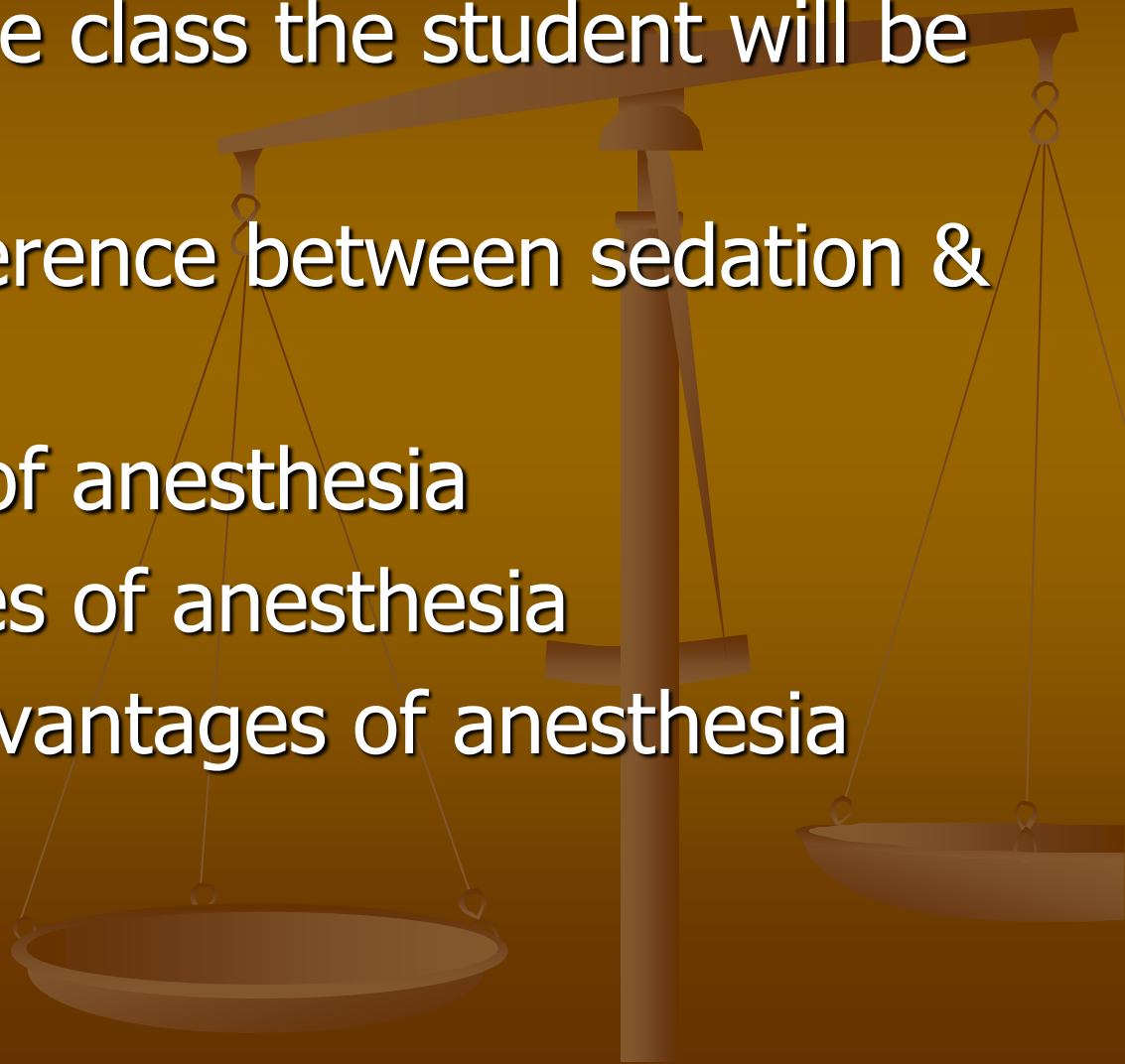
SEDATION AND ANESTHESIA

Specific Objectives

- At the end of the class the student will be able to:
- Explain the difference between sedation & anesthesia
- List the stages of anesthesia
- Explain the types of anesthesia
- Describe the advantages of anesthesia



The anesthesia experience

- For the patient, the anesthesia experience consists of having an intravenous line inserted, if it was not inserted earlier;
- receiving a sedating agent prior to induction with an anesthetic agent;
- losing consciousness; being intubated, if indicated;
- and then receiving a combination of anesthetic agents.
- Typically the experience is a smooth one and the patient has no recall of the events.

