

Potentially Preventable Readmissions in Rural Hospitals

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Background

- About 18% to 20% of Medicare beneficiaries who are discharged from a hospital are readmitted within 30 days. U.S. health care spending associated with potentially preventable readmissions has been estimated at \$12 billion to \$17.4 billion (MedPAC, 2007; Jencks et al., 2009).
- Readmission rates vary significantly across hospitals and states as well as across diagnoses, even after adjusting for disease-specific and severity-related differences. Unexplained variation in readmission rates suggests that opportunities exist to improve the quality of care and decrease waste (MedPAC, 2007).
- Hospital readmission rates differ depending on how they are defined. For example, rates are affected by the post-discharge time period examined, which diagnoses are included, whether all readmissions are counted or only those deemed to be “potentially preventable,” the risk adjustment methods used, whether the rates are calculated only for Medicare patients or for all patients, whether rates are calculated annually or over multiple years, and the treatment of transfers and readmissions to a different hospital than the initial admission.
- MedPAC (2007) has recommended publicly reporting hospital-level readmission rates for a select set of conditions and using Medicare payment policy to encourage hospitals to reduce readmissions. Florida is reporting hospital-level potentially preventable readmission rates for all patients for acute myocardial infarction (AMI), heart failure, and pneumonia (Goldfield et al., 2008); CMS has added 30 day risk-adjusted readmission rates for these three conditions of Medicare beneficiaries to the list of quality measures that will be publicly reported in *Hospital Compare*.
- Studies have not specifically addressed rural hospital readmission rates, except for Weeks et al. (2008), who compared readmission rates for older rural and urban veterans. Jencks et al. (2009) did not include data on Critical Access Hospital discharges in their study of readmission rates for Medicare beneficiaries; they focused on hospitals with 1,000 or more annual Medicare discharges.

Rural Issues Related to Readmissions

- The low volume of admissions in many small rural hospitals may limit the usefulness of condition-specific readmission rates as hospital-level quality measures, especially if patients who are transferred to another hospital during their initial episode of illness are excluded.
 - CMS has selected 25 as the minimum number of cases for calculating AMI, HF, and pneumonia readmission rates, and is using three years of Medicare data to improve the reliability of rates (CMS, 2009a).
 - Calculation of multiyear readmission rates improves the reliability of the rates for smaller facilities, but creates a long lag time before the impact of efforts to reduce readmissions can be measured.
- On average, rural hospitals admit a significantly higher proportion of Medicare beneficiaries and are more reliant on Medicare payment. Consequently, all other factors being equal, Medicare reimbursement penalties or rewards associated with readmission rates will have a disproportionate impact on rural hospitals.

Potentially Preventable Readmission Rates for Rural Hospitals

- We calculated potentially preventable readmission rates for two groups of hospitals: all rural hospitals and all urban hospitals in five states with rural populations (Iowa, Maine, North Dakota, Oregon and Utah) using 2004 and 2005 Medicare data and 3M Potentially Preventable Readmission (PPR) software.

Policy Issues and Recommendations

- Policy initiatives to reduce high readmission rates need to address the role of other providers in addition to hospitals in preventing readmissions. Physicians, other health care professionals, and post-acute providers such as skilled nursing facilities and home health agencies, along with patients and caregivers should share responsibility for preventing unnecessary readmissions in both rural and urban communities.

Table 1. Rates of Potentially Preventable Readmissions per 10,000 Patients after 15, 30, 60, and 90 Days for Rural and Urban Hospitals in Five States

	15 day	30 day	60 day	90 day
Rural Hospitals Unadjusted Rate	749	1,096	1,503	1,760
Urban Hospitals Unadjusted Rate	738	1,083	1,475	1,730
Urban Hospitals Rate Adjusted for Patient Age Relative to Rural Hospitals	748	1,093	1,492	1,743
Urban Hospitals Rate Adjusted for Patient Severity Relative to Rural Hospitals*	764	1,120	1,536	1,796

* $p < .05$ Data Source: 2004-2005 MedPAR data for Iowa, Maine, North Dakota, Oregon and Utah.

- Our preliminary analysis indicates that the unadjusted readmission rates for rural hospitals are higher than for urban hospitals in these five states (Table 1). After adjusting for patient age, urban hospital readmissions rates are very similar to those of rural hospitals. After adjusting for patient severity, urban hospital readmission rates are significantly higher than rural hospital rates for each time period.
- Table 2 shows the most common initial diagnoses for patients in rural hospitals and urban hospitals who are readmitted to any hospital within 30 days. All of the ten most common diagnoses for patients in rural hospitals who are later readmitted are medical conditions, while the ten most common diagnoses for urban hospitals include both medical and surgical conditions.
- Five conditions are in the top ten most common diagnoses for patients in both rural and urban hospitals who are readmitted within 30 days: pneumonia, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), arrhythmia/conduction, and schizophrenia.
- Compared to urban hospitals, patients at rural hospitals had significantly higher unadjusted readmission prevalence for pneumonia, CHF, angina/atherosclerosis, AMI, schizophrenia, and non-bacterial gastroenteritis.

Limited access to post-acute care services such as home health care may hamper efforts to reduce hospital readmissions in some rural communities.

