Al-Mustaqbal University

College of Health and Medical Technology

Anesthesia Techniques Department

Practical Lecture

Anesthesia for obese patient

BSc. Anesthesia & Intensive Care

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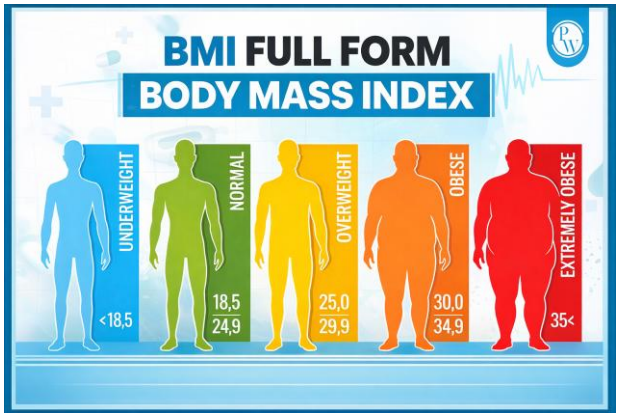
Anesthesia for an obese patient

Morbid obesity is defined in terms of body mass index (BMI).

BMI is calculated by establishing a ratio between the patient's weight and height as follows**:**

Body mass index (BMI) = weight in kg/height in m2.

BMI values are classified as follows:



BMI of 18.5–24.9 = normal

BMI of 25.0–29.9 = overweight

BMI of 30.0–34.9 = class I obesity

BMI of 35.0–39.9 = class II obesity

BMI of 40.0 or greater = class III obesity (sever or morbid obesity).

Cardiovascular Disorders

A. Systemic Hypertension. Obesity-induced hypertension is related to the effects of hyperinsulinemia on the sympathetic nervous system and extracellular fluid volume.

B. Coronary Artery Disease.

C. Congestive Heart Failure.

Respiratory disorders:

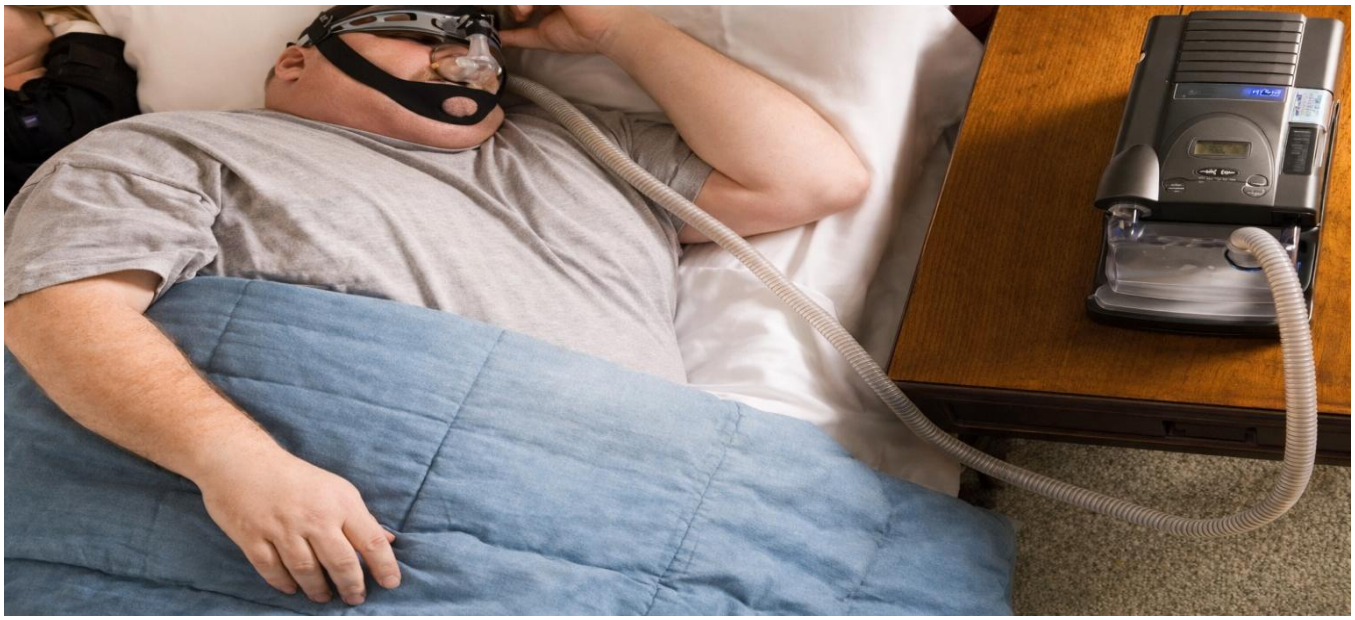
Since **obesity** is a **multisystem disease** affecting all organs, there are a number of implications relevant to the conduct of anesthesia:

A. Lung Volumes. Obesity imposes a restrictive ventilatory defect because the weight of the thoracic cage and abdomen impedes the motion of the diaphragm and decreases functional residual capacity (FRC), especially in the supine position.

