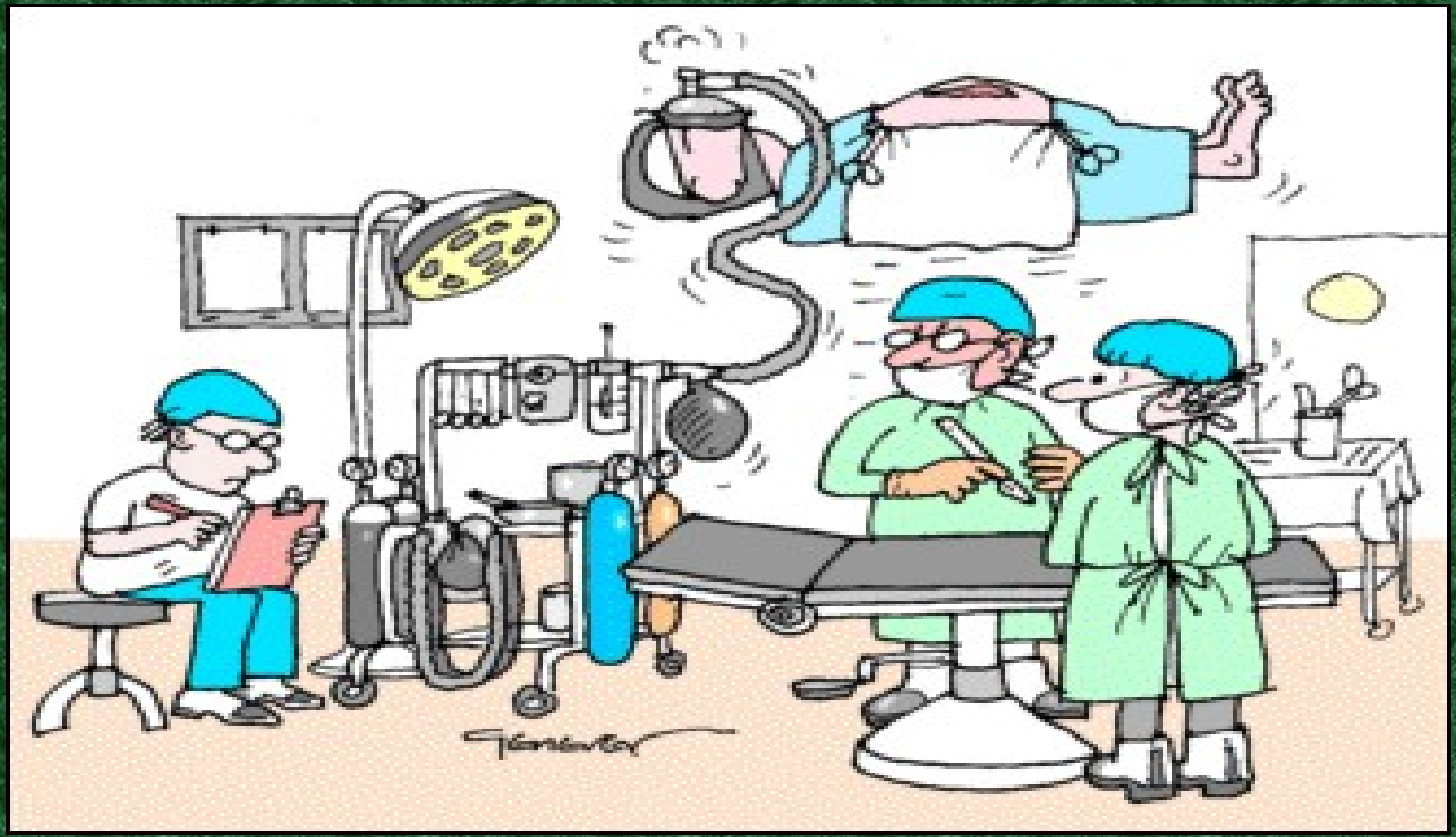
Welcome To Anesthesia !



Introduction[1].

Goals Of ANAESTHESIA:-

1- Loss of sensation, usually by damage to nerve or receptor.

2-Loss of ability to feel pain, caused by agent administration or other intervention.

3-skeletal muscular Relaxation.

