The effect of day of discharge on hospital readmission after minimally invasive partial nephrectomy

Kristian D. Stensland, MD,[1,2] Joan C. Delto, MD,[3] Navneet Ramesh, MD,[4] Chris Robertson, MD,[4] Jared P. Schober, MD,[1] Peter Chang, MD,[5] Andrew A. Wagner, MD[5]

[1]Lahey Hospital and Medical Center, Burlington, Massachusetts, USA
[2]University of Michigan, Ann Arbor, Michigan, USA
[3]Creighton University School of Medicine, Omaha, Nebraska, USA
[4]Tufts University School of Medicine, Boston, Massachusetts, USA
[5]Beth Israel Deaconess Medical Center, Boston, Massachusetts, USA

STENSLAND KD, DELTO JC, RAMESH N, ROBERTSON C, SCHOBER JP, CHANG P, WAGNER AA. The effect of day of discharge on hospital readmission after minimally invasive partial nephrectomy. *Can J Urol* 2022;29(2):11080-11086.

Introduction: *To assess the association between postoperative discharge day after minimally invasive partial nephrectomy with 30-day readmission rates, and specifically compare postoperative day 1 to postoperative day 2 discharge. We hypothesized that discharge on earlier postoperative days would be associated with higher rates of readmission after partial nephrectomy.*

Materials and methods: *The National Cancer Database was queried for patients undergoing minimally invasive partial nephrectomy for non-metastatic disease without chemo or radiation therapy from 2010-2014. Readmission rates were compared between postoperative discharge days. Multivariable logistic regression was used to analyze variables associated with 30-day readmission.*

Results: *A total of 19,300 patients undergoing minimally invasive partial nephrectomy were included, comprising patients discharged on postoperative day 0 (POD0) (n = 601, 3%), POD1 (n = 2,999, 16%), POD2 (n = 6,866, 36%), POD3 (n = 4,568, 24%), POD4 (n = 2,068, 11%), and POD5 or later (n = 2,198, 11%). Rates of 30-day readmission were similar between POD0, POD1 and POD2 discharges (1.8%, 1.9%, 2.2%, respectively), but were higher for discharges on POD3 or later (POD3 3.0%, POD4 4.9%, POD5 or greater 5.5%). On multivariable analysis, odds of 30-day readmission were similar between POD0 (OR 0.83 [95%CI 0.45-1.55], p = 0.56) and POD1 (OR 0.84 [95%CI 0.62-1.15], p = 0.28) compared to discharge on POD2.*

Conclusions: *Patients discharged on POD2 are not readmitted any less frequently than patients discharged on POD0 or POD1. Implementing protocols with POD1 as the default discharge day after partial nephrectomy should be considered. Future studies designing and evaluating safe and acceptable implementation strategies for these protocols are necessary.*

Key Words: length of stay, partial nephrectomy, robotics

Introduction

Efforts to minimize costs associated with minimally invasive and robotic surgery include shortening length of stay. However, from a patient safety and secondary cost perspective this must be balanced with an acceptable readmission and complication rate.[1,2] In an effort to decrease costs, there has been a trend by large payer plans to limit hospital admission for some urologic cancer surgery to 24 hours, in particular robotic prostatectomy and partial nephrectomy.[3,4] However, there may be a tendency, or de facto protocols, to observe patients in the hospital longer due to concerns of postoperative morbidity including readmission. While ultimately decisions regarding timing of discharge must be tailored to individual patients and situations, understanding readmission rates from larger datasets

Accepted for publication January 2022

Address correspondence to Dr. Kristian Stensland, Department of Urology, University of Michigan, 1500 E. Medical Center Drive, Ann Arbor, MI 48109 USA

can be helpful in anchoring anticipated readmission rates and generating hypotheses regarding safety of discharge criteria including timing of discharge. This information can be used to help plan prospective studies and ultimately help craft guidelines regarding standard hospital stays following surgery.

