Surgical Innovation

Improving Surgical Value and Culture Through Enhanced Recovery Programs

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What Is the Innovation?

Enhanced recovery pathways (ERPs) are evidence-based multidisciplinary clinical pathways. They are not any one particular intervention; rather, they are clinical care bundles that incorporate multiple evidence-based care processes encompassing all aspects of perioperative care for a particular procedure (**Table**). Initially developed for colorectal surgery, a litany of studies supporting the use of enhanced recovery concepts has also been published for a wide variety of surgical procedures, including hepatic, thoracic, pancreatic, orthopedic, urologic, and other procedures.

Table. Components of an Enhanced Recovery Program

Perioperative Phase	Component
Preoperative	Patient education, smoking cessation, prehabilitation, reduced fasting, carbohydrate loading
Intraoperative	Minimally invasive surgery, postoperative nausea and vomiting prophylaxis, nerve blocks, fluid balance, normothermia, euglycemia, short-acting opioids
Postoperative	Ileus prophylaxis, multimodal opioid-sparing analgesia, early nutrition, early mobilization, avoidance/early removal of drains and catheters, standardized daily care maps, discharge criteria and postdischarge planning

What Are the Key Advantages Over Existing Approaches?

The preponderance of clinical outcomes literature supports reduced surgical stress, improved recovery of gastrointestinal function, lower complication rates, and decreased length of stay with ERPs compared with conventional care.[1] One benefit of ERPs is the shift in organizational culture that results from the creation and implementation of these pathways, requiring close collaboration between surgeons, anesthesiologists, nurses, and other allied health care professionals to build consensus. These collaborations help shift the focus to organizing care around the patient rather than around specialties where the patient moves from service to service (ie, the traditional model).

Enhanced recovery pathways increase "value" in that they improve outcomes at the lowest cost.[2] From the patient's point of view, functional recovery (ie, freedom from nausea, being independently mobile, and being able to eat and drink as soon as possible) is one of the most important early postoperative outcomes.[3] From a clinician's and hospital administrators' point of view, the avoidance of complications and the reduction in length of stay may be their primary concerns. In both of these cases, ERPs have shown to be superior over traditional perioperative care. Ultimately, these improvements in clinical outcomes have resulted in lower use of resources and lower medical costs in favor of ERPs.[4]

How Will This Affect Clinical Care?

The elements prescribed by ERPs promote the diffusion of the best available evidence into practice (eg, increased patient participation and multimodal pain management), the "undiffusion" of traditional but potentially harmful practices (eg, prolonged fasting, fluid overload, and prolonged use of drains), and institutional standardization to reduce variability. Many ERP elements require close interaction between multiple health care professionals and the patients to be successfully implemented. For example, reducing the duration of preoperative fasting cannot be implemented by an individual surgeon alone; it requires changes in how patients are instructed at virtually every step of preadmission care, and it requires that the operating room nurses, surgeon, and anesthesiologist be aware of the change to avoid unnecessary cancelations. However, this simple intervention may then facilitate fluid balance, nutritional support, glucose control, and the patient's well-being. Hospitals with the highest levels of interdisciplinary and interspecialty collaboration, as well as communication between health care professionals and administrators, consistently demonstrate the best outcomes.[5]

Is There Evidence Supporting the Benefits of the Innovation?

The clinical benefits of ERPs over conventional care in colorectal surgery are supported by meta-analyses of randomized clinical trials that now include more than 2300 patients,[1] and evidence is accruing in other patient populations as well. Observational studies also suggest that ERPs are effective for specific high-risk patient subgroups, such as the elderly, and for emergency surgery.[6,7]

One of the criticisms of these data are that they originate from tertiary care institutions and may not be representative for community hospitals. However, large-scale national and provincial implementation programs demonstrate the benefits for larger and smaller hospitals alike.[8,9] Within the United States, the Enhanced Recovery in NSQIP (ERIN) collaborative was formed to facilitate the implementation of ERPs for colectomy across a wide range of hospital types. Novel ERP-specific variables were created in the National Surgical Quality Improvement Program (NSQIP) to provide individual institutions with the means to track adherence. The ERIN collaborative demonstrated a 1.2-day reduction in length of stay and a decrease in serious morbidity across its initial 16-hospital pilot, and more than 230 institutions are using these variables to enable frontline staff to identify targets for quality improvement (C. Ko, MD, written communication, October 2016).

What Are the Barriers to Implementing This Innovation More Broadly?

Many of the elements of ERPs represent significant departures from traditional perioperative care, and surgical culture relies on many

dogmas, which often persist despite high-level evidence to the contrary. Using the preoperative fasting example again, more than 20 randomized clinical trials have demonstrated the safety and efficacy of allowing clear fluids until 2 hours prior to surgery, and these data have been incorporated into national guidelines since the 1990s, yet the majority of patients undergoing elective surgery still must take nothing by mouth starting at midnight the day before surgery. Resistance to change has been identified as one of the major barriers to implementation, yet it is one that can be slowly broken down through enhanced multidisciplinary collaboration and communication, as well as support from hospital administration.

Another important barrier to implementation of ERPs is the perceived lack of resources that are available to design, implement, and maintain these pathways. While the up-front costs may appear daunting, the overall cost is amortized over the whole volume of patients, which often results in a negligible additional cost per patient. More importantly, the cost savings associated with ERPs more than make up for this cost.[4]

Like any quality improvement project, initial enthusiasm may wane over time. While there may be some variability between hospitals, the benefits of ERPs appear sustained at 3 to 5 years after implementation.[9] Ongoing audit and feedback to frontline staff are believed to be important for sustaining interest and support.[10] Ideally, over time, the implementation of ERPs encourages a slow but steady change in the culture, and it becomes "the way things are done" rather than a new project.

The idea of starting an ERP program from the ground up may seem daunting. To facilitate wider implementation, the Society of American Gastrointestinal and Endoscopic Surgeons introduced the SMART Enhanced Recovery Program (https://www.sages.org/smart-enhanced-recovery-program/), which includes a synopsis of the current evidence, a project management timeline, and examples of order sets and patient materials.

In What Time Frame Will This Innovation Likely Be Applied Routinely?

The perioperative care paradigm is shifting. High-quality data unequivocally demonstrate the value of ERPs for elective colorectal surgery, and indeed ERPs have been incorporated into many national guidelines. Entire health networks in the United Kingdom, the Netherlands, and the several Canadian provinces have mandated that patients undergoing elective colorectal surgery be managed by an ERP through all of their hospitals. As the clinical, cultural, and economic benefits of ERPs become increasingly recognized, ERP perioperative management will become the standard of care.

ARTICLE INFORMATION

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