

The Impact of Multimodal Analgesia on Length of Stay and Patient Satisfaction After COVID-19: A Retrospective Study Examining the Lean Methodology in Pain Management for Patients Undergoing Partial Nephrectomies

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Abstract

Introduction: Opioids are considered the standard of care for managing post-operative pain for nephrectomies, often with side effects that impact key hospital indicators. Research has shown that discharging patients earlier assists in operational efficiency from decreasing excessive holds in the emergency room to reducing the number of postoperative readmissions. At the University of Tennessee Medical Center, the COVID-19 pandemic strained healthcare delivery, prompting changes in pain management strategies to increase hospital resources. The purpose of this cross-sectional, retrospective study was to determine if applying lean methodology to the use of quadratus lumborum (QL) nerve blocks, as part of a multimodal pain management strategy, impacted hospital resources while maintaining patient satisfaction in patients undergoing partial nephrectomies.

Methods: All patients (n=217) who underwent non-emergent partial nephrectomies from 01/01/2019-12/31/2021 were included in this study. Continuous variables were measured by central tendency, and non-parametric Mann-Whitney U test was used to examine significance ($p < .05$). Statistical process control was applied at the level 3-sigma.

Results: Among participants who received multimodal analgesia, the length of stay significantly decreased ($p=.013$) compared to

standard of care. Those who did not receive a QL block were 100% above the mean length of stay ($\bar{x} = 1.29$ days) compared to those who utilized regional anesthetics. The average patient satisfaction of pain management score in patient's receiving the QL block for postoperative pain management was 4.7/5 the first 48 hours after operation.

Conclusions: Applying the principles of Lean Six Sigma to pain management for partial nephrectomies demonstrated that multimodal pain management strategies decreased length of stay, thus increasing hospital resources. In addition, this approach provided high patient satisfaction with pain control in the 48 hours post-surgery. These findings open the door for future prospective randomized control trials on the use of regional anesthetics to compare long-term pain management and readmission rates between current standard of care and multimodal analgesics.