

Short Communication

Identifying gaps in the initial surgical evaluation of elderly patients: the L.I.S.T.E.N. survey

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Received: 04 April 2025

Revised: 02 July 2025

Accepted: 14 July 2025

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ABSTRACT

By 2030, 20% of the global population will be over 65 years old. Elderly surgical patients face unique challenges, including reduced functional capacity, communication barriers, comorbidities, and social vulnerabilities. There are educational gaps in surgical resident training regarding the evaluation of geriatric-specific risk factors which can negatively affect outcomes. We present the results of the L.I.S.T.E.N. survey based on the ACS NSQIP model to address these gaps. A 12-question survey was administered to our surgical residents. The L.I.S.T.E.N. survey evaluated resident inquiries into: living conditions (disposition and baseline functional status), incidents (falls, ED visits), sensory deficits and skin integrity, thoughts (cognition, depression), enteral needs (nutrition, medications) and nurture needs (goals of care, surrogate decision-making). Results were analyzed for frequency of inquiry, comparing junior and senior residents. All residents frequently inquired about patient living situations (92%), medication (92%), surrogacy (75%). Key areas were significantly overlooked: depression (83% never assessed), sensory deficits (92% rarely or never assessed). Senior residents compared to juniors assessed baseline functional status (100% vs. 50%) and goals of care (83% vs. 33%). Junior residents more frequently inquired about prior emergency room visits or hospitalizations (83% vs. 66.7%). The study identifies areas of deficiencies in the initial evaluation of geriatric patients by surgical residents, varying by postgraduate level. Targeted educational interventions are needed to improve geriatric-specific competencies. Future research should focus on linking these educational efforts to patient-centered outcomes.

Keywords: Geriatric surgery, Surgical education, Resident training, Elderly, Patient-centered care

INTRODUCTION

Current estimates are that by 2030, 20% of the world's population will be >65 years of age.¹ This is a 5-fold increase since 1950.² In the United States, 31% of elderly patients (>65 years) undergo surgery in their last year of life, 18.3% within the last month, and 8% in the last week of life.³ 40% of inpatient operations and 33% of outpatient procedures are done on patients aged 65 years and older.³

The American college of surgeons (ACS) created the ACS national surgical quality improvement program (ACS NSQIP). This initiative was designed to identify risk factors leading to worse outcomes holistically, and findings were published⁴. In an effort to cater to an aging population with special needs, additional factors were added. More recently, the geriatric surgery verification (GSV) quality improvement program was launched, aimed at improving geriatric surgical outcomes.^{5,6} As people are living longer, with significant limitations and

comorbidities, the surgical care of the elderly needs to be more tailored from their initial evaluation and throughout their hospital stay. The objective of our study is to explore the gaps in the education of surgical residents in their ability to appreciate important geriatric specific factors from their initial evaluation.

METHODS

The current study adopted a cross-sectional design to assess the rate at which key information is collected by physicians during preoperative evaluations. The study took place at Flushing Hospital Medical Center, a community-hospital located in Queens, NY. The study took place October-November 2022. Respondents included all consulting residents at the hospital.

Respondents were administered a pilot version of an original survey developed by the study team. The 12-question L.I.S.T.E.N survey includes questions relating to risk factors outlined by the ACS NSQIP. These key risk factors include living conditions (patient disposition and

baseline functional status), incidents (emergency room visits, recent admissions, falls), sensory deficits and skin integrity, thoughts (depression and baseline cognition), enteral needs (nutrition, medications), and nurture (goals of care, surrogate decision-making). Each major risk factor was examined by individual items ranked along a 5-point Likert scale, with 1 indicating the respondent never assessed the item and 5 indicating the respondent always assessed the item. The survey was administered via Qualtrics. Figure 1 for all risk factors and items included in the survey.

Respondents were grouped by postgraduate year (PGY) of training: juniors (PGY-2 and PGY-3) and seniors (PGY-4 and PGY-5). For each item on the survey, respondents were considered to effectively address item by indicating “often”/“always”, while respondents were considered to have ineffectively addressed an item by indicating “sometimes,” “rarely,” and “never”. Results of survey reported descriptively. Proportions of effectively and ineffectively addressed items reported as proportions of responses among junior and senior residents.