At our institution, we previously discharged most minimally invasive partial nephrectomy patients on postoperative day 2 (POD2) or later. Prior to changing our protocol to permit discharge on POD1, we sought to evaluate readmission rates of each postoperative discharge day. Ultimately, there are many considerations for safe discharge, and clinical judgment is paramount in determining when a postoperative patient can be safely discharged home. We specifically sought evidence to support the implementation of a new discharge protocol at our institution permitting earlier discharge than our prior standard. We hypothesized that early discharge (POD0 or 1) would be associated with a higher readmission rate than those patients who are discharged on POD2 or later, warranting the longer stays in the hospital. To test our hypothesis, we used the National Cancer Database to evaluate differences in readmission in patients undergoing minimally invasive partial nephrectomy.

Materials and methods

The National Cancer Database (NCDB) was queried for patients undergoing minimally invasive partial nephrectomy (CPT procedure code 30) for clinical T1-T2 (cT1-cT2), node negative (cN0), non-metastatic (cM0) disease without chemotherapy or radiation therapy from 2010-2014. Cases were excluded if they were performed open or converted to open surgery. Histology was limited to the most common histologic subgroups of renal tumors with the aim of excluding renal pelvic (i.e., urothelial) tumors. Only patients with known length of stay and readmission status, and without a planned readmission were included. There were no significant differences in rates of unknown readmission status between post-operative discharge day groups. Cases with unknown values for variables included in any analytic model were excluded. Case inclusion and exclusion are presented in Figure 1.

NCDB is a joint project of the Commission on Cancer (CoC) of the American College of Surgeons and the American Cancer Society. The CoC's NCDB and the hospitals participating in the CoC NCDB are the source of the de-identified data used herein; they have not verified and are not responsible for the statistical validity of the data analysis or the conclusions derived by the authors.

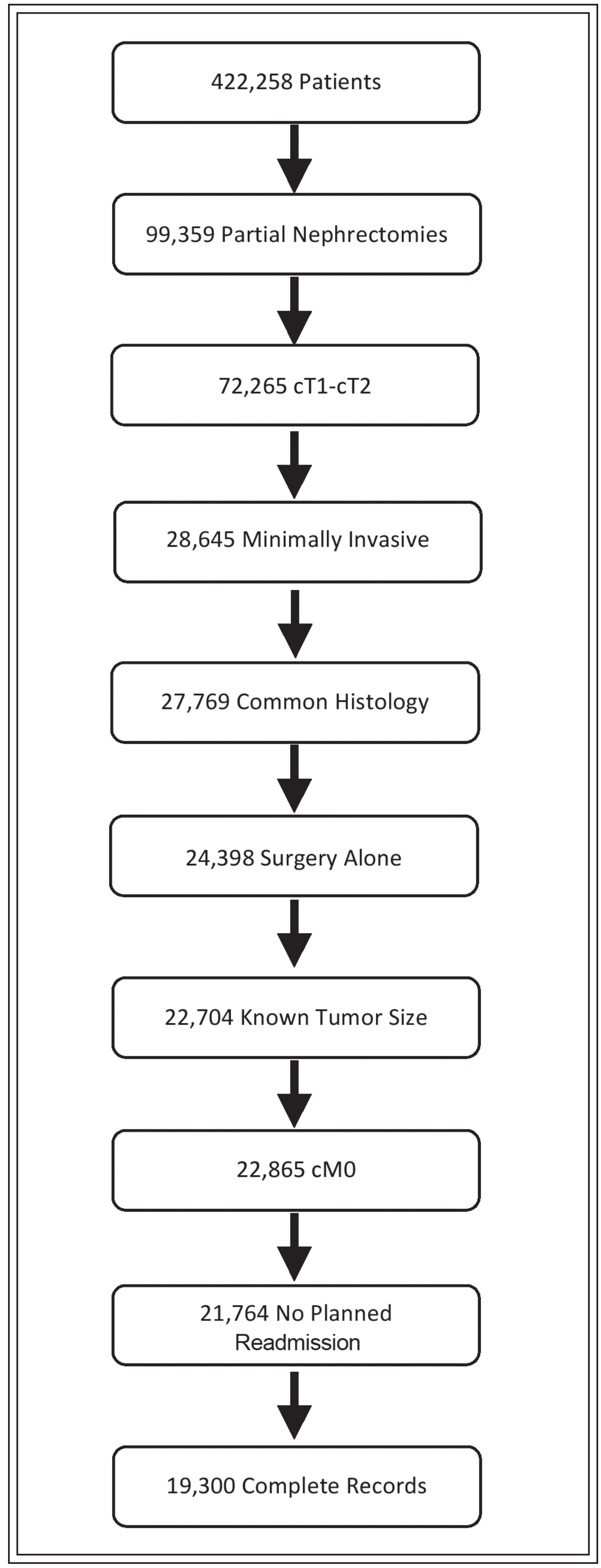

Figure 1. Cohort selection.

