Understanding Hospital Readmission Intensity after Radical Cystectomy

Ted A. Skolarus,*,†,‡ Bruce L. Jacobs,§ Florian R. Schroeck,§ Chang He,§ Alexander M. Helfand,§ Jonathan Helm,§ Michael Hu,§ Mariel Lavieri§ and Brent K. Hollenbeck‖

From the VA HSR&D Center for Clinical Management Research, VA Ann Arbor Healthcare System (TAS), Division of Oncology (TAS, FRS, BKH) and Dow Division of Health Services Research (TAS, FRS, CH, AMH, BKH), Department of Urology, and Department of Industrial and Operations Engineering (MH, ML), University of Michigan, Ann Arbor, Michigan; Department of Urology, University of Pittsburgh, Pittsburgh, Pennsylvania (BLJ); and Indiana University Kelley School of Business, Indianapolis, Indiana (JH)

Abbreviations and Acronyms

CMS = Centers for Medicare & Medicaid Services

CT = computerized tomography

LOS = length of stay

SNF = skilled nursing facility

Accepted for publication October 29, 2014.

Study received institutional review board approval.

Supported by the American Cancer Society Pennsylvania Division—Dr. William and Rita Conrady Mentored Research Scholar Grant (MSRG-07-006-01-CPHPS), the American Urological Association Foundation, Astellas Pharma US, and the University of Michigan Center for Healthcare Engineering and Patient Safety.

* Correspondence: Department of Urology, University of Michigan, VA HSR&D Center for Clinical Management Research, VA Ann Arbor Healthcare System (telephone: 734-936-0054; FAX: 734-232-2400; e-mail: tskolar@med.umich.edu).

† Supported by a VA HSR&D Career Development Award - 2 (CDA 12-171).

‡ Financial interest and/or other relationship with UpToDate.

§ Nothing to disclose.

‖ Financial interest and/or other relationship with Elsevier, AHRQ, American Cancer Society and National Cancer Institute.

See Editorial on page 1461.

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 1732 and 1733.

Purpose: Hospital readmissions after radical cystectomy vary with respect to intensity in terms of impact on patients and health care systems. Therefore, we conducted a population based study to examine factors associated with increasing readmission intensity after radical cystectomy for bladder cancer.

Materials and Methods: Using SEER (Surveillance, Epidemiology, and End Results)-Medicare data we identified 1,782 patients who underwent radical cystectomy from 2003 to 2009. We defined readmission intensity in terms of length of stay (days) divided into quartiles of less than 3 (lowest), 3 to 4, 5 to 7 and more than 7 (highest). We used logistic regression to examine factors associated with readmission intensity.

Results: More than half of the patients with the highest intensity readmissions were readmitted within the first week and 77% were readmitted within 2 weeks of discharge. Patients with the highest intensity readmissions were similar in age, gender, race, socioeconomic status, pathological stage, comorbidity, neoadjuvant chemotherapy use and urinary diversion type compared to patients with the lowest intensity readmissions. After multivariable adjustment, complications during the index cystectomy admission ($p < 0.001$), readmission week ($p = 0.04$), and the interaction between index length of stay and discharge to a skilled nursing facility ($p = 0.04$) were associated with the highest readmission intensity.

Conclusions: Readmission intensity differs widely after discharge following radical cystectomy. As postoperative efforts to minimize the readmission burden increase, a better understanding of the factors that contribute to the highest intensity readmissions will help direct limited resources (eg telephone calls, office visits) toward high yield areas.

Key Words: urinary bladder neoplasms; patient readmission; cystectomy; quality assurance, health care

RADICAL cystectomy is a complex surgical procedure used to treat bladder cancer. The use of post-acute care services (ie home health care, skilled nursing facilities) after hospital discharge has increased dramatically among patients who undergo cystectomy.[1] Despite the increases in

0022-5347/15/1935-1500/0
THE JOURNAL OF UROLOGY®

http://dx.doi.org/10.1016/j.juro.2014.10.107
Vol. 193, 1500-1506, May 2015
Printed in U.S.A.

post-acute care, hospital readmission rates after cystectomy have remained stable at approximately 25% during the last decade.[1–3]