The Stages of Anesthesia

- ***First stage (analgesia):*** from induction to loss of consciousness.
- ***Second stage(excitation):*** from loss of consciousness to automatic breathing associated with vomiting, breathing holding, and coughing.
- ***Third stage(surgical anesthesia):*** from automatic breathing to respiratory paralysis, divided into three planes [light Anes. , medium Anes., and deep Anesthesia].
- ***Fourth stage(over-dosage):*** from diaphragmatic paralysis to apnea and death . All reflexes lost and pupils widely dilated.

Levels of Reflexes during Anesthesia

- Eye signs, Eyelash, Eyelid, Conjunctivae, light exposure, lacrimution.
- Vomiting & swallowing .
- Movement of limbs , response to skin incision.
- Coughing & laryngeal spasm , Smoking...!
- Sweating

Types of Anesthesia[2-5].

- General Anesthesia
- Regional Anesthesia
  - * **Peripheral**
  - *central blockade
    - Spinal Anesthesia
    - Epidural Anesthesia
    - Caudal Anesthesia
- Local Anesthesia
  - * **Local *infiltrative***
  - ***Topical Anesthesia**

Types of Anaesthesia

- **General anesthesia** = unconsciousness patient with total lack of sensation.
- **Regional anesthesia** and **local anesthesia** = conscious patient with loss of sensation in targeted body part.

