

Management of hospital admission, patient information and education, and immediate preoperative care

ABSTRACT

An increasing proportion of surgical procedures involves elderly and frail patients in high-income countries, leading to an increased risk of postoperative complications. Complications significantly impact patient outcomes and costs, due to prolonged hospitalization and loss of autonomy. Consequently, it is crucial to evaluate preoperative functional status in older patients, to tailor the perioperative plan, and evaluate risks. The hospital environment often exacerbates cognitive impairments in elderly and frail patients, also increasing the risk of infection, falls, and malnutrition. Thus, it is essential to work on dedicated pathways to reduce hospital readmissions and favor discharges to a familiar environment. In this context, the use of wearable devices and telehealth has been promising. Telemedicine can be used for preoperative evaluations and to allow earlier discharges with continuous monitoring. Wearable devices can track patient vitals both preoperatively and postoperatively. Preoperative education of patient and caregivers can improve postoperative outcomes and is favored by technology-based approach that increases flexibility and reduce the need for in-person clinical visits and associated travel; moreover, such approaches empower patients with a greater understanding of possible risks, moving toward shared decision-making principles. Finally, caregivers play an integral role in patient improvement, for example, in the prevention of delirium. Hence, their inclusion in the care process is not only advantageous but essential to improve perioperative outcomes in this population.

Key words: Geriatric anesthesia, perioperative medicine frailty

Introduction

Every year, nearly 310 million people globally undergo surgical procedures, with a significant proportion originating from high income countries.^[1,2] Globally, persons aged 60 years and older are projected to become about 2.1 billion in 2050, whereas people aged 80 years or over will total about 426 million.^[3] As the average age of the population continues to rise, an increasing number of elderly patients are undergoing surgery, posing a continuing challenge for


anesthesiologists and surgeons due to a proportional increase in patients experiencing postoperative complications.^[4] In high-income countries, postoperative complications occur in about 20% of patients.^[5,6] This percentage is notably higher in frail patients.^[7-10] These perioperative complications not only immediately affect patient outcomes but also increase costs for the national health system, both directly and indirectly due to diminished quality of life.^[11-13] Vonlanthen and colleagues assessed the economic impact of complications

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and demonstrated an increase in mean in-hospital cost from \$27,946 (\$ 15,106) for patient without complications, to \$62,392 (\$ 72,47) for patients with complications—a 2.3-fold increase. These authors also demonstrated a dose–response association between complication severity and hospital costs, which are mainly driven by prolonged length of hospital stay.^[14–16] Aging is a complex interplay of different factors: environmental, stochastic, and genetic/epigenetic stimuli impacting human body.^[17,18] Although chronological age takes into account only the lifespan of an individual, the biological age is determined by functional status and physiological reserve.^[19] The latter is essential to predict resilience to the surgical stressor and for life expectancy.^[20]

Evaluation of preoperative functional status in ageing patients is essential for risk stratification and postdischarge planning in older surgical patients, as functional decline has been linked to morbidity, mortality, and functional loss after surgery.^[21] Each surgery constitutes an insult to the human body and to physiological balance; particularly in elderly and frail patients, where there is need for dedicated pathways to reduce the risk of complications.^[22] Several key factors warrant careful consideration when examining the process of hospital admission, the education of patients, and the time frame leading up to the immediate preoperative period, particularly in the context of elderly and frail individuals. These critical elements are illustrated in Figure 1 and further elucidated in the following discussion.

