Unplanned 30-day hospital readmission as a quality measure in gynecologic oncology

MaryAnn B Wilbur, MD, MPH [a], Diana B Mannschreck, BSN [b], Ana M Angarita, MD [a],
Rayna K Matsuno, PhD, MPH [c], Edward J Tanner, MD [a], Rebecca L Stone, MD, MS [a],
Kimberly L Levinson, MD, MPH [a], Sarah M Temkin, MD [a], Martin A Makary, MD, MPH [d], Curtis A Leung, MPH [e],
Amy Deutschendorf, MS, RN [e], Peter J Pronovost, MD, PhD [d], Amy Brown, RN, OCN [a], Amanda N Fader, MD [a,*]

[a] Kelly Gynecologic Oncology Service, Johns Hopkins Hospital, Baltimore, MD, United States
[b] Johns Hopkins School of Medicine, Baltimore, MD, United States
[c] Department of Radiation Medicine and Applied Sciences, University of California San Diego, La Jolla, CA, United States
[d] Division of Health Policy & Management, Johns Hopkins School of Public Health, Baltimore, MD, United States
[e] Care Coordination and Clinical Resource Management, Johns Hopkins Hospital, Baltimore, MD, United States

HIGHLIGHTS

- Thirty-day readmission is a quality measure for patient care and Medicare-based reimbursement.
- The readmission rate to an academic gynecologic oncology surgical service was 11%.
- In patients requiring >1 night stay after surgery, a readmission rate of 20.9% was observed.
- Readmissions were costly and associated with surgical, medical, and psychosocial risk factors.

ARTICLE INFO

ABSTRACT

Objectives. Thirty-day readmission is used as a quality measure for patient care and Medicare-based hospital reimbursement. The primary study objective was to describe the 30-day readmission rate to an academic gynecologic oncology service. Secondary objectives were to identify risk factors and costs related to readmission.

Methods. This was a retrospective, concurrent cohort study of all surgical admissions to an academic, high volume gynecologic oncology service during a two-year period (2013–2014). Data were collected on patient demographics, medical comorbidities, psychosocial risk factors, and results from a hospital discharge screening survey. Mixed logistic regression was used to identify factors associated with 30-day readmission and costs of readmission were assessed.

Results. During the two-year study period, 1605 women underwent an index surgical admission. Among this population, a total of 177 readmissions (11.0%) in 135 unique patients occurred. In a surgical subpopulation with >1 night stay, a readmission rate of 20.9% was observed. The mean interval to readmission was 11.8 days (SD 10.7) and mean length of readmission stay was 5.1 days (SD 5.0). Factors associated with readmission included radical surgery for ovarian cancer (OR 2.87) or cervical cancer (OR 4.33), creation of an ostomy (OR 11.44), a Charlson score of ≥5 (OR 2.15), a language barrier (OR 3.36), a median household income in the lowest quartile (OR 6.49), and a positive discharge screen (OR 2.85). The mean cost per readmission was $25,416 (SD $26,736), with the highest costs associated with gastrointestinal complications at $32,432 (SD $32,148). The total readmission-related costs during the study period were $4,523,959.

Conclusions. Readmissions to a high volume gynecologic oncology service were costly and related to radical surgery for ovarian and cervical cancer as well as to medical, socioeconomic and psychosocial patient variables. These data may inform interventional studies aimed at decreasing unplanned readmissions in gynecologic oncology surgical populations.

© 2016 Published by Elsevier Inc.

* Corresponding author at: 600 North Wolfe Street, Phipps 279, Baltimore, MD 21287, United States.
E-mail address: afader1@jhmi.edu (A.N. Fader).

1. Introduction

Unplanned readmissions are viewed as a marker of poor care quality, and incur expense both to the health care system and to the patient [1,2]. Interventions aimed at reducing readmissions have been the focus of several randomized trials addressing medical conditions, such as congestive heart failure [3], but few data exist on efforts to reduce readmissions in surgical patients. Furthermore, only limited studies focus on patients treated on a gynecologic oncology service.

Compared to other female surgical patients, women with gynecologic cancers are more likely older, obese and have complex care needs placing them at higher risk for hospital readmission after surgery [4–9]. Henretta et al. reported a readmission rate of 13.2% on a gynecologic oncology service at a single academic institution, with few planned readmissions and a mean cost of $9820 per readmission [10]. The same group updated their analysis in 2015 and reported that individual factors, such as mental health and socioeconomic status, appeared to contribute to unplanned readmissions [11]. There remains a paucity of data on readmission rates related to gynecologic oncology populations, on factors related to readmission, and on how well risk adjustment models account for these factors. In this study, we sought to identify the rate of readmission in patients who underwent surgery at a high volume, academic gynecologic oncology service and to define risk factors and costs associated with readmission. These objectives were designed with the goal of informing readmission-reduction interventions and U.S. health care policy, such as readmission thresholds being developed by the Centers for Medicare and Medicaid Services (CMS) Readmissions Reduction Program at the federal level and the Maryland Health Services Cost Review Commission (HSCRC) at the state level.