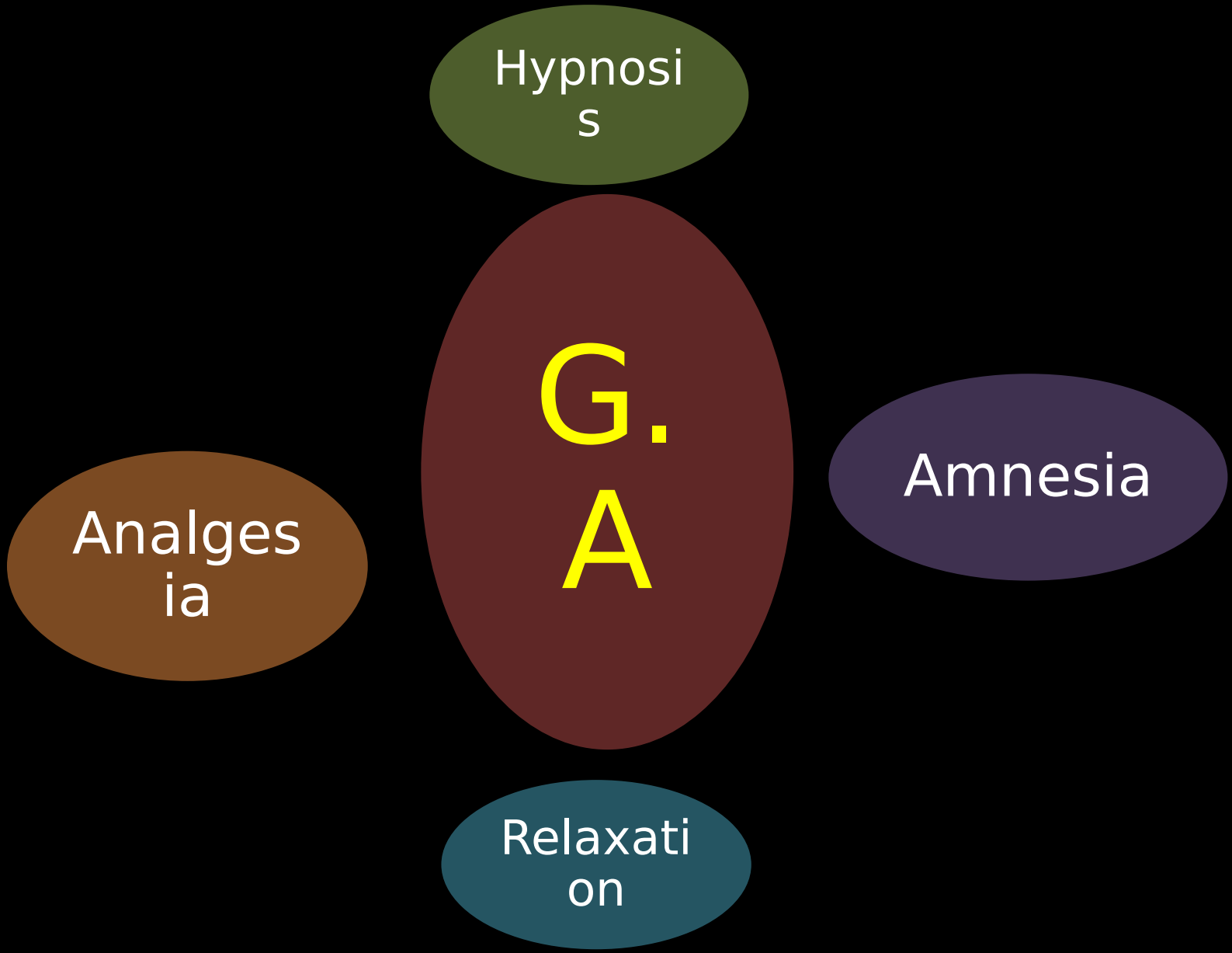

BOEING

General Anesthesia[1].

- Is state of unconsciousness and insusceptibility to pain that produced by administration of anaesthetics agents by inhalation, intravenously, intramuscularly, rectally, or via GIT route.
- G.A is to create reversible condition of comfort and physiological stability before, during, and surgical procedure.

* The term General Anesthesia in it's most general form can include :-

- ✓ **Analgesia:-** blocking the conscious sensation of pain.
- ✓ Hypnosis:- produces unconsciousness without analgesia.
- ✓ Amnesia:- preventing memory formation.
- ✓ Relaxation:- preventing unwanted movement or muscle tone.


Hypnosis
G.A
Amnesia
Analgesia
Relaxation

- Drug-induced loss of consciousness during which patients are not arousal, even by painful stimulation usually administered with inhalational agents and intravenous agents.

- Patients undergoing surgery usually undergo to pre-operative evaluation; includes history of previous anesthetics, and any medical problems, physical examination, ordering required blood work.

Steps Of General Anaesthesia

- Induction
- Maintenance
- Recovery

Maintenance

