

Special Report From the Society for the Advancement of Blood Management: The Choosing Wisely Campaign

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Over 7 years ago, the American Board of Internal Medicine Foundation (ABIM) created the national Choosing Wisely campaign with the purpose of encouraging active dialogue between health care providers and patients, focusing on appropriateness, quality care, and resource management. This special communication from the Society for the Advancement of Blood Management (SABM) serves to highlight the society's recent participation in the Choosing Wisely campaign, encouraging sensible dialogue between clinicians and our patients with the intent to promote patient-centered, evidence-based care. The article addresses the rationale and supportive data for the 5 SABM Choosing Wisely recommendations. (Anesth Analg XXX:XXX:00–00)

GLOSSARY

ABIM = American Board of Internal Medicine; **aPTT** = activated partial thromboplastin time; **BOD** = Board of Directors; **FDA** = Food and Drug Administration; **Hb** = hemoglobin; **INR** = international normalized ratio; **PBM** = Patient Blood Management; **PT** = prothrombin time; **RBC** = red blood cell; **SABM** = Society for the Advancement of Blood Management; **TXA** = tranexamic acid; **WHO** = World Health Organization

The Choosing Wisely campaign represents the culmination of what originated as a charter for medical professionals published by the Medical Professionalism Project, an international consensus group, focused on encouraging a commitment to high-quality care initiatives, stewardship, and cost-effective care.¹ This initiative led to an American Board of Internal Medicine (ABIM) practice grant resulting in a set of 3 specific lists for internal medicine, family practice, and pediatric physicians of the top 5 activities where the quality of care could and should be improved.² The ultimate creation of Choosing Wisely thus represents a multiyear campaign to challenge health care providers to continue vigilant use of evidence-based practice with appropriate utilization of health care resources. To date, over 80 professional society partners have embraced the concepts of the campaign and currently provide lists of the required “Five Things Physicians and Patients Should Question.” This includes >550 recommendations with distribution of >100 patient-oriented materials (available at www.choosingwisely.org). Choosing Wisely thus promotes dissemination of best practice guidelines to both health care providers and patients.

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CREATION AND DEVELOPMENT PROCESS

The Executive Committee and Board of Directors (BOD) of the Society for the Advancement of Blood Management (SABM) expressed strong support for SABM to become a participant in the Choosing Wisely campaign. Participation in the Choosing Wisely campaign would be an opportunity to further the mission of SABM for collaborative provider-patient health care delivery and responsible use of resources. A Task Force was appointed from within the SABM Board to draft an initial set of proposed recommendations.

The Choosing Wisely national office furnished guiding principles for the organization's participation. Guidelines for development of a list included:

1. Each item should be within the scope and control of the society and its members.
2. The recommendations should be evidence based and represent frequently used practices which may also incur significant cost.
3. The list should be well documented, readily available, and understood by the lay public.
4. Recommendations should be reviewed and updated to reflect best practice.
5. There should be active dissemination through journal articles, newsletters, member meetings, and patient engagement.

Evidence-based recommendations were built on our society's foundational pillars and structured around published SABM Standards. A critical feature was the review of relevant literature for supporting evidence applicable to each statement. Important in the process was involvement of the SABM membership; thus, the draft recommendations were submitted to the membership for input via e-mail survey. Based on this input, the final 5 statements including evidentiary materials and pertinent references were written. The Task Force presented the materials for Board approval before submission to the Choosing Wisely national

team. Our selected statements and integrated materials were revised based on subsequent National Campaign leadership review to assure alignment of content and required format. The list was published by the national team in its final format on the Choosing Wisely website in August 2018. These are displayed in the Table. Throughout this process, a Task Force liaison was appointed to participate with the ABIM via periodic calls and electronic communications regarding the national campaign efforts and impact.