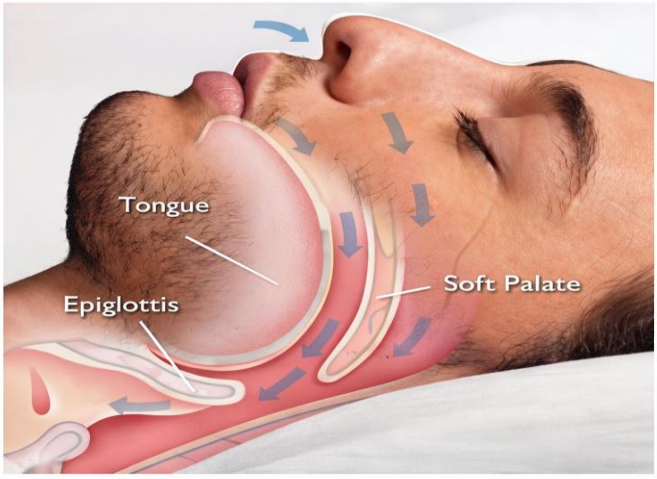
B. Gas Exchange and Work of Breathing. Paco2 and ventilatory response to carbon dioxide remain within a normal range in obese patients.

C. Lung Compliance and Resistance. Obesity is associated with a **decrease in lung compliance and an increase in airway resistance**.

D. Obstructive Sleep Apnea (OSA). OSA is cessation of breathing for **more than 10 seconds during sleep, and hypopnea is a reduction in the size and number of breaths compared with normal breathing.**

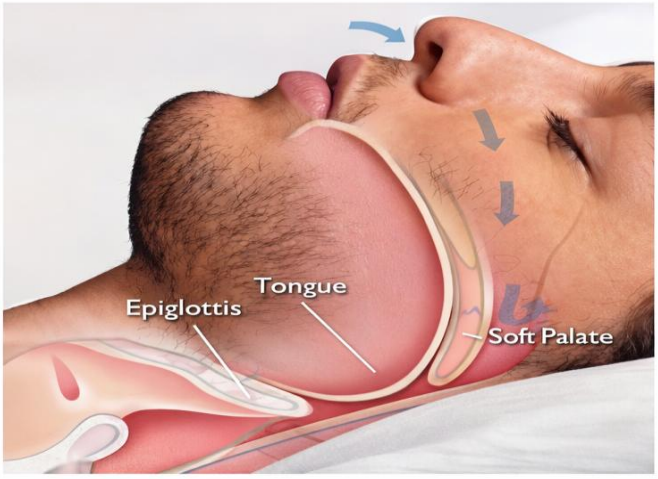


treatment includes removal of precipitants, weight loss, and nocturnal CPAP.



Normal breathing

During sleep, air can travel freely to and from your lungs through your airways.



