

# 30-Day Hospital Readmission after Robotic Partial Nephrectomy—Are We Prepared for Medicare Readmission Reduction Program?

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**Purpose:** After CMS introduced the concept of the Hospital Readmissions Reduction Program, hospitals and health care centers became financially penalized for exceeding specific readmission rates.

**Materials and Methods:** We retrospectively reviewed our institutional review board approved database of patients undergoing robotic partial nephrectomy at our institution and included in our analysis patients who were readmitted to any hospital as an inpatient stay within 30 days from discharge home after robotic partial nephrectomy.

**Results:** From March 2006 to March 2013 a total of 627 patients underwent robotic partial nephrectomy at our center and 28 (4.46%) were readmitted within 30 days of surgery. Postoperative bleeding was responsible for 8 (28.5%) readmissions. Pulmonary embolism was reported in 3 cases and retroperitoneal abscess was diagnosed in 2. Urinary leak requiring surgical intervention developed in 2 patients, pneumonia was diagnosed in 2 and 2 patients were readmitted for chest pain. Overall 9 (32.1%) patients presented with major complications requiring intervention. On multivariable analysis Charlson comorbidity index score was the only factor significantly associated with a higher 30-day readmission rate ( $p = 0.03$ ). If the Charlson score was 5 or greater the chance of hospital readmission would be 2.7 times higher.

**Conclusions:** Increased comorbidity, specifically a Charlson score of 5 or greater, was the only significant predictor of a higher incidence of 30-day readmission. This information can be useful in counseling patients regarding robotic partial nephrectomy and in determining baseline rates if CMS expands the number of conditions they evaluate for excess 30-day readmissions.

## Abbreviations and Acronyms

BMI = body mass index  
CKD = chronic kidney disease  
CMS = Centers for Medicare & Medicaid Services  
EBL = estimated blood loss  
eGFR = estimated glomerular filtration rate  
LOS = length of hospital stay  
R.E.N.A.L. = radius, exophytic/endophytic, nearness to collecting system or sinus, anterior/posterior and location relative to polar lines  
RPN = robotic partial nephrectomy  
WIT = warm ischemia time

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**Editor's Note:** This article is the second of 5 published in this issue for which category 1 CME credits can be earned. Instructions for obtaining credits are given with the questions on pages 1002 and 1003.

**Key Words:** patient readmission; nephrectomy; surgical procedures, minimally invasive; postoperative complications; laparoscopy

ON October 1, 2012 CMS introduced the concept of the Hospital Readmissions Reduction Program. Based on this program, hospitals and health care centers are penalized financially for exceeding specific hospital readmission rates. CMS established a methodology to calculate the excess readmission ratio for each applicable condition, which is used, in part, to calculate the readmission payment adjustment. Currently only the 3 diagnoses of myocardial infarction, congestive heart failure and pneumonia (with clinical adjustment factors such as comorbidities, patient frailty and demographics) are used as readmission measures for calculating excess readmission ratios.

However, there is a plan to expand the conditions subject to penalty in financial year 2015.<sup>1</sup> A recent analysis of Medicare claims data revealed that 15% of hospital readmissions after primarily surgical care were within 30 days after discharge.<sup>2</sup> Among the readmitted surgical patients 72.6% were hospitalized for medical diagnoses. It was estimated that in 2004 the cost of unplanned rehospitalization for Medicare was US\$17.4 billion. Beyond financial considerations the process of hospital readmission affects the overall health journey of patients negatively.<sup>3</sup>

There is a paucity of data with regard to 30-day readmissions after urological surgery. Given the widespread use of minimally invasive surgery and, more recently, robotic assisted laparoscopic surgery, it would be of interest to assess the 30-day readmission rates after such procedures. Thus, in this study we review our robotic partial nephrectomy 30-day readmission rate and evaluate the prevalence of factors with which it may be associated.

## PATIENTS AND METHODS

### Patients and Data

We retrospectively reviewed our institutional review board approved database of patients treated with RPN at our center. We included patients who were readmitted to any hospital for an inpatient stay within 30 days from discharge home after RPN. Patients were cross-referenced with our electronic medical records for accuracy of postoperative complications and readmissions. In cases of readmission to another hospital, medical records were obtained and examined. We collected data on patient demographics, tumor characteristics and perioperative events. The demographic parameters assessed were age, gender, race, BMI, tumor side, ASA® (American Society of Anesthesiologists®) classification, Charlson comorbidity index,<sup>4</sup> R.E.N.A.L. nephrometry score<sup>5</sup> and

preoperative estimated glomerular filtration rate. eGFR was calculated using the Modification of Diet in Renal Disease formula<sup>6</sup> and CKD was defined as an eGFR less than 60 ml/minute/1.73 m<sup>2</sup>.

Perioperative variables included in the study were operative time, WIT, EBL, LOS, intraoperative and postoperative complications, transfusion rates, histopathology evaluation, postoperative eGFR, hospital readmission, readmission LOS and cause of readmission. Postoperative complications were graded using the Clavien-Dindo classification.<sup>7</sup> A major complication was defined as Clavien grade III or higher.

Complications were also divided into genitourinary and nongenitourinary according to the systems involved. Bleeding was defined as a hemoglobin decrease greater than 2 gm/dl, gross hematuria or any clinically overt sign of hemorrhage regardless of whether it required any intervention. Urinary leak was defined as persistent drain output more than 48 hours after the procedure and with drained fluid analysis consistent with urine. Ileus was defined as the inability to tolerate a regular diet after 4 days from the procedure.<sup>8</sup>

Patients were divided into 2 groups (readmitted and nonreadmitted), and comparisons were made using the Wilcoxon rank sum test for continuous variables and the chi-square test for categorical variables. Multivariable logistic regression analysis was applied to identify factors associated with hospital readmission. Statistical software R (version 3) and its Regression Modeling Strategies package were used. Results were considered significant when  $p < 0.05$ .

### Surgical Technique, Postoperative Care and Discharge

Our surgical technique has been described in detail.<sup>9</sup> Postoperative care is based on our institutional care pathway but may have slight variations according to surgeon preference. Intravenous fluids, analgesics, 24 hours of antibiotics and prophylaxis for deep vein thrombosis, usually in the form of knee-high sequential compression stockings, are administered to patients. Hemoglobin levels and hematocrit are monitored daily during the postoperative period. The Foley catheter and drain are usually removed on the morning after surgery. Ambulation is encouraged and the diet is advanced. Patients are discharged home after passage of flatus, tolerating a regular diet, mobilizing and once pain is managed with oral medications. Discharge destination is determined on an individual basis and the need for inpatient rehabilitation is uncommon. At discharge home the patients have a followup appointment scheduled within 7 to 10 days from surgery. Patients are provided with advice, contact numbers and instructions in the event of any concerns or complications. If complications occur after hours, patients are assessed by an emergency/family physician and the decision regarding hospital readmission is made after discussion with the primary urologist.

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