International Journal of Surgery 38 (2017) 119–122

Contents lists available at ScienceDirect

International Journal of Surgery

journal homepage: www.journal-surgery.net

Original research

The use of the Risk Assessment and Prediction Tool in surgical patients in a bundled payment program

James Slover [a], Kathleen Mullaly [b], Raj Karia [c, *], John Bendo [d], Patricia Ursomanno [e], Aubrey Galloway [f], Richard Iorio [g], Joseph Bosco [h]

[a] Adult Reconstructive Division, Department of Orthopaedic Surgery, NYU Hospital for Joint Diseases, 301 East 17th Street, Suite 1616, New York, NY 10003, USA
[b] Department Network Integration, NYU Medical Center, 360 Park Avenue South, New York, NY 10010, USA
[c] Center for Clinical Research, Department of Orthopaedic Surgery, NYU Hospital for Joint Diseases, 301 East 17th Street, New York, NY 10003, USA
[d] Vice Chair Clinical Affairs NYUHJD, Department of Orthopaedic Surgery, 333 EAST 38th Street, 6th Floor, New York, NY 10016, USA
[e] Clinical Process Optimization & Quality, Strategic Areas and Program Development, Division of Cardaic Surgery, 530 First Avenue, Suite 9V, New York, NY 10016, USA
[f] Department of Cardiothoracic Surgery, Chair of the Department of Cardiothoracic Surgery, 530 1st Avenue, Suite 9V, New York, NY 10016, USA
[g] William and Susan Jaffe Professor of Orthopaedic Surgery, Department of Orthopaedic Surgery, NYU Langone Medical Center, Hospital for Joint Diseases, 301 East 17th Street, New York, NY 10003, USA
[h] Department of Orthopaedic Surgery, Vice Chair for Clinical Affairs, NYU Center for Musculoskeletal Care, 333 East 38th Street, 4th Floor, New York, NY 10016, USA

HIGHLIGHTS

- RAPT predict discharge disposition for total joint and spine surgery patients, but not cardiac valve surgery patients, in a bundled payment program.
- RAPT is valuable for improving care coordination, directing care resources and establishing and maintaining patient and family expectations.

ARTICLE INFO

Article history:
Received 13 June 2016
Received in revised form
15 December 2016
Accepted 20 December 2016
Available online 26 December 2016

Keywords:
Risk Assessment and Prediction Tool
Arthroplasty
Total joint replacement
Cardiac valve replacement
Bundled payment
Value base care
Spinal fusions

ABSTRACT

Objectives: The purpose of this study was to evaluate the relationship between the Risk Assessment and Predictor Tool (RAPT) and patient discharge disposition in an institution participating in bundled payment program for total joint replacement, spine fusion and cardiac valve surgery patients.
Method: Between April 2014 and April 2015, RAPT scores of 767 patients (535 primary unilateral total joint arthroplasty; 150 cardiac valve replacement; 82 spinal fusions) were prospectively captured. Total RAPT scores were grouped into three levels for risk of complications: <6 = 'high risk', between 6 and 9 = 'medium risk', and >9 = 'low risk' for discharge to a post-acute facility. Associations between RAPT categories and patient discharge to home versus any facility were conducted. Multivariate analysis was performed to determine if there was any correlation between RAPT score and discharge to any facility.
Results: 70.5% of total joint patients, 80.7% of cardiac valve surgery patients and 70.7% of spine surgery patients were discharged home rather than to a post-acute facility. RAPT risk categories were related to discharge disposition as 72% of those in the high risk group were discharged to a facility and 91% in the low risk group were discharged to home in the total joint replacement cohort. In the cardiac cohort, only 33% of the high risk group was discharged to a facility, and 94% of the low risk group was discharged to home. In the spinal fusion cohort, 60% of those in the high risk group were discharged to a facility and 86% in the low risk group were discharged to home. Multivariate analysis showed that being in the high risk category versus low risk category was significantly associated with substantially increased odds of discharge to a facility.
Conclusion: The RAPT tool has shown the ability to predict discharge disposition for total joint and spine surgery patients, but not cardiac valve surgery patients, where the majority of patients in all categories were discharged home, at an institution participating in a bundled payment program. The ability to

* Corresponding author.
E-mail address: raj.karia@nyumc.org (R. Karia).

http://dx.doi.org/10.1016/j.ijsu.2016.12.038

identify discharge disposition pre-operatively is valuable for improving care coordination, directing care resources and establishing and maintaining patient and family expectations.