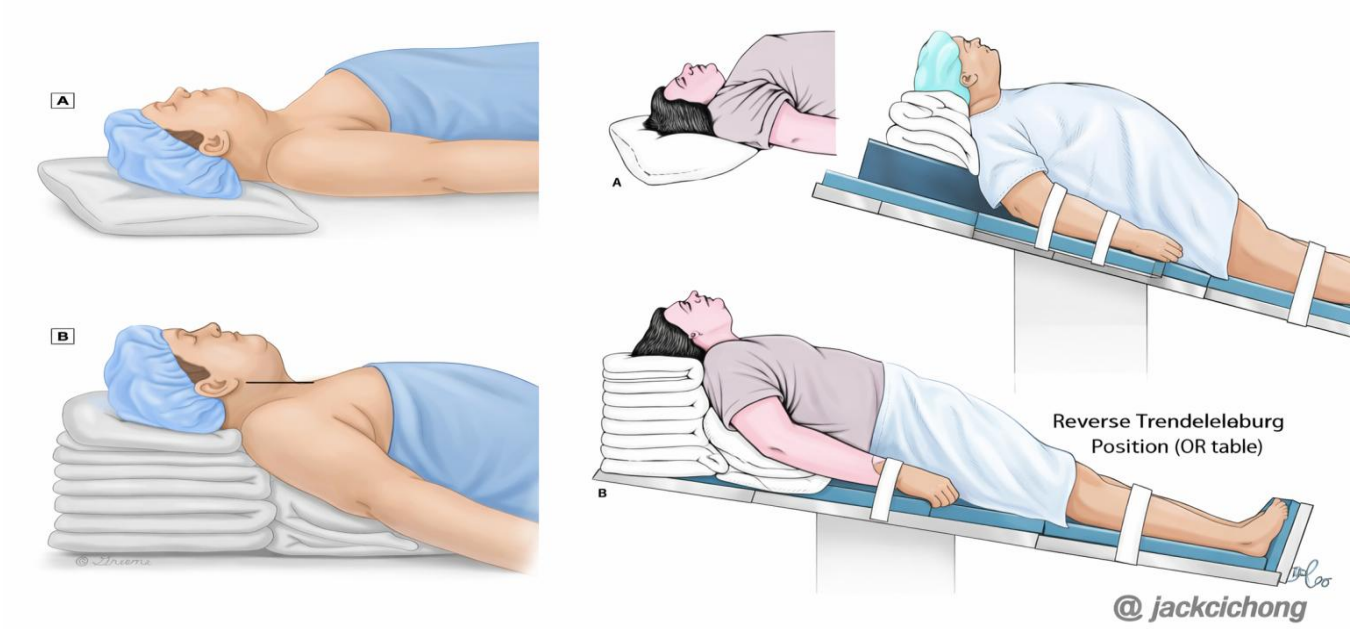
Obstructive Sleep Apnoea

Your airway collapses, stopping air from traveling freely to and from your lungs and disturbing your sleep.

Specific Anaesthetic Considerations:

- ✓ Avoid sedative premedication (difficult to maintain airway)
- ✓ Airway obstruction is very likely to occur in the postoperative period (give oxygen and apply CPAP if required)
- ✓ Regional techniques and short-acting anaesthetic agents are ideal to reduce postoperative drowsiness.
- ✓ Consider nocturnal oxygen for up to 5 days following major surgery if available.
- ✓ Regional anesthesia plus noninvasive mechanical ventilation represented the preferred techniques for obese patients with respiratory problems.
- ✓ Always assess the airway for prediction of difficult intubation.
- ✓ Difficult mask ventilation can sometimes be transformed by placement of an oral airway; typically, laryngeal mask airways (LMA) are used for this purpose .

- ✓ Obese women are more likely to have large breasts, which can interfere with easy placement of the laryngoscope. Aim for a degree of head-up tilt, and if necessary, apply traction on the breasts to allow placement of the laryngoscope.
- ✓ For intubation, ramps are recommended to achieve optimal sniffing position. These ramps are created by placing folded blankets under the patient's shoulders, neck, and occiput. **The idea is to bring the patient's chin to a higher point than the chest**.



Anesthesia management

1. Preoperative Evaluation.

The focus is on cardiovascular and respiratory systems and airway evaluation.

Continuous Positive Airway Pressure (CPAP) or Bi-Level Positive Airway Pressure (BiPAP). If such treatment is used at home, the patient should bring the mask so that this therapy can be continued in the perioperative period.

2 .Intraoperative Management

Positioning: Specially designed operating room tables may be needed, and special transfer devices (such as air transfer mattresses) can minimize the risk of injury to patient or staff. “Ramping” the patient may allow better ventilator mechanics. Pressure points require special attention. Neutral arm position is preferred when possible.

Choice of Anesthesia: Local or regional anesthesia is preferable to general anesthesia if feasible.

Regional Anesthesia: In obese patients, regional anesthesia may be technically difficult, as bony landmarks are obscured. Local anesthetic requirements for spinal and epidural anesthesia in obese patients may be as much **as 20% lower** than in nonobese patients.

General Anesthesia:

Premedication: Use of benzodiazepines is controversial owing to the risk of upper airway obstruction.

Management of Ventilation.

- Controlled ventilation using large tidal volumes is often applied in an attempt to offset the decreased FRC .

• Positive end- expiratory pressure (PEEP) may improve ventilation/perfusion matching and arterial oxygenation in obese patients, but adverse effects on cardiac output and oxygen delivery may offset these benefits.

Note: Patients should be maintained in a semi-upright position during spontaneous ventilation during emergence.

Monitoring.

• The technical difficulty of placing intravenous catheters and invasive monitors may be increased by the presence of obesity.

• for those patients in whom a poor fit of the noninvasive blood pressure cuff is likely because of the severe conical shape of the upper arms or unavailability of appropriately sized cuffs.

• For surgeries performed with the patient under local or regional anesthesia, capnography is recommended to decrease the risk of undetected airway obstruction.

Fluid Management.

Fluid management should be based on lean body weight. Urinary output during laparoscopic surgery does not necessarily reflect volume status.

Postoperative Management

Extubation:

When obese patients are fully recovered from the depressant effects of anesthetics, extubation is considered. Ideally, obese patients should recover in a head-up to sitting position.

Postoperative Analgesia.

- ✓ Opioid depression of ventilation in obese patients is a concern, and Patient-controlled analgesia or neuraxial opioids are commonly used.
- ✓ **Nonsteroidal anti-inflammatory agents** may reduce narcotic requirements.
- ✓ **Ketamine** and **dexmedetomidine** may be useful .
- ✓ Patients with OSA are at risk for the development of postoperative hypoxemia.
- ✓ Adequacy of ventilation should be assessed for 24 to 48 hours postoperatively.