Management of Hospital Admission

Hospitalization, particularly in elderly patients, is inherently associated with a host of potential complications. These

can range from an increased risk of infection, precipitated by the prolonged use of invasive devices such as urinary catheters and central venous catheters, to the hazards of immobilization including the possibility of becoming bedridden, to the risk of falls and the threat of malnutrition. The hospital environment often deprives elderly patients of their familiar setting and of significant figures such as relatives or caregivers, increasing the risk of delirium. This state of confusion can trigger a domino-effect of additional complications, including increased resort on medications like sedatives and antipsychotic drugs, especially when managing patients with active delirium or agitation. Moreover, the diffused habit of interdict the use of prosthetic devices such as dental prostheses, hearing aids, and visual aids can become a source of discomfort for elderly patients during hospitalization, further reducing their potential to interact with the surrounding world, and thereby exacerbating their cognitive impairments. Moreover, these measures significantly contribute to increase the risk of disorientation and falls. Consequently, a radical change in these non-patient-focused attitudes should be promoted and, at the same time, efforts should be directed toward minimizing the duration of preoperative hospital. This aspect is not something, which can be achieved over night but should be built through the implementation of team-conceived dedicated clinical pathways.

This principle is applicable not just to the course of hospital stay but extends to preoperative evaluation. For older patients, preoperative assessments that may seem straightforward and easily managed by younger individuals, can present a range of challenges. Such evaluations often require interactions with a host of healthcare professionals

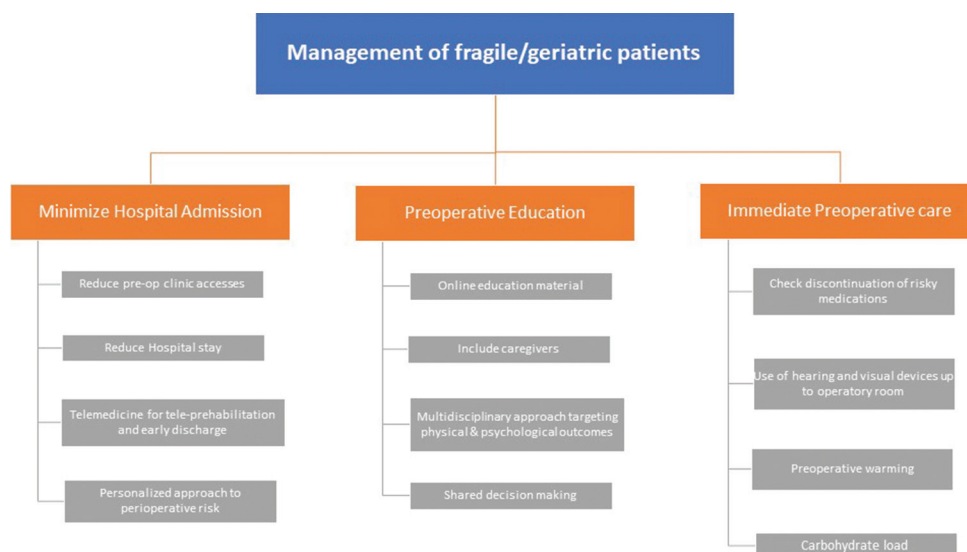


Figure 1: Key aspects to be considered regarding patient education, hospital admission process, and immediate preoperative period in elderly and frail patients

including nurses, surgeons, anesthesiologists, and other specialist such as cardiologists and diabetologist. Additionally, patients are subjected to a series of tests, from blood work and radiological examinations such as X-rays and CT scans, to spirometry and heart ultrasonography, which are obviously more frequent in elderly and patients with comorbid diseases. Most of these tests necessitate fasting during the day and are conducted in different hospital areas, which necessitates extensive range of walking, a task by definition impaired in frail patients. The tests and consultations are typically scattered across multiple days, exacerbating the logistical complexities for these patients. This translates into additional burdens for families, both financially and in terms of time, as caregivers often need to take time off work to accompany and care for their hospital-bound relatives. Therefore, streamlining these processes can greatly enhance the efficiency and quality of care provided to these patients. Given these considerations, both day-surgery and office-based procedures represent (when noncontraindicated by the patients' health status or the lack of family support) a good choice aimed to avoid hospitalization and its associated risks.^[23] The advent of new technologies further fortifies this shift toward patient-centric healthcare. Wearable devices serve dual purposes in this context: they facilitate telemedicine offering continuous patient monitoring and also promote earlier discharge while maintaining a safety net, as recently proposed in our centre.^[24] Moreover, telemedicine has the potential to revolutionize preoperative evaluation. In our experience, the use of wearable devices can act as a proxy of functional capacity in elderly patients (over 70 years old) undergoing major surgery.^[25] Our findings underscore a correlation between the performance metrics of these devices, including step count and other metrics, and results of the 6-minute walking test and other anesthesia evaluation tests, suggesting their future utility in minimizing hospital visits for preoperative functional assessments.

