"...at a single center, they found an approximate 11% readmission rate."

Hospital readmissions, especially within 30 days of a surgical "index" procedure, are believed to be an indicator of deficiencies in care, especially after the passage of the Affordable Care Act in 2010. Reduction of hospital readmissions became a major focus of the Centers for Medicare and Medicaid services (CMS) in reducing healthcare costs and improving outcomes.

Unfortunately, the tremendous variability in patient and disease characteristics in surgical patients makes this reduction a near-impossibly high hurdle, especially considering that many "surgical" patients suffer from the same chronic comorbidities as patients hospitalized for non-surgical diseases. "Preventable" readmissions after surgery, both elective as well as emergency surgery, have many potential causes including poor communication between caregivers and patients and their families, overlooked or missed medication reconciliation between in- and outpatient medications, poor coordination between inpatient hospital teams, often resulting from the fragmented "siloed" care that is all too common in the American healthcare system, escalating patient disease-state, and a myriad of other potential causes. Specific interventions in certain patient populations have been discussed in various papers: interventions such as comprehensive discharge planning and earlier follow-up for at-risk patients. These studies typically evaluated the impact of interventions in cardiac patient readmissions. Far less has been studied regarding readmissions following general surgical procedures, even less on patients undergoing emergency general surgical procedures or patients who suffer from traumatic wounds requiring emergency surgical care.

One national database from which patient data, characteristics, comorbidities, and complications can be evaluated is the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP). This voluntary nationally-validated, risk-adjusted, outcomes-based data collection program was conceived to measure and improve the quality of surgical care in the United States. First conceived and developed in the 1990's after public uproar over quality and outcomes of surgical care in Veterans Administrations (VA) hospitals and medical centers, it quickly proved itself to be a useful quality improvement tool in the civilian sector. Initial trials were conducted in 18 non-governmental hospitals. The program is now being used in approximately 690 hospitals across the U.S., and international trials are being conducted in 9 different countries.[1]

Several studies have utilized NSQIP data to look at hospital readmission causation in surgical patients. Kassin et al published risk factors of 30-day

readmission among general surgery patients, using NSQIP data as the data source. After evaluating approximately 1400 patient records from a 2-year time period at a single center, a readmission rate of approximately 11%. Using multivariate regression, they discovered certain comorbidities (disseminated cancer, pre-operative open wound, and history of dyspnea) and certain procedures (pancreatectomy, colectomy, enterectomy, gastrectomy, and ventral hernia repair) were more likely to result in readmission within 30 days. Ultimately, they concluded that "postoperative complications are the most significant independent risk factor leading to hospital readmissions," noting a 4-fold increase in readmission risk if ANY postoperative complication occurs (Kassin, 2012). Of course, conducting a single-center trial potentially limits generalizability of findings.[2]

Kassin and colleagues evaluated patients undergoing elective general surgical procedures. Emergency procedures such as appendectomy, enteral or colorectal resections, adhesiolysis, or even cholecystectomy often occur in an urgent or semi-urgent manner, and are not necessarily singled out in larger studies evaluating similarly performed elective procedures. In fact, Ingraham, et al, evaluated a variation of this very concern when they used NSQIP data from 142 hospitals to compare over 25,000 nonemergency colorectal resections to just over 5,000 emergency resections. In those patients who underwent nonemergent resections, approximately 24% experienced a postoperative complication, and 492 (1.9%) died. In the emergent resection group, over 48% had a postoperative complication and 780 (15.3%) died.[3] Not surprisingly, the emergent operation group tended to be older, had a higher ASA score (American Society of Anesthesiologists Physical Status Classification, a score that classifies patients into degrees of "fitness"; a higher score equals worse baseline health), had significantly more comorbidities, and were more functionally dependent than patients in the nonemergent surgery group. Perhaps more interesting was that they were able to evaluate risk-adjusted morbidity and mortality between the emergent and nonemergent groups, and using logistic regression models were able to predict both morbidity and mortality rates for each hospital. Comparing O/E ratios between emergent and nonemergent groups for both morbidity and mortality ultimately yielded the conclusion that "better outcomes after nonemergency operations do not generally translate into better outcomes after emergency operations" (Ingraham, 2010), since there was little correlation between outcomes between the groups on an individual hospital basis.[3]

Given that information, further evaluation of emergency surgery complications was conducted, again by Ingraham and colleagues. Again using NSQIP data, they looked at 3 "emergency procedures" — appendectomy, cholecystectomy, and colorectal resections — and evaluated any morbidity, "serious" morbidity, and mortality in the over 45,000 patients they evaluated who had these procedures between 2005 and 2008.[4] "Serious" morbidities included organ space infection, neurological event, myocardial infarction or cardiac arrest, pulmonary embolism, prolonged (>48 hr) unplanned ventilator dependence, or sepsis/septic shock. "Morbidity" included standard NSQIP definitions of "morbidity," including events such as superficial surgical site infections (SSI), pneumonia development, unplanned intubations, urinary tract infections, deep venous thromboses (DVT), and other similar events.

