

## Tips for the Intraoperative Management of Geriatric Patients

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### DESCRIPTION

The geriatric population is a distinct age group that requires particular attention in all areas. The purpose of this article is to highlight some key points in the intraoperative anesthetic management of elderly patients.

### Monitoring

**Standard monitoring:** Pulse oximetry, electrocardiography, noninvasive blood pressure device, temperature monitor, measurement of end tidal carbon dioxide, inspired oxygen concentration, and the use of low oxygen concentration and ventilator disconnect alarms are all used in older adults by the American Society of Anesthesiologists (ASA) [1]. Quantitative monitoring of the amount of expired gas is also strongly recommended, especially for the elderly [2]. A peripheral nerve stimulator should be used to guide dose if a Neuromuscular Blocking Medication (NMBA) is utilized. Monitoring decisions are made depending on patient and surgery-specific factors.

**Brain function monitoring:** In older adults, raw or processed Electroencephalography (EEG) or other brain function monitors, such as the Bispectral Index (BIS), are frequently used [3].

**Positioning:** Due to inadequate peripheral circulation and friable skin, older people are more prone to nerve and other pressure point damage [4].

### Selection and dosing of anesthetic agents

**General considerations:** Due to age-related changes in pharmacokinetics and pharmacodynamics, older adult patients are more susceptible to medicines [5,6].

Excessive anesthetic depth and other anesthetic side effects (e.g., hypotension) can be avoided using the following strategies:

- Reducing anesthetic dosages
- Increasing the time between repeat doses
- Using shorter-acting anesthetic drugs

**Intravenous anesthetic and adjuvant agents:** In older adults, the dosages of Intravenous (IV) anesthetic induction drugs are lowered, the time between repeat doses is greater, and bolus injections should be given slowly [6]. The following are specific concerns for individual anesthetic agents:

**Propofol:** Propofol's effects are roughly 30% more sensitive in older people [7]. Additionally, propofol clearance is reduced [8]. Propofol's first induction dose and future bolus doses should be lowered by 40 to 50% and given slowly [6,8].

**Etomidate:** Because it has little hemodynamic side effects, etomidate is frequently used as an anesthetic induction drug in elderly patients with documented cardiovascular impairment or hemodynamic instability [9].

**Ketamine:** Because of its distinctive cardiovascular effects (increases in blood pressure and heart rate owing to a centrally-mediated sympathetic response) and the unfavorable side effect of postoperative delirium, ketamine is rarely utilized for anesthetic induction in older patients [9,10].

**Opioids:** In elderly people, all opioids are around twice as powerful. Furthermore, because opioids can cause respiratory depression, higher brain sensitivity and slower opioid elimination in elderly people might lead to severe hypoventilation or apnea [11].

**Short-acting opioids:** Respiratory depression is predominantly a pharmacodynamic consequence of fentanyl, sufentanil, and alfentanil due to age-related increased brain sensitivity to opioids [8].

**Long-acting opioids:** In elderly individuals, the volume of distribution of morphine increases, while renal clearance of the parent drug and its active metabolite, morphine-6-glucuronide, decreases [12,13]. Because hydromorphone has primary renal clearance, initial dosages are lowered by 25 to 50 percent to avoid a lengthy duration [12].

**Medications to use with caution:** In elderly persons, a number of drugs are reduced or avoided [5]

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**Benzodiazepines:** If at all possible, benzodiazepines should be avoided. An initial IV dosage of midazolam, if needed to relieve anxiety, is generally just 0.25 to 1 mg, and the time between future doses may be greater than in younger patients [6,8].

**Other agents:** Meperidine, anticholinergics (especially scopolamine), diphenhydramine, and metoclopramide all enhance the risk of perioperative delirium and other neurocognitive disorders [5].

**Inhalation anesthetic agents:** After age 40, the Minimal Alveolar Concentration (MAC) at 1 atmosphere that prevents movement in 50% of individuals exposed to a surgical incision of all inhalation agents drops by about 6% every decade. MAC is lowered by 30% by the age of 90 [14,15].

According to the ASA recommendations, neuromonitoring such as EEG may be effective in guiding volatile drug titration and maintaining appropriate anesthetic depth [3].

**Neuromuscular blocking agents:** In particular, in older patients, various Neuromuscular Blocking Agents (NMBAs), such as succinylcholine, may have a longer onset time and duration. Reduced muscle blood flow and cardiac output are two likely reasons [16]. When at all feasible, NMBAs are used sparingly. Because age-related decreases in hepatic metabolism and renal excretion may result in longer duration of action for some drugs, shorter-acting NMBAs are often used (eg, vecuronium, rocuronium) [16]. Sugammadex, which allows fast reversal from rocuronium-induced neuromuscular blockade, has been shown to impede muscle function recovery in elderly adults [17]. All NMBAs should be dosed with the use of a peripheral nerve stimulator [2,18]. Furthermore, cholinesterase inhibitors (eg, donepezil, rivastigmine, galantamine) may be used by older patients with Alzheimer's disease and other forms of dementia. Chronic use of these medications may cause a decrease in plasma cholinesterase, extending the succinylcholine duration [19].

**Fluid management:** The overall aims of intraoperative fluid management are to minimize dehydration, keep a good circulation volume, and avoid poor tissue perfusion [20].

**Hemodynamic management:** As noted above, Hemodynamic instability during anesthesia and surgery can be caused by changes in the older adult's circulatory system, such as vascular stiffness and autonomic alterations [21]. In elderly individuals, episodes of intraoperative hypotension, in particular, may contribute to unfavorable cardiac events [22]. Some patients, particularly those with persistent hypertension, require an intraoperative mean arterial pressure goal greater than the standard 65 mmHg [23,24].