Length of stay was categorized by day of discharge into 6 groups: POD0, POD1, POD2, POD3, POD4, and POD5 or later. Length of stay in the NCDB is calculated as the number of days between the definitive surgical date and date of discharge: discharge on POD0 reflects discharge on the same day of surgery, POD1 is one calendar day after surgery, etc. Univariable comparisons of group characteristics were performed between day of discharge categories using chi-squared (count variables) and Kruskal-Wallis (continuous variables) tests. The primary outcome for this study was readmission within 30 days of surgery. A logistic regression models was constructed to identify characteristics associated with readmission. The model included day of discharge, surgical approach, age, race, year of diagnosis, facility type, sex, Charlson-Deyo comorbidity index (0, 1, or >=2), tumor size, insurance status, median income quartile of patient home ZIP code (adjusted to 2012 USD), educational attainment of patient ZIP code (percentage of adults in the ZIP code who did not graduate from high school), distance from patient's home ZIP code to treatment facility (great circle distance in miles), laterality of tumor, and whether a lymph node dissection was performed. We did not include histology in this model as this information would presumably not be known prior to surgery or discharge unless surgery was for a renal pelvic tumor, which we attempted to exclude by our histologic inclusion criteria. Odds ratios presented for day of discharge are compared to POD2 (the most common day of discharge for partial nephrectomy patients).

We performed sensitivity analyses to explore our results, controlling for observable confounders as possible given the limitations of the NCDB. First, we ran our model limited only to patients who were discharged on POD1 or POD2 under the hypothesis that these patients may be more similar than patients discharged on later postoperative days, i.e., other potential confounders may be limited. Moreover, this is likely the most pertinent question for those clinicians facing pressure to discharge patients on postop day 1 versus day 2 after minimally invasive partial nephrectomy. We then ran our model on five other subgroups, limiting to young patients (age < 60), patients without preexisting comorbidities (Charlson-Deyo score 0), small tumors (tumor diameter < 4 cm), and combinations of these variables. We additionally performed a two-stage propensity score matched analysis for patients discharged on POD1 and POD2 to support our regression model. All data analysis was performed in Stata 14.[5]

Results

A total of 19,300 patients undergoing partial nephrectomy were included, comprising patients discharged on POD0 (n = 601, 3.1%), POD1 (n = 2,999, 15.5%), POD2 (n = 6,866, 35.6%), POD3 (n = 4,568, 23.7%), POD4 (n = 2,068, 10.7%), and POD5 or later (n = 2,198, 11.4%). Characteristics of each group are presented in Table 1. Notably, patients staying at least 5 days were older, had more comorbidities, and had larger tumors than patients with shorter stays.

Patients discharged on POD0 (reflecting a same day surgical discharge) had a 1.8% readmission rate, compared to 1.9% for POD1, 2.2% for POD2, 3.0% for POD3, 4.9% for POD4, and 5.5% for POD5 or later.

On multivariable analysis, Table 2, odds of 30-day readmission were similar for discharge on POD1 compared to POD2 (OR 0.84, 95% CI 0.62-1.15, $p = 0.28$) and POD0 compared to POD2 (OR 0.83, 95% CI 0.45-1.55, $p = 0.56$), and were higher for POD3 (OR 1.34, 95% CI 1.06-1.70, $p = 0.01$), POD4 (OR 2.12, 95% CI 1.63-2.75, $p < 0.001$), and POD5 or greater (OR 2.26, 95% CI 1.76-2.91, $p < 0.001$), compared to POD2. Female patients were less likely to be readmitted than male patients (OR 0.84, 95% CI 0.70-1.00, $p = 0.05$). Younger patients were less likely to be readmitted than older patients (OR 0.99 for each year, 95% CI 0.98-1.00, $p = 0.05$). Patients with larger tumors (OR 1.01 for each 1 mm, 95% CI 1.01-1.02, $p < 0.001$), or a Charlson-Deyo score of 2 or greater (OR 1.47, 95% CI 1.11-1.95, $p = 0.008$) compared to a score of 0, were more likely to be readmitted. Robotic approach (compared to laparoscopic), race, year of diagnosis, facility type, ZIP code median income or education attainment, county urban-rural status, distance from hospital, and laterality were not associated with odds of readmission within 30 days of surgery at the $\alpha = 0.05$ level, Table 2.

