Evaluation of Older Adults

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Functional Status Assessment in the Preoperative Evaluation of Older Adults

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Any common surgical procedures such as spinal fusion, coronary artery bypass grafting, and arthroplasty are routinely performed on older adults. Although such procedures can enhance quality and duration of life, adverse events related to the procedure and postoperative period are key considerations. Important complications include delirium, infection, and cardiac events. Development of these and other complications are associated with increased length of stay, increased rate of discharge to chronic care facilities, and increased mortality. Although age has been considered a primary predictor of surgical outcomes, preoperative functional status is likely a better surrogate for postoperative risk.

Delirium is a major concern for older patients. Although risk factors for postoperative delirium are well defined, relatively few patients receive targeted interventions for prevention.1 If preoperative evaluation helped identify patients with poor functional status (cognitive and physical impairment predicts delirium), these individuals might benefit from specific environmental and pharmacologic interventions.1 Although some institutions have addressed delirium prevention in a proactive, multidisciplinary manner, wide-scale implementation lags.

Another important complication is surgical site infection (SSI). Besides increases in length of stay and health care costs associated with SSI, treatment can require additional surgical procedures and extended antimicrobial therapy.2,3 The resulting immobility often contributes to poor functional outcomes, thereby potentially reducing any palliative benefit of surgery.

Even though age has been recognized as a risk factor for infection, the association has traditionally been attributed to immune senescence and patient comorbidities. Compelling evidence for a link between impaired functional status and SSI was recently demonstrated by Anderson et al,4 who reviewed 141,345 operative procedures, examining risk factors for the development of methicillin-resistant Staphylococcus aureus (MRSA) SSI. The need for assistance with 3 or more activities of daily living (ADLs) was independently associated with an increased risk of MRSA SSI, an association that persisted after stratifying patients by age.4

Despite increasing evidence suggesting that impaired functional status is associated with poor postoperative outcomes, the exact connection remains elusive. For instance, development of MRSA SSI is often preceded by MRSA colonization. Yet among older adults who develop SSI, it is unclear whether these patients are colonized with MRSA prior to their operation because of previous health care exposure or whether poor functional status results in increased length of stay and MRSA exposure postoperatively. Although decolonization strategies have been explored for SSI prevention, randomized studies have failed to show consistent benefit.5,6

As the number of older adults undergoing major operative procedures continues to increase, several critical changes must occur to address the care needs of this expanding population.

Routine Preoperative Functional Assessment

Although generations of surgeons have observed the association between older age and surgical complications, formal incorporation of preoperative functional status has not occurred. While significant resources are expended to assess cardiovascular risk, most surgeons do not routinely measure baseline physical and cognitive function. Preoperative cardiac risk stratification includes a brief assessment of exercise capacity and mobility, but this evaluation should be expanded.

Some suggested measures include the timed up-and-go7 test of mobility and the Mini-Cog8 screen for cognitive impairment, along with a review of ADLs and instrumental ADLs.9 These tests require only a few minutes to administer and provide objective information that can aid in patient and family counseling regarding risks of surgery as well as postoperative care planning.

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Broad implementation of preoperative functional assessment will require strong support within the surgical community along with focused educational initiatives. Internists and anesthesiologists involved in preoperative assessment would also need to embrace this approach. Information about a patient’s ability to bathe, dress, and walk should become a routine part of the preoperative evaluation. Such assessment is not only feasible but necessary.

One possible outcome of a detailed functional assessment is that some patients may decide that the associated risks of an operation outweigh the potential benefits. Although the best approach for functionally impaired patients undergoing operations is not clear, the need to identify such impairment is. Some patients who develop delirium, depression, and general failure to thrive postoperatively had clear evidence of cognitive and functional impairment that was not documented preoperatively.

Further research is needed to clarify how preoperative assessment of functional status can be translated into effective measures for prevention of postoperative decline in older adults. The question of what can be done to prevent surgery-related adverse events should be the focus of interventional studies. The approach to older adults with functional impairment will likely require an individualized solution. For instance, intensive physical therapy and occupational therapy programs may help improve strength and mobility prior to elective surgery. Anticipating the need for subacute rehabilitation from the time of admission could help decrease length of stay and perhaps improve the likelihood of functional recovery.

**Incorporation of Functional Measures Into Research**

Although functional and cognitive impairment is common among older adults, the influence of such deficits on operative outcomes remains largely unexplored. Prospective studies for prevention of adverse events associated with surgical procedures are necessary. Essential to these steps is the need to improve the understanding of the association between debility and adverse events. While mortality rates are high among older adults who experience serious adverse outcomes, the effects of such complications on long-term physical and cognitive functional status and post-discharge care needs is unknown. Functional status should be considered both as an outcome and as a risk factor in rehospitalization and mortality rates.

**Accurately Inform Patients and Their Families**

Many older patients stand to benefit from major interventions and a simple one-size-fits-all approach will not work.

Although age alone is not a contraindication to surgery, advanced age is repeatedly identified as an independent risk factor for poor operative outcomes. Moreover, the risk of adverse events is likely much higher than suggested by published series that tend to reflect the selection bias of high-volume, tertiary care centers. Undergoing a surgical procedure is a major undertaking with associated risks and must be presented as such.

Prior to performing major invasive procedures, surgeons must take into account an individual patient’s overall goals of care, particularly among older adults with significant impairments in mobility and cognition. Patients and their primary care physicians should work in conjunction with surgeons to develop realistic treatment goals.

The demand for high-risk procedures will continue to increase among older adults, including individuals with significant functional and cognitive impairments. Technologic advances may reduce adverse events but paradoxically increase the number of medically frail patients undergoing surgery. Studies examining clinical outcomes of interest among older adults, including functional end points, will remain an essential component for measuring the success of new operations. The biggest change in the field of surgery during the next decade might not be finding new applications of minimally invasive techniques or developing improved bioprosthetics, but rather meeting the challenge of caring for the increasing number of elderly patients who require operations. The need to incorporate preoperative measures of functional status into existing preoperative assessment is vital to the optimal care of older adults.

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**REFERENCES**