Policy initiatives are currently under way to address readmissions including the CMS Hospital Readmissions Reduction Program.[4] This program was enacted under the Affordable Care Act in October 2012 and reduces payments to hospitals with excess 30-day readmissions. While initially focused on common medical conditions such as pneumonia and heart failure, it is expanding to postoperative orthopedic care in 2015 and will likely broaden in scope to other surgical procedures with time. However, viewing all readmissions as equal impedes policy efforts to reduce them in at least 2 ways. 1) Short duration (ie low intensity) readmissions may be necessary early in the post-discharge course to prevent further clinical deterioration. For example, treating early signs of dehydration during a brief inpatient stay may prevent acute kidney injury and its sequelae, and thus, avoid a longer duration (ie higher intensity) readmission. 2) Focusing simply on whether a readmission occurs fails to identify patients who consume a disproportionate share of resources and who are at risk for serious, if not life threatening, adverse events. Identifying which patients are susceptible to such high intensity readmissions may help direct discharge planning and better target resources to maximize patient welfare.[5,6]

Therefore, we conducted a population based study to better understand why some readmissions after radical cystectomy are more resource intensive than others. We evaluated the differences in readmission intensity after radical cystectomy as measured by LOS. We also examined factors associated with increasing readmission intensity. The goal of these efforts is to inform strategies to decrease readmission intensity for at-risk patients and avoid readmission when possible for patients treated with radical cystectomy.

METHODS

Study Population

We used SEER-Medicare data to identify patients who underwent cystectomy (ICD-9 codes 57.7, 57.71, 57.79, 68.8) to treat bladder cancer between 2003 and 2009.[7] We followed beneficiaries' hospital based medical care over time using Medicare Provider Analysis and Review files. We included patients between the ages of 66 and 99 who were continuously enrolled in Medicare Parts A and B during the 12 months before and 6 months after cystectomy. We excluded patients in the Medicare Advantage program to ensure all health care was ascertained. We also excluded those who died within 6 months of diagnosis. We classified urinary diversion type using Medicare Part A and B data according to described methods.[2] We used ICD codes in the outpatient files to identify 2 or more neoadjuvant chemotherapy claims within 6 months of surgery. Applying these criteria resulted in a study population of 1,782 patients.

Readmission Intensity

We chose to characterize differences in hospital readmission intensity using LOS for 2 reasons. Readmission LOS is clinically applicable, easy to measure, and is meaningful to patients and their families, providers and hospitals. Hospitals should be particularly interested given the burden of unplanned readmissions.[6,8,9] In addition, LOS is strongly correlated with spending for episodes of surgical care. Improving the efficiency of episodes of care is a priority of the Affordable Care Act and its policies.[4] Based on the CMS Hospital Readmissions Reduction Program, we defined readmission as rehospitalization to any acute care hospital within 30 days of the index discharge date. We then categorized patients into quartiles based on LOS for their hospital readmission as less than 3 (lowest intensity), 3 to 4, 5 to 7 and more than 7 days (highest intensity).

Outcomes

The primary outcome for this study was highest intensity readmission defined as a hospital readmission with a LOS greater than 7 days (ie the top quartile of hospital readmission duration). We chose to examine factors associated with longer readmissions as they are among the most resource intensive and costly.

Statistical Analysis

We used chi-square and Student t-tests to identify relationships between readmission intensity and patient and hospitalization characteristics. Patient characteristics included age, gender, race, pathological stage, urinary diversion, comorbidity based on Medicare claims for the 12 months preceding surgery[10] and socioeconomic status using each patient's ZIP Code™.[11] Hospitalization characteristics included intensive care and CT use, type of complication during the index admission,[12] index LOS, discharge to a skilled nursing facility after hospitalization, surgery or blood transfusion during readmission and new diagnoses upon readmission (ie reasons for readmission as described in our prior work).[12] To examine the relationship between annual hospital cystectomy volume and readmission intensity,[12] we identified whether patients were treated at a top quartile (4 or more cases per year) or top 5% (12 cases or more per year) hospital based on hospital identifiers and cystectomy claims during the study period. We also examined time to readmission classified based on week(s) after discharge from the index hospitalization (1 to 4).[13]

We then used multivariable Firth's penalized likelihood logistic regression to examine factors associated with the highest vs lowest readmission intensity to handle the quasi-complete separation caused by including interacted categorical predictors, and to generate finite bias reduced estimates. Factors in our starting model included the aforementioned patient and index hospitalization characteristics and pairwise interactions between any

complication, initial LOS and SNF use given the possible relationships among these factors. A backward model building procedure was used to determine the most parsimonious model. Based on the multivariable logistic model, we generated predicted probabilities of highest intensity readmissions using a marginal standardization method.[14] All analyses were performed using SAS® 9.3 software and all testing was 2-sided. The probability of a Type I error was set at 0.05. The University of Michigan institutional review board approved the study protocol.

