Is it appropriate to have separate transfusion guidelines for 'cardiac patients' and/or for those undergoing specific diagnostic or therapeutic procedures?

The transfusion service medical director at a US hospital near one of the Great Lakes reports that their local guideline for transfusion of RBCs to a non-bleeding patient is a hemoglobin level of **8 g/dL or less**. However, the hospital cardiologists follow a different strategy and routinely order RBC transfusions whenever a 'cardiac patient' has hemoglobin level is **9 g/dL or less**, to raise the level to at least 10g/dL. In addition, the physician overseeing their 'Cardiac Cath' Lab requires that patient be transfused to a hemoglobin level of **at least 10g/dL before a procedure** like PTCA will be done. Their Transfusion Committee wants to know if it is an appropriate for there to be separate transfusion guidelines for 'cardiac patients' and/or for those undergoing specific diagnostic or therapeutic procedures, and if so, **what approach is followed at other institutions?**

The following comments have been received.

ADDENDA Oct. 28, 2005

1. **According to Dr. Breanndan Moore at the Mayo Clinic in Minnesota** (attribution used with permission), it has always been the practice at that institution for transfusion guidelines to be generally **applicable to all patient groups, but with clearly outlined sets of clinical situations where clinical judgment takes precedence over standardized sets of guidelines** ... i.e. common sense over format! He does not believe that there should be a separate set of guidelines for subsets of patients, because such a policy might lead to demands from clinical groups to have their very own guidelines, which would be applied to "narrow" or highly specific subgroups of patients. He reasons that if this were to occur, it would make it difficult for transfusion medicine auditors and transfusion committees to accurately and consistently decide which of the narrow groups a particular patient belongs to. He states: "Indeed, in real life, **patients often belong to several "subgroups" simultaneously** e.g. cardiac condition, elderly, diabetic, hypertensive, etc. This would make it quite impossible to figure out just which of the multiple specific predetermined transfusion algorithm applied in many cases." He laments that they have trouble enough getting clinicians to abide by one set of guidelines without cluttering up the scene with multiple complicated sets pertaining to this or that set of clinical circumstances. He believes that such a "stew" is more likely to be confusing and not be adhered to consistently by clinicians. He concludes with an opinion stating that we **should be simplifying guidelines, not making them more complex**.

ADDENDA Nov. 8, 2005

2. **Richard K. Spence, MD, FACS, Senior Vice President for Clinical Affairs for Infonale, Inc.**, (attribution used with permission), who is an experienced surgeon and clinician comments that he is troubled as much by continued use of hemoglobin triggers as he is by the use of separate guidelines based on a patient's initial diagnosis. He writes:

   "The NIH consensus conference recommendations, reported over 15 years ago, stressed the need to assess transfusion need individually using clinical signs and symptoms along with a hemoglobin trigger of between 7 and 8 gm/dL. Similar guidelines have been promulgated over the years by a variety of organizations. The use of a hemoglobin-based transfusion trigger has helped transfusion services by providing a benchmark for analysis of transfusion practice. However, transfusing a patient just to raise the hemoglobin level is not appropriate. Clinicians must remember that red cell transfusion presents both benefit and risk. The former is essentially assumed and unproven whereas the latter is known, measurable and quantifiable. The only evidence to support transfusing "by the numbers" in patients with cardiac disease is limited and controversial. Our paper published in the Lancet in 1996 noted that mortality increased progressively with an admission hemoglobin level below 8 gm/dL in a group of 1958 patients with a history of cardiovascular disease. However, this was a group of Jehovah's Witness patients who were NOT transfused, so the benefit of transfusion for a lower hemoglobin cannot be assumed. Furthermore, these patients were a mix of actively bleeding, emergency surgical patients and those who underwent routine, elective surgery. Carson addressed the issue of transfusion benefit in a later study of 8787 consecutive hip fracture

patients, aged 60 years or older, who underwent surgical repair. He concluded that peri-operative transfusion in patients with hemoglobin levels 8.0 g/dL or higher did not appear to influence the risk of 30- or 90-day mortality. Hebert's sentinel study confirmed that transfusing a patient from a hemoglobin level of 8 gm/dL to 10 gm/dL added no benefit and potentially increased the risk of multi-system organ failure. In the 257 patients with severe ischemic heart disease, there were no statistically significant differences in all survival measures, although absolute survival was lower in the restrictive group. In a subsequent call for further clinical trials, Hebert suggested that a more aggressive transfusion trigger (9-10 g/dL) be used in patients with active cardiac disease, basing this on acknowledged weak data. Further controversy emerged with the publication of Wu and colleagues analysis of a Medicare data base of 65 year old patients admitted with a diagnosis of acute myocardial infarction, which lead them to conclude that blood transfusion is associated with a lower short-term mortality rate among elderly patients with acute myocardial infarction. Unfortunately, their science was flawed by selective elimination of patients, e.g., those who underwent any intervention for the infarction, arbitrary grouping of patients into admission Hct groups, e.g., 5.0 to 24.0% compared to higher Hct groups that ranged across only 3 percentage points, and failure to discriminate adequately between transfused and non-transfused patient outcomes in the less than 24% Hct group. Wu concluded that raising the admission Hct to as high as 33.0 percent may improve outcomes, which, to me was unproven and unwarranted. Unfortunately, this report has had much traction in clinical practice. Rao and colleagues refuted this position with their analysis of the effect of transfusion on outcome in 24,112 enrollees in three clinical trials of acute coronary syndrome. They concluded that blood transfusion in the setting of acute coronary syndromes is associated with HIGHER mortality, and that this relationship persisted after adjustment for other predictive factors and timing of events. It is understandable that cardiologists, as well as others, may fear the potential negative impact of anemia in the patient about to undergo PTCA and wish to reduce this with red cell transfusion. However, current evidence not only does not support such prophylactic transfusion practices as being beneficial but also indicts transfusion as being harmful. Therefore, I recommend that the transfusion service meet with the cardiologists(s) who insist on higher hemoglobin levels to review the existing evidence and to recommend modification of his/her transfusion practice in a collaborative manner."

Please submit comments to the e-Network Forum.

Ira A. Shulman, MD
CBBS e-Network Forum Editor & Moderator

Printable PDF of this page

Posted: October 25, 2005

Addenda: Oct. 28 & Nov. 8, 2005

The e-Network Forum is supported by the California Blood Bank Society (CBBS) and endorses collegial discussion among blood banking and transfusion medicine professionals. However, the CBBS does not necessarily endorse the specific views and opinions expressed in the forum. The forum is not intended as a substitute for medical or legal advice and the content should not be relied upon for any medical or legal purposes. Readers should make their own determinations as to: (i) what constitutes appropriate medical, technical, and administrative practices, and (ii) how best to comply with laws and regulations relevant to their questions. For the latter, they should consider consulting, as to any medical matters, a qualified physician, and, as to any legal matters, an attorney familiar with related state and federal laws. The user of the forum, by accessing same, assumes all risks arising out of such use and releases CBBS and their respective members, directors, officers and agents from and against any loss, damage, claim or liability arising out of such use of the forum.