STATEMENTS AND EVIDENCE REVIEW

Do Not Proceed With Elective Surgery in Patients With Properly Diagnosed and Correctable Anemia Until the Anemia Has Been Appropriately Treated

Anemia is common, presenting in approximately one-third of patients undergoing elective surgery.³ There is a common misconception that anemia is harmless, when, in fact, even mild anemia is independently associated with significant morbidity and mortality.³⁻⁵

A large retrospective study of almost 8000 noncardiac surgical patients found that the prevalence of preoperative anemia was almost 40%.⁴ Preoperative anemia was associated with a nearly 5-fold increase in the odds of postoperative mortality. Even mild preoperative anemia (hemoglobin [Hb], 10–12 g/dL in women; 10–13 g/dL in men) was independently associated with a 41% increased risk of mortality and a 31% increase in composite morbidity in patients undergoing major noncardiac surgery.³

Anemia can complicate a wide range of underlying acute and chronic conditions for which treatment may vary significantly depending on etiology. Clinicians often utilize transfusion as the default to treat anemia without identifying the etiology, thus failing to recognize and implement appropriate nontransfusion therapy.^{6,7} Transfusion is associated with significant risks including potential severe acute or delayed transfusion reactions, an increase in hospital length of stay and readmission rates, ventilator dependence, increased risk of health care-associated infections, venous thromboembolism, and mortality.⁸⁻¹¹

An approach to properly diagnose and treat preoperative anemia will improve patient readiness for surgery, potentially eliminate the need for transfusion exposure, and improve overall outcomes.¹² Current evidence-based guidelines and

consensus include strong recommendations to detect and manage anemia early and sufficiently before major elective surgery.^{13,14} Timely screening, diagnosis, and treatment of anemia reduce the independent unfavorable complications associated with anemia.¹⁵ Optimization of preoperative anemia is applicable to a broad range of patient populations, and published algorithms for diagnosis and treatment are readily available.¹⁶⁻¹⁸ Therapeutics include oral or intravenous iron, with or without erythropoiesis-stimulating agents, B₁₂, and folate for nutritional deficiencies. This should be coupled with vigorous treatment and optimization of comorbidities such as renal insufficiency or failure, congestive heart failure, gastrointestinal loss, and other inflammatory conditions.¹⁸ Consultation with specialty clinicians may be necessary.

Do Not Perform Laboratory Testing Unless Clinically Indicated or Necessary for Diagnosis or Management to Avoid Iatrogenic Anemia

Over 90% of patients become anemic by day 3 in the intensive care unit.¹⁹ Hospital-acquired anemia complicates almost 75% of hospital admissions.²⁰ Although laboratory testing can aid diagnosis, prognosis, and treatment of disease, a significant number of ordered tests may be inappropriate or unnecessary. Anemia secondary to iatrogenic blood loss causes an increased length of stay and mortality.²¹ Repeated phlebotomy for laboratory testing also increases the odds for transfusion and its associated risks.²² Unnecessary laboratory testing adds to the cost of care through laboratory test charges and by increasing downstream costs due to unnecessary interventions and treatments.^{4,23-25} Thus, judicious use of laboratory testing is recommended and testing should not be performed in the absence of clinical indications.

The Society of Hospital Medicine and the Critical Care Societies Collaborative also recommend against daily test utilization unless necessary for management decisions, given the risk of iatrogenic anemia and its attendant poorer outcomes.^{26,27} Performance of daily laboratory tests results in increased sensitivity, but decreased specificity of testing and thus increases the likelihood of false-positive results. Quality initiatives via education, rounding, auditing, checklists, and cost transparency can decrease phlebotomy and provide more appropriate clinically relevant laboratory testing.²⁵ Other interventions include noninvasive hemodynamic monitoring, point-of-care testing, small volume collection, and the use of closed in-line flush devices.^{28,29} Reducing phlebotomy does not have a negative impact on quality of care, length of stay, readmission rates, or mortality.

Table. Society for the Advancement of Blood Management

Five Things Physicians and Patients Should Question^a

1. Do not proceed with elective surgery in patients with properly diagnosed and correctable anemia until the anemia has been appropriately treated.
2. Do not perform laboratory blood testing unless clinically indicated or necessary for diagnosis or management to avoid iatrogenic anemia.
3. Do not transfuse plasma in the absence of active bleeding or significant laboratory evidence of coagulopathy.
4. Avoid transfusion when antifibrinolytic drugs are available to minimize surgical bleeding.
5. Avoid transfusion, outside of emergencies, when alternative strategies are available as part of informed consent; make discussion of alternatives part of the informed consent process.

^aSource: Choosing Wisely (www.choosingwisely.org).

