

Notable Outcomes and Trackable Events after Surgery: Evaluating an Uncomplicated Recovery after Radical Prostatectomy

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Purpose: A priority of MUSIC (Michigan Urological Surgery Improvement Collaborative) is to improve patient outcomes after radical prostatectomy. As part of these efforts we developed a novel system that uses unambiguous events to define an uncomplicated 30-day postoperative recovery and compares these outcomes across diverse urology practices.

Materials and Methods: MUSIC used a consensus approach to develop an uncomplicated recovery pathway comprising a set of precise perioperative events that are reliably measured and collectively reflect resource utilization, technical complications and coordination of care. Events that occurred outside the uncomplicated recovery pathway were considered deviations, including rectal injury, high blood loss, extended length of stay, prolonged drain or catheter placement, catheter replacement, hospital readmission or mortality. For men undergoing radical prostatectomy trained abstractors prospectively recorded clinical and perioperative data in an electronic registry. When a deviation from the NOTES (Notable Outcomes and Trackable Events after Surgery) pathway occurred, precipitating events were described by abstractors and we analyzed the events.

Results: From April 2014 through July 2015 a total of 2,245 radical prostatectomies were performed by 100 surgeons in a total of 37 diverse participating MUSIC practices. In the 29 practices in which 10 or more radical prostatectomies were performed during the interval analyzed the risk adjusted deviation rate ranged from 0.0% to 46.1% ($p < 0.0001$). Anastomotic and gastrointestinal events were contributing factors in 50.2% of deviated cases.

Conclusions: The novel NOTES system provides comparative data on unambiguous and actionable short-term outcomes after radical prostatectomy. The observed variation in outcomes across practices suggests opportunities for quality improvement initiatives. Decreasing anastomotic and gastrointestinal events represents a high impact opportunity for initial quality improvement efforts.

Abbreviations and Acronyms

BMI = body mass index
EBL = estimated blood loss
GI = gastrointestinal
LOS = length of stay
PSA = prostate specific antigen
RP = radical prostatectomy

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IN the United States there has been a significant shift toward measuring the value of health care provided to

patients, which is typically measured by tracking the quality and the cost of care.¹ Surgical complications increase

the cost and decrease the quality of care. Therefore, they are logical targets for initiatives aimed at enhancing the value of surgical care. Prior analyses of population based data showed a 21.9% complication rate for RP, one of the most common oncologic procedures performed by urologists.² While reducing complications makes great sense, the ability of clinicians to identify opportunities for improvement and measure the success of subsequent interventions requires access to pragmatic and trustworthy data on the frequency of specific perioperative events.

Traditional data sources to track perioperative complications after RP lack reliability and are often difficult to translate into meaningful quality improvement activities. Administrative claims data do not include robust, specific clinical information and are subject to the interpretation of medical billing coders.³ Standard chart review data have several limitations, including disparities in clinician and abstractor interpretations of complication definitions and reporting of generic surgical complications that are difficult to categorize for actionable change.⁴ The Clavien-Dindo system has improved the reporting of complications across a wide breadth of surgical procedures. However, certain events such as urine leak after RP may still be reported variably due to inconsistencies in categorizing the events as complications vs sequelae. Furthermore, the Clavien-Dindo system may not offer insights into aspects of care that are important to patients but may not represent a traditional complication, such as prolonged catheter placement. An ideal perioperative outcomes tracking system would provide consistent, objective and procedure specific measures that are pertinent and actionable for surgeons pursuing quality improvement as well as meaningful to patients.⁵

In this context we developed a system to assess short-term recovery after RP that provides more reliable, meaningful and actionable data. Additionally, we developed a statewide reporting system to provide clinicians with access to their outcomes data compared to that of their peers. We hypothesized that our novel measure, NOTES, would identify variances in recovery after RP that clinicians can translate into specific quality improvement initiatives aimed at making early recovery easier for men undergoing RP.

METHODS

Michigan Urological Surgery Improvement Collaborative

MUSIC (www.musicurology.com) was established in 2011 as a physician led, quality improvement consortium. The primary goal of the collaborative is to

improve the quality and cost efficiency of care provided to men with prostate cancer in Michigan. Currently 42 community based and academic practices participate in the collaborative, representing approximately 85% of urologists in Michigan. Due to the MUSIC focus on quality improvement each practice was able to obtain regulatory exemption from local internal review boards prior to participating.

NOTES Metric Development

MUSIC quality improvement efforts are guided by topic specific working groups comprising expert urologists and patient advocates from across the consortium. Members of the RP working group used a consensus approach to identify data points that should be tracked to measure perioperative outcomes. They aimed to select measures that were reliable, meaningful and actionable. The RP working group also followed the principles that data points must be unambiguous and easy to extract from medical records, and the measures must collectively reflect practice patterns, coordination of care, technical complications and resource utilization.

The RP working group reached consensus. They identified 4 distinct phases of perioperative care and 2 data points to evaluate each phase, including rectal injury and EBL to measure the intraoperative phase, LOS and duration of drain use to assess the hospitalization phase, catheter duration and catheter replacement reflecting postoperative catheter management and finally hospital readmission and mortality as indicators of 30-day postoperative outcomes.

Following development by the RP working group, including endorsement by patient advocates, threshold criteria were established to set maximum limits for each data point. Therefore, the NOTES uncomplicated RP recovery pathway was collectively defined as 1) no rectal injury, 2) EBL 400 ml or less for laparoscopic approaches, or 1,300 ml or less for open or perineal approaches, 3) LOS 2 days or less, 4) drain placement 2 days or less, 5) catheter placement 16 days or less, 6) no 30-day indwelling catheter replacement, 7) no 30-day hospital readmission and 8) no 30-day mortality. Perioperative events occurring outside any criteria, such as readmission or 4-day LOS, were considered deviations from the uncomplicated recovery pathway.

Data Collection

Trained data abstractors at each site prospectively enter standardized clinical, pathological and perioperative morbidity data elements into an electronic clinical registry for patients treated with primary or salvage RP. Programming in the registry software automates calculations for days of LOS, drain placement and catheter placement based on surgery, discharge home, drain removal and catheter removal dates entered by data abstractors. After a deviation from the uncomplicated pathway criteria is identified by the registry, data abstractors are asked to answer supplemental questions describing the underlying events associated with that deviation. We reviewed these underlying events, termed deviation drivers, and assigned them to categories to analyze trends in the types of events that caused deviations.

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