1. Introduction

Healthcare spending in the United States has continued to rise, and surgical services can represent a significant cost to the overall healthcare budget [1]. Surgical procedures, including total joint replacement, spine surgery and cardiac valve surgery, provide significant benefits to patients, but at substantial costs to society. [3–5] Given the need to control overall healthcare expenditures, the federal government has proposed alternate payment models designed to reward value rather than volume [2] These models cover the entire episode of care associated with a surgical procedure including post-acute care. Alternative payment model (APM's), such as bundled payment, where providers work towards providing care using a single spending target for the surgery and initial hospital stay, as well as the costs of post-acute care for up to ninety days after surgery, require increased care coordination between providers [6]. Our institution has participated in a Center for Medicare Services (CMS) Bundled Payment for Care Improvement Initiative (BPCI)for total joint replacement, spine surgery and cardiac valve surgery procedures,. Our institution was accountable for the cost of care of the index admission and all care up to 90 days after discharge.

The post-acute discharge disposition, home versus inpatient rehabilitation facility, is an important aspect of coordinating care in this period. The Risk Assessment and Prediction Tool (RAPT) [7] has previously been shown to be predictive of discharge disposition in total joint replacement patients. The purpose of this analysis is to examine the predictability of the RAPT in a patient population where the institution is participating in bundled payment program not just for total joint replacement patients, but also for spine and cardiac valve surgery patients, and where the predictability has not previously been explored.

2. Methods

2.1. Patients

Over a one year period, we prospectively assessed all patients having procedures included in our Bundled Payment Program using the Risk Assessment and Prediction Tool [8] This included elective primary unilateral total joint arthroplasty (DRG MS470, MS469), cardiac valve replacement (DRG MS216-221, MS266,267) and spinal fusion (DRG MS459-460) cases from April 2014 to April 2015. Physicians were unaware of the RAPT score, and no targeted efforts were made based on these scores, although efforts to encourage discharge to home with services, where appropriate, are increasingly prevalent in the institution.

2.2. Instrument

Each patient completed the six questions on the RAPT questionnaire as directed by a Clinical Care Coordinator (CCC) (Table 1). Each patient had a clinical care coordinator assigned to their care episode. CCC's were responsible for preoperative education, postoperative planning, and care transition management during the care episode. There was approximately 1 CCC per 200 patients annually. The total RAPT score was derived from the first six items in the RAPT questionnaire, which included age, gender, ambulatory status, use of walking aids, community support, and patient's ability to live with or without a caregiver following surgery. The questions in the score are weighted differently and the number of points assigned to each question depends on their correlation to discharge disposition. Patients were also asked whether the patient would prefer to be discharged home (non-institutional destination) or to a post-acute facility (institutional non-acute care destination). This is their preferred discharge destination. This question is not included in the total RAPT score, so the total RAPT score is between 1 and 12.

2.3. Statistical analysis

Lower RAPT scores indicate increased likelihood of needing discharge to a post-acute facility. Total RAPT scores were grouped into three levels for risk of complications: <6 = 'high risk', between 6 and 9 = 'medium risk', and >9 = 'low risk' for discharge to a post-acute facility. Associations between RAPT categories and patient discharge to home versus any facility were conducted using chi-square tests in univariate testing. Multivariate linear regression analysis was performed to determine if there was any correlation between RAPT score and discharge to any facility while controlling for age, gender and length of stay (LOS). Statistical level of significance was set a $p = 0.05$ and all statistics performed using Statistical Package for the Social Sciences Version 21.0 (SPSS Inc., IBM Corp., New York, USA).

3. Results

In total, 999 patients were analyzed. Two-hundred thirty-two patients were excluded due to missing RAPT information. Patient demographics and discharge disposition for total joints, cardiac valve and spinal fusion patients are shown in Table 2. Overall, 70.5% of total joint patients, 80.7% of cardiac valve surgery patients and 70.7% of spine surgery patients were discharged home rather than to a post-acute facility (Table 2).

Table 3 shows the RAPT score breakdown and discharge

Table 1
Items included in the Risk Assessment and Prediction Tool (RAPT) and associated score for each item.

Item	Value	Score
Age group (years)	50–65	2
	66–75	1
	>75	0
Sex	Male	2
	Female	1
Walking distance	Two Blocks or more	2
	1-2 Blocks	1
	Housebound	0
Use of gait aid	None	2
	Single-point stick	1
	Crutches/frame	0
Use of community supports	None or one per week	1
	Two or more per week	0
Caregiver at home	Yes	3
	No	0