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Care transitions in a changing healthcare environment

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Abstract

Readmissions are a significant element in the ongoing healthcare debate, and new evidence suggests that high readmissions can be a surrogate marker for poor quality healthcare. Additionally, although readmissions can offer a financial incentive for some hospitals, that model is being phased out; readmissions in a pay-for-performance or bundled payment model represent significant financial risk for providers and hospitals. Although no specific strategy at discharge has proven to be effective in reducing readmissions, practices that include good posthospital communication to the patient and care team, access to follow-up, and attention to mobility and self-care deficits are important factors in limiting readmissions. PAs play a key role in assessing for high readmission risk and implementing prevention strategies in real time.

Graphical Abstract

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Keywords

readmission risk; healthcare quality; pay-for-performance; communication; follow-up; care transitions

Discussion of hospital readmissions has typically focused on their cost implications, but high hospital readmissions are increasingly recognized as representing poor quality care.[1,2] Rates of 30-day readmission for Medicare beneficiaries are near 20%, and 90-day readmissions are up to 34%.[3] The Medicare Payment Advisory Committee estimates that improvements in the safety of transitions from hospital to home could prevent up to one-third of unplanned readmissions. Through provisions in the Patient Protection and Affordable Care Act (ACA), the Centers for Medicare and Medicaid Services (CMS) has mandated reduced payments for hospitals with 30-day readmission rates above the projected value for target conditions.[2] Within the present fee-for-service model, readmissions may still be in a hospital's best financial interest, as penalties for readmissions are often lower than the revenue they produce.[4] However, as hospitals move from fee-for-service volume-based care toward population-focused value-based care, unplanned hospital readmissions will lose their financial ambiguity and become an area in which hospitals need to control cost.

Unfortunately, solutions are complicated; research suggests that many readmissions are driven by factors beyond hospital control, such as mental illness and poverty.[5] This article will discuss the value of measuring hospital readmissions as a surrogate for quality of care, make the cost-reduction case for lowering readmissions, and offer practical tools to help physician assistants (PAs) reduce hospital readmissions.

COSTS OF REHOSPITALIZATION

Healthcare policy experts point to readmission reduction as a means to eliminate wasteful spending.[1] At the same time, many hospitals rely on the revenue generated from readmissions to maintain their operating margin. Up to 12% of Medicare patient hospitalizations are due to readmission.[4] Although penalties for high readmission rates can be steep, legislation and program logistics capped the penalties at a 1% reduction in Medicare payments to hospitals in 2013, eventually rising to 3% in subsequent years.[4,6] Given that readmission reduction strategies have significant short-term costs, the long-term rate of return for organizations implementing a successful readmission program ranges from 41% to 112%.[6] The combination of loss of current income combined with the unclear future return on investment of implemented readmission strategies give hospitals little financial incentive to reduce readmissions. Policymakers will need to carefully balance developing short-term support for hospitals mandated to improve readmission rates while maintaining long-term incentives for organizations to willingly change their delivery models to an episodic or performance-based system.

More importantly, unplanned hospital readmissions have been posited, amidst debate, as a surrogate marker for overall poor quality of care for adults.[5,7,8] Readmission negatively affects patient function and quality of life.[5,7,8] About one-third of inpatients over age 70 years leave the hospital with a new impairment in their activities of daily living (ADLs) or instrumental activities of daily living (IADLs).[9,10] This occurs despite patient recovery from the medical illness that led to hospitalization. Well-described “hazards of hospitalization” for older adults stem from immobility, muscle loss, bone resorption, and vasomotor instability.[11] Prognosis for functional recovery is poor; at one year, 41% of older adults with a new hospitalization-related ADL deficit have died, and 28% have not regained baseline function.[12] More than half of disability in older adults requiring long-term care begins at hospitalization.[10,12] Recurrent hospital admissions are also associated with higher mortality.[13] Thus, recurrent hospitalization carries high risk for morbidity and disability, leading to loss of independence and death—unwelcome events for previously functional older adults.

