

EDITORIAL COMMENT

# Percutaneous Coronary Intervention Readmissions



## Where Are the Solutions?\*

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Percutaneous coronary intervention (PCI) is one of the most commonly performed procedures in the United States, and is associated with high readmission rates. Although several studies have shown the association between PCI and 30-day readmissions in the last decade (1), the validity of this measure as a quality metric remains debatable. Importantly, no clear solutions to have an impact on post-PCI readmissions have been identified. In this issue of *JACC: Cardiovascular Interventions*, Kwok et al. (2) once again report data on 30-day unplanned readmissions from 824,747 patients undergoing PCI between 2013 and 2014 in the U.S. Nationwide Readmission Database.

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In this study, the investigators report a 9% rate of unplanned readmissions at 30 days. The predictors of readmission included older, female patients, and patients who were admitted to the hospital on a weekend. In addition, patients who were readmitted within 30 days had more frequent stroke or transient ischemic attack, acute kidney injury, major bleeding, blood transfusion requirement, and vascular complications. Independent predictors of unplanned readmission included patients self-discharging against medical advice, or patients transferred to either a short-term hospital, a care home, or to another

institution. Interestingly, no insurance status was also associated with decreased odds of an unplanned 30-day readmission. The major strengths of the analysis include the completeness of data, its representation of the Medicare, Medicaid, private and uninsured patient population, and segregation of planned from unplanned readmissions. However, a major limitation is the unavailability of granular insights to better define appropriate and inappropriate readmissions.

Clearly, readmissions are costly, and when possible, should be avoided; however, reducing appropriate readmissions may come at a cost. Indeed, the Veterans Affairs Clinical Assessment, Reporting and Tracking (VA CART) program has demonstrated a lack of correlation between 30-day readmission and mortality at the facility level, implying that quality improvement at the facility level will not modify mortality in this high-risk demographic (3). In addition, recent data from 115,245 fee-for-service Medicare beneficiaries across 416 U.S. hospitals participating in the American Heart Association Get With The Guidelines-Heart Failure registry showed that the 30-day risk-adjusted readmission rate declined from 20% before the implementation of the Hospital Readmission Reduction Program (HRRP) to 18% in the HRRP penalties phase (4). However, during the same duration between January 2006 and December 2014, there was a concomitant increase in the 30-day risk-adjusted mortality rate from 7.2% before the HRRP implementation to 8.6% in the HRRP penalties phase (4). How can we reduce inappropriate readmissions and impact important clinical outcomes such as mortality? Identifying patients at high risk is the first step in reducing PCI-related readmissions. There is now an abundance of risk models that are available for hospitals to better screen patients pre-PCI who may be at a higher risk for readmission.

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Minges et al. (5) linked data from the CathPCI Registry-participating hospitals to Medicare fee-for-service claims between January 2007 and December 2009, and developed a 14-point risk score to predict 30-day readmission after PCI for Medicare patients (N = 388,078). Patients with a score of  $\geq 13$  (15%) had an 18.5% readmission risk, compared with those with a score  $\leq 6$  (42%) that had an 8% readmission risk (5). Thus, better optimization of comorbid conditions and streamlining of discharge disposition based on pre-PCI risk-adjusted readmission screening may guide clinical decision making and resource allocation at the time of hospital discharge.

Beyond risk models and identifying high-risk patients for readmission, how can we apply the insight and the vast knowledge gained from the work published by Kwok et al. (2) in reducing PCI readmissions? An interesting finding of the current analysis was the lower readmission rate among those with private insurance and the uninsured. Although the exact mechanism for this is unknown, it is possible that patients who are uninsured have a higher threshold for seeking emergent medical care. Beyond addressing patient-related anxiety, educating

allied health care professionals and post-care facilities may also reduce readmissions.

In conclusion, data on readmissions alone without further insights into appropriate versus inappropriate readmissions leaves us wanting more. Although we should strive to reduce all readmissions, developing risk models that identify patients at risk for inappropriate readmissions is a priority. In addition, a comprehensive approach that extends patient care from the hospital facilities to patients' homes in a continuum will be indispensable to curb inappropriate readmissions. Lastly, depending on institution, 20% to 50% of PCIs are performed as same-day discharge or in observation status, and therefore are not included in readmission data. Because the percentage of these patients is increasing in most programs, quality efforts should also focus on understanding the factors that lead to re-hospitalization and admit status for this group of patients.

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