

Perioperative Care for Geriatric Patients Undergoing Surgery

Haxhire Gani¹, Franceska Beqiri²

Abstract: Increasing numbers of elderly patients are undergoing an increasing variety of surgical procedures¹. The older adult population (>65 years) is growing at a rapid rate, and a significant percentage of older adults undergo surgical procedures². There is an age-related decline in physiological reserve, which may be compounded by illness, cognitive decline, frailty and polypharmacy. Compared with younger surgical patients, the elderly are at relatively higher risk of mortality and morbidity after elective and (especially) emergency surgery. Multidisciplinary care improves outcomes for elderly surgical patients. Protocol-driven integrated pathways guide care effectively, but must be individualised to suit each patient. The AAGBI strongly supports an expanded role for senior geriatricians in coordinating peri-operative care for the elderly, with input from senior anaesthetists (consultants/associate specialists) and surgeons. The purpose of this review is the importance of better knowing the status of the elderly, the anaesthesia and surgery effect on these patients, in order to help in the postoperator rehabilitation of the elderly.

Keywords: elderly, anaesthesia, Perioperative

1. Predictive Factors

The function capacity of organs reduces with ageing, resulting in decreased reserve and ability to endure stress^{3,4}. Advanced age is, therefore, a significant risk factor for increased mortality^{5,6,3}. Co-existing disease further depresses organ function and/or reserve, exacerbating risk^{3,7}. For example, pre-existing hypertension, diabetes mellitus, or renal failure contributes to a higher incidence of perioperative myocardial infarction (MI) (5.1%), cardiac death (5.7%)⁸ or ischaemia (12–17.7%)⁹. Additional risk factors in the elderly^{10,11,6} include the need for emergency surgery,^{9,10} major surgical procedures, ASA physical status III or IV, and poor nutritional status.

Table 1: Risk factors for postoperative mortality in elderly surgical patients

ASA physical status	III and IV
Surgical procedures	Major and/or emergency procedures
Co-existing disease	Cardiac, pulmonary disease, diabetes mellitus, liver, and renal impairment
Functional status	<1–4 MET*

Clinical predictors of increased perioperative cardiovascular risk. ECG indicates equivalent.

Major: Unstable coronary syndromes, Recent myocardial infarction* with evidence of important ischaemic risk by clinical symptoms or non-invasive study, Decompensated congestive heart failure, Significant arrhythmias, High-grade atrioventricular block, Symptomatic ventricular arrhythmias in the presence of underlying heart disease, Supraventricular arrhythmias with uncontrolled ventricular rate, severe valvular disease.

Intermediate: Mild angina pectoris (Canadian Class I or II), Prior myocardial infarction by history or pathological Q waves, Compensated or prior congestive heart failure, Diabetes mellitus. Cardiac risk stratification for non-cardiac surgical procedures. High risk (reported cardiac risk often more than 5%). Intermediate risk (reported cardiac risk generally less than 5%). Low risk (reported cardiac risk often more than 1%)†.

2. Cardiac Risk Index

Risk category	Points
Aged >70 yr	5
Myocardial infarction within last 6 months	10
S ₃ gallop or jugular venous distension	11
Significant valvular stenosis	3
Rhythm other than sinus or premature atrial contractions	7
Premature ventricular contractions >5/min	7
Poor general medical condition	3
Abdominal or thoracic aorta surgery	3
Emergency surgery	4
Total	53

Godman multifactorial risk assessment .

Risk class	Points	Risk	Mortality (%)
I	0–5	0.7	0.2
II	6–12	5.0	2.0
III	13–25	11	2.0
IV	>26	22	56

Anaesthesia management for elderly patients undergoing major surgery. Preoperative assessment for identifying high risk patients. Careful history, Physical examination, Twelve-lead ECG, Functional status assessment, Nutrition assessment. Patients with decompensated heart failure should be treated in accordance with existing guidelines, and elective surgery should be delayed if feasible.¹² Preoperative preparation: Effective control of co-existing disease, Stopped smoking for 8 weeks, Training in cough and lung expansion techniques, Chest physiotherapy for elderly at risk of postoperative pulmonary complications, Correct of malnutrition. Routine precautions for major surgery: Temperature monitor and control, Ripple mattress, DVT prophylaxis, Intra-arterial pressure monitoring. Haemodynamic stability: Combination of anaesthetic and vasopressor, beta-blockers or vasodilators, Avoid fluid overload, Quick recovery from anaesthesia, Use short-acting anaesthetic agents, Combine epidural anaesthesia and GA for major abdominal and thoracic surgery, Antagonize neuromuscular blocking drugs.