Table 1: Our original survey: the L.I.S.T.E.N survey.⁴

Variables	How well do you L.I.S.T.E.N.?	Ranking				
Living conditions	How often do you inquire about patients’ disposition (lives alone, lives with family/caretaker, institutionalized) on admission?	1	2	3	4	5
	How often do you inquire about patients’ baseline functional status (i.e., level of dependency for activities of daily living and use of mobility devices) on admission?	1	2	3	4	5
Incidents	How often do you inquire about previous emergency department visits and hospitalizations on admission?	1	2	3	4	5
	How often do you inquire about fall history?	1	2	3	4	5
Sensory deficits and skin	How often do you inquire about communication deficits (vision, hearing, speech impairments) on admission?	1	2	3	4	5
	How often do you examine the patient for ulcerations on admission?	1	2	3	4	5
Thoughts	How often do you inquire about baseline cognition on admission?	1	2	3	4	5
	How often do you inquire about past or current depressive symptoms on admission?	1	2	3	4	5
Enteral needs	How often do you inquire about nutritional habits on admission?	1	2	3	4	5
	How often do you review patients’ medication list and usage (prescription, over-the-counter, herbs, and supplements) on admissions?	1	2	3	4	5
Nurture	How often do you inquire about goals of care on admission?	1	2	3	4	5
	How often do you inquire about the patients’ surrogate decision maker on admission?	1	2	3	4	5

*Risk factors were selected based on ACS NSQIP. Scale: 1-Never, 2- Rarely, 3-Sometimes, 4-Often, 5-Always.

RESULTS

Twelve residents were surveyed (6 juniors and 6 seniors). Overall, 92% inquired about living conditions and medications, 75% about surrogate decision making, and 83% about functional status and cognition. On their initial evaluation, both junior and senior residents were likely to inquire about patient living situations (92%), medication reconciliation (92%), surrogacy (75%), and cognition status (83%). The most neglected inquiries among both groups were depression (83% never inquired

about it), sensory deficits (92% rarely or never inquired), and nutrition (75% inadequately inquired). Senior residents were more likely than juniors to inquire about patient baseline functional status (100% vs 50%) and cognition (100% vs 66.7%), falls (83% vs. 50%), skin integrity (66.7% vs 50%) and goals of care (83% vs. 33%).

Juniors were more likely to inquire about prior emergency department visits or hospitalizations (83% vs. 66.7%).

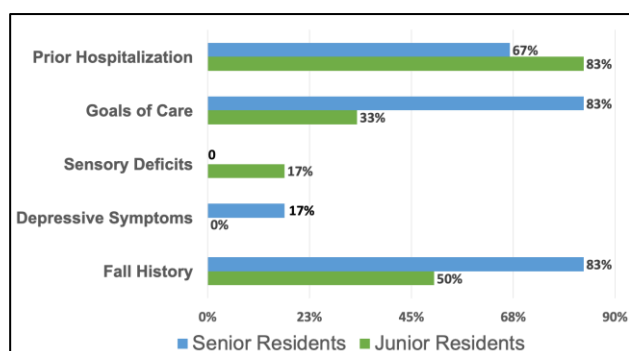


Figure 1: Junior versus senior % appropriate responses to key items.*

*appropriate=response of often or always

DISCUSSION

In the United States, 31% of elderly patients (>65 years) will undergo surgery in their last year of life, 18.3% within the last month, and 8% in the last week of life.³ As people are living longer, with significant limitations and comorbidities, the surgical care of our elderly needs to be more inclusive from their initial evaluation throughout their stay. Consulting surgical residents in teaching institutions are the first to assess patients in the emergency departments and on the floor and are more likely to identify concerning parameters that may significantly impact outcomes.

The L.I.S.T.E.N. survey examined these issues: patient disposition and baseline functional status (living conditions), past emergency department visits and fall history (incidents), communication deficits (sensory deficits) and skin integrity, baseline cognition and depression history (thoughts), nutritional habits and medication use (enteral), and goals of care and surrogate decision makers (nurture).