- Inhaled agents are supplemented by intravenous anaesthetics, such as opioids (usually Fentanyl or morphine).
- At the end of surgery the volatile anaesthetic is discontinued.
- In order to prolong anaesthesia for the required duration (usually the duration of surgery), patient has to breathe a carefully controlled mixture of oxygen, nitrous oxide, and a volatile anaesthetic agent.

Recovery

- Is immediate time after anesthesia.
- Recovery from general anesthesia or sedation requires:-

1- careful monitoring

2- may be airway support

EQUIPMENTS[3].

1-Anaesthetic machine act as delivery system to inhalational Anaesthetic and gases.

2-Anaesthetic machine has Vaporizers, Ventilators, anaesthetic breathing circuit, waste gas scavenging system and pressure gauges.

3-infusion pump To delivery intravenous Anaesthetics.

4-Monitoring device:-

- **electrocardiography (ECG),**
- **pulse oximetry to oxygen saturation of the blood .**
- **blood pressure monitor for non-invasive B.P.(cuff).**
- **Probe for body temperature.**
- Capnograph to Carbon dioxide measurement.

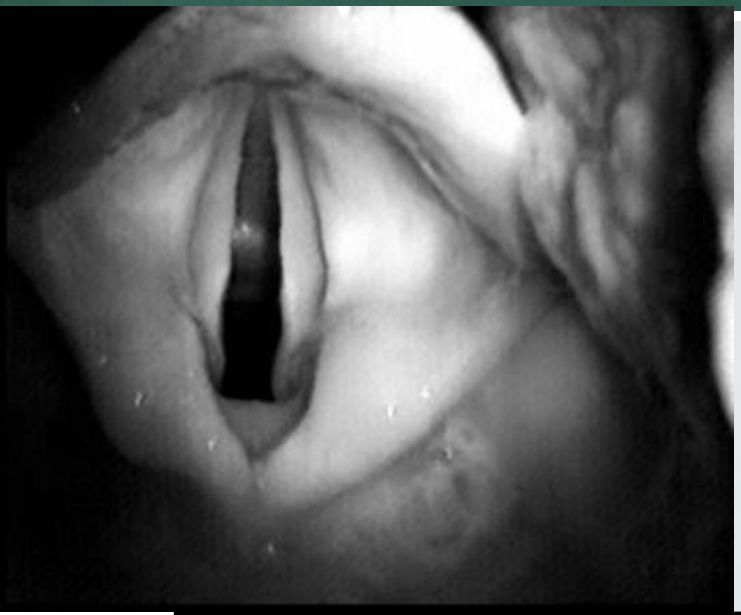
5-endotracheal tube, laryngoscope, airways and sucker.