- Strategies such as payment bundling, patient-centered medical homes, and improvements in care transitions and accountable care organizations (ACOs) could potentially reduce hospital readmission rates by improving care coordination and efficiency of care.
 - A CMS demonstration project is assessing the feasibility of bundled payments for acute and post-acute care episodes (CMS, 2007).
 - A variety of organizations, including public and private insurers, have initiated medical home demonstration projects around the country (Carrier et al., 2009).
 - CMS (2009b) recently funded pilot “Care Transitions” projects in 14 communities, led by Quality Improvement Organizations, to reduce rates of hospital readmissions and fragmentation of care.
 - MedPAC (2009) has suggested that the Medicare program consider implementing ACOs composed of a hospital, primary care physicians, and specialists that would have joint responsibility for the quality and cost of care provided to a large Medicare patient population.

Table 2. Rank and Prevalence of 30 Day Unadjusted Readmissions for Most Common Initial Diagnoses in Rural and Urban Hospitals in Five States

Diagnosis (APR-DRGs)	Rank		Percentage of Patients Readmitted in 30 Days	
	Rural Hospitals	Urban Hospitals	Rural Hospitals	Urban Hospitals
Pneumonia	1	3	11.2***	9.8
Congestive Heart Failure (CHF)	2	2	15.8*	14.9
Chronic Obstructive Pulmonary Disease (COPD)	3	4	14.8	14.1
Arrhythmia/Conduction	4	10	10.9	10.1
Kidney/Urinary Tract Infection	5	15	10.5	10.0
Angina/Atherosclerosis	6	28	9.7***	7.8
Acute Myocardial Infarction (AMI)	7	13	15.8*	13.9
Schizophrenia	8	8	21.8**	18.8
Septicemia	9	20	11.6	12.0
Non-Bacterial Gastroenteritis	10	40	11.2*	9.9
Percutaneous coronary intervention (PCI)without AMI	28	1	12.7	11.6
Knee Joint Replacement	14	5	5.1**	6.0
PCI with AMI	43	6	18.9**	15.2
Other Vascular Procedures	41	7	15.6	16.1
Bowel Procedures	16	9	11.6*	13.1

Data Source: 2004-2005 MedPAR data for Iowa, Maine, North Dakota, Oregon and Utah.

*Differences between rural and urban hospitals are significant at $p < .05$

**Differences between rural and urban hospitals are significant at $p < .01$

***Differences between rural and urban hospitals are significant at $p < .001$

- To the extent that demonstrations and pilot projects of these strategies focus on urban communities and large integrated delivery systems, it may be difficult to translate their findings to rural environments. Rural demonstration projects are needed to identify models that will succeed in rural settings.
- Implementation of these strategies needs to take into account differences in urban and rural health care systems. For example, MedPAC (2009) suggests that ACOs could be formed from an integrated delivery system, physician-hospital organization, or academic medical center, and concludes that ACOs would have to have a minimum of at least 5,000 patients. These characteristics suggest that alternative models would need to be considered for rural areas that are less-densely populated and where providers are not formally linked. Similarly, Town et al. (2009) describe several challenges that rural providers face in participating in a bundled payment initiative (e.g., different incentives in cost-based reimbursement and bundling; difficulty in “virtually” integrating when rural patients receive hospital and post-acute care in geographically dispersed facilities; negotiation disadvantages for rural hospitals with few post-acute care options); and suggest actions that policymakers could take to facilitate rural participation (e.g., developing risk and volume-adjusted performance criteria for contracts; providing contract guidance and technical support for small rural providers; carving out CAH post-acute services; or creating a “fixed-bonus” payment to support continued operation of CAHs).
- As MedPAC (2007) has noted, improving patient safety in hospital settings, improving communication with patients before and after discharge, and improving communication with community physicians and post-acute care providers can lower readmission rates. It is important to examine the rural context for these efforts. For example, we have developed and field-tested quality measures addressing provider communication about rural patients who are transferred between health care settings.

- To help inform the policy debate about readmissions of rural patients, we are currently conducting additional research using national Medicare data to assess how hospital and patient attributes affect potentially preventable hospital readmission rates for heart failure, pneumonia, and chronic obstructive pulmonary disease. This analysis will be completed in fall 2009.

Additional Information about Study Methods and Data

The analysis in this policy brief utilized a model developed by 3M Health Information Systems for identifying potentially preventable readmissions using hospital claims data. Based on an extensive review of the existing permutations of diagnoses for index hospitalizations and readmissions, the 3M PPR model determines the likelihood that a given readmission diagnosis is related to the index hospitalization and thus potentially preventable. The analysis excluded readmissions due to unrelated causes, transfers and deaths, and adjusted rates for patient age and severity. UMRHRC researchers received permission from 3M to use the PPR software to analyze Medicare claims data.

The 2004–2005 MedPAR data used in this analysis were originally obtained for an AHRQ Building Research Infrastructure and Capacity (BRIC) Program grant to the Center for Rural Health at the University of North Dakota. Permission was obtained from CMS to reuse the data for this analysis. For additional information about the 3M PPR model, see Goldfield et al., 2008.

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