RESULTS

Of the patients who underwent cystectomy 1 in 4 (25.5%) was readmitted within 30 days of discharge representing the cohort for this study. As shown in table 1 we found no differences in readmission intensity according to age, gender, race, socioeconomic status, pathological stage, comorbidity or urinary diversion type. Neoadjuvant chemotherapy use ranged from 5% to 7.5% with no differences across the readmission intensity groups (p=0.53).

Differences in readmission intensity were much more apparent when we examined hospitalization characteristics pertaining to the index admission and readmission (table 2). In terms of the index hospitalization for radical cystectomy, patients discharged to a SNF were much more likely to have a high intensity readmission (p <0.001) as were those who underwent CT during the index hospital stay (p <0.01). Postoperative complications during the index admission were associated with higher readmission intensity, particularly for medical, major and sepsis complications.

In terms of the readmission hospitalization more than half of the patients with a high intensity readmission were readmitted within the first week. We found that the highest readmission intensity was associated with intensive care use, CT use, blood transfusions and surgery during the readmission, in addition to being readmitted after treatment at a lower volume hospital compared with hospitals in the top quartile (p=0.03) and top 5% (p=0.08, table 2). Patients with the highest intensity readmissions were 5 times as likely to be discharged to a SNF after readmission compared to those with the lowest readmission intensity (p <0.001).

As shown in table 3, the highest intensity readmissions occurred more commonly in week 1 and week 3 after discharge compared with week 4. Complications during the index cystectomy admission were associated with the highest compared to the lowest readmission intensity, whereas an index CT was no longer a significant predictor. The interaction between initial LOS and discharge to SNF was significant for patients discharged after a short (less than 8 days) or long (11 or more days) index LOS (table 3). As illustrated in the figure, the presence of any postoperative complication after radical cystectomy had a strong association with highest intensity readmissions across age categories. The association between index LOS and discharge to a SNF was variable across LOS categories (ie the SNF association may decrease with increasing age for lower index LOS) (part *B* of figure).

Table 1. *Patient characteristics and readmission intensity after radical cystectomy*

	Readmission Intensity Quartile (days LOS)				
	Less than 3	3–4	5–7	Greater than 7	p Value
No. pts	80	138	116	121	
Age (%):					0.09
66–69	15.0	19.6	11.2	13.2	
70–74	32.5	26.8	25.0	25.6	
75–80	35.0	34.0	34.5	39.7	
Greater than 80	17.5	19.6	29.3	21.5	
Gender (male) (%)	78.8	81.2	75.9	70.3	0.07
Race (white) (%)*	93.8	89.9	93.1	89.3	0.78
Socioeconomic status (%):					0.68
Low	30.8	25.6	27.8	29.6	
Med	33.3	37.6	33.1	29.6	
High	35.9	36.8	39.1	40.8	
Comorbidity (%):					
0	43.7	52.2	46.5	45.4	0.56
1	30.0	29.7	25.9	28.1	
2+	26.3	18.1	27.6	26.5	
Pathological stage (%):*					0.15
T1 or less	34.3	35.7	33.9	25.2	
T2/T3	64.4	61.9	64.1	73.0	
Urinary diversion type (%):					0.35
Ileal conduit	73.6	79.0	81.1	81.5	
Neobladder/other	26.4	21.0	18.9	18.5	

*In accordance with SEER-Medicare rules pathological stage T4/metastases and race African-American or other had cells involving less than 5% of patients and were suppressed.

DISCUSSION

Readmission intensity differs widely after discharge following radical cystectomy with more than half of readmissions lasting 5 or more days. The highest intensity readmissions were most common during the initial 2 weeks after discharge and among patients discharged to SNF after particularly brief or prolonged index LOS. Not surprisingly we found that increasing readmission intensity was associated with intensive care and CT use, blood transfusions and surgery during the readmission hospitalization. Discharge to a SNF after the index hospitalization and postoperative complications were associated with high readmission intensity, indicating intervention opportunities along the perioperative and post-acute course. Exploring readmission intensity as a unique approach to understanding readmissions after major

Table 2. *Hospitalization characteristics and readmission intensity after radical cystectomy**