2. Methods

Institutional review board approval was obtained for this retrospective cohort study performed at Johns Hopkins Hospital, Baltimore, MD. Our study population included all surgical admissions to the gynecologic oncology service at Johns Hopkins Hospital during the study period of January 1, 2013–December 31, 2014. Prospectively collected data on unplanned readmissions were obtained from the Johns Hopkins Office of Care Coordination and Clinical Resource Management. Patients were included in the study if the index admission was for a surgical procedure requiring at least a one-night hospital stay during the study period. Patients with a planned readmission for surgery, chemotherapy or radiation treatment were excluded from the analysis.

Baseline data collected on all women admitted to the gynecologic oncology service included age, comorbidity status, body mass index (BMI), race, insurance type, primary cancer diagnosis, surgical procedure performed during the index admission, primary ostomy surgery, perioperative complications, and length of stay during index admission. The surgical procedures were listed by CPT code and verified through clinical chart review. The electronic medical charts for patients were then reviewed to obtain additional demographic, medical, and psychosocial information. Data abstracted from the inpatient chart included the admission history and physical, the nursing admission intake form, a social work screening survey (Fig. 1) and a discharge screening survey (Fig. 2). The social work and discharge screenings are institutional surveys routinely administered to all patients admitted on our hospital unit (if they will be spending at least one night in the hospital) to assess for inpatient and post-discharge patient care needs. If there are ≥1 positive findings from the questions asked on either survey, a social work and/or discharge care coordination consult is requested, respectively.

Johns Hopkins Social Work Screening Survey

Does this patient require a social work consult?

1. No social risk factors noted.
2. Anticipated need of assessment for family/social/financial support?
3. Anticipated need of competency/guardianship issues?
4. End of life or terminal Illness?
5. New diagnosis of chronic/life-altering illness?
6. Anticipated need for rehab/nursing home/subacute/dialysis placement?

Fig. 1. Johns Hopkins social work screening survey.

Medical comorbidity information was collected for all patients in the study. The Charlson comorbidity score [12] was calculated in each patient and is comprised of the following medical conditions: malignant tumor, metastases, AIDS (vs. HIV without AIDS defining illness), liver disease (including severity), hemiplegia, kidney disease (including severity), diabetes (with/without end organ damage), leukemia, lymphoma, myocardial infarction, congestive heart failure, peripheral vascular disease, dementia, cerebrovascular disease, chronic pulmonary disease, connective tissue disorders, and history of ulcer.

Psychosocial patient variables included in the analysis were tobacco and alcohol use, depression, identification of a language barrier, number of medications at time of discharge, distance from our facility, median household income, positive social work screening, and positive discharge screening. A patient's history of tobacco use, alcohol use, depression, and language barriers were assessed by nurses on the inpatient gynecologic oncology unit. All patients spending at least one night in the hospital were admitted to the gynecologic oncology unit and participated in an admission questionnaire. Queries regarding a patient's history of current or past depression and current treatment for depression were ascertained. Additionally, questions regarding the patient's primary language were administered, with a translator when necessary. A language barrier was noted if a patient's primary language was not English and/or if a translator was needed to communicate with the patient and family. The number of medications at discharge was taken from the discharge instruction form. Tobacco use, alcohol use, depression, language barrier, positive social work screening, and positive discharge screening were recorded as dichotomous variables. Patient zip code was recorded from the patient's electronic medical record and used to calculate distance from the hospital. Distance from the hospital was calculated in miles as the shortest road distance to the center of the patient's zip code using Google Maps and categorized as 0–5, 5–20, 20–100, or >100 miles. Patient zip code was then used to collect 2013 census data for median household income and used as a surrogate for socioeconomic status (SES) [13]. Median household income was categorized into quartiles.

For patients who required at least one 30-day readmission, we recorded interval time to readmission, length of hospital stay, and hospital cost for readmission from the institutional database. We analyzed readmissions in two ways: first, by calculating the readmission rate in the overall study population for all surgical

Johns Hopkins Discharge Screening Survey

Does this patient require a discharge coordination consult?

1. No discharge needs identified.
2. Anticipated complex needs?
3. Anticipated disposition other than home self-care?
4. Anticipated need for home care infusion?
5. Anticipated need for durable medical equipment?
6. Unplanned hospitalization or Emergency Department visit >1 in past 6 months?
7. Difficulty filling prescriptions in the past 12 months?

Fig. 2. Johns Hopkins discharge screening survey.