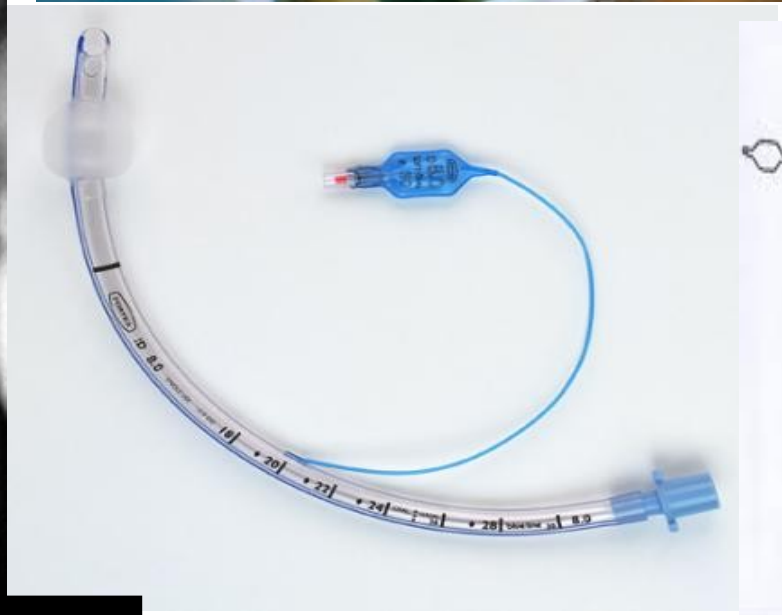


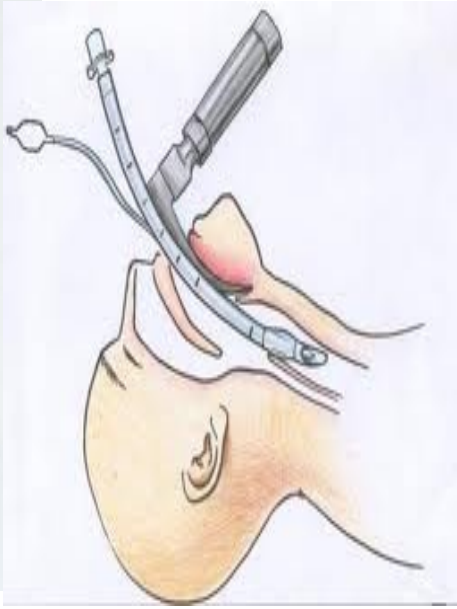
Modern anaesthetic machine











Tracheal

General Anesthetic Drug

[1],[3].

- Is an anesthetic drug that brings about reversible loss of consciousness.

- These drugs are generally administered by anesthesia provider in order to induce or maintain general anesthesia to facilitate surgery.

Characteristics of ideal General Anesthetic Drug

- produce amnesia.
- produce analgesia.
- produce skeletal Muscle relaxation.
- provide smooth and rapid induction of unconsciousness.

5’P

- provide smooth and rapid recovery without long lasting adverse effects.

Routes Of Administration

- Drugs given to induce or maintain G.A are either given as :-

1-Gases or vapors (inhalational anesthetics).

2-injections (intravenous anesthetics).

- it’s possible to deliver anesthesia solely by inhalation or injection.

Pre-anesthetic medications

Anxiolysis → Diazepam(valium^{R}).

Antihistamine → Hydroxyzine.

Analgesia → Morphine, Fentan

Anticholinergic → atropine,
glycopyrollate.

Antiemetic → Metoclopramide (Plasil^{R}).

Antacid → * ondansetron (zofran^{R}),
* cimetidine (tagamet^{R}).