Postoperative period: Prevent hypoxemia, supplement oxygen, reversal of neuromuscular blocking drugs, prevent

hypothermia. Pulmonary diseases increase the risk of postoperative complications, accounting for 40% of postoperative complications and 20% of deaths^{13,14}. Age related changes such as increased closing volumes, decreased expiratory flow rates, increased dead space and decreased diffusing capacity predispose older persons to pulmonary complications. Renal diseases, Preoperative renal status is the best universal predictor of postoperative renal failure. Serum creatinine is a poor predictor of renal function in older patients with renal disease. Paying close attention to volume status, aggressively treating infections and avoiding these of nephrotoxic drugs are critical to minimize postoperative renal deterioration in older adults. Diabetes mellitus is associated with increased incidence of perioperative complications including ketoacidosis, stroke, renal failure and sepsis. Recommendations for the control of blood sugar levels are made based on the extent of surgery and time of resumption of a normal diet. The glucose level should be less than 300 mg/dl preoperatively (preferably <200mg/dl). Prevention of hyperglycemia during the perioperative period has been shown to improve wound healing, reduce the risk of infection and reduce cerebral damage in the presence of a hypoxic event. Diabetic patients undergoing major noncardiac surgery appear to have a high mortality rate, often because of cardiovascular death.¹⁵Thromboembolic disease' An estimated 20-30% of patients undergoing general surgery without prophylaxis develop deep vein thrombosis and the incidence rate is as high as 40% in those undergoing hip and knee surgery, gynecologic cancer operations, open prostatectomies and major neurosurgical procedures. Fatal pulmonary embolism is a major cause of operative deaths in elderly persons. Hypothermia. Maintaining body temperature is important because hypothermia is associated with myocardial ischemia and hypoxia in early postoperative period.¹⁶ Advanced age and general anesthesia are associated with hypothermia. Spinal anaesthesia with high blockade can also lead to decreased core temperature. There is age related decrease in pain perception.^{18,17}. Neuropsychiatric disorders

- 1) Neuropsychiatric problems are common among older patients. Delirium, dementia and depression are common important conditions to be considered. Postoperative delirium is common, but underdiagnosed, in elderly surgical patients, and delays rehabilitation. Multimodal intervention strategies are recommended for preventing postoperative delirium.
- 2) Peri-operative pain is common, but underappreciated, in elderly surgical patients, particularly if they are cognitively impaired. Anaesthetists should administer opioid-sparing analgesia where possible, and follow published guidance on the management of pain in older people.
- 3) Elderly patients should be assumed to have the mental capacity to make decisions about their treatment. Good communication is essential to this process. If they clearly lack that capacity, proxy information should be sought to determine what treatment, if any, is in the patient's best interests.
- 4) Anaesthetists must not ration surgical or critical care on the basis of age, but must be involved in discussions about the utility of surgery and/or resuscitation¹⁹.

- 5) The evidence base informing peri-operative care for the elderly remains poor²⁰. Anaesthetists are strongly encouraged to become involved in national audit projects and outcomes research specifically involving elderly surgical patients.

Anaesthetic consideration. Preoperative evaluation is standard. Extra examinations such as echocardiography, spirometry, cycloergometry, depend on whether the patient has other diseases. The biochemical panel includes all analyzes and of course the entire coagulation profile. In order to execute an objective examination, we should focus on the clinical data (consciousness, motoric/sensor deficits, arterial pressure, obligated position, orthostatism, cardiac frequency, cyanosis, polypnea/dyspnea, swollen jugulars, and edema) and the patient's ability to strain. With simple questions we collect valuable information on how much stress the patient can bear. The role of spinal/epidural and plexial anaesthesia is to be considered. Preoperator morbidity and mortality will continue to be a significant problem. Preoperative clinical evaluation, knowing the risk rate of the patient, anaesthetic management depending on age, preoperative comorbidity, functional capacity of the organs, surgery type, hemodynamic stability, normothermia, good pain control, and hypoxia prevention will minimize side effects on elderly patients.

3. Recommendations

- 1) Evaluating and noting high risk patients
- 2) Preoperative testing (invasive or not depending on the intervention type)
- 3) Effective control of preexisting diseases
- 4) Good hemodynamic management
- 5) Using as little as possible invasive surgical procedures
- 6) Intensive preoperative monitoring in high risk patients
- 7) Prevention of hypoxia, hypothermia and delirium
- 8) Good pain control

Including each of these elements in making decisions in perioperative management of elderly patients, results in better outcomes for this population which is growing in number day by day.

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