In a subset analysis including only patients discharged on POD1 or POD2, there were no significant differences in the cohorts. The estimated association of variables on 30-day readmission on multivariable analysis were similar to estimates from the whole cohort. In a propensity-score matched model, patients discharged on POD1 were matched to patients discharged on POD2 using the same covariates as our multivariable model (with the exclusion of day of discharge). There was good balance between covariates after matching, and all but nine cases were on the common support. After matching, there was an estimated difference of 0.2% in the 30-day readmission rate for POD1 versus POD2 discharge (2.1% versus 1.9%).

On further sensitivity analyses, we found similar rates of readmission for POD1 and POD2 on univariable

TABLE 1. **Cohort characteristics**

Variable	Postoperative day of discharge					
	POD 0	**POD 1**	**POD 2**	**POD 3**	**POD 4**	**POD >= 5**
Year of diagnosis						
2010	66 (11%)	291 (10%)	826 (12%)	633 (14%)	313 (15%)	365 (17%)
2011	98 (16%)	426 (14%)	1,157 (17%)	876 (19%)	413 (20%)	411 (19%)
2012	129 (21%)	570 (19%)	1,432 (21%)	994 (22%)	449 (22%)	458 (21%)
2013	146 (24%)	787 (26%)	1,646 (24%)	1,000 (22%)	460 (22%)	478 (22%)
2014	162 (27%)	925 (31%)	1,805 (26%)	1,065 (23%)	433 (21%)	486 (22%)
Race						
White	481 (80%)	2,530 (84%)	5,823 (85%)	3,877 (85%)	1,742 (84%)	1,825 (83%)
Black	80 (13%)	336 (11%)	726 (11%)	501 (11%)	237 (11%)	297 (14%)
Asian	19 (3%)	46 (2%)	130 (2%)	81 (2%)	38 (2%)	30 (1%)
Other	21 (3%)	87 (3%)	187 (3%)	109 (2%)	51 (2%)	46 (2%)
Male sex	370 (62%)	2,006 (67%)	4,223 (62%)	2,784 (61%)	1,210 (59%)	1,368 (62%)
Insurance						
Uninsured	15 (2%)	60 (2%)	142 (2%)	89 (2%)	50 (2%)	42 (2%)
Private	330 (55%)	1,741 (58%)	3,895 (57%)	2,448 (54%)	977 (47%)	892 (41%)
Medicaid	33 (5%)	143 (5%)	303 (4%)	202 (4%)	120 (6%)	159 (7%)
Medicare	217 (36%)	992 (33%)	2,421 (35%)	1,766 (39%)	891 (43%)	1,085 (49%)
Other	6 (1%)	63 (2%)	105 (2%)	63 (1%)	30 (1%)	19 (1%)
ZIP code median annual income						
< $38,000	103 (17%)	444 (15%)	1,055 (15%)	719 (16%)	342 (17%)	370 (17%)
$38,000-47,999	110 (18%)	670 (22%)	1,434 (21%)	967 (21%)	405 (20%)	502 (23%)
$48,000-62,999	142 (24%)	802 (27%)	1,797 (26%)	1,203 (26%)	589 (28%)	607 (28%)
>= $63,000	246 (41%)	1,083 (36%)	2,580 (38%)	1,679 (37%)	732 (35%)	719 (33%)
Tumor size						
0-39 mm	477 (79%)	2,512 (84%)	5,565 (81%)	3,526 (77%)	1,513 (73%)	1,557 (71%)
40-69 mm	117 (19%)	450 (15%)	1,214 (18%)	941 (21%)	507 (25%)	560 (25%)
70-99 mm	7 (1%)	37 (1%)	87 (1%)	101 (2%)	48 (2%)	81 (4%)
Charlson-Deyo score						
0	460 (77%)	2,218 (74%)	4,949 (72%)	3,008 (66%)	1,325 (64%)	1,293 (59%)
1	112 (19%)	633 (21%)	1,573 (23%)	1,245 (27%)	558 (27%)	613 (28%)
>= 2	29 (5%)	148 (5%)	344 (5%)	315 (7%)	185 (9%)	292 (13%)
Age (median, IQR)	61 (53-67)	60 (52-67)	60 (53-68)	61 (53-68)	62 (54-70)	64 (55-71)
Facility type						
Community Cancer	23 (4%)	65 (2%)	196 (3%)	160 (4%)	60 (3%)	78 (4%)
Comprehensive Community Cancer Center	228 938%)	1,059 (35%)	2,175 (32%)	1,636 (36%)	821 (40%)	856 (39%)
Academic/research	281 (47%)	1,632 (54%)	3,753 (55%)	2,238 (49%)	923 (45%)	949 (45%)
Integrated network	69 (11%)	243 (8%)	742 (11%)	534 (12%)	264 (13%)	285 (13%)
ZIP code % no high school degree						
>= 21%	99 (16%)	447 (15%)	1,050 (15%)	699 (15%)	318 (15%)	353 (16%)
13-20.9%	153 (25%)	748 (25%)	1,756 (26%)	1,141 (25%)	507 (25%)	591 (27%)
7-12.9%	193 (32%)	1,020 (34%)	2,258 (33%)	1,537 (34%)	728 (25%)	764 (35%)
< 7%	156 (26%)	784 (26%)	1,802 (26%)	1,191 (26%)	515 (25%)	490 (22%)
Node dissection performed	24 (4%)	176 (6%)	154 (2%)	103 (2%)	46 (2%)	67 (3%)
Robotic assisted	456 (76%)	2,525 (84%)	5,706 (83%)	3,592 (79%)	1,561 (75%)	1,624 (74%)
Laterality: right	318 (53%0	1,461 (49%)	3,467 (51%)	2,406 (53%)	1,125 (54%)	1,162 (53%)