Minimal Sedation

- The minimal sedation level is a drug-induced state during which the patient can *respond normally to verbal commands*.
- Cognitive function and coordination may be impaired, but ventilatory and cardiovascular functions are not affected (JCAHO, 2001; Patterson)

Moderate Sedation

- *It is defined as a depressed level of consciousness that does not impair the patient's ability to maintain a patent airway and to respond appropriately to physical stimulation and verbal command.*

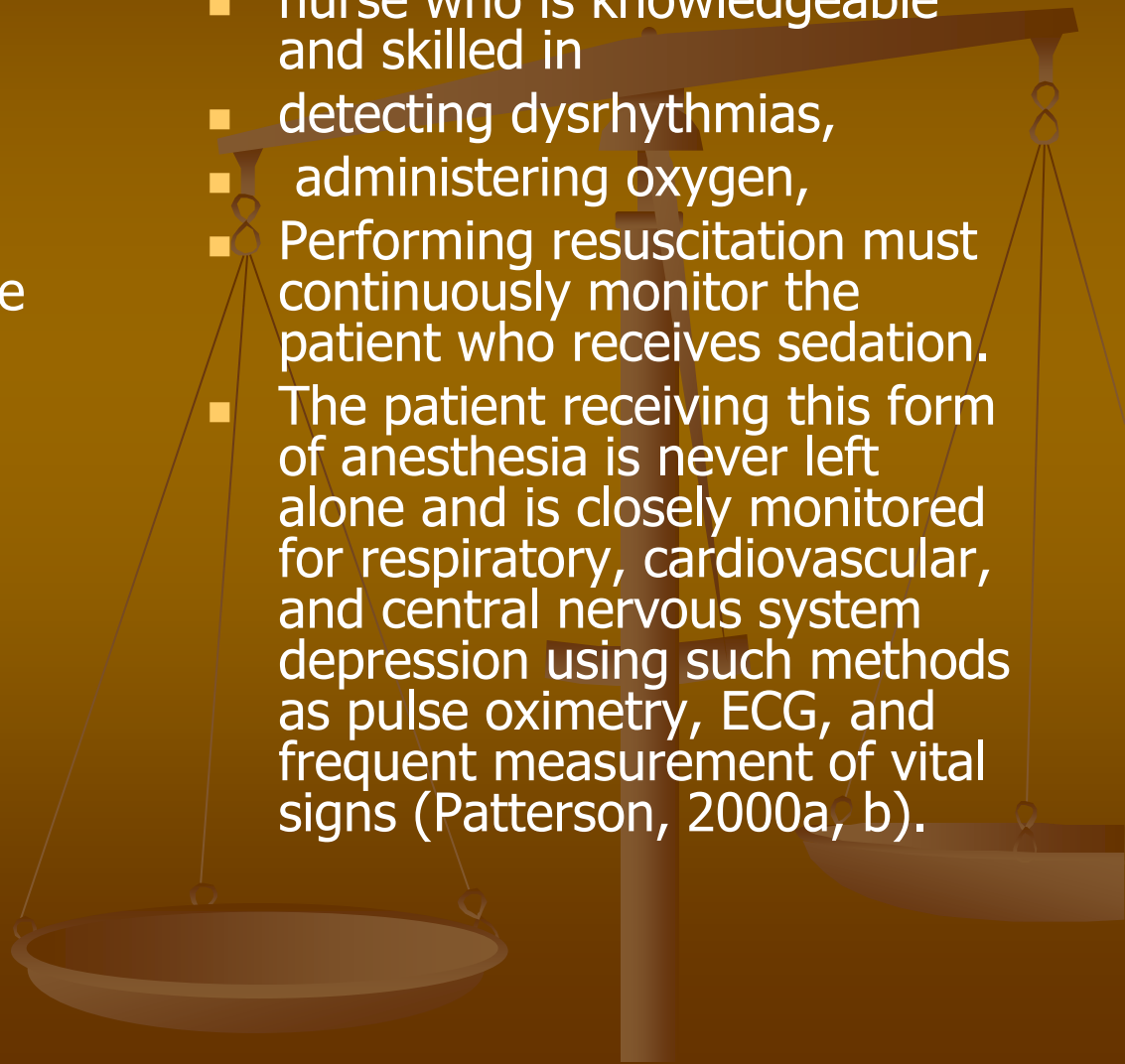
  Its **goal** is a calm, tranquil, amnesic patient who, when sedation is combined with analgesic agents, is relatively pain-free during the procedure but able to maintain protective reflexes (JCAHO, 2001; Patterson, 2000a, b).