	Readmission Intensity Quartile (days LOS)				
	Less than 3	3—4	5—7	Greater than 7	p Value
Index stay for radical cystectomy					
Discharge to SNF (%)	Less than 15*	16.7	26.7	31.4	<0.001
Intensive care (%)	62.5	68.1	71.6	71.1	0.19
CT (%)	15.0	15.9	37.9	27.3	<0.01
Days LOS (%):					0.03
Less than 8	27.5	29.7	20.7	24.0	
8—10	38.7	39.9	33.6	29.7	
11 or Greater	33.8	30.4	45.7	46.3	
Hospital cystectomy vol-annual:					
Top quartile (%)	77.5	68.8	65.5	62.8	0.03
Top 5% (%)	51.3	40.6	38.0	38.0	0.08
Any complication during index admission (%):	66.7	72.4	79.5	88.2	<0.001
Medical (%)	43.6	56.7	65.2	80.7	<0.001
Surgical (%)	39.7	32.8	35.7	42.0	0.48
Major (%)	52.6	51.5	65.2	79.0	<0.001
Sepsis (%)	15.4	29.9	34.8	48.7	<0.001
Readmission after radical cystectomy					
Intensive care (%)	Less than 15*	13.8	31.9	42.2	<0.001
CT (%)	38.8	47.8	47.4	75.2	<0.001
Emergency room charge (%)	61.3	68.8	69.0	66.1	0.62
Surgery (%)	28.8	34.1	63.8	85.1	<0.001
Discharge to SNF (%)	Less than 15*	16.7	21.6	37.2	<0.001
New diagnoses on readmission (ie reasons for readmission):*					
Infectious	42.3	50.8	45.5	61.3	0.02
Failure to thrive	24.4	36.6	39.3	38.7	0.06
Urinary	28.2	36.6	32.1	32.8	0.83
Gastrointestinal	20.5	18.7	24.1	30.3	0.04
Metabolic	15.4	17.9	19.6	13.5	0.68
Neurological/psychological/ musculoskeletal/ophthalmologic/ otorhinolaryngologic	18.0	11.2	10.7	15.1	0.77
Wound related, hematoma	19.2	11.9	10.7	16.8	0.83
Readmitted in wk 1 (%)	38.4	34.3	38.3	54.6	<0.01
Readmitted in wk 2 (%)	30.8	29.1	29.5	22.7	
Readmitted in wk 3 (%)	Less than 15*	22.4	17.0	13.5	
Readmitted in wk 4 (%)	20.5	14.2	15.2	9.2	

Top quartile and top 5% of annual hospital cystectomy volume defined as 4 or more and 12 or more cases per year, respectively.
* In accordance with SEER-Medicare rules index blood transfusion (p=0.84), readmission blood transfusion (p=0.03) and new diagnoses upon readmission for pulmonary (p=0.02), vascular (p=0.02), cardiac (p=0.40), hematologic (0.82) and female genitourinary/gynecologic (p=0.77) reasons had cells involving less than 5% of patients or cell sizes less than 11 and were suppressed.

cancer surgery may inform solutions that limit the impact of readmissions on patients and hospitals.

