

Commentary: Outcomes of Three-Day Discharge after Elective Cardiac Surgery

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Outcomes of Three-Day Discharge after Elective Cardiac Surgery

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I read with interest the study¹ by Son and colleagues regarding outcomes of cardiac surgery patients discharged from hospital on post-operative day three. The impetus for this single-center retrospective review was the interest in implementing an Enhanced Recover After Surgery (ERAS) program at Northwestern University Hospital, Chicago, IL but a concern existed regarding potential untoward effects of earlier patient discharge, a downstream positive effect reported by programs already implementing ERAS protocols. The analysis consisted of review of patients undergoing elective cardiac surgery with cardiopulmonary bypass between July of 2004 and June of 2017 with exclusion of trans-catheter approaches, ventricular assist devices, transplants, and trauma. Patients were divided into two cohorts by length of stay (LOS), one with shorter

hospitalizations (LOS \leq 3 days) and one with longer hospitalizations (LOS $>$ 3 days). A 1:3 propensity score matching (PSM) algorithm was implemented in an effort to eliminate potential confounding variables and differences between the two groups were compared. Of a total of 5,987 patients surveyed, 131 (2.2%) patients had LOS \leq 3d with a median Society of Thoracic Surgeons (STS) Risk score of 1.2. Propensity matching identified 357 comparison patients with a LOS $>$ 3 days. The results showed that the patients with LOS \leq 3 days had lower rates of post-operative atrial fibrillation (2% vs. 19%, $p<0.001$) and major in hospital complications (0% vs. 9%, $p=0.001$); however, 30-day readmissions (8% LOS \leq 3 days vs. 6% LOS $>$ 3 days, $p=0.66$) and mortality rates (0% vs. 0%) were comparable between the two groups. The authors concluded that LOS \leq 3 days was associated with less post-operative atrial fibrillation and fewer major in-hospital complications, but not with increased re-hospitalization or mortality.

ERAS programs constitute a comprehensive perioperative patient management strategy that incorporates multiple patient care components working efficiently in order to improve the patient care experience and achieve significant benefits for both the patient and the hospital. The components are broken down into 3 areas: pre-operative, intra-operative, and post-operative. Pre-operative strategies include counseling, education identification of potential barriers to hospital discharge, nutrition and pre-emptive pain control regimens. Intra-operative strategies include use of short-acting anesthetics and regional nerve blocks, judicious fluid management and enhanced use of less invasive surgical approaches. Post-operative strategies include early extubation including in the operating room where appropriate, early mobility of patients, pain control, nutrition, gastrointestinal function, and post-operative fluid and blood product management.

There are a few reports regarding the use of ERAS in cardiac surgery which have appeared in the last 2-3 years.²⁻⁸ As seen with application of ERAS programs in other surgical specialties, the results have been positive and include decreased hospital and intensive care unit lengths of stay, improved perioperative pain control, improvements in early postoperative mobility and oral diets and reduction in some specialty specific complications such as post-operative atrial fibrillation. These early results indicate that all programs performing cardiac surgery should consider the creation of a formal ERAS pathway.

The present study which focused primarily on early discharge has some limitations. The STS risk score is a reasonable marker of perioperative risk, but it does not code for factors such as frailty, socioeconomic status, and need for post-discharge care, all of which can affect post-operative stay times. It is further unclear whether propensity matching would effectively adjust for these differences. Patients were screened over a 13 year period; significant advances in care have occurred over this time period which may have confounded the results, especially if the patients in each group were not distributed evenly over the time period analyzed. LOS $<$ 3 days patients had procedures associated with shorter cross-clamp and bypass time, and a higher percentage of “other” surgical procedures which were not delineated (Table 2). It is not surprising that the LOS $<$ 3 days patients had less atrial fibrillation (2%) and post-operative complications (0%), both of which would contribute to a shorter length of stay, but these results are so low as to be an unreasonable expectation for a large cohort of surgical patients. Finally, the choice to separate patients at post-operative day three is interesting, since patients discharged at this time point comprised only 131 of 5987 or 2% of the patients cared for in the overall cohort. While the average length of stay of the total patient cohort was not explicitly stated in the article, it is unlikely that an implementation of an ERAS protocol would result in a consistent reduction of hospital stays to 3 days. The current literature suggests that ERAS reduces LOS by 1 to 4 days depending to some extent on the baseline LOS; however no study to date has reported a reduction in LOS to three days.

Nevertheless, the results of this study¹ did show positive effects and no untoward sequelae of shorter hospital stays, and provide further support of development and implantation of ERAS programs in cardiac surgery patients.

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