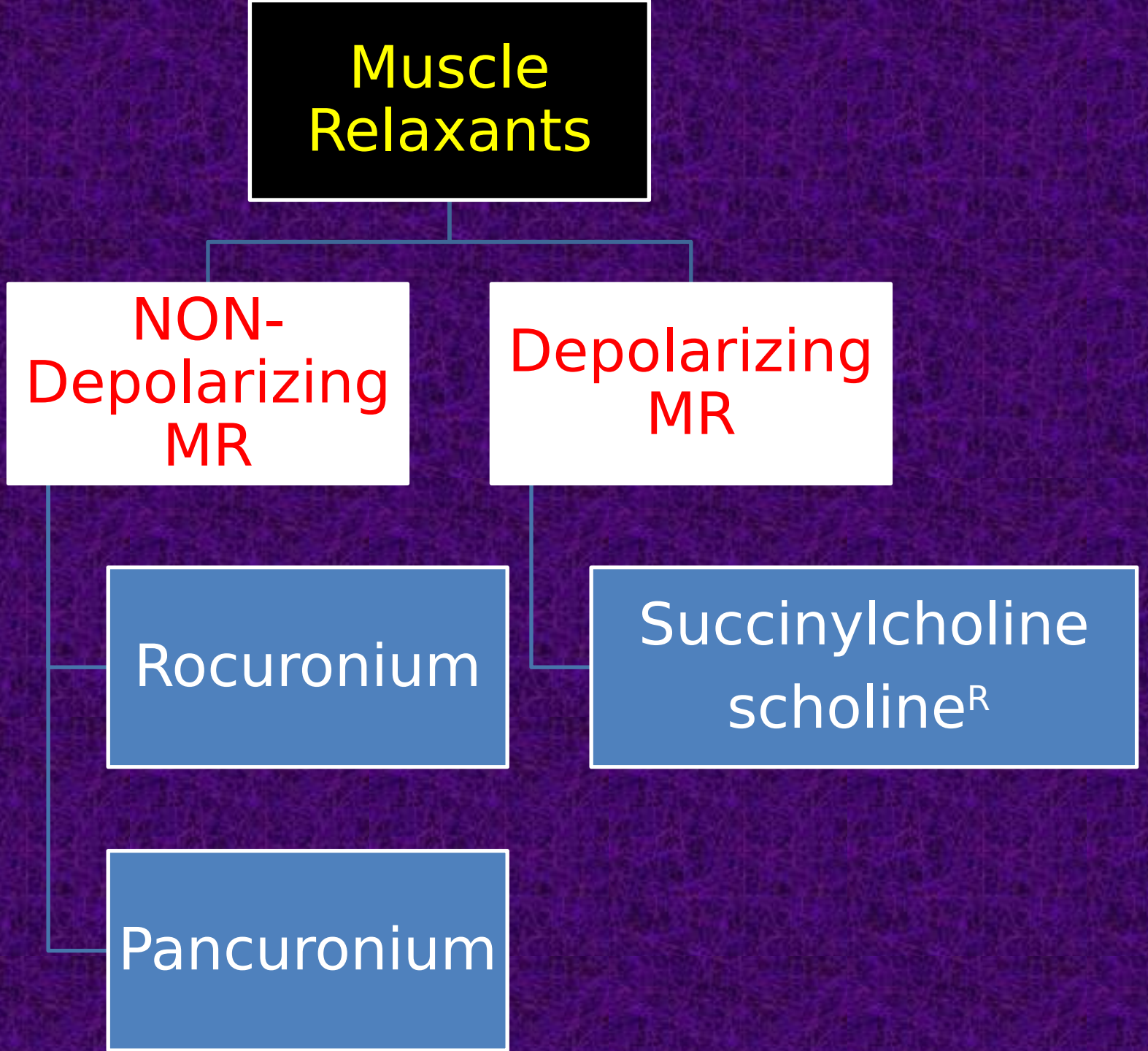


Anesthetic agents

- Inhalation agents
  - Gases
    - *Nitrous oxide
    - *Ether
  - Volatile liquids
    - -Halothane
    - -Sevoflurane
    - -isoflurane
    - -Desflurane
    - -Enflurane
- I.V anesthetic agents

i.V Anesthetic agents

- Ketamine
- Benzodiazepines
  - Midazolam
  - Diazepam
- Barbiturates
  - Thiopental
  - propofol
- opioids
  - Morphine
  - Fentanyl