Living conditions

Older adults may suffer from social isolation, higher rates of food insecurity, and an increased risk of malnutrition, all of which contribute to inadequate postoperative support.⁷ This lack of support can lead to poor recovery, increased complications, and a greater likelihood of requiring institutional care rather than returning home. This association was demonstrated in a retrospective cohort study of community-dwelling older adults (aged ≥65 years) hospitalized for emergency surgery in Ontario, Canada, between 2006 and 2018, which found that patients who underwent emergency surgery had a fivefold greater risk of death or postoperative discharge to a skilled nursing facility, rather than home, within the first three months postoperatively compared to matched controls who did not undergo emergency surgery.⁸ Geographic and community-level factors may increase the likelihood of unplanned surgery with adverse outcomes. Between 2014 to 2018, fee-for-service Medicare beneficiaries ages 65-99 were studied, with

patients from communities with the highest vulnerability being more likely to undergo unplanned surgery (36.2% vs. 33.5%), to experience worse outcomes (5.4% mortality versus 5.0%) and additional surgery within thirty days (19.6% vs. 18.1%).⁹ Social and behavioral determinants of health, such as insurance status, median household income in the patient's residential zip code, and substance disorders are associated with a higher risk of developing postoperative infectious complications in emergency general surgery, including urinary tract infection (UTI), methicillin-resistant *Staphylococcus aureus* (MRSA) sepsis, and catheter-associated urinary tract infection (CAUTI).¹⁰⁻¹² The baseline context of current living conditions and time at home has to be considered when evaluating the risk of functional decline whenever possible, preoperatively, as well as when complications with prolonged length of stay occur postoperatively. Loss of time at home is critical because it is associated with poor functional outcomes.¹³ Family members play a crucial role in the postoperative recovery of older adults by providing necessary support that impacts discharge disposition, functional recovery, and overall quality of life. Recognizing their involvement early in the surgical care process can help mitigate the risks associated with social isolation and inadequate postoperative support. In our study, 92% of residents inquired about living conditions.

Frailty has been linked to poor postoperative outcomes, including length of stay and short- and long-term mortality.¹⁴ ADLs should be delineated at initial evaluation as they can predict post-hospitalization discharge disposition among the elderly and guide follow-up care.¹⁵ In 2020, the national health and aging trends study identified that the proportion of adults over 70 fully capable of performing self-care and mobility tasks dropped from 29.4% in 2011 to 23.2% in 2020, while the percentage who adapted successfully using assistive devices rose from 30.0% to 39.3%.¹⁶ Kang et al using the Barthel index (BI), showed a direct correlation between ADL and postoperative survival: low ADL ability of BI 0-20 (55.7% survival), compared to a high ADL ability of BI 81-100 (84.2% survival) in elective abdominal surgeries in the elderly.¹⁷ In our study, 83% of the consulting residents initially inquired about the functional status of geriatric patients.

Incidents

Inquiring about falls and impaired mobility, as well as past emergency department visits at the initial surgical evaluation, may provide information independent of commonly assessed comorbidities and serve as a complementary and convenient measure of preoperative health status. This can rapidly identify patients most likely to need post-acute care. Elderly patients with a history of falls have the highest risk of falling again; Kronzer et al reported that in the six months prior to surgery, 26% of patients had fallen at least once, and 12% had fallen at least twice.¹⁸ In their study of 3,494

emergency surgery patients ≥ 65 years of age, Hu et al found 53.9% had discharges to acute rehabilitation, skilled facilities, or unskilled facilities, identifying a fall within the past year as the strongest finding associated with nonhome discharge.¹⁹ Geriatric patients with multiple comorbidities, abdominal or orthopedic injuries, or those living in low-income regions were more likely to be admitted to the hospital within 9 or 30 days following recent ED discharges.²⁰ In our study, 83% of senior residents inquired about falls compared to 50% of junior residents during their initial evaluation. When inquiring about past ED visits and hospitalisations, junior residents more often addressed prior hospitalisations, with 83% of junior residents inquiring versus 66.7% of senior residents.