The ACA’s hospital readmission reduction program reduces Medicare reimbursements for hospital systems nationwide whose readmissions for target conditions fall above the expected rate.[14] Specifically, this program measures hospitals’ risk-standardized all-cause 30-day readmission ratio following index hospitalizations for the targeted conditions of heart failure, acute myocardial infarction (AMI), or pneumonia. Readmission reduction is part of CMS’s current strategic plan. Chronic obstructive pulmonary disease (COPD) and stroke readmissions are proposed for fiscal year 2016 (October 1, 2015, to September 30, 2016), with vascular surgery and joint replacements being considered as other potential targets.[2,14] Under this system, hospitals with unfavorable readmission ratios incur payment penalties, which reduce Medicare base reimbursements for inpatient services rendered for all diagnosis-related groups.[2]

PATIENT-SPECIFIC RISK FACTORS

The system is clearly moving toward defining target readmission rates for all conditions. Therefore, PAs must become comfortable identifying patients at highest risk for adverse reactions during a care transition. Readmissions prediction generally is split into two major divisions: individual patient characteristics and breakdowns in systems of care. The best studied patient-specific risk factors for avoidable readmissions include admission diagnosis, comorbidity, sociodemographic factors (age, race, ethnicity, and sex), and social determinants of health (socioeconomic status, caregiver support, marital status, literacy, and health literacy).[15–25]

Admitting diagnosis and comorbidities

Patient medical history and comorbidities contribute to rehospitalizations. Heart failure is the most likely admitting diagnosis after discharge for any condition.[3] Higher readmission rates after acute MI, pneumonia, and heart failure have led to the initial targeting of these admitting diagnoses to reduce readmissions.[26] Measures of severity of illness, including acuity at admission, length of stay, clinical measures specific to the disease process, or medical complications after a surgical procedure, may each increase risk.[15,17,24,27,28] Diagnoses such as diabetes and hypertension, asthma, coronary artery disease, and chronic pulmonary disease have progressive courses, complex management, and the potential for exacerbations.[3,28–31] However, the most commonly cited medical risk for readmission is a patient's total comorbidity burden.[15,17,24,27,32] Comorbidity often is defined by a patient's score on the Charlson Comorbidity Index, a method of estimating overall prognosis for patients who experience multiple comorbid conditions.[33] The higher the score, the more likely the predicted outcome will result in mortality or higher resource use. Although the presence of specific diseases may contribute to readmission, disease severity and burden of diseases do not alone explain rehospitalization risk.

Depression and mental illness

Mental illness has long been recognized as a risk factor for nonadherence in chronic disease management, leading to recurrent rehospitalization and poorer outcomes.[5,34] Depression is included in many risk prediction models but is nevertheless underrecognized as a target for inclusion in readmissions intervention trials for older adults.[18,35,36] Depression increases risk of rehospitalization as much as threefold for high-risk older adults.[37,38] Schizophrenia, bipolar disorder, and substance abuse each markedly increase readmission risk.[39]

Cognitive and physical functional impairment

Cognitive impairment at hospital admission may range from 15 to 35% of older adults, yet healthcare providers recognize fewer than 40% of cases.[40,41] Older adults with dementia have high healthcare use rates, undergo multiple care transitions, and suffer higher mortality.[42,43] The significance of functional impairment to prognosis and mortality is increasingly recognized, particularly with respect to walking speed, mobility, and dependence in ADLs and IADLs.[44,45] Dependence in ADLs and IADLs and poor mobility correspond to a higher risk of hospital readmissions.[46–48] Mobility and functional

dependence clearly relate to poorer prognosis and represent a common outcome for disparate chronic progressive diseases.[49,50]

Cues that older adults with serious chronic disease are nearing the end of life include worsened mobility and functional status.[50,51] Recurrent readmissions may serve as a marker that any patient with a serious chronic illness is nearing the end of life.[13] Often, this marker goes unnoticed. Proper prognostication and effective communication during hospital stays and in ambulatory services can lead to appropriate palliative care and hospice, which improve quality of life and reduce risk of readmission for older adults at the end of life.[52]

Demographics and social determinants of health

Social factors such as older age, male sex, and minority status have been linked to increased 30-day readmission risk.[3,20,53,54] Older adults who are unmarried or who live alone have shown higher risk for readmission; strong social support is associated with lower readmissions.[19,22,23,55,56] Lower socioeconomic status has demonstrated inconsistent results.[19,23,57] Low health literacy increases readmission risk, leading to its regular inclusion as a target for interventions.[21,58–62] However, health literacy's link with education, minority status, socioeconomic status, and insurance status demonstrate the complexity of addressing these interrelated social variables. The most effective interventions promote self-advocacy and early social services involvement for caregivers to mitigate social vulnerabilities for older adults experiencing healthcare transitions.[60]