TABLE 2. **Multivariable logistic regression predicting 30-day readmission**

		Odds ratio	**95% CI**	**p value**
Postoperative day of discharge	POD 0	0.83	0.45-1.55	0.56
	POD 1	0.84	0.62-1.15	0.28
	POD 2	(reference)		
	POD 3	1.34	1.06-1.70	0.01
	POD 4	2.12	1.63-2.75	< 0.001
	POD 5 or later	2.26	1.76-2.91	< 0.001
Surgical approach	Laparoscopic	(reference)		
	Robotic	0.95	0.78-1.17	0.64
Age (years)		0.99	0.98-1.00	0.05
Race	White	(reference)		
	Black	1.03	0.79-1.34	0.82
	Asian	1.13	0.61-2.09	0.70
	Other	0.75	0.41-1.37	0.35
Year of diagnosis	2010	(reference)		
	2011	0.86	0.64-1.15	0.31
	2012	0.86	0.64-1.14	0.28
	2013	0.85	0.65-1.13	0.27
	2014	0.87	0.66-1.15	0.33
Facility type	Community cancer program	(reference)		
	Comprehensive community cancer program	1.21	0.71-2.06	0.49
	Academic Program	1.25	0.74-2.13	0.40
	Integrated network cancer program	1.00	0.56-1.79	0.99
Female sex		0.84	0.70-1.00	0.05
Charlson-Deyo score	0	(reference)		
	1	1.13	0.93-1.37	0.21
	>=2	1.47	1.11-1.95	0.008
Tumor size (mm)	1.01	1.01-1.02	< 0.001	
Insurance status	Uninsured	(reference)		
	Private insurance	0.91	0.52-1.62	0.76
	Medicaid	1.28	0.67-2.42	0.46
	Medicare	1.09	0.60-1.99	0.77
	Other government	0.61	0.21-1.73	0.35
ZIP code median income	<$38,000	(reference)		
	$38,000-47,999	1.17	0.86-1.58	0.31
	$48,000-62,999	1.20	0.88-1.64	0.25
	>= $63,000	1.02	0.72-1.44	0.90
ZIP code % no high school degree	>= 21%	(reference)		
	13%-20.9%	0.89	0.66-1.18	0.41
	7%-12.9%	1.13	0.84-1.53	0.42
	< 7%	0.85	0.59-1.22	0.38
Distance to center (miles)		0.99	0.99-1.00	0.06
Laterality	Right	(reference)		
	Left	0.89	0.75-1.05	0.17
Node dissection		1.48	0.98-2.23	0.06

analysis when limiting to young patients, patients with no preexisting conditions, patients with small tumors, young patients with no preexisting conditions, and young patients with no preexisting conditions and small tumors.

