Published in final edited form as:

Surgery. 2018 June ; 163(6): 1189–1190. doi:10.1016/j.surg.2017.08.016.

Population-Based Evaluation of Implementation of an Enhanced Recovery Protocol in Michigan

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Introduction

Aiming to accelerate postoperative recovery and hospital discharge, many institutions have worked to establish Enhanced Recovery Protocols (ERP) for intestinal surgery, and, increasingly, other specialties as well. These multidisciplinary, multimodal pathways of perioperative care aim to decrease postoperative pain, hasten recovery of intestinal function, and decrease postoperative morbidity.¹ As evidence for their effectiveness continues to emerge, there is increasing pressure to disseminate ERP more widely. For example, in the United Kingdom, national associations have signed a consensus statement that “enhanced recovery should be considered as standard practice for most patients undergoing major surgery across a range of procedures and specialties” and the National Health Service has endorsed ERAS throughout its institutions (<http://mdbulletin.dh.gov.uk/2012/09/21/enhanced-recovery/>).

The majority of literature examining effects of ERP on clinical outcomes and costs has come from highly select institutions who benefit from high volume practices, effective care coordination, highly motivated surgeons, and ancillary care providers.¹ Recently, some regional consortia including the provincial health system in Alberta, Canada have demonstrated success with broader implementation of ERP for colorectal surgery. Yet, it remains unknown to what extent ERPs can be implemented successfully outside the unique settings that pioneered them.

In the state of Michigan, the population-based, 72-hospital Michigan Surgical Quality Collaborative (MSQC, www.msqc.org) has been advocating statewide adoption of ERP principles among member hospitals since 2012. Efforts at promotion have included implementation toolkits, hand-on development support, webinars, and analytic support. The success of these efforts, however, has not been evaluated systematically. In this study, we

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sought to quantify the results of statewide efforts at promotion of ERP among member hospitals and to understand obstacles to further dissemination.

Methods

We conducted a statewide telephone survey among member hospitals belonging to the MSQC, a voluntary network of 72 institutions, predominantly community hospitals, that collect data on surgical patients for the purpose of quality improvement. MSQC is funded by Blue Cross Blue Shield of Michigan, a private, not-for-profit insurance company, but they are not involved in the clinical recommendations that are developed within the collaborative and do not view identifiable data from participating sites.

We conducted structured interviews with the key stakeholders at each institution most knowledgeable about the hospital's protocol for perioperative care of patients undergoing elective colorectal resection. Because previous studies have found that comprehensive application of ERP is an important factor in its outcomes,² we applied a strict definition of ERP that included at a minimum, preoperative education, carbohydrate loading, multimodal analgesia, limitation of intravenous fluid, early enteral nutrition, and ambulation.³ Hospitals were considered to have a fully-implemented ERP if their protocol included these interventions. In each hospital, we identified the dates of full ERP implementation and the time period for protocol development. A closed-ended survey then assessed key obstacles to ERP implementation and detailed specific clinical practices included in their protocols. Hospital characteristics were obtained from the Annual Survey of the American Hospital Association, and characteristics of hospitals with and without ERP were compared using chi square tests for proportions.

Results

Interviews with 63 respondent hospitals (87% response rate) revealed that between 2010 and 2016, 16 (22%) hospitals fully implemented an ERP. As of the end of calendar year 2016, there were 11 hospitals (15%) with protocols in development, and 46 hospitals (63%) with no progress toward ERP implementation. The time trend of ERP development in these hospitals and uptake is detailed in the Figure. The time period for protocol development ranged from less than 3 months to over 2 years.

Hospitals with ERPs identified coordination time and logistics of development and implementation (54%) as the most common obstacle, followed by disagreement on standard practices (15%) and nursing preferences (8%). For those without ERPs, the most common obstacles noted were surgeon engagement (52%), disagreement on standard practices (15%), coordination time and logistics for development and implementation (15%), and anesthesiology preferences (12%).

ERP hospitals were more likely than non-ERP hospitals to be teaching institutions (81% vs. 54%, $p=0.03$) and to have more than 300 beds (69% vs. 44%, $p=0.04$). Of the 63 hospitals, 21 (33%) were teaching institutions with more than 300 beds, and 8 of the 21 large teaching hospitals had ERPs.

Discussion

Despite increasing consensus on the effectiveness of ERP for colectomy and years of emphasis among our statewide collaborative, full implementation of the ERP protocol appears challenging at small, non-academic hospitals. Results from the structured interviews suggest that lack of administrative support, lack of time to commit to developing protocols, organizing teams, and overcoming logistical burdens, and lack of surgeon engagement are the most common challenges to more widespread ERP adoption. While our evidence suggests highly specialized teaching hospitals may have greater capacity to overcome these obstacles, implementation of ERP alone may not provide the necessary knowledge to support and accelerate wider ERP dissemination.

This population-based study suggests that ongoing dissemination will require tailored educational toolkits and order sets that can both ease the burden of implementation in smaller hospitals with limited resources. With the advent of nationwide efforts to disseminate ERP, such as the American College of Surgeons and Agency for Healthcare Research and Quality-sponsored Safety Program for Enhanced Recovery After Surgery which aims to instruct up to 750 hospitals in the development and implementation of ERP⁴, a further understanding of the barriers and facilitators to ERP implementation in community hospitals is fundamental. Our conclusions may be limited somewhat by the lack of assessment of compliance with ERPs, and the potential for heterogeneity between hospitals in the protocols themselves. We did not assess the clinical outcomes of ERP in participating hospitals, nor did we evaluate the role that differences in ERP design might have on success with implementation. Our experience may serve to inform these efforts, because our statewide survey suggests that broader implementation of ERP will require a three-pronged approach: improved dissemination of evidence-based standardized protocols to foster wider consensus, administrative support to incentivize the time and logistic burden of implementation, and opportunities to educate and engage surgeon leaders. This approach may prove even more important in achieving success in the smaller, community hospitals where there may be less personnel and financial resources. Going forward, we must attend to the unique circumstances, needs, and challenges of community hospitals in which the benefits of care standardization may be greatest. To date, these hospitals have not been the focus of ERP development or implementation, and careful attention must be paid to differences that may arise in the outcomes of ERP in these settings.

Acknowledgments

Disclosures: Dr. Regenbogen is supported by American Society of Colon and Rectal Surgeons Career Development Award CDG-015, National Institute on Aging Grants for Early Medical/Surgical Specialists Transition to Aging, R03-AG047860, and National Institute on Aging K08-AG047252. The Michigan Surgical Quality Collaborative is supported by Blue Cross Blue Shield of Michigan, but the funders were not involved in the collection or interpretation of data or the manuscript preparation for this study.

References

1. Lee L, Feldman LS, M G, et al. Improving Surgical Value and Culture Through Enhanced Recovery Programs. *JAMA Surg.* 2017; 38(6):1531–1541.
2. Maessen J, Dejong CH, Hausel J, et al. A protocol is not enough to implement an enhanced recovery programme for colorectal resection. *Br J Surg.* 2007; 94(2):224–231. [PubMed: 17205493]

3. Lassen K, Soop M, Nygren J, et al. Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg. 2009; 144(10):961–969. [PubMed: 19841366]
4. American College of Surgeons Will Recruit 750 Hospitals for New Program to Lower Costs, Improve Safety, and Shorten Recovery Times for Surgical Patients. American College of Surgeons; Available from: <https://www.facs.org/media/press-releases/2017/eras020617/> [cited 23 February 2017]

Figure.