Muscle Relaxants
NON-Depolarizing MR
Depolarizing MR
Rocuronium
Pancuronium
Succinylcholine
scholine^R

Postoperative Complications

*myocardial infarction
* shock
* pneumonia
* pulmonary embolism
* renal failure
* cognitive dysfunction

*allergy
*nausea, vomiting
*readmission
* urinary retention
*hypotension
* Hypothermia
*shivering
*confusion
* delirium

Local Anaesthetics

- Local anaesthetic agents:- are used clinically to produce reversible loss of sensation in circumscribed area of the body.
- Local anaesthetics are divided into two groups on the basis of their chemical structure:-

1-amide Local anaesthetic(lidocaine,ropivacaine, bupivacaine)

2-ester Local anaesthetics (tetracaine , chloroprocaine, cocaine)

Regional Anesthesia [2-5].

- ✓ is reversible loss of sensation in a specific area or region of the body when a local anaesthetic is injected to block or anaesthetize nerve fibres in and around the operative site.
- ✓ Commonly R.A techniques include:-

Central nerve blocks (Spinals, epidurals, caudals) , and major peripheral nerve blocks.

1-Peripheral blockade:

- inhibits sensory perception in an isolated part of the body

* numbing a tooth for dental work
* nerve block to inhibit sensation in an entire limb.

2-Central blockade:

- administers the anesthetic in the region of the central nervous system itself.

*epidural anaesthesia

*spinal anaesthesia

*Caudal anaesthesia

i.V Regional anesthesia

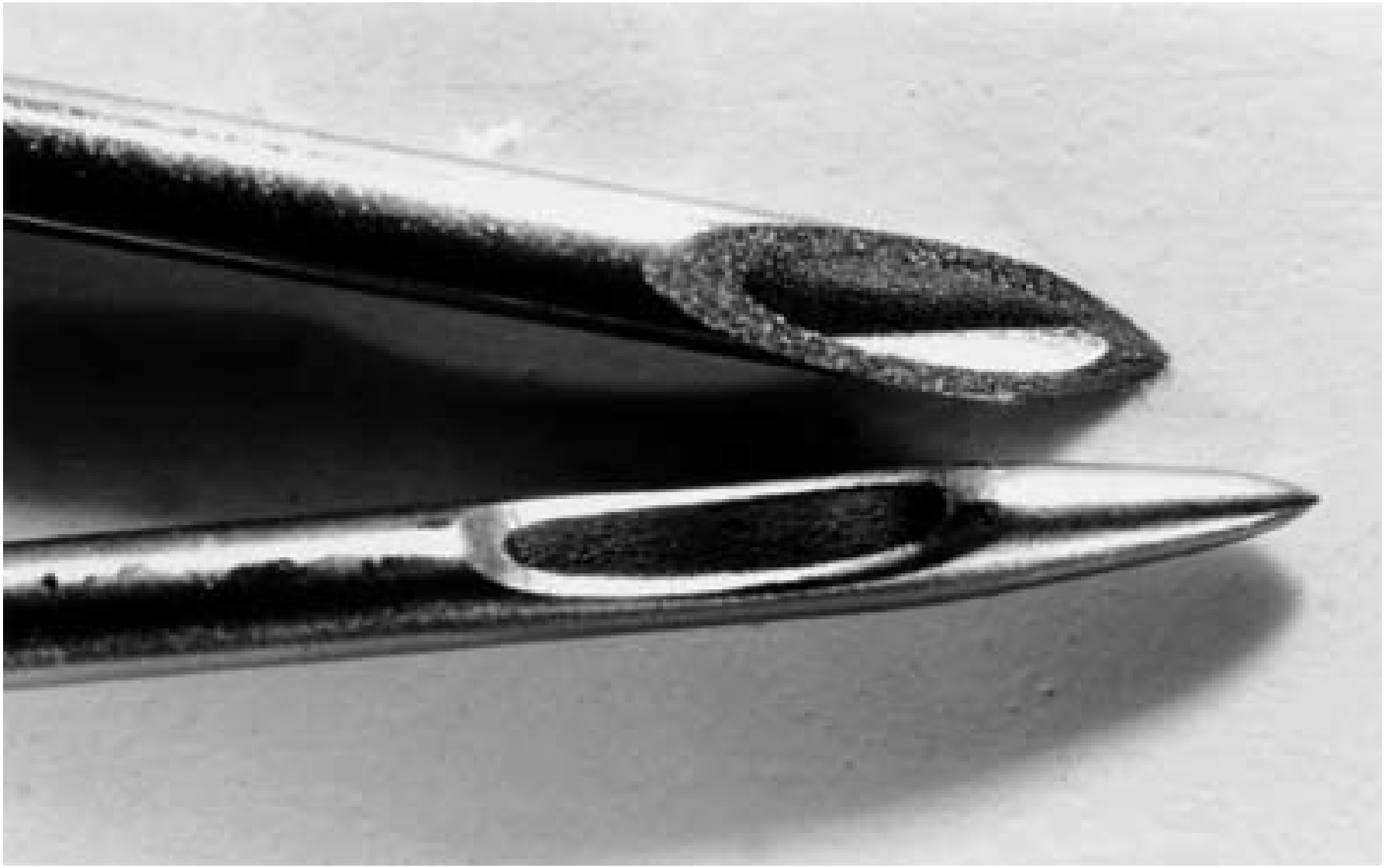
- *Bier's block*:- is blood circulation of a limb is interrupted using a tourniquet (a device similar to a blood pressure cuff), then a large volume of local anesthetic is injected into a peripheral vein.
- tourniquet placed to prevent the drug from diffusing out of the limb.
- The drug fills the limb's venous system and diffuses into tissues where peripheral nerves and nerve endings are anesthetized.