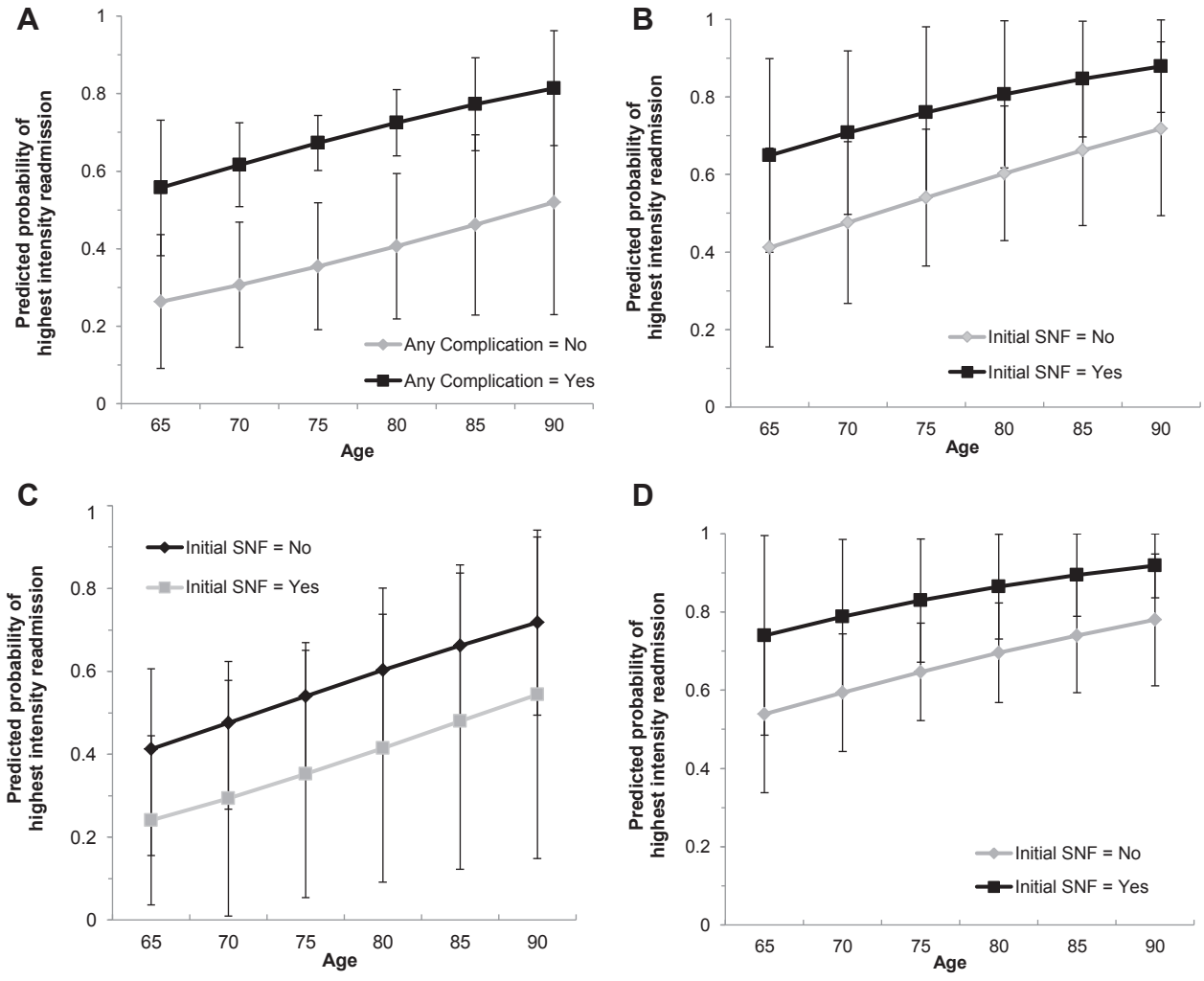
Efforts to reduce excessive readmissions in common chronic diseases include transitional care programs, improved discharge planning, high risk patient identification, medication reconciliation and telemedicine.[5,15–17] As the CMS Hospital Readmissions Reduction Program expands its scope to postoperative care, understanding the degree to which these interventions can help prevent postoperative readmissions will be critical.[4] Increasing access to outpatient care through hotlines or extended clinic hours may also benefit postoperative patients.[6] Given the association of postoperative complications with readmission across various procedures,[18,19] decreasing complications through quality improvement initiatives (eg collaboratives)[20] and surgical coaching[21] would also be expected to have beneficial spillover effects on readmissions.

Despite advances in perioperative management for radical cystectomy,[22–25] readmission rates often remain stable,[1] likely due to the complexity of the surgery and the patient population. Moreover the optimal use of post-acute care for patients treated with radical cystectomy is unknown. As shown in

Table 3. *Multivariable analysis of factors associated with highest vs lowest intensity readmission within 30 days after radical cystectomy*

	Adjusted OR (95% CI)
Index hospitalization	
Discharge to SNF/days LOS:	
Less than 8	24.97 (1.10, 567.97)
8 - Less than 11	0.79 (0.22, 2.86)
11 or Greater	5.43 (1.51, 19.54)
Any postop complication	5.35 (2.27, 12.66)
Readmission wk	
Wk 1 vs wk 4	3.46 (1.37, 8.73)
Wk 3 vs wk 4	3.91 (1.16, 13.21)

Adjusted for patient and index hospitalization characteristics, and pairwise interactions between any complication, initial LOS and SNF use.



