



Quantifying Costs and Demonstrating Value of Enhanced Recovery After Surgery

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As a 2016 recipient of the FAER Research in Education Grant (REG), I can tell you firsthand how important FAER is to the specialty.

This grant enabled me to explore an exciting new area of research related to shared decision making in the surgical patient and establish the role of the anesthesiologist in this process. Titled “Conducting Perioperative Code Status and Goals of Care Discussions: A Bi-Institutional Study to Develop a Novel, Evidence-Based Curriculum for Anesthesiology Trainees,” my study focused on creating an education curriculum for anesthesiology residents focused on the preoperative setting. I used Objective Standardized Clinical Examination (OSCE) methodology to assess the impact of the educational intervention on their patient interviewing skills and self-reported impact on clinical care. I believe we can facilitate shared decision-making before surgery by improving the quality of these difficult conversations and implementing them into clinical practice. This project emphasizes a multidisciplinary approach, patient-centered care and evidence-based care with the ultimate goal of improving the health care value we deliver. This study led to new research collaborations and grant funding.

I am now pleased to contribute this article on a topic that is a focus of my current research and clinical interests, and it has also given me a wonderful opportunity to mentor anesthesiology trainees and junior faculty. Similar to the research I conducted through my FAER REG, a multidisciplinary, system-based approach to patient care is at the core of Enhanced Recovery After Surgery (ERAS®) programs, with many studies showing an improvement in patient outcomes and a decrease in health care costs after successful implementation. In this article, a CA-3 anesthesiology resident from my institution, Dr. Alex Stone and I provide a brief summary of how ERAS can reduce these costs as we continue to transition to value-based care.

In the U.S., health care reimbursements are gradually shifting from fee-for-service to pay-for-performance, incentivizing high-value care. Value is most simply defined as quality divided by costs. ERAS programs are complex quality-improvement programs that rely upon the simultaneous adoption of multiple interventions at all points in the perioperative process. ERAS programs lead to more consistent high-quality



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perioperative care and have been associated with decreased length of hospital stays, better perioperative outcomes, and improved patient satisfaction without increasing readmission rates.^{1,2} The clinical impact of ERAS programs has been linked to the level of compliance with ERAS process measures.³ The implementation, surveillance and maintenance of a robust ERAS program is a major investment by a hospital or health system in terms of time and resources.⁴ We will briefly review evidence regarding the potential cost savings of ERAS program implementation.

Reduction of Hospital Charges

Most articles on economic impact of ERAS programs conclude that ERAS is cost saving.^{2,5,6} These data have led many to agree that ERAS can improve quality while reducing costs, making it an economically dominant intervention. The most commonly reported metric is the reduction in direct hospital costs. While encouraging, studies that report reductions in direct costs must be interpreted with some limitations. In multiple reviews of the economic impact of ERAS, the numbers reported for the direct hospital costs ranged widely, even for identical procedures.⁵ This likely reflects a difference in what was included in the “direct hospital costs,” which is difficult to compare as most studies include only a single value for direct costs. In addition, the large range in values may represent differences in health care costs between countries and health care systems. The overall quality of reporting for ERAS economic outcomes is not consistent. In a recent systematic review of ERAS programs, the mean Consensus Health Economic Criteria list (CHEC-list) score was 7.8 out of 19; a score that corresponds to a mediocre ranking.⁶

One way that ERAS programs are thought to decrease hospital costs is by decreasing the index length of stay (LOS), and most ERAS programs have been shown to reduce hospital index LOS.² A reduction in hospital stay means that fewer resources from different hospital cost centers will need to be allocated to each patient and that the annual volume of surgery can theoretically be increased. Some ERAS researchers calculate the yearly extra hospital bed days and use this figure to extrapolate yearly cost savings.^{7,8} However, caution should be used when interpreting these calculations. The direct costs per hospital day are significantly higher at the start of the hospitalization, and ERAS programs typically reduce the hospital days at the end of the hospitalization. Also, it may not be possible for lower volume centers to increase their surgical capacity to realize all of the potential economic benefit.

Another mechanism by which ERAS programs reduce costs is through the reduction of perioperative complications. The costs of a surgical complication have been estimated to be approximately \$10,000 and vary depending on the severity

of complication. However, there have been no studies that directly link the reduction in complications to decreased hospital costs. Financial models associated with rare yet expensive events like surgical complications may magnify the impact of a non-statistically significant change in complication rate shown in smaller studies.

Implementation Costs

The implementation costs of ERAS programs have not been widely reported. The current studies come from large academic medical centers. Based on the existing reports, the majority of implementation-related expenses likely stem from increased personnel costs in the form of salary support for ERAS staff and coordinators.⁴ Less is known about the costs of maintaining an ERAS program. The most significant costs are likely personnel costs as well as data maintenance costs.

The spread of an ERAS program from once service line to another within an institution has been reported multiple times. It is likely that the initial investment in establishing an ERAS program will reduce the subsequent costs of expanding a program to a new service line. However, no group to date has investigated this specifically.

An economic argument can help increase the effectiveness of ERAS program implementation. Multiple groups from the U.S. have claimed that it is essential to gain a “buy-in” from hospital leadership before ERAS programs are adopted, which often involves estimating a return on investment (ROI) and taking into account both implementation costs and potential cost-savings.⁹ However, differences in institutional structure and regional variations in payor structures make it difficult to apply a single economic model across multiple health care institutions. Development of local pilot programs and analysis of local data on the economic effect can facilitate hospital executive support and resources for wider ERAS program expansion. Care should be taken when extrapolating potential cost savings based on LOS or reduction in complications.

Despite the aforementioned limitations, the available data have repeatedly demonstrated that implementation and maintenance of ERAS programs benefit both the patient by improving the consistency and quality of perioperative care and the hospital by reducing costs. Further high-quality economic studies¹⁰ are needed including studies on the long-term economic effects of ERAS programs.

Note: ERAS® is a registered trademark of the ERAS® Society.

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