Moderate sedation :-

Drugs used :-

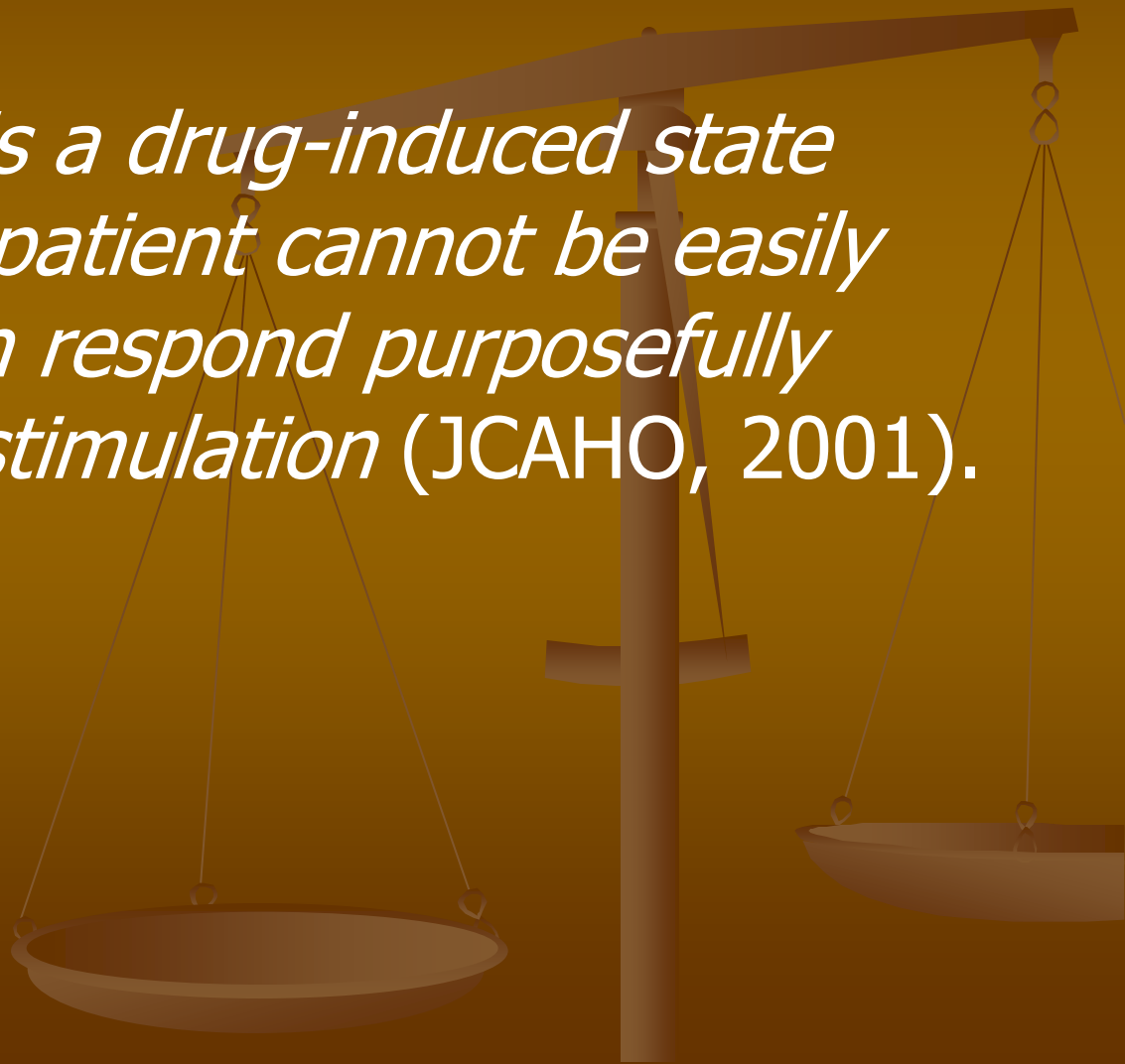
- Midazolam (Versed) or diazepam (Valium)
- Analgesic agents (eg, morphine, fentanyl)
- reversal agonists naloxone (Narcan)

- nurse who is knowledgeable and skilled in
- detecting dysrhythmias,
- administering oxygen,
- Performing resuscitation must continuously monitor the patient who receives sedation.
- The patient receiving this form of anesthesia is never left alone and is closely monitored for respiratory, cardiovascular, and central nervous system depression using such methods as pulse oximetry, ECG, and frequent measurement of vital signs (Patterson, 2000a, b).



