



**PERIOPERATIVE BLOOD MANAGEMENT:  
IMPROVING PATIENT OUTCOMES  
AND REDUCING HEALTHCARE COSTS**

devoted physicians.  
collaborative partners.  
metrics-driven quality.



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### ANESTHESIA PARTNERS PROVIDE LEADERSHIP

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Healthcare reform is increasing demands on hospitals to achieve higher levels of quality, patient safety, efficiency and accountability. While reimbursements are shrinking, payor incentives are increasingly tied to evidence-based care and outcome measurements. Healthcare leaders are tasked with the challenge of identifying and rooting out "waste" -- defined by The New England Healthcare Institute as healthcare spending that can be eliminated without reducing quality of care. Premier healthcare alliance estimates that waste in the U.S. Healthcare system exceeds \$1 trillion or nearly half of all healthcare costs.

**Perioperative blood management**, an evidence-based, multidisciplinary process designed to promote the optimal use of blood products throughout the hospital, directly addresses two of these unnecessary costs: resource over-utilization and avoidable complications. And anesthesiologists, because of their comprehensive role in preparing patients for surgery, reducing blood loss during surgery and directing care for patients post-operatively, can play a critical leadership role in the development and implementation of perioperative blood management programs.

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### Anesthesiologists: Operating Room Stewards

The Society for the Advancement of Blood Management defines patient blood management as the timely application of evidence based medical and surgical concepts designed to maintain hemoglobin concentration, optimize hemostasis and minimize blood loss in an effort to improve patient outcomes. There are a number of strategies anesthesiologists can employ to achieve these goals from pre-op thru recovery. Since a majority of hospital patients enter the institution through the operating rooms, and the operating room has the lion's share of multi-unit transfusions, the anesthesiologists' role is critical. Oversight of preoperative assessment and patient optimization from integrated pre-op clinics is essential. Intraoperatively, techniques include sophisticated point-of-care coagulation monitoring with algorithm-guided transfusion therapy, controlled hypotension, warming and maintenance of normothermia, choice of ventilation patterns, choice of drugs, timing and amount of fluid administration, and choice of anesthetic techniques.<sup>1</sup>

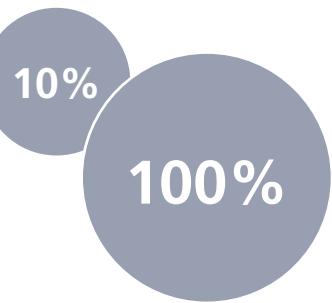
In addition to their medical role, anesthesiologists increasingly hold valuable administrative responsibilities as well. Unlike the surgeons they work alongside, anesthesiologists do not have to split their time between the surgical suite and seeing patients in the office. They work day in and day out in the operating room. As a result, many hospitals are turning to their anesthesiology partners to manage operating suite resources, including the efficient use of operating rooms, equipment, supplies and personnel.<sup>2</sup> No one is more naturally aligned with the operating rooms' performance.

This combination of medical and administrative skills and experience uniquely positions anesthesiologists to provide leadership in hospital efforts like blood management that are designed to both improve patient outcomes and safety as well as enhance operating efficiency and reduce unnecessary costs.

## Why is Perioperative Blood Management Necessary?

Transfusion practices vary greatly throughout facilities and across specialties for the exact same diagnosis and procedure, increasing over-utilization and exacerbating the challenges healthcare executives face. In one study Premier conducted of red blood cell use in 560 hospitals, transfusion rates in cardiac surgery varied from 10 to 100 percent per case.

According to Premier, this occurs because physicians often rely on prescribing habits, using transfusions empirically to elevate blood counts rather than relying upon evidence-based guidelines that focus on clear indications and specific thresholds.



As a result of this variance, hospitals across the country are increasingly developing or expanding blood management programs to address these challenges. What typically started as a way to treat patients who refused transfusions, has evolved into an effort by hospitals to evaluate the necessity, outcomes and financial costs associated with transfusions.<sup>3</sup> Researchers have identified five primary drivers for the paradigm shift to patient blood management:<sup>4</sup>

1. The growing gap between supply and demand for blood products
2. The escalating cost of transfusion
3. Product safety issues
4. Adverse transfusion outcomes
5. Questionable efficacy of transfusions

In addition, the Joint Commission has adopted Patient Blood Management Performance Measures,<sup>5</sup> and The World Health Assembly, part of the World Health Organization, identified the need for patient blood management and passed a resolution adopting this approach at its 63rd session in 2010.<sup>4</sup>

## Improving Outcomes and Patient Safety

Although the United States blood supply is safer today than ever before, transfusions carry risks. In fact, each unit of red blood cells transfused is associated with an incremental increased risk for an adverse outcome, including:

- An increase in morbidity and mortality
- Nosocomial infections
- Transfusion-related circulatory overload
- Higher financial costs
- Immunosuppression
- Transfusion-related lung injury
- Longer lengths of stay

In cardiac care, for example, red blood cell transfusion is directly associated with a risk-adjusted increased risk for every postoperative morbid event:

- Mortality (odds ratio [OR], 1.77)
- Prolonged ventilatory support (OR, 1.79)
- Cardiac complications (OR, 1.55)
- Renal failure (OR, 2.06)
- Serious infection (OR, 1.76)
- Neurologic events (OR, 1.37).

