# Patient Safety Tip of the Week

## May 16, 2017

## Are Surgeons Finally Ready to Screen for Frailty?

In a recent interview we did with HCPro's Patient Safety Monitor (Ward 2017) we emphasized our long-advocated view that screening for frailty is one of the three most important activities that should be done pre-operatively (the other two being screening for obstructive sleep apnea and delirium risk). We discussed this in our August 17, 2010 Patient Safety Tip of the Week "Preoperative Consultation – Time to Change" and the numerous columns on frailty listed at the end of today's column.

Frailty is associated with both increased complications following surgery and a number of other undesirable outcomes, such as discharge to destinations other than home. Add to the many prior studies a new one that demonstrates frailty is associated with unplanned readmission among military veterans following surgery (Wahl 2017). Wahl and colleagues used the Modified Frailty Index (mFI) to assess adult patients who underwent surgery and were discharged alive from Veterans Affairs hospitals for orthopedic, general, and vascular conditions. Unadjusted rates of overall 30-day readmission, postdischarge emergency department visit, any predischarge or postdischarge complication, and postdischarge mortality varied by frailty in a dose-dependent fashion. Thus, the mFI was associated with poor surgical outcomes, including readmission, primarily due to impaired functional status. The authors suggest that targeting potentially modifiable aspects of frailty preoperatively, such as improving functional status, may improve perioperative outcomes and decrease readmissions.

That latter suggestion has always been somewhat problematic in that there has been scant evidence that programs aimed at modifying frailty (eg. physical therapy or "pre-hab") before planned surgery impact outcomes.

But now evidence is beginning to accumulate demonstrating improved outcomes related to identification of frailty before surgery. Hall and colleagues compared mortality and complications before and after implementation of a program of screening for frailty prior to surgery (Hall 2017). The Risk Analysis Index (RAI) was used as the tool to screen for frailty (Hall 2016). If a patient had an RAI score ≥21 clinicians from surgery, anesthesia, critical care, and palliative care were notified of the patient's frailty and associated surgical risks; if indicated, perioperative plans were modified based on team input. Overall 30-day mortality decreased from 1.6% to 0.7% after frailty screening implementation. Improvement was greatest among frail patients (12.2% to 3.8%) although it also improved in "robust" patients (1.2% to 0.3%). Improvement was even

greater among frail patients at 180 (23.9% to 7.7%) and 365 days (34.5% to 11.7%). This was a single site study and, though prospective, was an observational study rather than a randomized controlled trial. The observed improvement cannot be causally linked to the frailty screening initiative with certainty. Further study in multiple centers, perhaps with a randomized trial design, would be helpful.

Another RCT (randomized controlled trial) of standard preoperative assessment or preoperative comprehensive geriatric assessment and optimization was also recently published (Partridge 2017). The patients aged at least 65 years were scheduled for elective aortic aneurysm repair or lower-limb arterial surgery. We're not told how many had frailty but certainly some percentage of frail patients would be expected in this population. Randomization was stratified by sex and surgical site (aorta/lower limb). Geometric mean length of stay was 5.53 days in the control group and 3.32 days in the intervention group. There was a lower incidence of delirium (11% vs. 24%), cardiac complications (8% vs. 27%), and bladder/bowel complications (33% vs. 55%) in the intervention group compared with the control group. Patients in the intervention group were also less likely to require discharge to a higher level of dependency (4.7% vs. 13.2%).

Another interesting finding comes from a retrospective, population-based cohort study using linked administrative data in Ontario, Canada (McIsaac 2017). They identified all adult major, elective noncardiac surgery patients who were frail according to the validated Johns Hopkins Adjusted Clinical Groups (ACG®) frailty-defining diagnoses indicator. They then compared mortality rates across hospitals, stratified by the volume of frail patients seen at those hospitals. The thirty-day mortality rate in the lowest volume quintile was 1.1% compared to 0.9% in the highest and, after adjustment for a variety of demographic and clinical variables, found a significant association between frailty volume and improved survival (hazard ratio 0.51 for highest volume vs. lowest volume hospitals).

McIsaac et al. and Wang and Wunsch in an accompanying editorial (Wang 2017) surmise that hospitals caring for higher volumes of frail patients likely have teams and protocols that recognize the increased vulnerabilities of frail patients and address them both before and after scheduled surgery. And, just as we recommend certain surgeries be preferably performed in high volume hospitals, perhaps frail patients should be preferably treated in hospitals with high volumes of frail patients.

There are, of course, a variety of tools used for screening for frailty, varying from simple to complex. Many are described in our May 31, 2016 Patient Safety Tip of the Week "More Frailty Measures That Predict Surgical Outcomes" and the other columns listed at the end of today's column. We've noted some of the simpler ones have looked at gait speed, the timed up-and-go test, handgrip strength, and others. A recent study looked at the trajectory of handgrip strength in a community-dwelling population of 70-90 year olds (Stessman 2017). As expected, handgrip strength decreased with age. They found associations between low handgrip strength and poor functional measures, lower educational and financial status, smoking, and diabetes mellitus. After adjustment for a

number of variables, low handgrip strength predicted subsequent activity of daily living dependence from age 78 to 85 (OR = 2.68) and 85 to 90 (OR = 2.31) and low handgrip strength was associated with significantly higher mortality. Subjects in the lowest age-specific quartile of handgrip strength had a higher risk of subsequent functional decline and mortality.

Another Canadian study looked at individual components of the Fried frailty phenotype measures (gait speed, hand-grip strength as measured by a dynamometer, and self-reported exhaustion, low physical activity, and unintended weight loss) in a primary care setting (Lee 2017). The researchers found that individual criteria all showed sensitivity and specificity of more than 80%, with the exception of weight loss. The positive predictive value of the single-item criteria in predicting the Fried frailty phenotype ranged from 12.5% to 52.5%. When gait speed and hand-grip strength were combined as a dual measure, the positive predictive value increased to 87.5%. They conclude that, while use of gait speed or grip strength alone was found to be sensitive and specific as a proxy for the Fried frailty phenotype, use of both measures together was found to be accurate, precise, specific, and more sensitive than other possible combinations and that assessing both measures is feasible within the primary care setting.

The bottom line: screening for frailty is not time consuming and can be easily performed in an office or clinic setting prior to anticipated surgery using either one of the formal frailty scores or one of the simple tests noted above. Patients identified as frail by these methods not only need closer surveillance for complications post-operatively but may benefit from a multidisciplinary comprehensive geriatric management program prior to surgery.

**Some of our prior columns on preoperative assessment and 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”
- February 17, 2015 “Functional Impairment and Hospital Readmission, Surgical Outcomes”
- June 2015 “Get a Grip on It!”
- January 26, 2016 “More on Frailty and Surgical Morbidity and Mortality”
- May 2016 “Guidelines for Perioperative Geriatric Care”
- May 31, 2016 “More Frailty Measures That Predict Surgical Outcomes”

**References**:


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