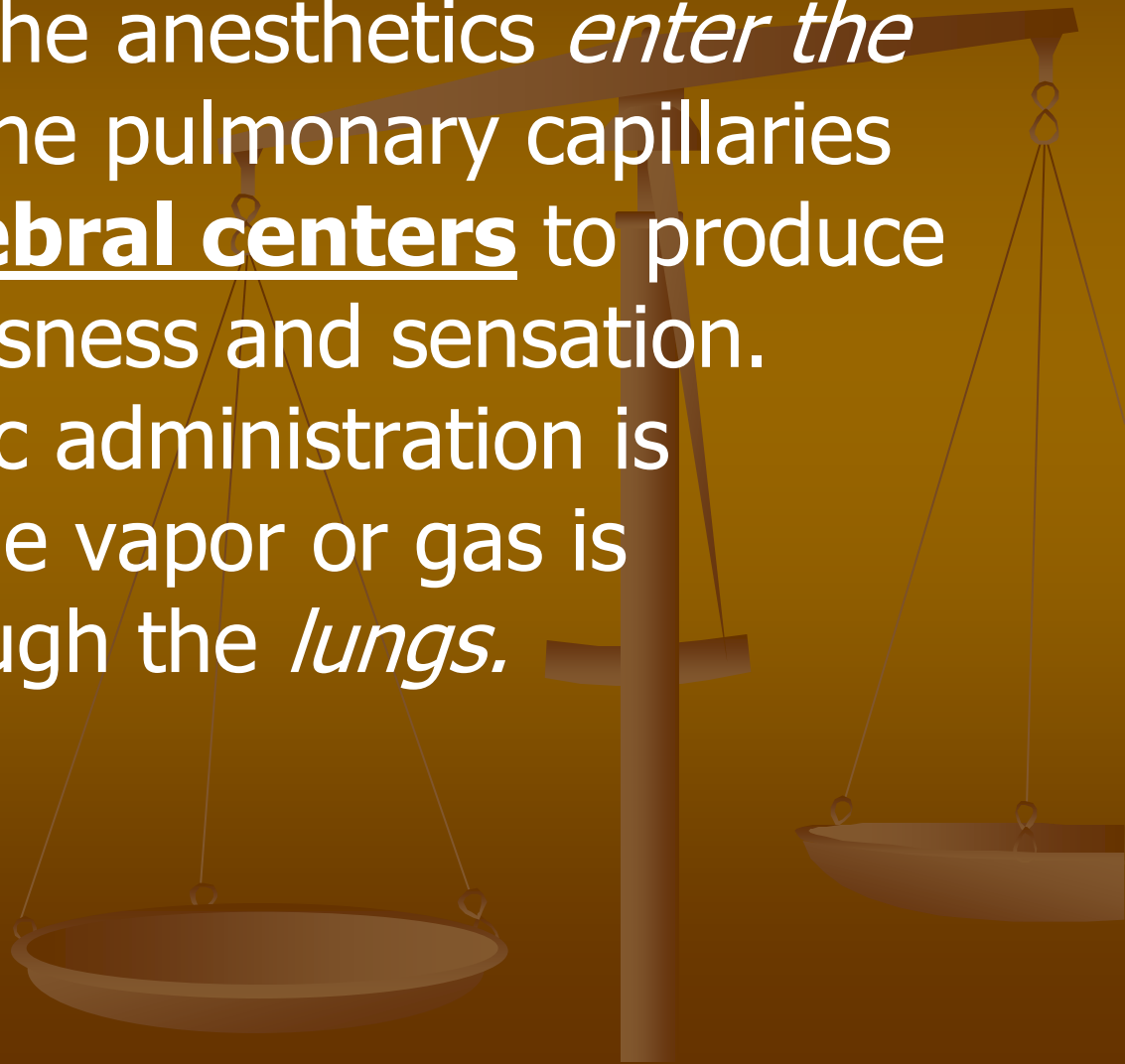
Deep Sedation

- *Deep sedation is a drug-induced state during which a patient cannot be easily aroused but can respond purposefully after repeated stimulation* (JCAHO, 2001).



Mechanism

- When *inhaled*, the anesthetics *enter the blood* through the pulmonary capillaries and act on **cerebral centers** to produce loss of consciousness and sensation. When anesthetic administration is discontinued, the vapor or gas is eliminated through the *lungs.*



Anesthesia

- **Anesthesia** is a state of
- narcosis (severe central nervous system depression produced by pharmacologic agents), analgesia, relaxation, and reflex loss.
- Patients under general anesthesia are not arousable, even to painful stimuli.
- They lose the ability to maintain ventilatory function and require assistance in maintaining a patent airway.
- Cardiovascular function may be impaired as well (JCAHO, 2001).

STAGE I: BEGINNING ANESTHESIA

- As the patient *breathes in* the anesthetic mixture, warmth, dizziness, and a feeling of detachment may be experienced.
- The patient may have a ringing, roaring, or buzzing in the ears and, though still conscious, may sense an inability to move the extremities easily.
- During this stage, noises are exaggerated; even low voices or minor sounds seem loud and unreal.
- For this reason, the nurse **avoids** making unnecessary noises or motions when anesthesia begins.

STAGE II: EXCITEMENT

- The excitement stage, characterized variously by *struggling, shouting, talking, singing, laughing, or crying*, is often avoided if the anesthetic is administered smoothly and quickly. The pupils *dilate*, but *contract if exposed to light*; the *pulse rate is rapid*, and *respirations may be irregular*.
- Because of the possibility of uncontrolled movements of the patient during this stage, the anesthesiologist or anesthetist must always be assisted by someone ready to *help restrain the patient*.
- A *strap* may be in place across the patient's thighs, and the hands may be secured to an arm board.
- The **patient should not be touched** except for purposes of restraint, but restraints should not be applied over the operative site.
- Manipulation increases circulation to the operative site and thereby increases the potential for bleeding.

STAGE III: SURGICAL ANESTHESIA

- Surgical anesthesia is reached by continued the administration of the anesthetic vapor or gas.
- The patient is unconscious and lies quietly on the table. The pupils are small but contract when exposed to light. Respirations are regular,
- the pulse rate and volume are normal, and the skin is pink or slightly flushed.
- With proper administration of the anesthetic, this stage may be maintained for hours in one of several planes, ranging from light (1) to deep (4),depending on the depth of anesthesia needed.

