

Transfusion and Management of Surgical Patients with Hematologic Disorders



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KEYWORDS

- Transfusion • Massive transfusion protocols • Transfusion-related lung injury
- Transfusion-related outcomes

KEY POINTS

- In the hemodynamically stable patient, restricted use of packed red blood cells appears to be at least equal to liberal use of packed red blood cells.
- The use of fresh frozen plasma and platelets along with packed red blood cells in the massively transfused patient appears to be of benefit.
- Transfusion-related lung injury is one of the leading causes of mortality in the transfused patient.
- Meta-analysis suggests that transfused patients with colorectal cancer have worse outcomes when compared with nontransfused patients.

Surgeons frequently encounter patients with hematologic disorders in the perioperative period. A fundamental understanding of the cause and the management of these clinical derangements is required. Most of these derangements occur as a result of abnormal production, dysfunction, or rapid loss.

This section explores the recent literature and how it has transformed how blood is used in the surgical patient, how blood transfusions impact other patient outcomes, and the current treatment schemes of the massively transfused patient.

LIBERAL VERSUS CONSERVATIVE TRANSFUSION

Recently, there has been a paradigm shift in packed red blood cell (PRBC) utilization. The studies that compare liberal versus restrictive transfusion policy and how these they impact patient outcomes are examined.

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Since the development of blood banks through the significant contributions of Dr Charles Drew around the beginning of World War II, the medical community has had many paradigm shifts on the appropriate clinical triggers for transfusion. In the acutely injured bleeding patient, the benefits outweigh the risks associated with blood transfusion. In all other surgical patients, the current paradigm would suggest that conservative clinical triggers provide the benefit and mitigate the risk. For many years, most clinicians used the 10/30 rule as a clinical trigger for transfusion of PRBCs. Because of concerns over transmission of blood-borne diseases and costs associated with a liberal transfusion rate, a re-examination of that clinical trigger began in the 1980s and continues to date. The 1988 National Institutes of Health Consensus Conference concluded that no one criterion should be used as an indication for transfusion and that multiple patient factors should be considered.¹ Since that time, many associations have published many guidelines in an attempt to determine the elusive trigger.²⁻⁵ The indications and thresholds for PRBCs transfusion in adults are discussed in this section.

The support for a liberal transfusion protocol was developed primarily through observational studies that identified an association between anemia and poor outcomes.

- In a 1958 study of patients who declined blood transfusions for religious reasons, the mortality increased as the preoperative hemoglobin (Hgb) decreased.⁶
- That study had a mortality of 61.5% in the patients with an Hgb of less than 6.
- Patients with an Hgb of greater than 10 had a 7.1% mortality.⁷
- These observational studies help formulate the 10/30 rule.

Also, studies suggested that there were groups of anemic patients that were at high risk for poor outcomes. Geriatric patients and patients with coronary artery disease are the groups that were determined to be most at risk when anemic in the perioperative period. When a patient is anemic, there are physiologic changes that occur to compensate for the anemia and hemodilution. Many articles describe the association of hemodilution and normalization of tissue oxygen delivery through increasing cardiac output.^{7,8} However, in patients who cannot increase stroke volume because of coronary artery disease and/or decreased physiologic reserve, compensating during periods of anemia becomes the challenge.

- Multiple studies did not demonstrate worse outcomes with hemodilution; the animal studies illustrated that the hemodilution was mitigated by increased stroke volume and cardiac output in the animals with normal physiology. Patients who cannot increase their stroke volume or cardiac output have worse outcomes when they are anemic.⁹

The geriatric patient is a patient that surgeons care for frequently in the United States. Because anemia is quite prevalent in this population, many of these patients present anemic with a need for surgical intervention.

- Based on the World Health Organization definition of anemia, which is an Hgb less than 13, 10% of patients 65 to 84 and 25% of patients 85 and older are anemic.
- Perioperative anemia constitutes a bad prognosis and increased mortality in elderly patients.¹⁰
- Symptomatic anemia and severe anemia should always be treated in the elderly.
- One observational study revealed a benefit for liberal transfusion rate in the elderly population.¹¹

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