The recent pandemic has accelerated the adoption of telehealth in preoperative care, as multiple contexts have capitalized on telehealth and telemedicine consultations in the face of COVID-19 restrictions.^[26]

In our center, we recently adopted a recalibration of the preoperative evaluation process, using the principles of Value-Based Healthcare (VBHC). VBHC underscores the enhancement of value in healthcare, including value for patients and caregivers, which transcends mere cost reduction and highlights the significance of preoperative care quality. Implementing a VBHC approach has yielded promising results; a reduction in preoperative visits was not only associated with decreased costs, but also improved

value for patients and caregivers by reducing their hospital exposure time.

Preoperative Education of Patients and Caregivers

Preoperative patient education is of fundamental importance for the patient care pathway, as it can increase compliance with care and reduce some metrics related with frailty. It is defined as any educational action before surgery to enhance health behaviors, outcomes, and people's awareness, since patients are still at home. It has been proven that it enhances psychological and physical outcomes.^[27,28] In the standard and traditional clinical practice, patient is usually informed by in-person interaction with healthcare specialists during the preoperative visit. In this case the visit, which is generally time-constrained and mainly focused on comorbidities, home medications, and the collection of informed consent relatively to the planned anesthesia, there is little room for patient education. This method of information has been proven inadequate, as it can lead to low understanding, and low retention of provided information. Moreover, it has been established that limiting patient information to a short single moment of patient information can negatively impact the postoperative period, and in some cases, patients delay or delete their surgery. With the onset of COVID-19 pandemic, technology-based approaches have been widely and quickly adopted, with telehealth care being recognized as effective, economical, safe, timely, and patient-centered platform.^[29] Providing educational programs online has pros and cons. Not all people have free access to internet and/or devices, or they are not familiar with technology, and this is generally increased in elderly patients.^[30] Nonetheless, the reduction in healthcare costs, clinical attendance, reduced travel, and time flexibility provide strong reasons to improve the use of internet, apps, or other devices in elderly patients, to educate them and their caregivers.^[31] A recent systematic review that evaluates the use of video-based education modality as supplement to the traditional method of patients undergoing surgery; overall, they reported an improving in patients' satisfaction, knowledge, understanding, preparedness, anxiety, and postoperative quality of life.^[29] A recent single-centre quality improvement pilot study described with some preliminary data the safety and the utility to use telemedicine in postoperative time at home in patients undergoing mini-invasive robotic surgery for early stage NSCLC; in fact, it allowed to have a faster discharge (reduction in hospitalization) with all the indirect benefit (optimization of beds, economic savings for healthcare system).^[24]

Another aspect to consider is the fundamental importance of caregivers, which with the right education and support can

be used to improve outcomes. Elderlies, most of the time, depend on family members for different tasks; furthermore, family can provide more information about patients' cognitive and functional status. Family members can be helpful in prevention and management of delirium. Indeed, delirium is the most common surgical complication in older patients and is well known to be linked with increased mortality and morbidity. Thus, it is really important to educate and explain to the family members how to engage the patient in cognitively stimulating activities, motivate ambulation and hydration, and help to use sensory aids. For example, tools like the Family-HELP, an adaptation of the Hospital Elder Life Program (HELP), engage family caregivers in delirium prevention reducing its incidence. Finally, the anesthesiologists should encourage the family members to be proactive during all the perioperative period since they are essential part of the care teams improving the final outcome.^[32] Good information for family and patients is also essential for shared decision making before surgery. To avoid decision regret after surgery, it is fundamental to share and discuss information with the patient and relatives, collaborating to choose the most suitable treatment options.^[33]