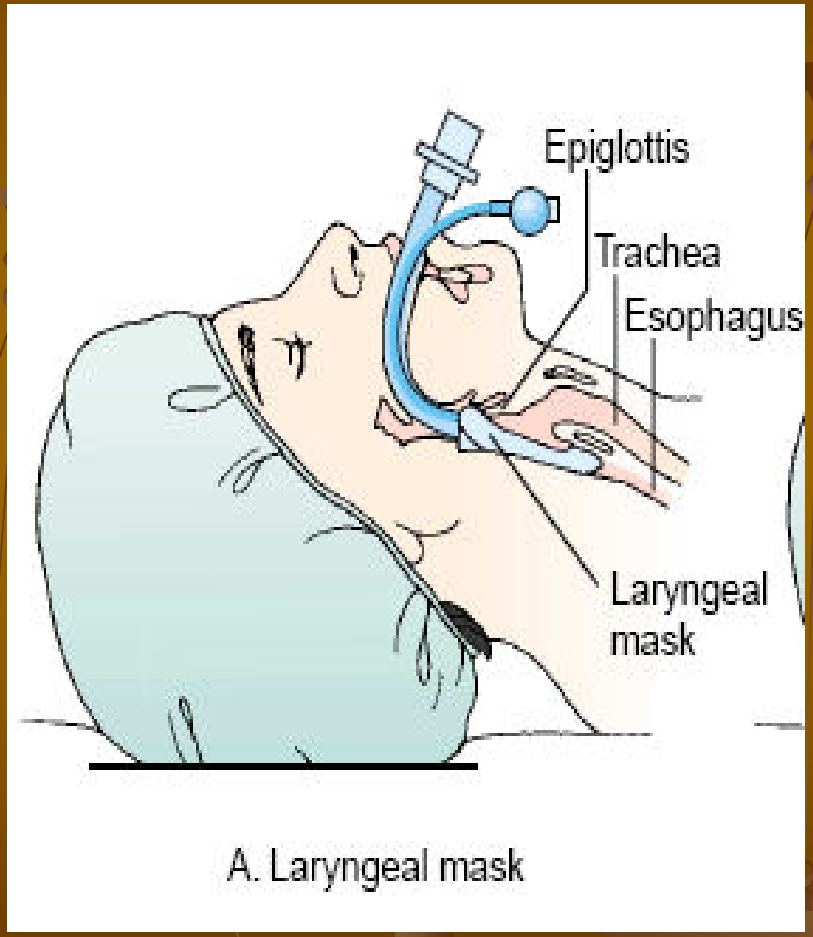
STAGE IV: MEDULLARY DEPRESSION

- This stage is reached when too much anesthesia has been administered.
- Respirations become shallow, the pulse is weak and thready, and the pupils become widely dilated and no longer contract when exposed to light.
- Cyanosis develops and, without prompt intervention, death rapidly follows.
- If this stage develops, the anesthetic is discontinued immediately and respiratory and circulatory support is initiated to prevent death.
- Stimulants, although rarely used, may be administered; narcotic antagonists can be used if over dosage is due to opioids.

- **Anesthetics produce anesthesia because they are** delivered to the brain at a high partial pressure that enables them to cross the blood–brain barrier.
- Relatively large amounts of anesthetic must be administered during induction and the early maintenance phases because the anesthetic is recirculated and deposited in body tissues.
- As these sites become saturated, smaller amounts of the anesthetic agent are required to maintain anesthesia because **equilibrium** or near equilibrium has been achieved between brain, blood, and other tissues.

A. Laryngeal mask

- The inhalation anesthetic may also be administered through a laryngeal mask (Fig. 19-1), a flexible tube with an inflatable silicone ring and cuff that can be inserted into the larynx (Fortunato, 2000).

