
transfused, there was usually enough evidence to demonstrate
that the transfusion was necessary. This suggests that alerts
need to be better targeted to situations in which unnecessary
transfusions are likely.