Sensory deficit and skin integrity

High-quality communication is the foundation upon which patient-centered care is achieved. Hearing loss (HL) is not only a core barrier to communication but has been associated with poor surgical outcomes following major surgery. A drop in hearing of 10 dB was associated with a 14% increase of having a surgical complication, and has been linked to concomitant visual impairment.^{2,21} Visual impairment increases resource utilization, leading to increased length of stay, readmission, higher hospital charges, and worse medical outcomes, such as discharge to non-home sites.¹ The severity of vision loss is significantly proportional to all-cause mortality.²² Even in those who are discharged home, these compounded sensory deficits have a direct impact on quality of life, performance of activities of daily living (ADLs), and staying compliant with medications.^{23,24} Alternative and augmentative communication (AAC) for critically ill patients using sign language, picture boards, and high technology resources such as speech-generating apps, can help geriatric patients facing challenges due to HL, vision loss, and changes in cognition.²⁵ In our study, 92% of consulting residents reported rarely or never inquiring about communication deficits (visual/sensory aids).

Regardless of the surgical disease process that prompted the consult, it is crucial to first take into consideration the added burden of pressure ulcers (PU) present on admission to the current condition and secondly to prevent their occurrence in an already fragile patient. In the US, an estimated 2.5 million hospitalisations are linked to PU, with an annual cost of \$27 billion.²⁶ Patients transferred from nursing homes are five times more likely to experience an occurrence of PU due to their health conditions, emphasizing the importance of comprehensive evaluations upon admission. Rates of PUs presented on arrival (POA) are increasing even in individuals coming from home. A deeper understanding of at-risk individuals' living conditions and the level of care they receive could help inform targeted interventions that might prevent the progression of PU to severe stages.²⁷ We reported that 66.7% of consulting senior

surgical residents reported doing this "often", compared to only 50% of juniors.

Thoughts

Urgent surgical intervention, particularly in individuals with dementia, is linked to higher rates of mortality. Risk reduction requires early identification and management of cognitive decline.²⁸ In cognitively frail patients, surgical procedures act as triggers for delirium, which occurs in 17-61% of major surgical interventions. Functional impairment and sensory deprivation should be taken into consideration as 30-40% of delirium is considered preventable.²⁹ In a patient with cognitive dysfunction, polypharmacy, history of falls, malnutrition, type of surgery, and preoperative anemia can also contribute to delirium.²⁹ Personalized assessment of patient needs, such as adjusting the physical spaces to create a nurturing and secure environment, is paramount to potentially reduce complications.^{30,31} 83% of all consulting surgical residents reported inquiring about cognition status at baseline-100% of seniors vs 66.7% of juniors.

Preoperative and postoperative evaluations should also focus on depression, as the preoperative emotional state of patients can greatly alter their path to recovery.³² Depression can affect immune system function, pain sensitivity, and survival. Although levels of depression and anxiety can influence how patients approach surgery, they are not linked to worsened cognitive decline post-surgery.³³ Tailored measures aimed at preserving well-being after surgery can assist patients who are experiencing heightened levels of anxiety and depression.³⁴ Studies have shown that early psychosocial management may help reduce length of stay and analgesic use, and improve coping mechanisms.³⁵ In our study, we found that surgical residents from all years of the residency program failed to inquire about depression (83% reported 'never' asking).

Enteral needs (nutrition and polypharmacy)

Geriatric patients often have lower baseline nutritional status than other populations. In a study from 2024, Simpson et al observed that between 35% and 50% of nursing home residents are malnourished or at risk of malnutrition in the United States.³⁶ High preoperative geriatric nutritional risk has been linked to increased postoperative delirium and length of stay.³⁷ Despite this evidence, there is a large disparity in nutrition education in medical training.³⁸ Incorporating nutrition as a separate topic into an already heavily saturated curriculum may be a significant challenge.³⁹ A cross-sectional analysis using data from the association of program directors in surgery (APDS) reported that a majority of surgical residents felt underprepared to manage all routes of feeding, despite the fact that 90.2% had received education on nutrition and 78% provided nutrition to patients on a regular basis.⁴⁰ In our department, senior residents (PGY2 to PGY5) receive courses on nutrition during their rotation

in the surgical intensive care unit. In conjunction with the nutrition team, residents work daily on assessing nutritional status and provision of enteral and parenteral solutions to meet patients' needs. However, the importance of the initial assessment of nutrition remains underestimated. Our study found that 75% of resident participants did not adequately inquire about nutritional status during their initial consults.