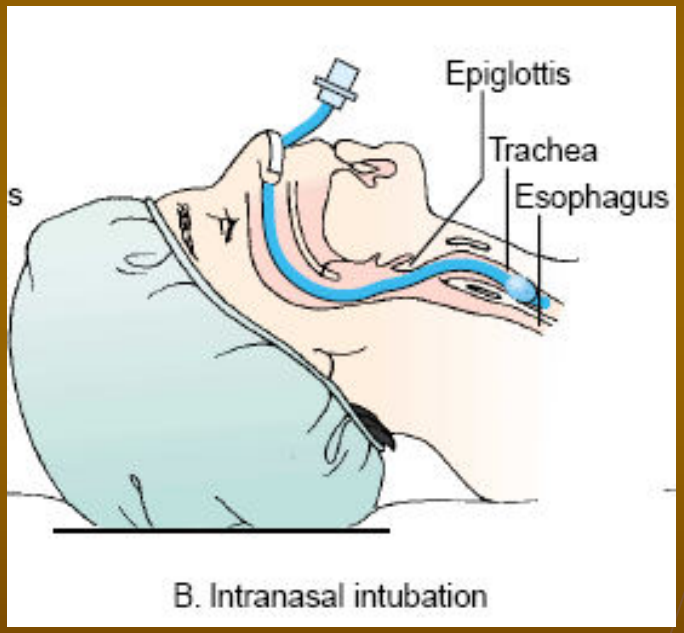


A. Laryngeal mask

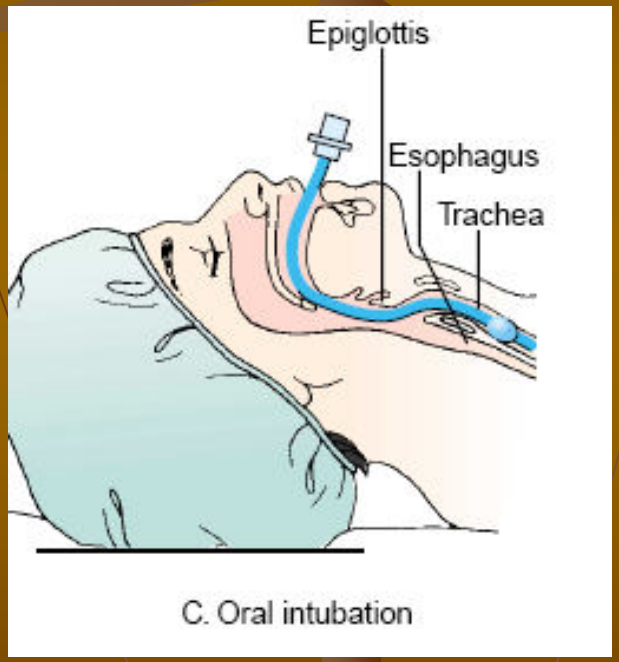
The endotracheal technique

- The endotracheal technique for administering anesthetics consists of introducing a soft rubber or plastic endotracheal tube into the trachea, usually by means of a laryngoscope. The endotracheal tube may be inserted through either the nose or mouth. When in place, the tube seals off the lungs from the esophagus so that if the patient vomits, stomach contents do not enter the lungs.

The endotracheal technique



B. Intranasal intubation



C. Oral intubation

Intravenous

- General anesthesia can also be produced by the intravenous injection of various substances, such as barbiturates, benzodiazepines,nonbarbiturate hypnotics, dissociative agents, and opioid agents (Aranda & Hanson, 2000; Townsend, 2002). These medications may be administered for induction (initiation) or maintenance of anesthesia.

Ideal Muscle Relaxant

1. It is nondepolarizing (noncompetitive agent), with an onset and duration of action similar to succinylcholine but without its problems of bradycardia and cardiac dysrhythmias (Townsend, 2002).
2. It has a duration of action between those of succinylcholine and pancuronium.
3. It lacks cumulative and cardiovascular effects.
4. It can be metabolized and does not depend on the kidneys for its elimination.

Regional Anesthesia

- Regional anesthesia is a form of local anesthesia in which an anesthetic agent is injected around nerves so that the **area supplied by these nerves** is anesthetized.

Types of conduction block

*Epidural anesthesia
*Brachial plexus block
* Paravertebral anesthesia
* Transsacral (caudal) block