Discussion

There are many pressures for early discharge following partial nephrectomy, including a desire for cost savings by reducing length of stay. However, a shorter hospital stay may result in a higher readmission rate, incurring a major cost burden to the hospital and erasing the savings from the initially shorter stay.[6] We did not substantiate these concerns, and instead found that discharge on POD1 was not associated with a higher readmission rate than discharge on POD2.

While many factors contribute to determining appropriate discharge timing, the results of our study suggest that discharge on POD1 is safe and not significantly different from discharge on POD2, at least in terms of readmission rates. Decreasing length of stay has the potential to decrease hospital costs without apparent increases in readmission rates. Consideration of POD1 discharge as the "default" after minimally invasive partial nephrectomy should be strongly considered to anchor patient and provider expectations and maximize the benefit of minimally invasive surgery on length of stay and cost containment.

We have applied these results and amended our standard postoperative protocol. Notably, there are still many clinical benchmarks that must be met prior to a safe discharge, and strict adherence to a specific day for discharge is inconsistent with good clinical care. Clinicians should still utilize judgment in determining when patients are ready for discharge home and incorporate variables such as tumor complexity and intraoperative complications that may affect readmissions, but could not be included in our study due to database limitations.

Our results are consistent with prior studies. A recent study using the National Surgery Quality Improvement Program Database (NSQIP) demonstrated similar complication rates and readmission rates from POD 1 compared to POD 2-3 discharges after minimally invasive partial nephrectomy using a matched propensity score model.[7] This analysis did not include tumor characteristics, however, limiting inference from the results. While we similarly found no difference in readmission based on postoperative discharge day, we did find larger tumor size and higher Charlson comorbidity scores were associated with higher rates of readmission.

These findings support implementing POD1 discharge for more patients. In our sample, 6,866 patients were discharged on POD2 compared to 2,999 on POD1. It is likely that many of these POD2 patients could have been discharged earlier without impacting their risk of readmission. Consideration of these results must be placed in the local context to ensure feasibility of the protocol and acceptability by patients and providers, and may not be translatable to all settings. Some prior institutional series have proven this possible, including a series from Abaza et al, implementing a protocol for POD1 discharge resulted in 90% POD1 discharge without an increase in complications.[8] Similarly, Patel et al implemented a standardized care pathway to optimize patients for POD1 discharge, and found similar readmission rates for patients discharged on POD1 compared to later postoperative days.[9]

Similar to prior studies, such as the NSQIP study, we consider patients with a stay beyond POD2 (i.e. POD3 or greater) to represent a distinct group of patients.[7] It is hypothesized that these cases may be more complex either due to tumor characteristics or patient comorbidities. We did find a higher rate of readmission for patients discharged on POD3 or later, consistent with prior studies.[10-13] It is possible that there were complications in these patients resulting in longer stays that also led to higher readmissions, but we were unable to account for specific complications in our analysis.

We were similarly limited by the lack of information on perioperative complications, duration of surgery, estimated intraoperative blood loss, or blood transfusions, which would likely influence length of stay as well as become a factor in readmission. Tumor complexity, such as a nephrometry score, is also not captured in the NCDB. These and other unmeasured variables may confound our results, though we have attempted to address observable confounders via our multivariable model, sensitivity analyses by stratified multivariable models, and propensity score analysis. It is likely that patients discharged on POD1 and POD2 are highly similar. We specifically limit some of our sensitivity analyses to these groups to further account for possible confounders, with similar results to our primary analyses.