Do Not Transfuse Plasma in the Absence of Active Bleeding or Significant Laboratory Evidence of Coagulopathy

Recent studies demonstrate that plasma is often transfused inappropriately.^{30,31} In the absence of active bleeding and clear evidence of coagulopathy, current literature shows no reduction in blood loss or transfusion requirements with the use of plasma.³²⁻³⁶ However, studies do show increased risk of transfusion-associated adverse events such as transfusion-related acute lung injury, transfusion-associated circulatory overload, and allergic reactions. These transfusion-associated adverse events lead to poorer outcomes and increased cost of care.

Prophylactic plasma transfusion in the nonbleeding patient does not mitigate bleeding and has been associated with increased frequency of bleeding, an increased need for periprocedural red blood cell (RBC) transfusion, and post-procedural admission to the intensive care unit.^{37,38}

Abnormal coagulation studies do not predict bleeding.³⁹ and an isolated elevation of international normalized ratio (INR) does not reflect coagulopathy.⁴⁰ Of note, transfusion of prophylactic plasma will result in little change in the INR when the INR is below 2.0.^{41–43}

The presence or absence of coagulopathy based on standard laboratory tests alone remains elusive and not well defined. A study of patients with blunt trauma defined acute trauma coagulopathy as an INR >1.5 and found an associated increase in morbidity and mortality in this patient subgroup.⁴⁴ Traditional coagulation tests such as prothrombin time (PT) and activated partial thromboplastin time (aPTT) represent initiation of clotting; however, it does not reflect the full hemostatic capacity for full thrombin generation and clot formation, and the PT/INR, in particular, does not have a linear relationship with procoagulant factor concentrations.³⁹ Viscoelastic whole blood clotting assays may better represent the full spectrum of the clotting cascade and, thus, might more readily identify coagulopathy. Use of viscoelastic testing has shown to be favorable in guiding appropriate transfusion and to reduce the need for transfusion, in general, particularly in cardiovascular surgery.⁴⁵

Patients with end-stage liver disease, where routine coagulation tests are often abnormal, do not require routine plasma transfusion even in the face of invasive procedures. These patients have rebalanced hemostasis and generally maintain normal thrombin generation with little risk of bleeding in the face of significant abnormalities of the INR.⁴⁶ These patients may, in fact, be hypercoagulable despite an elevated INR.⁴⁷ Viscoelastic testing may better assess coagulation in these patients.⁴⁸

Clinically, there should be very rare occasions, outside of a massive hemorrhage protocol or therapeutic plasma exchange for the patient with thrombotic thrombocytopenic purpura, where isolated orders for plasma should occur. The activity-based cost of plasma is quite high, calculated at 10 times the acquisition cost of a single unit.⁴⁹

Avoid Transfusion When Antifibrinolytic Drugs Are Available to Minimize Surgical Bleeding

Antifibrinolytic agents are lysine analogs that prevent plasminogen activation resulting in the blockade of fibrinolysis. Tranexamic acid (TXA) is specifically listed by the World Health Organization (WHO) as one of the world's essential medicines.⁵⁰ These agents are inexpensive and have a consistent safety profile.⁵¹ Oral, topical, and intravenous preparations are available. While dosing may vary based on published studies and high doses are likely related to increased side effects, it is recommended that TXA dosage regimens be based on pharmacokinetic studies.^{52–54}

The Food and Drug Administration (FDA)-approved indications are relatively limited to hemophiliacs needing short-term prophylaxis before and after dental extraction and for the treatment of cyclic severe menorrhagia.^{55,56} Historically, however, there has been extensive off-label prophylactic and therapeutic use. Antifibrinolytic pharmacological

therapy has been shown to reduce blood loss and transfusion requirements across a broad range of orthopedic, gynecologic, and cardiovascular surgeries.^{57,58} Meta-analyses have shown a reduction in the probability of transfusion and overall bleeding by one-third.⁵⁹ Early administration of TXA, specifically within 3 hours, in trauma and obstetric hemorrhage, significantly reduces mortality and bleeding.^{60,61} A recent study of TXA use, pre- and postprotocol, in patients undergoing major joint arthroplasty found transfusion rates decreased from 10.3% to 4.8% ($P < .001$). Importantly, there was no increase in adverse events including death, myocardial infarction, stroke, pulmonary embolism, deep venous thrombosis, seizures, or acute renal injury. The authors stress the need for universal use of TXA in this patient population.⁶²