SYSTEM-LEVEL RISK FACTORS

Comprehensive medication management

Unplanned rehospitalization also is linked to health system issues.[63–66] The most common system-level risk is medication errors due to ineffective medication reconciliation at the time of transition.[67] Hospitalization results in an average of 3.1 medication changes for older adults, which can lead to challenges with medication adherence in the postacute period.[68,69] The highest risk medications are insulin, other hypoglycemic agents, and cardiovascular agents such as warfarin and clopidogrel.[36] Poor communication about dosage, timing, or use with other drugs or substances may lead to adverse reactions. Patients also struggle on discharge with access to medications, particularly high-cost medications.[67,70] Comprehensive medication management at hospital admission and again at discharge reduces adverse reactions and readmissions.[70,71]

Communication and access

Communication errors cut across multiple phases of hospitalization. Fewer than 20% of hospitalizations result in direct communication between inpatient and outpatient providers.[72] Systems errors and discontinuity across multiple silos of care are considered characteristic of low-quality care transitions.[63,69,73] Discontinuity of care across inpatient and postacute realms may lead to diagnostic errors.[57] For example, up to 40% of patients leave the hospital with test results still pending.[57,74,75] Unless ambulatory providers know to follow up results, patients are at risk for avoidable readmission.[65,69] Once the patient arrives in the provider's office, the discharge summary often is not available or if it is, it may not include

core information about the hospitalization that the provider needs to assume care of the patient.[72,76] In addition to these communication deficits, access to care is also a challenge for patients seeking follow-up care, whether through transportation difficulties or trouble booking a timely appointment.[65,77]

Geographic trends

Geographic variability in 30-day readmissions has been explored as a function of healthcare access, hospital use patterns, and disease prevalence. Geographic variation in index hospitalization rates coincide with the readmission rates, the implication being that communities with heavy use of hospital resources have a culture that leads to readmission.[78] Readmission rates decrease in areas where community-based efforts to promote population health have been developed, supporting a role for preventive medicine and community partnership.[79] Higher readmission rates occur in states with greater income inequality.[80] Review of state-by-state variation in readmission rates reveals that regions with the highest rates of readmission also demonstrate the highest rates of obesity, diabetes, and cardiovascular disease.[3,81] Thus, geographic variation in readmission patterns coincides with similar geographic variability in socioeconomics, healthcare use patterns, and patient-level comorbidity patterns. This supports the notion of readmissions being a marker of a community's overall health and habits.

RISK ASSESSMENT AND INTERVENTION

With quality metric groups and healthcare financing agencies examining readmissions, tools geared toward identifying high-risk groups and tools with interventions aimed to reduce the risk of readmissions have proliferated and have been endorsed by national health policy-makers.[4,35,81,82] Systematic review shows that most of these interventions have had uneven success.[36] A meta-analysis of 43 studies found that no specific intervention showed significant effect, although interventions that included patient-centered discharge instructions and postdischarge phone calls showed a positive trend.[36] Available tools may focus on risk prediction or on interventions, with most of the best-known tools incorporating both functions. The components of a successful intervention have also been the subject of much exploration. Coleman and Naylor were early leaders in developing risk assessment and prevention tools to reduce readmissions.[83,84] Specifically, Coleman's early work focused on the Four Pillars:

- effective use of the medical health record
- timely follow-up
- patient-centered education emphasizing the identification of red flags that signal impending complications
- medication self-management.[70]

Coleman's Care Transitions Intervention (CTI) is a self-care tool supported by an interdisciplinary team of healthcare professionals working in collaboration with patients and caregivers.[6] The CTI has been shown to reduce readmissions by up to 30% in specific populations. Both the Naylor nurse practitioner-based model and Coleman's CTI involve

interdisciplinary healthcare teams, requiring significant upfront financial investment that may be difficult for community programs to emulate. However, models of population-based healthcare reimbursement structures suggest a clear positive return on investment using Coleman's methods in the future.[83]

Several additional risk assessment tools have had both high degrees of visibility and use, including Project BOOST, the Mayo Clinic Early Screen for Discharge Planning algorithm, the HOSPITAL screening tool developed at Brigham and Women's Hospital, and Project Red.

Project BOOST

Developed by the Society of Hospital Medicine, Project BOOST includes a risk assessment component, suggested interventions, and technical support from an expert mentor. The BOOST assessment is focused on the 8 P's: polypharmacy, prior hospitalizations, problem medications, psychological comorbidities, primary diagnosis, poor health literacy, poor patient support, and palliative care.[85] The BOOST tool identifies patients with these characteristics who are more likely to be readmitted; the BOOST intervention component identifies measures to mitigate each factor, enacted by a specific interdisciplinary team member who also teaches the patient compensation strategies.[85] BOOST further creates a network of resources for providers using its system by linking participating institutions with patient and provider education materials, physician mentors, and a support community of other member organizations. When used together, the assessment and intervention tools have been found to reduce readmissions by up to 15%.[85] Limitations include the requirement that institutions buy both tools as a packaged product, a significant upfront cost for the medical center.[85]

