



Department of Anesthesia Techniques
**Title of the lecture: - Anesthesia for geriatric
and obese patients**

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Anesthesia for Geriatric and Obese patients

(Practical Anesthesia)

3^{ed} stage

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Geriatric anesthesia: - is defined as providing anesthetic care for patients older than 65 years old in which perioperative morbidity and mortality are greater.

- The elderly patient typically presents multiple chronic medical conditions.

Some similarities between elderly and pediatric patients

1. Decreased lung compliance.
2. Decreased arterial oxygen tension.
3. Impaired ability to cough
4. Decreased renal tubular function.
5. Increased susceptibility to hypothermia.

Age-Related Anatomic & Physiological Changes

1. Age-related changes to the CVS

- ♠ Increase blood pressure and afterload on the heart. (e.g., from hypertension)
- ♠ Diastolic dysfunction minimizes the ability to adjust stroke volume.
- ♠ The atrium dilates as result of impaired outflow and to ventricular hypertrophy.
- ♠ Down regulation of B-adrenergic receptors magnifies the decreased ability of the heart to reach maximal cardiac output acutely in response to stress.

2. Age-related changes to the pulmonary system

- ♠ increase functional residual capacity (FRC) by age 65 years.
- ♠ Decreased cough reflex, and decrease in protective laryngeal reflexes increase risk of perioperative aspiration and pneumonia.
- ♠ centrally mediated decrease in ventilatory response to hypoxia and hypercapnia.
- ♠ Both anatomic and physiological dead space increase.

3. Age-related changes to the nervous system

- ▶ decreased synthesis of neurotransmitters.
- ▶ increased fibrosis of peripheral sympathetic neurons.

All of above leads to:

1. Increased sensitivity to all anesthetic agents.
2. Decrease dosage requirements for local and general (MAC) anesthetics.
3. Postoperative cognitive dysfunction.

4. Age-related changes to Renal System

- ♠ Progressive decrease in glomerular filtration rate (GFR) because of a decrease in renal blood flow, lead to an increased risk of acute renal failure.
- ♠ Any medications depend on renal clearance have prolonged elimination half-life's and longer durations of action. An example morphine and its metabolites, can result in prolonged.

5. Age-related changes to Liver and GIT

- ♠ Liver mass, hepatic blood flow, and hepatic reserve decrease. leads to decreased protein synthesis, including albumin. Decreases in drug metabolism.

6. Musculoskeletal Changes

- ♠ Muscle mass is reduced in elderly patients.
- ♠ Increase in percentage of body fat.
- ♠ Veins are often frail and easily ruptured by intravenous infusions.

7. Age-Related Pharmacological Changes

Aging produces both pharmacokinetic (the relationship between drug dose and plasma concentration) and pharmacodynamics (the relationship between plasma concentration and clinical effect) changes.

The principal pharmacodynamics change associated with;

- ♠ Aging is a reduced anesthetic requirement, represented by a reduced MAC.
- ♠ Drugs that are not significantly dependent on hepatic or renal function or blood flow, such as atracurium or cisatracurium, are useful.

Intraoperative management

» Pre-oxygenation:

desaturation occurs faster in older patients 8 deep breaths of 100% oxygen within 60 seconds with an oxygen flow of 10 L/min

» Induction of Anesthesia:

- = Use of aspiration prophylaxis and rapid sequence intubation (RSI)
- =Concurrent use of propofol, midazolam, opioids, increase the depth of anaesthesia

Anesthesia for obesity: obese: Obesity is one of the most common nutritional disorders. Obesity is classified by the BMI. BMI is defined as weight (in kg) divided by height (in m²).

Adipose tissue is a normal constituent of the human body that serves the important function of storing energy as fat for mobilization in response to metabolic demands. The body cannot store proteins & carbohydrates, so excess proteins & carbohydrates are converted to fat in the body. An imbalance between energy intake & expenditure causes obesity.

Body mass index (BMI) قياس نسبة السمنة للجسم

A measure of obesity is the Body mass index (BMI)

A BMI of 28 for men and 27 for women correspond to 20% above Ideal body weight

$$\text{Body mass index (BMI)} = \text{weight in kgs} / \text{height in meters}^2$$

Ideal body weight (IBW) قياس الوزن المثالي للجسم

Various methods and formulas can be used to calculate IBW. A common formula is as follows:

$$\text{Men: IBW (kgs)} = 22 \times (\text{height in meters})^2$$

$$\text{Women: IBW (kgs)} = 22 \times (\text{height in meters} - 10 \text{ cm})^2$$

Pre anesthesia assessment:

1 - Difficult intubation and or ventilation

- Neck circumference >40 cm or mallampati 3 or 4
- Pt with home cpap >10 usually have difficult mask ventilation

2 - Associated comorbidities

- HTN, DM, OSAS (Obstructive Sleep Apnea Syndrome)

Cardiac & Respiratory problems.

- High risk of esophageal reflux & Aspiration.

Intra OR / Monitoring

NIBP: large cuff is needed. And pulse oximeter for PR & SpO₂

IBP required in morbid obesity with severe cardiopulmonary disease CVP, and intra op. ECHO may also be required.

Intra OR / Intubation:

Intubation with fiber-optic bronchoscope in selected patients.

- Rapid sequence intubation with

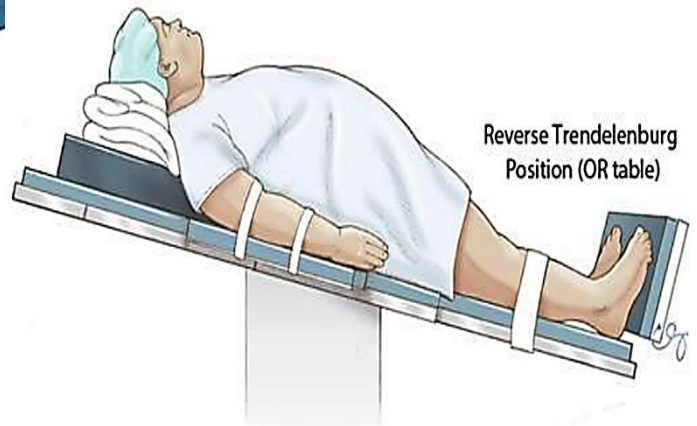
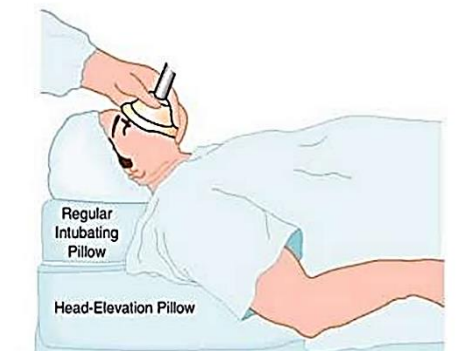
• pre-oxygenation • cricoid pressure • Succinylcholine

Position:

Head-up



Head Elevated
Laryngoscopy Position (patient)



Postoperative considerations: Extubation:

- Delayed until effects of NMBAs completely reversed
- Fully awake
- Adequate airway maintenance
- Adequate tidal volume
- Supplemental oxygenation
- Modified sitting position

Postoperative / Complications:

- * Respiratory failure
 - Pre-operative hypoxia.
 - Thoracic & upper abdominal Surgery.
- * Deep Venous Thrombosis.
- * Pulmonary Embolism.