A quality patient education needs more sophisticated methods, using predefined preoperative programs that can be delivered in different ways (online, in person, brochure, etc.) and can be fitted to a particular surgery or patient. Decision-making support tools have been developed and validated, including videos, written depliant, and interactive presentations, and are mostly useful for older patients.^[34]

Immediate Preoperative Care

Perioperative medicine is a dynamic and evolving field that prioritizes the optimization of patient health and healthcare delivery for individuals undergoing surgery.^[35] This focus becomes even more critical as patient age and comorbidity increase, necessitating advanced perioperative assessments and techniques. Therefore, anesthesiologists and surgeons must proactively identify and address geriatric vulnerabilities before surgery. This will help in better introducing older patients in the interactive discussion about surgical risks and pinpointing opportunities for optimization during the preoperative phase.

In order to effectively identify modifiable risk factors and facilitate the improvement of surgical outcomes, such assessments should start at least some days (or even weeks, in case of multimorbid, complicated patients) before surgery. This timeline also paves the way for prehabilitation implementation—the process of enhancing a patient's

physiological and functional reserve through preoperative physical conditioning.^[36] Evidence from perioperative geriatric optimization programs, such as the preoperative optimization of senior health study, suggests that a combination of prehabilitation and inpatient geriatric co-management can shorten hospital stays and decrease readmission rates.^[37]

Other aspects should be mentioned when considering the immediate perioperative period: chief among them is the subject of fasting. Existing guidelines advocate for a six-hour fasting period prior to surgery; however, this recommendation is rarely followed in clinical practice, according to published surveys.^[38] Different researches, as reported by EJA Guidelines, have brought to light the benefits of preoperative carbohydrate consumption. This intervention proves to be particularly effective for older patients who are more susceptible to postoperative complications. Preoperative carbohydrate load may also play a significant role. It curtails the fasting response, expedites postoperative reuptake of oral nutrition and the overall recovery process.^[39]

Anxiety and cognitive impairment should also be considered. Hearing aids and visual aids should be maintained in the preoperative room until immediately before anesthesia induction, to avoid exacerbating anxiety through sensory deprivation. The soothing presence of family members in mitigating anxiety and delirium cannot be overlooked.^[40]

Preoperative warming is another pivotal measure in elderly patients. In a recent study, although short-term preoperative forced-air warming did not entirely stave off intraoperative hypothermia or shivering, it considerably reduced the severity of both conditions. Similar observations were made in a group of elderly patients with hip fractures.^[41] These data are useful to understand the importance of preoperative warming in senior patients.

Several of these interventions are incorporated into the enhanced recovery after surgery (ERAS) protocols. By adhering to these protocols, a significant number of patients have experienced a reduction in hospital lengths of stay and postoperative complications.^[42] Each of these components, when taken together, helps to mitigate the effects of surgical trauma, which acts as a stressor on the body and throws off its homeostatic equilibrium. This causes a heightened stress response, which in turn leads to a cascade of negative effects, including hyperglycemia, tachycardia, hypertension, protein catabolism, and immunosuppression.^[43]

In conclusion, the role of the anesthesiologist in the preoperative care of elderly patients is constantly evolving,

becoming increasingly pivotal as an expert in perioperative and geriatric medicine. When working with old or frail patients, the preoperative evaluation process and patient education, which is already an essential aspect of all anesthesia and surgical practices, take on an especially critical role. In such populations, the importance of patient education and enhanced patient–hospital communication is amplified. It serves the broader goal of improving patient outcomes and reducing perioperative morbidity, while allowing for shared decision-making and move further toward increased value in health.

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Conflicts of interest

There are no conflicts of interest.

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