While our study supports POD1 discharge from the perspective of readmission rates, we could not consider patient satisfaction. Implementing a POD1 discharge as 'default' may increase patient satisfaction as some patients are eager to return home, while others, particularly those active in treatment decision making, may wish to stay longer in the hospital.[14,15]

Consideration of these metrics will gain importance as the Centers for Medicare and Medicaid Services factors satisfaction into reimbursement, potentially offsetting increased costs from length of stay increases.[16] Additionally, further analyses into specific types of complications leading to readmission (e.g. urine leak, pseudoaneurysm, urinary tract infection, DVT/PE) compared to day of discharge may aid in assessing the cost effectiveness of each marginal day spent in the hospital from a protocol and policy standpoint.

Conclusions

Discharge after minimally invasive partial nephrectomy on POD1 in appropriately selected patients does not appear to increase the readmission rate. Future work is needed to implement earlier discharge into postoperative protocols safely, and to determine the impact of such protocols on patient satisfaction. □

References

1. Jeong IG, Khandwala YS, Kim JH et al. Association of robotic-assisted vs. laparoscopic radical nephrectomy with perioperative outcomes and health care costs, 2003 to 2015. *JAMA* 2017;318(16):1561-1568.
2. Alemozaffar M, Chang SL, Kacker R, Sun M, DeWolf WC, Wagner AA. Comparing costs of robotic, laparoscopic, and open partial nephrectomy. *J Endourol* 2013;27(5):560-565.
3. Sood A, Abdollah F, Sammon JD, Menon M, Rogers CG. Classification of partial nephrectomy as an outpatient surgery under CMS part B reimbursement program—Does the evidence justify the recommendation? *Urology Practice* 2017;4:444-447.
4. Choi JE, You JH, Kim DK, Rha KH, Lee SH. Comparison of perioperative outcomes between robotic and laparoscopic partial nephrectomy: a systematic review and meta-analysis. *Eur Urol* 2015;67(5):891-901.
5. Stata Statistical Software. College Station, TX: StataCorp LP; 2015.
6. Vonlanthen R, Slankamenac K, Breitenstein S et al. The impact of complications on costs of major surgical procedures: a cost analysis of 1200 patients. *Ann Surg* 2011;254(6):907-913.
7. Berger I, Xia L, Sperling C et al. Next-day discharge after minimally invasive partial nephrectomy: an analysis of the US National Surgical Quality Improvement Program. *World J Urol* 2019;37(5):831-836.
8. Abaza R, Paulucci D, Hemal A,et al. Does routine overnight stay after robotic partial nephrectomy increase complications? *J Urol* 2017;197:e1299.
9. Patel A, Golan S, Razmaria A, Prasad S, Eggener S, Shalhav A. Early discharge after laparoscopic or robotic partial nephrectomy: care pathway evaluation: Care pathway evaluation for early discharge after LPN or RPN. *BJU Int* 2014;113(4):592-597.
10. Bazzi WM, Sjoberg DD, Grasso AAC, Bernstein M, Parra R, Coleman JA. Predicting length of stay after robotic partial nephrectomy. *Int Urol Nephrol* 2015;47(8):1321-1325.
11. Brandao LF, Zargar H, Laydner H et al. 30-day hospital readmission after robotic partial nephrectomy—are we prepared for Medicare Readmission Reduction Program? *J Urol* 2014;192(3):677-681.
12. Maurice MJ, Ramirez D, Kara Ö et al. Non-modifiable factors predict discharge quality after robotic partial nephrectomy. *Int Urol Nephrol* 2017;49(1):37-41.
13. Autorino R, Zargar H, Butler S, Laydner H, Kaouk JH. Incidence and risk factors for 30-day readmission in patients undergoing nephrectomy procedures: a contemporary analysis of 5276 cases from the National Surgical Quality Improvement Program Database. *Urology* 2015;85(4):843-849.
14. Tak HJ, Ruhnke GW, Meltzer DO. Association of patient preferences for participation in decision making with length of stay and costs among hospitalized patients. *JAMA Intern Med* 2013;173(13):1195-1205.
15. Tsai TC, Orav EJ, Jha AK. Patient satisfaction and quality of surgical care in US hospitals. *Ann Surg* 2015;261(1):2-8.
16. HCAHPS: Patients' Perspectives of Care Survey; available at https://hcahpsonline.org/