Epidural anesthesia

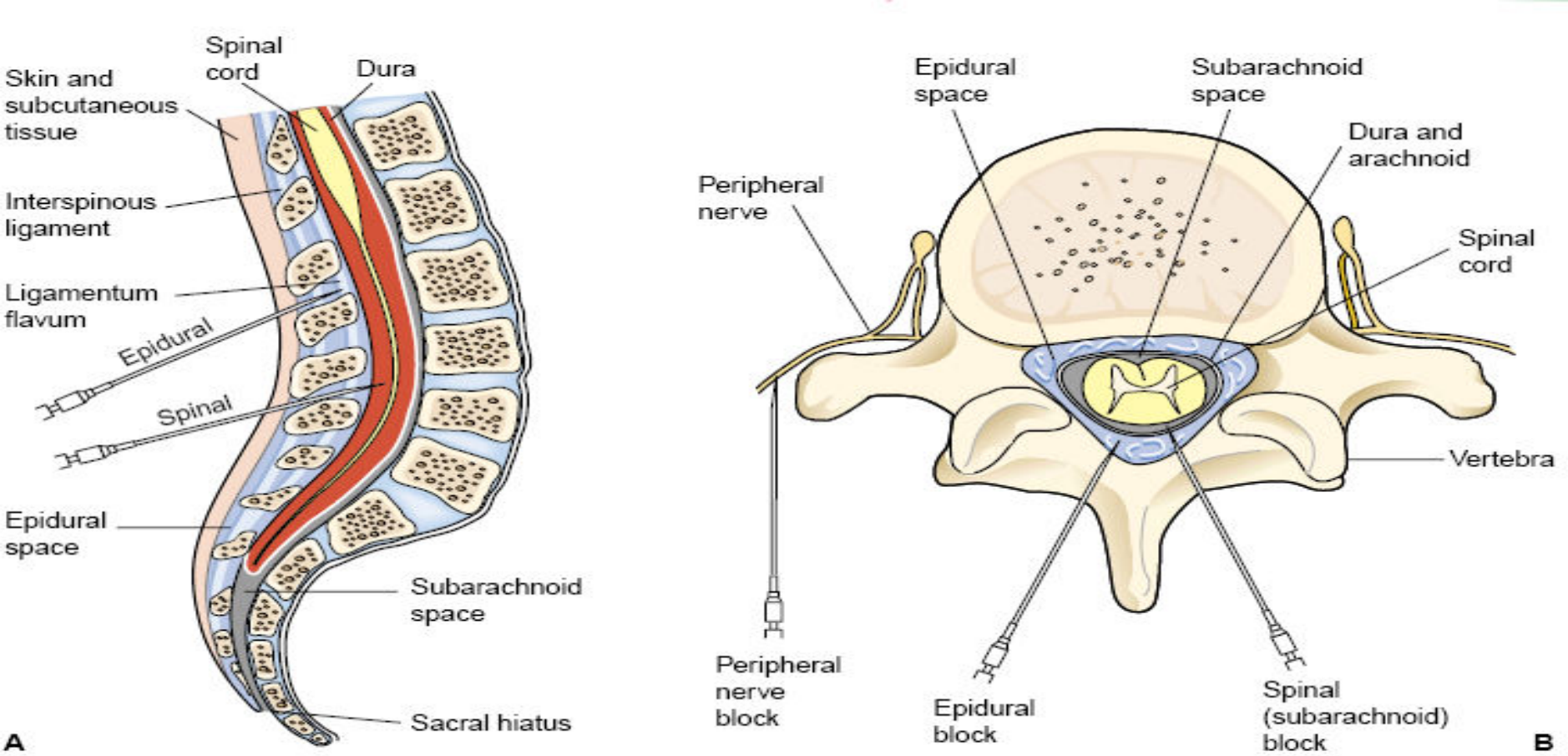
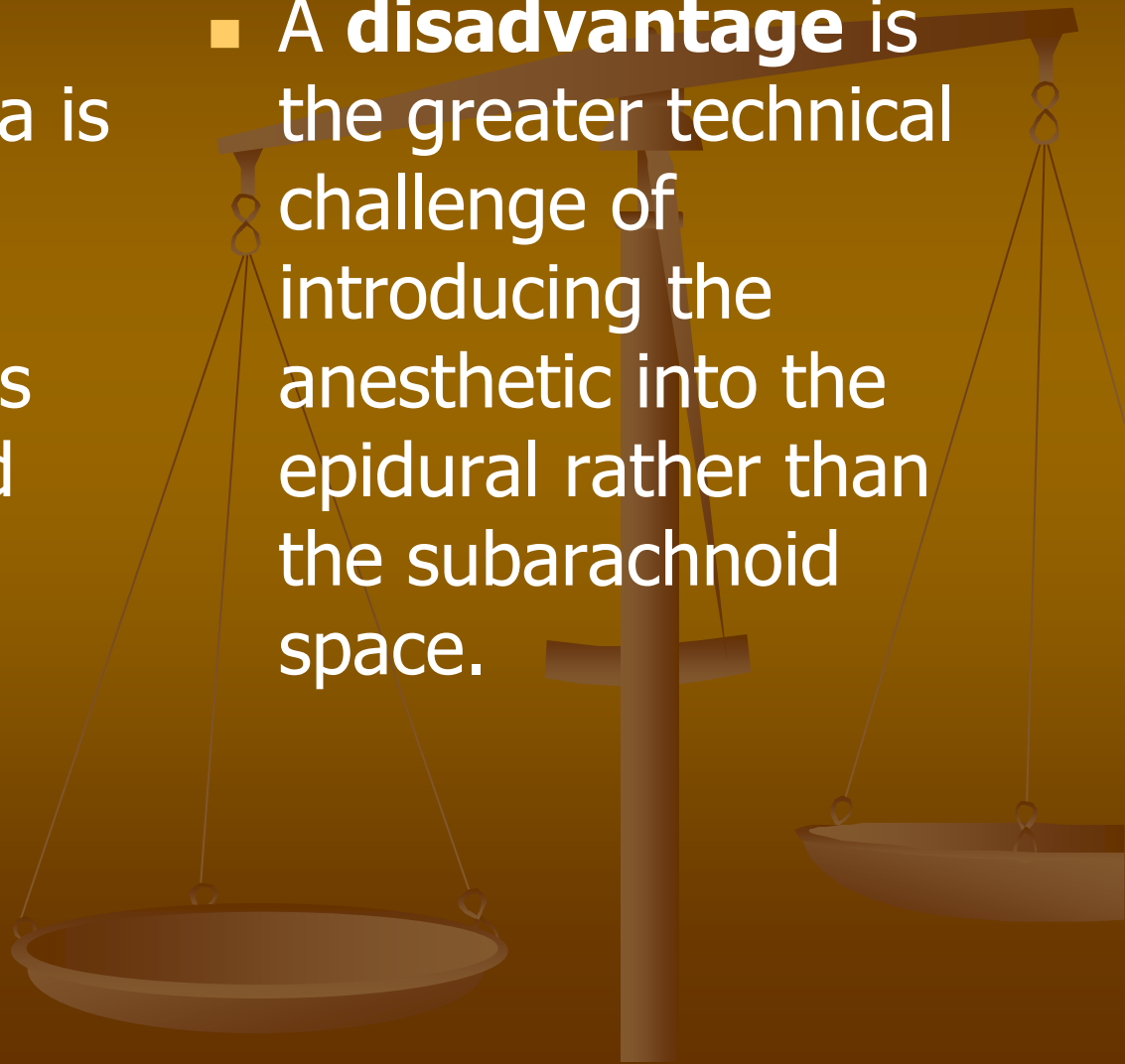


FIGURE 19-2 (A) Injection sites for spinal and epidural anesthesia. (B) Cross-section of injection sites for peripheral nerve, epidural, and spinal blocks.