Of nearly 31,000 appendectomies performed, almost 2,000 patients had a complication, and over 1,100 had a serious complication or died. Over 5,800 cholecystectomies were performed, 503 patients had any morbidity, and 371 had a serious

complication or death. Almost 9,000 colorectal resections were performed and 4,202 patients had a complication, with over 3,700 having had a serious or life-threatening issue. Logistic regression once again led to O/E ratios for each procedure, showing significant variability between hospitals and between procedures. Recommendations from this group included recognition of the relatively high morbidity risk with emergency surgical procedures, but also recognition of "high performance" outliers from whom "best practices" may potentially be gleaned to better standardize emergency surgical care.[4]

Readmission following trauma is just as much a concern as elective or emergency surgery, so much so that the ACS initiated its own designated data collection similar to ACS NSQIP, called TQIP (Trauma Quality Improvement Program), in 2008. Traumatic injuries are a major cause of significant morbidity and mortality, and are often preventable. In the United States, they account for approximately $406 billion annually in healthcare and productivity loss costs.[5] Having insight into readmission rates for trauma patients would be potentially beneficial to patients and their families as well as payors.

Unfortunately, unlike ACS NSQIP, ACS TQIP does not capture 30-day readmission. Shapiro et al in Connecticut identified 698 patients via TQIP admitted to the trauma service and compared their records with NSQIP readmission data to better capture readmissions. Using a telephone questionnaire (ACS NSQIP QAI tool), they confirmed the readmission status of 378 patients (54%). They noted a readmission rate of 7.1% based on TQIP data (27of the 378 patients). Querying their hospital-based trauma registry, they noted a readmission rate of 4% (28 of the original 698). Eighteen patient readmissions were missed by the hospital-based trauma registry, primarily because they were admitted to other facilities. Reasons for readmission were diverse, including SSI, DVT, cardiovascular issues, and other miscellaneous causes. They surmised that missed readmissions in trauma patients are likely common given the makeup of trauma versus general surgery patients, and that including the questionnaire tool based on ACS NSQIP would be useful for accurate data collection.[5]

Another study, one predating the Affordable Care Act out of California, looked at 5-year trauma readmissions at a Level 1 trauma center.[6] Of over 15,400 admissions, 209 (1.4%) were readmitted for a constellation of reasons. Risk factors for readmission included operation during the initial admission, penetrating injury, and older patient age. They also noted that the timing of readmission was important, with half of patients readmitted

within 1 week of discharge and another 1/3 in the following week (71% of readmissions were within 2 weeks of discharge). They note that "because most complications manifested within 2 weeks of discharge, we recommend that the first outpatient visit take place approximately 1 week after discharge."[6] Corroborating data for early outpatient follow-up was made by Copertino et al, who noted that after a 3-year retrospective review of over 3,600 trauma patients, 6.5% of the 30-day readmissions were within 9 days of discharge.[7]

Where does that leave the practitioner taking care of surgical patients? Aside from frustration, lessons regarding the discharge planning and process of surgical or trauma patients are likely there to be had. We know that, much like in quantum mechanics, in healthcare increased scrutiny can produce results. Discharge planning, especially with an intention towards maximizing success – i.e., returning patients to maximal, safe function and preventing them from coming back with problems – takes many viewpoints. The level of expertise that a team brings to patient care far exceeds the level of expertise that a single, even extremely well- trained individual, can. Truly "mindful" multidisciplinary care that includes the patient and their family in the daily process can likely improve outcomes; and improved outcomes can likely be demonstrated by reduced readmissions.

Since the late 1940's "multidisciplinary care" for the burn patient has been the norm. Dr. Truman Blocker established multidisciplinary rounding in caring for the hundreds of patients at the Galveston burn center, injured during the "Texas City Disaster" in 1947, as the complex and extremely lengthy care of the large thermally injured patient required collaboration between numerous specialties – surgery, rehabilitation, psychology, nutrition, and especially nursing – for achieving optimal functional results. Over the following decades, "team rounding" has likewise become the norm for many services and lines. Including patients and their families, when applicable, in discharge planning very early on in a hospitalization, focusing on the goal of a return to home and baseline health and function, should be emphasized. Questions and concerns need to be actively sought from all team members, even "what if" scenarios explored, to ensure that the patient and family are confident in their ability to receive appropriate care.

On a surgical service, caregivers are often asked to demonstrate routine wound care like wound packing or dressing. They may be asked to help bathe or shower the patient, feed the patient, or help the patient ambulate (when deemed safe by therapy, of course). Potential complications, which may be more common and less obvious in the emergency surgery or trauma population given the acute nature of the inciting event, should be sought after in the days leading to discharge and not just the hour before.

In a busy hospital on an understaffed floor or on weekends, all of this coordination understandably can be difficult, especially when unexpected emergencies, admissions, or other events continue to occur. However, similar to safety programs for airlines, factories, and operating rooms, if a team member caring for a patient — including the patient and their family — feels safety is an issue, they should be encouraged to "stop the line" to prevent an injury. Reservations about discharge by team members, patients, or their families are likely the potential "missed opportunity" to better steer the discharge process to one of "safe" discharge, and "safe" discharges are less likely to need readmission and more likely to lead to better function and speedier recovery. Empowerment of all team members caring for a sick or injured patient is an opportunity to help ensure we see all aspects of safe patient care and discharge, hopefully to home without an unplanned hospital return.

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