

## Patient Safety Tip of the Week

February 17, 2015

# Functional Impairment and Hospital Readmission, Surgical Outcomes

It's been just over 2 years since Harlan Krumholz described the "Post-hospital syndrome—an acquired, transient condition of generalized risk" ([Krumholz 2013](#)). He described that recently hospitalized patients experience a period of generalized risk for a range of adverse health events and called this a post-hospital syndrome, "an acquired, transient period of vulnerability". He suggested that the "the risks in the critical 30-day period after discharge might derive as much from the allostatic and physiological stress that patients experience in the hospital as they do from the lingering effects of the original acute illness". This state leaves patients vulnerable to readmission, often for conditions different from that of the index hospitalization.

He went on to describe some of the likely factors contributing to this reduction of functional reserve, including metabolic derangements, disturbed sleep patterns, nutritional factors, cognitive factors, pain and other discomforts, etc.

Obviously, there is considerable overlap here with the concept of **frailty** and reduced physiologic reserves, which we have discussed in many columns (see the full list at the end of today's column). In addition, **functional impairment and functional dependence** are related to frailty and are part of the same spectrum. Yet these have generally received much less attention than frailty (other than in the long-term care literature).

Now a new study has looked at the impact of **functional impairment**, as measured by difficulty with instrumental activities of daily living (IADL) or activities of daily living (ADL), on readmission rates for seniors ([Greysen 2015](#)). The researchers found a progressive increase in the adjusted risk of readmission as the degree of functional impairment increased.

Activities of daily living (ADL) include bathing, dressing, transferring, toileting, and eating. Instrumental ADL's (IADL) require higher levels of functioning and include things like managing finances, shopping, using the phone, taking medications as prescribed, preparing meals, and using transportation.

Greysen and colleagues found a progressive increase in the adjusted risk of readmission as the degree of functional impairment increased: 13.5% with no functional impairment, 14.3% with difficulty with 1 or more instrumental activities of daily living, 14.4% with difficulty with 1 or more ADL, 16.5% with dependency in 1 to 2 ADLs, and 18.2% with dependency in 3 or more ADLs.

Subanalysis for those conditions targeted by Medicare (ie, heart failure, myocardial infarction, and pneumonia) revealed the same trend with larger effects (16.9% readmission rate for no impairment vs 25.7% for dependency in 3 or more ADLs, a 70% increase in risk of readmission).

Many of our columns on frailty have focused on outcomes in patients undergoing surgery. While frailty and functional dependence are two separate entities, they are very much interrelated and part of the same spectrum. Though frailty risk assessments are generally simple, they are not routinely captured on hospitalized patients, whereas functional assessments are often captured (for example, in nursing assessments). Another set of researchers ([Scarborough 2015](#)), therefore, looked at functional status and its impact on patients in the ACS-NSQIP database who underwent complex general or vascular operations over a 5-year period. Compared to a propensity-matched cohort, dependent patients had 1.75-fold greater odds of postoperative death than functionally independent patients. They also had a significantly higher incidence of major morbidity (51% higher), failure-to-rescue, and reoperation compared to functionally independent patients. The authors strongly recommend that functional status assessment become a routine part of the preoperative assessment. They note that in some cases the functional impairment might be able to be modified in the preoperative period (eg. through physical therapy). It would also identify a group of patients likely to need additional services postoperatively and at discharge. And it would provide patients and physicians a more realistic expectation of outcomes.

In an editorial accompanying the Scarborough study Robinson and Rosenthal ([Robinson 2015](#)), names you'll recognize from the frailty literature, note that 14 new geriatric focused variables are being collected by 23 NSQIP medical centers in a pilot project. The hope is that these will be used to quantify frailty accurately in older adults and further expand on the already considerable evidence base on the relationship between frailty and surgical outcomes.

Burke and Jha ([Burke 2015](#)), commenting on the Greysen study, note that hospitals serving a patient population with more functional dependency will have a more difficult time reducing readmissions. However, they note that functional dependency and preventing declines in functional dependency are obviously very important to patients and their families and would actually be excellent quality metrics for health systems and accountable care organizations.

We've long considered assessment for frailty to be one of the three most important components of a good preoperative assessment (the other two being assessments for

delirium risk and obstructive sleep apnea). We also mentioned assessment of a patient's ability to perform activities of daily living in our August 17, 2010 Patient Safety Tip of the Week "[Preoperative Consultation – Time to Change](#)". Given the findings in the current study by Scarborough and colleagues, doing a formal functional assessment before patients are admitted for elective surgery would make a lot of sense. And, for those patients admitted emergently for surgery or admitted to nonsurgical services, doing the functional assessment obviously provides important information about potential extra services the patient may need after acute hospitalization.

We expect we'll see a lot more in the future about functional dependence, its measurement, and interventions to improve it or prevent deterioration.

#### **Some of our prior columns on frailty:**

- March 31, 2009 "[Screening Patients for Risk of Delirium](#)"
- January 26, 2010 "[Preventing Postoperative Delirium](#)"
- June 2010 "[The Frailty Index and Surgical Outcomes](#)"
- August 17, 2010 "[Preoperative Consultation – Time to Change](#)"
- August 31, 2010 "[Postoperative Delirium](#)"
- August 9, 2011 "[Frailty and the Surgical Patient](#)"
- September 2011 "[Modified HELP Helps Outcomes in Elderly Undergoing Abdominal Surgery](#)"
- October 18, 2011 "[High Risk Surgical Patients](#)"
- November 2011 "[Timed Up-and-Go Test and Surgical Outcomes](#)"
- April 3, 2012 "[New Risk for Postoperative Delirium: Obstructive Sleep Apnea](#)"
- August 7, 2012 "[Cognition, Post-Op Delirium, and Post-Op Outcomes](#)"
- August 14, 2012 "[Gait Speed: A New Vital Sign?](#)"
- September 25, 2012 "[Preoperative Assessment for Geriatric Patients](#)"
- September 3, 2013 "[Predicting Perioperative Complications: Slow and Simple](#)"
- November 2013 "[Predicting Perioperative Complications: Even Simpler!](#)"
- June 2014 "[Another Study Linking Frailty to Surgical Complications](#)"
- September 2, 2014 "[Frailty and the Trauma Patient](#)"

#### **References:**

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Burke LG, Jha AK. Patients' Functional Status and Hospital Readmissions. Remembering What Matters (Invited Commentary). JAMA Intern Med 2015; Published online February 02, 2015

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