**Avoidance of hypothermia:** In older adults, who have a reduced ability to swiftly reestablish thermoregulatory control, perioperative hypothermia is more common, severe, and persistent [25].

## CONCLUSION

In conclusion, intraoperative care of the geriatric patient group is a one-of-a-kind procedure with all of its characteristics. We've

given a few things to be concerned about in order to avoid any potential difficulties.

## REFERENCES

- Lizasoain A, Tort L, Garcia MJASA. Standards for basic anesthetic monitoring: Committee of origin: standards and practice parameters. 2015;1: 1-4.
- Kim DK. Nonoperating room anaesthesia for elderly patients. *Curr Opin Anaesthesiol.* 2020;33(4): 589-593.
- Berger M, Schenning KJ, Brown CHt, Deiner SG, Whittington RA, Eckenhoff RG, et al. Best Practices for Postoperative Brain Health: Recommendations From the Fifth International Perioperative Neurotoxicity Working Group. *Anesthe Analg.* 2018;127(6): 1406-1413.
- Adedeji R, Oragui E, Khan W, Maruthanair N. The importance of correct patient positioning in theatres and implications of mal-positioning. *J Perioper Pract.* 2010;20(4): 143-147.
- Irwin MG, Ip KY, Hui YM. Anaesthetic considerations in nonagenarians and centenarians. *Curr Opin Anaesthesiol.* 2019;32(6): 776-82.
- Rivera R, Antognini JF. Perioperative drug therapy in elderly patients. *Anesthesiology.* 2009;110(5): 1176-1181.
- Schnider TW, Minto CF, Shafer SL, Gambus PL, Andresen C, Goodale DB, et al. The influence of age on propofol pharmacodynamics. *Anesthesiology.* 1999;90(6): 1502-1516.
- Shafer SL. The pharmacology of anesthetic drugs in elderly patients. *Anesthesiol Clin North Am.* 2000;18(1): 1-29.
- Das S, Forrest K, Howell S. General anaesthesia in elderly patients with cardiovascular disorders: choice of anaesthetic agent. *Drugs Aging.* 2010;27(4): 265-282.
- Weinstein SM, Poulsides L, Baaklini LR, Mörwald EE, Cozowicz C, Saleh JN, et al. Postoperative delirium in total knee and hip arthroplasty patients: a study of perioperative modifiable risk factors. *Br J Anaesth.* 2018;120(5): 999-1008.
- Cepeda MS, Farrat JT, Baumgarten M, Boston R, Carr DB, Strom BL. Side effects of opioids during short-term administration: effect of age, gender, and race. *Clin Pharmacol Ther.* 2003;74(2): 102-112.
- Chau DL, Walker V, Pai L, Cho LM. Opiates and elderly: use and side effects. *Clin Interv Aging.* 2008;3(2): 273-278.
- Macintyre PE, Jarvis DA. Age is the best predictor of postoperative morphine requirements. *Pain.* 1996;64(2): 357-364.
- Nickalls RW, Mapleson WW. Age-related iso-MAC charts for isoflurane, sevoflurane and desflurane in man. *Brit J Anaesthe.* 2003;91(2): 170-174.
- Mapleson WW. Effect of age on MAC in humans: a meta-analysis. *Brit J Anaesthe.* 1996;76(2): 179-185.
- Bjerring C, Vestad M, Arleth T, Eriksen K, Albrechtsen C, Rasmussen LS. Onset time and duration of action of rocuronium 0.6 mg/kg in patients above 80 years of age: A comparison with young adults. *Acta Anaesthesiol Scand.* 2020;64(8): 1082-1088.
- McDonagh DL, Benedict PE, Kovac AL, Drover DR, Brister NW, Morte JB, et al. Efficacy, safety, and pharmacokinetics of sugammadex for the reversal of rocuronium-induced neuromuscular blockade in elderly patients. *Anesthesiology.* 2011;114(2): 318-329.
- Cedbog AI, Sundman E, Bodén K, Hedström HW, Kyulenstierna R, Ekberg O, et al. Pharyngeal function and breathing pattern during partial neuromuscular block in the elderly: effects on airway protection. *Anesthesiology.* 2014;120(2): 312-325.
- Grocott MPW, Mythen MG, Gan TJ. Perioperative fluid management and clinical outcomes in adults. *Anesth Analg.* 2005;100(4): 1093-1106.

20. Rooke GA. Cardiovascular aging and anesthetic implications. *J Cardiothorac Vasc Anesth.* 2003;17(4): 512-523.
21. Kheterpal S, O'Reilly M, Englesbe MJ, Rosenberg AL, Shanks AM, Zhang L, et al. Preoperative and intraoperative predictors of cardiac adverse events after general, vascular, and urological surgery. *Anesthesiology.* 2009;110(1): 58-66.
22. Wu X, Jiang Z, Ying J, Han Y, Chen Z. Optimal blood pressure decreases acute kidney injury after gastrointestinal surgery in elderly hypertensive patients: A randomized study: Optimal blood pressure reduces acute kidney injury. *J Clin Anesth.* 2017;43: 77-83.
23. Al-Qamari A, Adeleke I, Kretzer A, Hogue CW. Pulse pressure and perioperative stroke. *Current Opin Anaesthesiol.* 2019;32(1): 57-63.
24. Karalapillai D, Story D, Hart GK, Bailey M, Pilcher D, Schneider A, et al. Postoperative hypothermia and patient outcomes after major elective non-cardiac surgery. *Anaesthesia.* 2013;68(6): 605-611.