In an observational cohort study of 11,963 patients who underwent isolated coronary artery bypass from 1995 to 2002, of which 5,814 (48.6%) were transfused, each unit of red blood cells transfused was associated with an incrementally increased risk for adverse outcome.<sup>6</sup>

Meanwhile, studies show the clinical benefits of surgeries that avoid transfusions include lower infection rates, faster wound healing, shorter lengths of stay and fewer readmissions, just to name a few.

## Blood Management Programs Save Hospitals Money

In addition to improving patient outcomes, blood management programs positively impact the bottom line. According to a study published in the April 2010 issue of the journal Transfusion, the cost of a red blood cell transfusion ranges from \$522 to \$1,183 per unit. This includes obtaining consent, screening, lab work, education and treating short-term side effects.<sup>3</sup> And in the U.S., approximately 15 million units of red blood cells are transfused every year according to the AABB (formerly the American Association of Blood Banks). Sherri Ozawa, R.N., board member for the Society for the Advancement of Blood Management and clinical director of the Institute for Blood Management at Englewood Hospital and Medical Center in New Jersey, estimates that about 90 percent or more of those 15 million units are provided to stable, non-bleeding patients.<sup>3</sup>

Adding to the direct and indirect costs, healthcare providers also increasingly face financial penalties for adverse clinical outcomes related to inappropriate transfusion practices. Medicare and most commercial health insurance carriers will not pay for transfusion errors, bleeding complications in cardiac surgery, and hospital-acquired infections that are increased significantly by blood transfusions.<sup>7</sup>

And when it comes to perioperative blood management, even small improvements can make a sizable financial impact. MedStar Georgetown University Hospital brought the first blood management program to the Washington, D.C., area in January 2011. Prior to that, the hospital had averaged about 1,200 units of blood a month. One of its orthopaedic surgeons, Mark Zawadsky, M.D., estimated that just reducing that amount by 10 percent resulted in an annual savings of about \$750,000.<sup>3</sup>

## Success Requires a Collaborative, Metrics-driven Approach

Critical factors for successful blood management programs include:

1. Measure and obtain an accurate comparison of utilization data.
2. Utilize a multi-disciplinary Blood Stewardship team to lead improvement efforts. Include anesthesiologists, surgeons, internists/hospitalists, family physicians, hospital administration, nursing, pharmacy and blood bank.
3. Work collaboratively with practitioners and identify physician champions.
4. Implement evidence-based transfusion guidelines and protocol-driven transfusion pathways.
5. Provide education and clinical decision support tools.
6. Develop a measurement and feedback process to monitor adherence to guidelines, track improvements and impacts, and communicate progress back to practitioners.

Many hospitals have also formed service-line focused blood management teams (i.e. cardiac surgery, orthopaedic surgery, etc.) to maximize efforts.

In the end, developing and implementing a comprehensive blood management program not only roots out "waste," improves hospitals' positions and directly addresses the key drivers of accountable care - it is simply good medicine.

## About JLR Medical Group, Inc.

Founded in Orlando, Florida, in 1988 by Joseph L. Riley, MD, JLR Medical Group is a physician-owned, perioperative services company, providing anesthesia services and pain management throughout Central Florida. Its growing clinical team of 75 anesthesiologists and 120 nurse anesthetists perform over 100,000 cases per year. The company offers a complete, streamlined medical and management solution to achieve an optimally performing operating room.

JLR has established evidence-based transfusion guidelines for perioperative care and works with its clients to lead in blood management. One example of its recent efforts is the group's liver transplant program, which worked in partnership with surgeons and hospital leadership to achieve a better-than-average transfusion rate of under 5 units of blood per transplant during the first three years of the program. This was accomplished through intraoperative point-of-care coagulation analysis with thromboelastometry/thromboelastography as well as lower, more conservative transfusion triggers and algorithm-guided care.

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## About U.S. Anesthesia Partners

U.S. Anesthesia Partners is a single-specialty physician services organization that offers practice management to anesthesiologists. It was formed by JLR Medical Group and other leading anesthesia practices to create a platform with the capital resources and expertise to invest in their practice support infrastructure and position them for continued success and growth within their markets. Key elements of USAP's business model are its single-specialty focus and its ability to offer anesthesiologists equity ownership in USAP. USAP and its affiliates have more than 1,200 anesthesia providers serving three major metropolitan markets. USAP is sponsored by Welsh, Carson, Anderson & Stowe, an investment firm with significant experience investing in and building leading healthcare companies. Please visit [www.usap.com](http://www.usap.com) to learn more.

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## REFERENCES

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  - <sup>2</sup>Lifeline to Modern Medicine: American Society of Anesthesiologists
  - <sup>3</sup>Frellick, M., "Better Blood Management Could be a Boon for Hospitals." Hospitals & Health Networks, September 9, 2012
  - <sup>4</sup>Hofmann, A., Farmer, S., Shander, A., "Five Drivers Shifting the Paradigm from Patient-Focused Transfusion Practice to Patient Blood Management." The Oncologist, 2011:16(suppl3):3-11
  - <sup>5</sup>[http://www.jointcommission.org/patient\\_blood\\_management\\_performance\\_measures\\_project/](http://www.jointcommission.org/patient_blood_management_performance_measures_project/)
  - <sup>6</sup>Koch CG, et al, "Morbidity and Mortality Risk Associated with Red Blood Cell and Blood-component Transfusion in Isolated Coronary Artery Bypass Grafting." Critical Care Medicine 2006
  - <sup>7</sup><http://www.bloodmanagement.com/the-bloody-truth/the-bloody-truth>
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## ADDITIONAL RESOURCES

Society for the Advancement of Blood Management  
<http://www.sabm.org>



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