Nearly 40% of adults over 65 are on five or more prescription medications.⁴¹ Polypharmacy is associated with increased rates of non-adherence, medication errors, postoperative delirium, and drug-drug interactions. In a study of over 260,000 older adults undergoing elective, non-cardiac surgery, investigators found polypharmacy to be associated with increased postoperative mortality.⁴² In their work on geriatric polypharmacy education among surgical residents, Duane et al found minimal improvement in a post-test-a 60% correct pretest versus a 63% post-test, despite education and training.⁴³ However, in our study, most surgical residents reported taking polypharmacy into consideration, with 11 out of 12 participants (92%) always reviewing patients' medications.

Nurture

Surrogate consent is sought when patients lack capacity, and the importance of surrogate decision-makers and goals of care in managing elderly patients' treatment cannot be understated. Advanced care planning (ACP) is the process of preparing for future medical decisions to ensure the care aligns with the patient's values, views on quality of life especially during serious illness or end of life, focusing on overall goals rather than specific treatments.⁴⁴ The ACP contains preferences documented in an advance directive, such as a medical power of attorney or living will, and identifies a trusted person as a surrogate decision-maker.⁴⁴ ACP is linked to end-of-life wishes being significantly more likely to be recognized and honoured (86%) compared to a control group (30%) with family members of deceased patients experiencing lower levels of stress, anxiety (0 vs. 3), and depression.⁴⁵ In their 4 year review of elderly patients (65 and older), Miller et al found that 6.6% required surrogate consent. This was more common in patients who were female or dependent on others for ADLs had a higher comorbidity burden or cognitive impairment, and who were undergoing emergency surgery.⁴⁶ Communication challenges between the patient, surrogate, and surgeon can arise, particularly when prognosis is difficult to interpret, surrogates experience anxiety or hesitation in decision-making, and when incomplete or vague ACP discussions lead to non-beneficial surgery at the end of life.⁴⁷ Our study found that 75% of surgical residents initially inquired about the appointed surrogate in elderly patients, and 83% of seniors vs 33% of junior residents initially inquired about goals of care.

Limitations

The L.I.S.T.E.N. survey is a novel tool that has not yet undergone formal validation. However, it was designed based on established risk factors identified in the ACS NSQIP, ensuring relevance to perioperative risk assessment. Second, the survey was distributed to a limited number of residents at a single institution, which may affect generalizability. Future studies involving a larger and more diverse sample across multiple institutions could help strengthen the findings. Additionally, we did not assess patient-centered outcomes such as ICU length of stay, hospital length of stay, discharge disposition, or mortality. Incorporating these outcomes in future research could provide a more comprehensive evaluation of the survey's clinical impact.

CONCLUSION

The increase in elderly surgical patients presents unique challenges that necessitate tailored, comprehensive approaches to ensure optimized outcomes. The L.I.S.T.E.N. survey highlighted gaps in residents' initial evaluation of geriatric patients, particularly in areas such as communication deficits, nutrition, falls, skin integrity and depression. Incorporating simulation-based learning, case-based discussions, and interdisciplinary collaboration with geriatricians, nutritionists, and social workers could help foster a more inclusive, proactive, and effective approach to initial assessment and enhance residents' ability to provide comprehensive geriatric care. Future studies should focus on patient-centered outcomes such as hospital length of stay, discharge disposition, and long-term recovery to evaluate the impact of a comprehensive assessment on outcomes of this vulnerable population.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Shahpuri M, Dowers K, Curry S, Williams S, Griner S, Bodden C, et al. Identifying gaps in the initial surgical evaluation of elderly patients: the L.I.S.T.E.N. survey. *Int Surg J* 2025;12:1307-13.