Unplanned Readmission After Colorectal Surgery - A Quality Improvement Initiative

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Introduction

Readmission after colorectal surgery creates a significant burden on both patients and healthcare systems, accounting for $300 million annually[3].

Previous studies have suggested that prehabilitation efforts (such as referral to pre-surgery centers to medically optimize and educate patients regarding ERAS protocols) have been shown to reduce complications and expedite recovery. However, effects on readmission rates remain unknown.

In this quality improvement project, we investigate factors contributing to readmission after colorectal surgery.

Methods

A retrospective analysis of readmission data for patients undergoing elective colorectal surgery between 1/1/2018 and 12/31/2022 was performed using the NSQIP database at a single tertiary center.

We analyzed the effect of the following on readmission rates:

- -Pre-surgery center (PSC) utilization
- -Duration of surgery (DOS)
- -Hospital length of stay (LOS)
- -Post-op deep organ space SSI
- -Post-op VTE
- -Pre-op VTE prophylaxis
- -Quantity of opioids prescribed at time of discharge

Statistical significance was determined using unpaired t-test.

Results

Post-op deep organ space SSI was the only factor that was consistently found to be statistically significant for unplanned readmission ($P < 0.001$).

Sub-analysis for 2020 did show that post-op VTE was statistically significant for unplanned readmission ($P < 0.02$), but this did not hold true in other years.

The annual readmission rate steadily declined: 14.54% in 2020, 7.69% in 2021, and 0% in 2022. During this time period, PSC utilization remained relatively consistent, trending from 68.09% in 2020 to 66.67% in 2021, and 62.07% in 2022.

There was no statistically significant impact on readmission from PSC utilization, LOS, DOS, pre-op VTE prophylaxis, or quantity of opioids prescribed at time of discharge.

Year	2018	2019	2020	2021	2022
Readmission Rate	10.17% (6/59)	5% (3/60)	14.54% (8/55)	7.69% (4/52)	0% (0/42)
PSC Utilization	83.33% vs 60.00% (P 0.4577)	66.67% vs 57.9% (P = 0.8809)	75% vs 68.09% (P = 0.7021)	75% vs 66.67% (P = 0.7389)	n/a vs 62.07%
DOS (min)	246 vs 201 (P = 0.7025)	202 vs 217 (P = 0.6618)	240 vs 226 (P = 0.7749)	334 vs 259 (P = 0.2968)	n/a vs 285
LOS (days)	6 vs 4.3 (P = 0.3783)	4.67 vs 5.43 (P = 0.6221)	5.75 vs 8.09 (P = 0.7122)	8.5 vs 5.75 (P = 0.1618)	n/a vs 4.90
Post-op Deep Organ Space SSI	16.67% vs 0% (P = 0.0045)	66.67% vs 8.77% (P = 0.003)	37.5% vs 4.26% (P = 0.002)	0 vs 0	n/a vs 0%
Post op VTE Requiring Rherapy	0 vs 0	0 vs 1.75% (P = 0.8144)	12.5% vs 0% (P = 0.0139)	0 vs 2.08% (P = 0.776)	n/a vs 4.76%
Preop VTE ppx	40% vs 31.25% (P = 0.7071)	33.33% vs 31.58% (P = 0.9825)	37.5% vs 42.55% (P = 0.7935)	75% vs 54.17% (P = 0.4302)	0 vs 58.62%
Quantity Opioids Prescribed	n/a	n/a	17 vs 19.26 (P = 0.2374)	11.67 vs 18.2 (P = 0.339)	0 vs 19.06

Discussion & Conclusions

Our analysis suggests that post-op deep organ space SSI is a strong independent risk factor for unplanned readmission after elective colorectal surgery

Post-op VTE may also increase readmission rates, but more data is needed to confirm this.

Our hypothesis that prehabilitation efforts with PSC utilization would decrease readmission rates was not reflected in this data set. Nevertheless, we did observe a steady decline in readmission rates while PSC utilization rates remained consistent, suggesting that this may be playing a subtle underlying role that may be revealed with larger data sets.

During this time period there was also a steady decrease in hospital LOS, consistent with trends in existing medical literature.

Overall, our analysis indicates that targeted interventions to prevent post-op deep organ space SSI and post-op VTE may decrease unplanned readmissions and improve patient outcomes.

References:

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