Mayo Clinic Early Screen for Discharge Planning Algorithm

This algorithm is based on a review of more than 900 patients in the Mayo Clinic system over a 4-year period. The researchers analyzed 24 different variables that required specialized services at discharge.[86] From the data, researchers found the following variables to be predictive of problems after discharge: advanced age, functional disability, living alone, and self-reported ambulation deficits.[86] The Mayo team developed a predictive model to alert providers to patients at high risk for needing additional services at discharge. When combined with the Rankin Disability Score and embedded in the electronic health record, the algorithm helped Mayo Clinic reduce readmissions by 20%.[87] Limitations include generalizability, as the predictive tool has only been used in one healthcare system.

HOSPITAL model

This model identifies seven factors found in patients at high risk for readmission within 30 days.[88] By connecting the factors to the HOSPITAL acronym (Table 1) researchers were able to combine a reasonably easy to recall tool with fair discriminatory ability. Limitations of this model include its applicability across diverse populations (the initial research involved one health system). In addition, the tool is drawn from aggregate medical record data, and therefore does not include known patient-level risk factors such as mobility, health literacy, social support, or medication adherence.[88] The other main limitation is that the HOSPITAL model is simply a stratification tool that lacks an intervention component.

Project RED

Project RED is sponsored through a partnership between Boston University, the Agency for Healthcare Research and Quality, and the National Heart, Lung and Blood Institute. The goal of the program is to overhaul current discharge processes and replace them with 12 evidence-based strategies to reduce ED visits and readmissions. The strategies were developed after an intensive review of discharge practices including gap analysis, failure mode effect analysis, process engineering, and root cause analysis. The resultant product has been shown to reduce readmissions by up to 30%.[89] The primary limitation is the question of applicability at other sites of care.

GENERAL APPROACH

Apart from the structured available tools, individual providers can take steps in their own practices to ensure a smooth transition at discharge and help reduce readmissions. Kripalani suggests four core elements are critical to a successful discharge: communication between inpatient and outpatient provider, accurate medication reconciliation, effective patient-provider communication, and recognition and management of self-care deficits.[72] Table 2 summarizes sensible approaches for providers to take to lower the chance of readmission. Other successful strategies include integrating an interprofessional team of hospital and community resources such as case management, physical and occupational therapists, home healthcare agencies, and long-term care facilities; incorporating “teach-back” methods into standard patient education; and appropriately using hospice and palliative care resources in the community. Together, these may foster a truly patient-centered approach to help reduce hospital readmissions.

CONCLUSION

Hospital readmissions are a significant financial cost to the healthcare system, and a surrogate marker for poor quality care. Hospital readmissions result from many different patient-specific risks and system-level risks, such as medication errors and poor patient access to follow-up. Care transition processes that are patient-centered and team-coordinated are most effective in preventing and reducing hospital readmissions. **JAAPA**

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Learning objectives

- Explain the concept of and the major contributors to hospital readmissions.
- Discuss concepts that identify the risks for and methods to reduce hospital readmissions.

Key points

- Hospital readmissions are a significant financial burden to the healthcare system and a surrogate marker for poor quality care.
- Hospital readmissions are a result of many different patient-specific risks and system-level risks.
- Care transition processes that are patient-centered, team-coordinated efforts are the most effective way of preventing and reducing hospital readmissions.

TABLE 1.

HOSPITAL tool to screen for readmission risk[88]

Factor	Points
Hemoglobin <12	1
Oncology service discharge	2
Sodium <135	1
Procedure performed during hospitalization	1
Index admission	1
Type of admission (emergency)	1
Admissions during last 12 months:	
• 0	0
• 1-5	1
• >5	5
Length of stay >5 days	2

Scoring: 0-4 points, low risk; 5-6 points, intermediate risk; >7 points, high risk.

TABLE 2.

Suggested provider interventions

Follow-up
• Contact outpatient provider to review care and inform of required outpatient follow-up
• Timely and properly routed discharge summary
• Reconcile outstanding test results
• Early referral to hospice or palliative care if applicable
Medications
• Careful medication reconciliation
• Avoid polypharmacy/high-risk medications
• Close monitoring for adverse reactions to new medications
Communication
• Effective patient-provider communication
• Communicate with caregivers and family members
• Communicate effectively with all team members
Functional assessment
• Engage interprofessional team (physical therapy, occupational therapy, speech therapy, case management, social work) to access function deficits and discharge barriers