Predicted probability of highest intensity readmission according to any postoperative complication (*A*), and SNF use according to low index (less than 8 days) LOS (*B*), intermediate index (8 to 10 days) LOS (*C*) and high index (11 days or more) LOS (*D*) after cystectomy. Presence of any postoperative complication after radical cystectomy had strong association with highest intensity readmissions across age categories. Association between index LOS and discharge to SNF was variable across LOS categories. Highest predicted probabilities appeared among patients discharged to SNF after 11 days or more

this study there is significant variation in the type of 30-day readmissions after radical cystectomy. One issue is that all 30-day hospital readmissions are not created equal, making a one-size-fits-all solution unlikely. Some readmissions are short, and some are long and resource intensive. Most stakeholders would prefer shorter readmissions, potentially in the face of slightly higher readmission rates. For example, treating early signs of dehydration during a brief inpatient stay may prevent a longer duration, ie higher intensity, readmission a few days later due to acute kidney injury. These are the high impact tradeoffs that hospitals will need to address given unraveling readmission policy issues and public reporting.[26]

Based on our work the first week or 2 after discharge from the hospital is the most common time for readmissions, as well as highest intensity readmissions, after radical cystectomy. This might indicate that these patients should not have been discharged in the first place or that close monitoring of patients in the days immediately after discharge should be a priority. Focusing on prevention and/or the early detection of infectious and gastrointestinal etiologies may be high yield when it comes to decreasing readmissions and readmission intensity. Regardless of the timing of readmissions, patients who go to a SNF are at high risk for readmission, with a high intensity readmission raising 2 considerations.[27] Readmissions remain stable at 25% despite increasing use of post-acute care services, calling into question confidence in these transitional care resources for this complex patient population.[1,28] In addition, patients with the most

social and physiological reserve usually do not go to a SNF to recover after radical cystectomy (ie sicker patients go to nursing facilities). However, our multivariable model still demonstrates that these patients are at significant risk for highest intensity readmissions. It remains unclear if we are doing a disservice to patients by discharging them to a SNF vs keeping them in the hospital to detect and manage incident complications with those most in tune with the early signs of clinical deterioration.

Our findings involve several limitations to consider. We used Medicare hospitalization claims, thus potentially limiting the generalizability of our findings. However, the majority of patients with bladder cancer are in the seventh decade of life or older and have Medicare coverage. In addition, we used LOS as our measure of readmission intensity because of its correlation with hospital spending and clinical relevance, thereby giving it face and construct validity for informing readmission reduction strategies. However, examining all inpatient care within 30 days of surgery might be another approach. While we did not examine this in great detail, 14.5% of patients had multiple readmissions within 30 days, warranting future investigation with respect to policy and expenditure implications.[29] We did not examine intervening outpatient care that might have impacted readmission intensity. However, any valuable intervening care would arguably decrease readmission intensity. This warrants further study of administrative claims and clinical data (eg followup telephone calls) to characterize this pre-readmission phase of care. Unmeasured factors such as surgeon volume may also influence complications, readmission rates and subsequent readmission intensity. Nonetheless, raising awareness of readmission intensity may help all providers with discharge planning and identification of high risk patients. Finally, translating these findings into interventions to reduce readmissions after radical cystectomy and other complex surgical care is warranted. This may include better understanding those institutions and best practices associated with less intense readmissions.

These limitations notwithstanding, we found that readmission intensity differs widely after radical cystectomy for bladder cancer. As clinical solutions to limit the impact of readmission after radical cystectomy become increasingly popular, developing the ability to differentiate high from low intensity readmissions will help direct limited clinical resources, such as telephone calls and office visits, toward the highest yield areas.