The Society of Thoracic Surgeons includes the use of antifibrinolytics in their blood conservation clinical practice recommendations.⁶³ The Australian Government Department of Health Therapeutic Goods Administration provides expanded indications for the use of antifibrinolytics including adult and pediatric patients.⁶⁴ The most recent European guideline for the management of trauma-induced coagulopathy embeds TXA within the treatment modalities.⁶⁵

Antifibrinolytic agents have also been shown to affect platelet function. This is likely through the inhibition of plasmin concentration.⁶⁶ Although there are limited studies, antifibrinolytics have been used to prevent and mitigate bleeding in thrombocytopenic patients.⁶⁷ A clinical trial is underway to evaluate the effect of TXA therapy in thrombocytopenic patients.⁶⁸ TXA may have additional properties that modulate immune responses with associated reduction in postsurgical infections.⁶⁹

Antifibrinolytics are contraindicated in those with acquired deficiency of color vision, and this sign should be monitored for drug toxicity. Use should be avoided in patients with active thrombosis, known hypersensitivity or seizures with prior exposure. Likely the greatest barrier to more extensive use is the fear of thromboembolic adverse events. Robust evidence in the literature, however, does not reveal an increase in either venous thromboembolism or pulmonary embolism with the use of TXA.⁵¹

Given current evidence, these agents should be a part of Patient Blood Management (PBM) program strategies, helping to reduce and potentially eliminating the need for transfusion.⁷⁰

Avoid Transfusion, Outside of Emergencies, When Alternative Strategies Are Available as Part of Informed Consent; Make Discussion of Alternatives Part of the Informed Consent Process

Throughout the world, there is wide variation among medical practitioners and hospitals with regard to medical knowledge about the true risks of transfusion, alternatives to transfusion, and the delivery of this information to patients.^{71–73} Outside of the truly emergent clinical situation, transfusion should be avoided or limited when other interventions are available.

Patient-centered decision-making, as defined by informed choice, demands evaluation of the overarching medical condition(s), coagulation status, presence of anemia, medications and a thorough assessment of the scheduling, timing, staging, and complexity of any potential procedures.

Given the significant risks of transfusion, patient choice and consent are of utmost importance.^{74–76} Obstacles to obtaining appropriate informed consent are plentiful and not often addressed. The consent process tends to be viewed as merely a document to be signed and placed in the patient's chart. The pace of medical practice today may minimize the time spent on these crucial conversations. Patients are not typically well versed in medical vernacular or may have limited language proficiency, thus to adequately explain and discuss the patient's disease and potential treatment options take time and effort.⁷⁷ Little attention has been given to training medical students and residents in the process of informed consent discussions or their documentation.⁷⁸ Education to health care providers is vital because the concepts of informed choice and consent must be consistently delivered throughout our facilities/systems.⁷⁹

Choices and alternatives to transfusion should be clearly outlined, discussed, and documented. Alternative strategies include, but are not limited to pharmacological agents, perioperative cell collection and readministration (cell salvage), normovolemic hemodilution, and minimally invasive surgical techniques.

It must be remembered that informed consent is much more than a mere signature on a page. Informed choice represents free selection after consideration of all options. Informed consent represents compliance to or approval of what is done or proposed by another. Blood transfusion has been a part of our clinical practice for decades, and many clinicians have neglected to clearly address options to transfusion that are available and the modifiable risks such as anemia that lead to both transfusion and poor outcomes.

CONCLUSIONS

The ABIM Foundation's Choosing Wisely campaign provides an avenue for health care professionals to move beyond their society guidelines and publications expanding the concept of patient-centered care and dialogue. SABM is an international leader in PBM with its core foundational principles of bringing state-of-the-art science and education to promote appropriate use of transfusion therapy and utilization of alternatives to reduce or even eliminate this need. SABM is guided by a patient-centered approach to achieve improved outcomes through patient-clinician communication and alignment of health goals and values. As such, SABM saw participation in the Choosing Wisely initiative as an opportunity to challenge our leadership and membership to further promulgate PBM principles, to reach out to the public, empowering clinicians and patients alike to shape joint health care choices.

We encourage our members, as well as other health care providers, to actively utilize this list, incorporating its principles into daily practice. Future lists could be created as the science and recognition of PBM expands as the standard of care. ■■

DISCLOSURES

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