Patient Care and Quality Improvement: Utilization of a Novel Risk Calculator to Predict Unanticipated Postoperative Readmission

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Purpose: Unanticipated postoperative readmission will be a quality-directed metric linked to CMS reimbursement. In an effort to both optimize patient care and prevent negative financial implications, we have identified patient risk factors that contribute to unanticipated postoperative readmissions for plastic surgery patients. Building on this knowledge, the aim of this curret study is to create a risk index calculator to quantifiably predict the likelihood of 60-day postoperative readmissions.

Methods: An IRB approved retrospective review was done evaluating 671 randomly-selected patients undergoing procedures with the Plastic & Reconstructive Surgery service at our institution between January 1, 2013 and December 31, 2014. 60-day postoperative readmissions were identified for 58 (8.6%) patients. Logistical regression and backward variable selection with an inclusive p-value <0.30 yielded patient age, BMI, same-site procedure, renal disease, thyroid disease, CAD, COPD, and history of malignancy as variables associated with readmission.

Results: We used a linear combination rule with the associated variables associated with readmission to create a risk index calculator (Figure 1). The product of the risk calculator yields a Risk Index Value (RIV). The RIV corresponds to a Predicted Percentage (PP) representing the probability of a 60-day postoperative readmission (Figure 2).

Conclusion: Patient risk factors associated with unanticipated postoperative readmissions can be used to calculate the percentage likelihood of 60-day postoperative readmission. With this information, practitioners can provide appropriate resources for patients at increased risk of readmission ultimately satisfying quality-directed metrics linked with CMS reimbursement as well as optimizing the delivery of patient care.

Figure 1:

Risk Calculator Equation
(-) 2.5309
+ Age x 0.0127
+ BMI x 0.041
+ Same Site (Yes = 1, No = 0) x 0.4427
+ Renal Disease (Yes = 1, No = 0) x 0.499
+ Thyroid Disease (Yes = 1, No = 0) x 0.392
+ CAD (Yes = 1, No = 0) x 0.3743
+ COPD (Yes = 1, No = 0) x 0.4644
+ History of Malignancy (Yes = 1, No = 0) x 0.4644
= Risk Index Value, RIV

Figure 2:

Risk Index Value	Predicted Percentage	Risk Index Value	Predicted Percentage
-2.2	1-10%	0.41	51-60%
-1.39	11-20%	0.85	61-70%
-0.85	21-30%	1.39	71-80%
-0.41	31-40%	2.2	81-90%
0	41-50%	2.21+	90+%