REFERENCES

1. Jacobs BL, Zhang Y, Tan HJ et al: Hospitalization trends after prostate and bladder surgery: implications of potential payment reforms. J Urol 2013; **189:** 59.
2. Gore JL, Lai J and Gilbert SM: Readmissions in the postoperative period following urinary diversion. World J Urol 2011; **29:** 79.
3. Stimson CJ, Chang SS, Barocas DA et al: Early and late perioperative outcomes following radical cystectomy: 90-day readmissions, morbidity and mortality in a contemporary series. J Urol 2010; **184:** 1296.
4. Centers for Medicare & Medicaid Services: Readmissions Reduction Program. Available at www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html. Accessed August 20, 2013.
5. Minott J: Reducing Hospital Readmissions, November 2008. Available at www.academyhealth.org/files/publications/ReducingHospitalReadmissions.pdf. Accessed August 22, 2013.
6. Silow-Carroll S, Edwards JN and Lashbrook A: Reducing Hospital Readmissions: Lessons from Top-Performing Hospitals, Synthesis Report. Commonwealth Fund pub. 1473, Vol. 5, April 2011. Available at www.commonwealthfund.org/~/media/Files/Publications/Case%20Study/2011/Apr/1473_SilowCarroll_readmissions_synthesis_web_version.pdf. Accessed April 10, 2014.
7. National Cancer Institute: Applied Research: Cancer Control and Population Sciences. SEER-Medicare linked database. Available at http://appliedresearch.cancer.gov/seermedicare/.
8. van Walraven C, Jennings A, Taljaard M et al: Incidence of potentially avoidable urgent readmissions and their relation to all-cause urgent readmissions. CMAJ 2011; **183:** E1067.
9. Jencks SF, Williams MV and Coleman EA: Rehospitalizations among patients in the Medicare fee-for-service program. N Engl J Med 2009; **360:** 1418.
10. Klabunde CN, Potosky AL, Legler JM et al: Development of a comorbidity index using physician claims data. J Clin Epidemiol 2000; **53:** 1258.
11. Diez Roux AV, Merkin SS, Arnett D et al: Neighborhood of residence and incidence of coronary heart disease. N Engl J Med 2001; **345:** 99.
12. Mayer EK, Bottle A, Aylin P et al: The volume-outcome relationship for radical cystectomy in England: an analysis of outcomes other than mortality. BJU Int 2011; **108:** E258.
13. Hu M, Jacobs BL, Montgomery JS et al: Sharpening the focus on causes and timing of readmission after radical cystectomy for bladder cancer. Cancer 2014; **120:** 1409.
14. Sato T and Matsuyama Y: Marginal structural models as a tool for standardization. Epidemiology 2003; **14:** 680.
15. Mittler JN, O'Hora JL, Harvey JB et al: Turning readmission reduction policies into results: some lessons from a multistate initiative to reduce readmissions. Popul Health Manag 2013; **16:** 255.
16. Costantino ME, Frey B, Hall B et al: The influence of a postdischarge intervention on reducing hospital readmissions in a Medicare population. Popul Health Manag 2013; **16:** 310.
17. Hall MH, Esposito RA, Pekmezaris R et al: Cardiac surgery nurse practitioner home visits prevent coronary artery bypass graft readmissions. Ann Thorac Surg 2014; **97:** 1488.
18. Morris MS, Deierhoi RJ, Richman JS et al: The relationship between timing of surgical complications and hospital readmission. JAMA Surg 2014; **149:** 348.
19. Lawson EH, Hall BL, Louie R et al: Association between occurrence of a postoperative complication and readmission: implications for quality

improvement and cost savings. Ann Surg 2013; **258:** 10.

20. Share DA, Campbell DA, Birkmeyer N et al: How a regional collaborative of hospitals and physicians in Michigan cut costs and improved the quality of care. Health Aff (Millwood) 2011; **30:** 636.

21. Birkmeyer JD, Finks JF, O'Reilly A et al: Surgical skill and complication rates after bariatric surgery. N Engl J Med 2013; **369:** 1434.

22. Chang SS, Cookson MS, Baumgartner RG et al: Analysis of early complications after radical cystectomy: results of a collaborative care pathway. J Urol 2002; **167:** 2012.

23. Raynor MC, Lavien G, Nielsen M et al: Elimination of preoperative mechanical bowel preparation in patients undergoing cystectomy and urinary diversion. Urol Oncol 2013; **31:** 32.

24. Pruthi RS, Chun J and Richman M: Reducing time to oral diet and hospital discharge in patients undergoing radical cystectomy using a perioperative care plan. Urology 2003; **62:** 661.

25. Djaladat H and Daneshmand S: Enhanced recovery pathway following radical cystectomy. Curr Opin Urol 2014; **24:** 135.

26. Gorodeski EZ, Starling RC and Blackstone EH: Are all readmissions bad readmissions? N Engl J Med 2010; **363:** 297.

27. Mor V, Intrator O, Feng Z et al: The revolving door of rehospitalization from skilled nursing facilities. Health Aff (Millwood) 2010; **29:** 57.

28. Hollenbeck BK, Taub DA, Miller DC et al: The regionalization of radical cystectomy to specific medical centers. J Urol 2005; **174:** 1385.

29. Wick EC, Shore AD, Hirose K et al: Readmission rates and cost following colorectal surgery. Dis Colon Rectum 2011; **54:** 1475.