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## Review

# Challenges in anaesthesia for elderly



C. Strøm\*, L.S. Rasmussen

Department of Anaesthesia, Centre of Head and Orthopaedics, Rigshospitalet, Copenhagen University Hospital, Copenhagen, Denmark

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### ABSTRACT

The segment of elderly individuals comprises a growing proportion of the global population. Health care systems and health care providers worldwide need to understand the specific challenges related to treatment of this heterogeneous patient population. The process of ageing is complex and under constant influence by numerous factors, for which reason the way human age is extremely individual.

It is important to understand and acknowledge how elderly differ from younger adults, and how management needs to be modified and tailored to the individual patient in order to improve outcomes. The goal of treatment of an elderly patient is not necessarily to increase human longevity regardless of the consequences, but to increase active longevity free from disability and functional dependence. For older people, deterioration in function can be devastating and is often precipitated by a stressful event such as an acute episode of illness or injury. Therefore a mainstay of treatment of the aged is prevention of functional decline.

In this review, we will outline the extreme variability in the aging process, and its implications for tailoring the perioperative care for the elderly. We will provide an overview of the challenges, when dealing with the aged surgical population with emphasis on postoperative cognitive changes.

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\*Corresponding author. Tel.: +45 35 456389; fax: +45 35 452950.  
E-mail address: [camilla.stroem.01@regionh.dk](mailto:camilla.stroem.01@regionh.dk) (C. Strøm).

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## Introduction

In recent years a growing interest has revolved around the impact of surgery and anaesthesia on the elderly. As life expectancy increases with more elderly patients undergoing surgery [1], it is imperative that knowledge on this important topic is disseminated for health care systems and providers to understand why elderly are different and how management needs to be modified to improve outcome.

Especially postoperative cognitive decline is much more common in the elderly and this has been associated with higher morbidity and mortality among elderly, which challenges the benefits of surgery in this population.

In this review, we will provide an overview of the problems when dealing with the aged, with emphasis on postoperative cognitive changes.

## Ageing and the aged patient population

Ageing is a physiological process, where the structure and functional capacity of organs and tissue progressively degenerates over time. The ageing process is extra-ordinarily complex, and is constantly influenced by numerous factors; such as life style choices, environment, genetics, social network and chronic diseases [2]. The geriatric population has a higher prevalence of numerous medical conditions and comorbidity; including atherosclerosis, heart failure, diabetes, chronic obstructive lung disease, kidney impairment, and dementia. Often patients receive several drugs for their chronic diseases, which may have negative connotations. Polypharmacy can be associated with increased risk of adverse drug reactions, problematic drug interactions, and medication errors [3].

Humans age differently, for which reason the elderly patient population is health-wise extremely diverse. A large proportion of elderly is functionally independent; they are healthy or have well treated milder chronic diseases. However, a significant proportion of elderly are particularly frail; they have severe chronic diseases, high level of co-morbidity, and may have low functional capacity.

The human body has the capability to compensate for the age related changes to some extent, but elderly, healthy or sick, have a limited physiological reserve that can become evident upon application of stressors [4,5]. The increased frailty renders the elderly patient at risk of transient disabilities. This can potentially push the elderly into a vicious cycle that ultimately may lead to permanent loss of daily functions, loss of self-care capacity, dependence on supportive care or institutionalization [6]. Clinicians should be particularly aware of tailoring care and support to the individual patient's needs, and for the elderly this may include careful considerations on how to prevent functional decline and disabilities

## Important aspects of perioperative care of the aged

A preoperative consultation is essential to evaluate the perioperative risks and plan preventive perioperative actions. It is important to address all the aspects of the elderly patient, which include changes induced by the process of aging, the cumulative impact of co-existing diseases, presence of polypharmacy, difficulties in communication and comprehension (reduced hearing or vision), compromised cognitive function, and a consideration whether the patient can provide informed consent [7]. It should always be considered, where a certain procedure for the individual patient could be best carried out. Certain patients should only be treated in places where supportive care and increased monitoring are available, for example elderly patients with bleeding disorders, or significant heart disease going through more invasive procedures. Relevant specialists e.g. a geriatrician should be consulted whenever in doubt how to provide best practice of care.

Generally, adjustment of drug selection and dosage is required for the elderly. Elderly patients are generally more sensitive to analgesics and sedatives. As polypharmacy is frequent, one should be aware of potential interactions. The variability in pharmacodynamics and kinetics is high; usually, smaller doses are needed for clinical effect compared to the adult population, and the duration of action is prolonged. Therefore dosing should be carefully titrated by the principle: "start low – go slow" [8]. Using local anaesthetics for elderly is usually safe. Not different from other adults, clinicians should be aware of allergies, decreased liver and kidney function, and pay attention to correct dosing of local anaesthetics to prevent toxic reactions [9].

It is essential to avoid inadequate pain relief; particular awareness should be given to the patients lacking communication abilities, as they may not be able to express if they experience pain (for an example a patient with severe dementia, or a patient suffering from a severe stroke). The use of multimodal analgesia is usually beneficial. This includes a combination of different analgesics and adjuvants. Anti-inflammatory drugs should be used cautiously, especially because of the risk of gastric bleeding, and renal impairment [10].

Sedation should be carried out with extreme caution since elderly are more susceptible to drugs acting on the central nervous system. Premedication with anxiolytics with weak sedative effects may be feasible with no further monitoring [11]; however deeper sedation should be carried out under continuous monitoring of vital functions (oxygen saturation, respiratory rate, heart rate, blood pressure, and electrocardiogram). General anaesthesia can be performed with either intravenous or inhaled anaesthetics. Selection of anaesthesia has to be individualized and influenced not only by the condition, but also by the anaesthesiologist's skill and expertise.

Elderly are at higher risks for complications postoperatively. The immune system is not as effective as in the younger population, why elderly are more prone to hospital

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