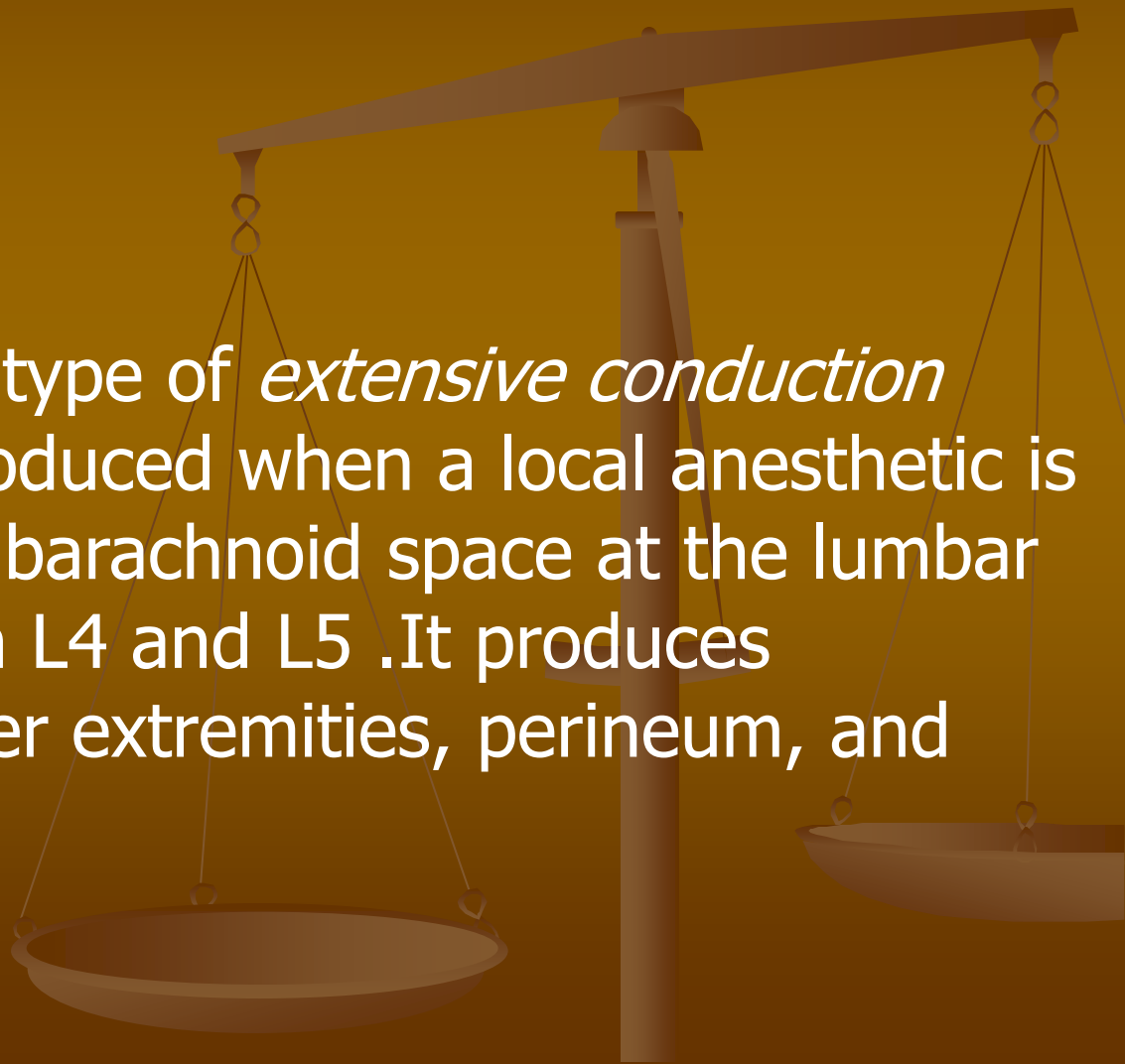
- **Epidural anesthesia is achieved by injecting a local anesthetic into the spinal canal in the space surrounding the dura mater.**

For/Against

- An **advantage** of epidural anesthesia is the absence of headache that occasionally results from subarachnoid injection.
- A **disadvantage** is the greater technical challenge of introducing the anesthetic into the epidural rather than the subarachnoid space.



Spinal anesthesia



Spinal anesthesia is a type of *extensive conduction nerve block* that is produced when a local anesthetic is introduced into the subarachnoid space at the lumbar level, usually between L4 and L5 .It produces anesthesia of the lower extremities, perineum, and lower abdomen.