Spinal Anaesthesia

- "one-shot" injection that provides rapid onset and profound sensory anesthesia with lower doses of anaesthetic.
- is usually associated with neuromuscular blockade (loss of muscle control).
- Spinal (intrathecal) anaesthesia by results from the Single injection of a local anaesthetic drug directly into the cerebrospinal fluid (CSF) within the subarachnoid space, The spinal needle can be inserted within L2-L3 level.

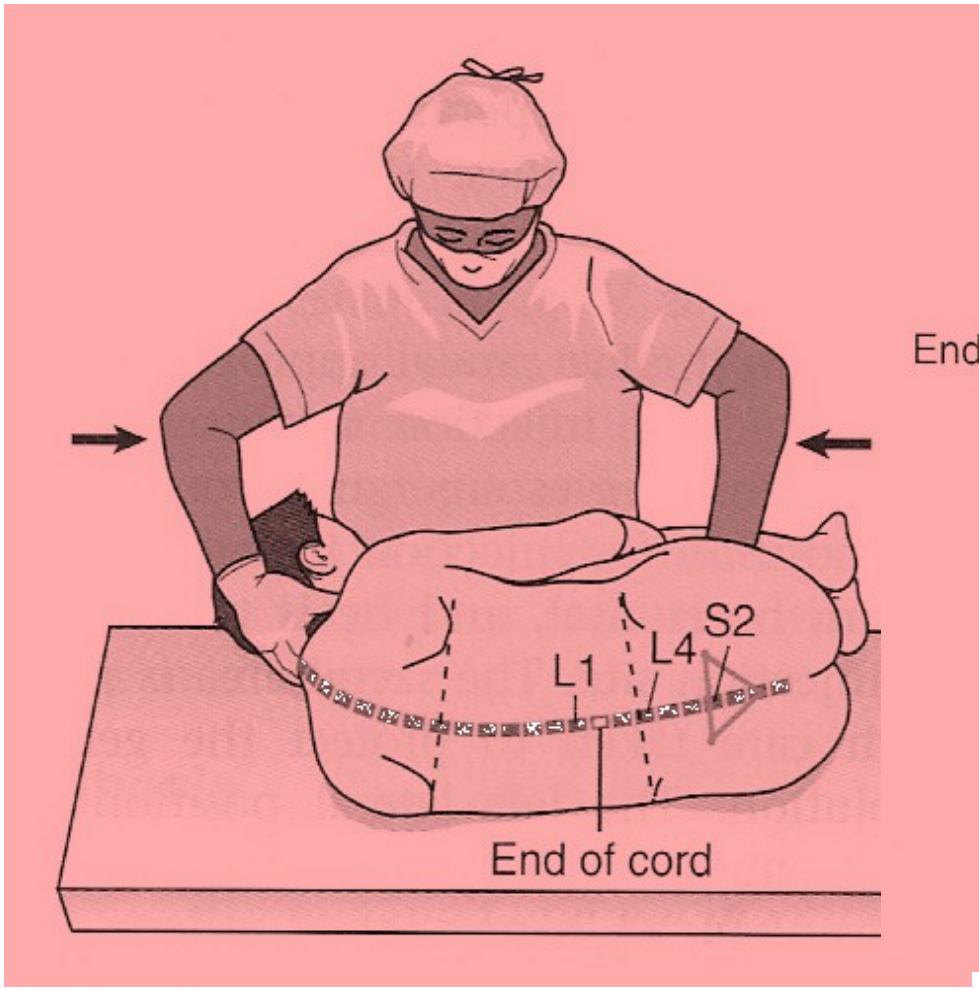
Types of spinal needle :-

1-bevel needle

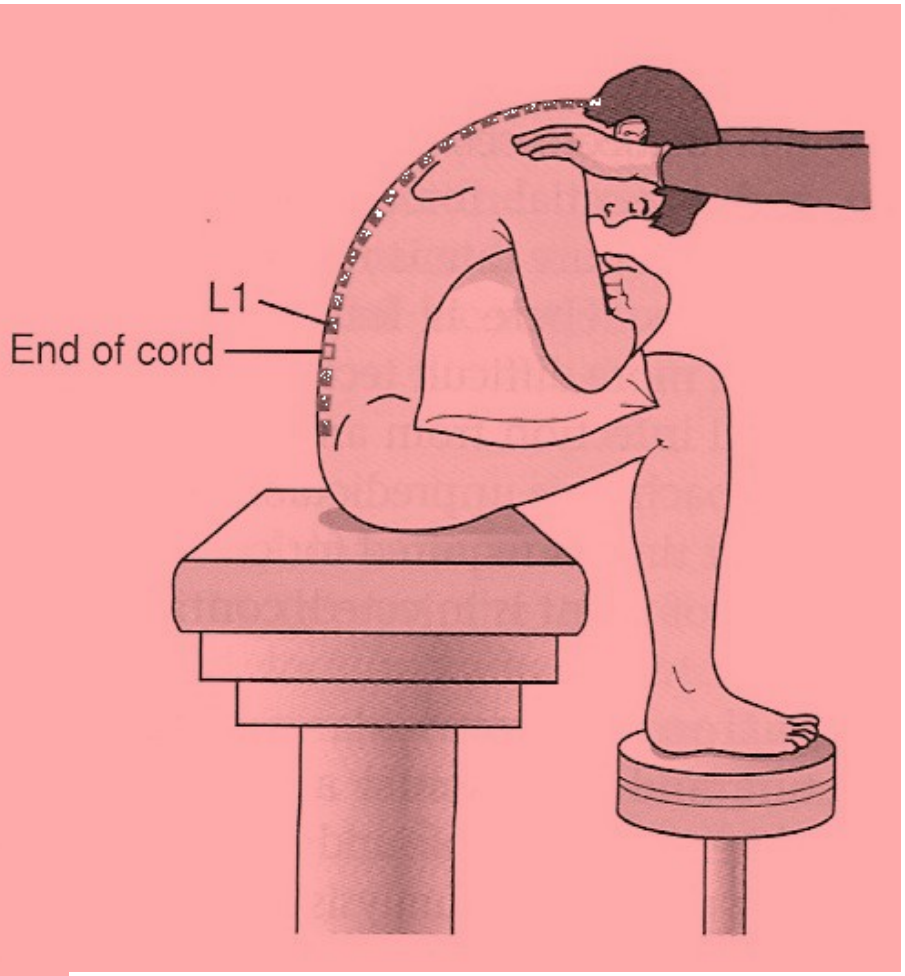


’bevel needle’ (top) and ‘pencil point’ needle (below).

Spinal Block - Position



Lateral position



Sitting position

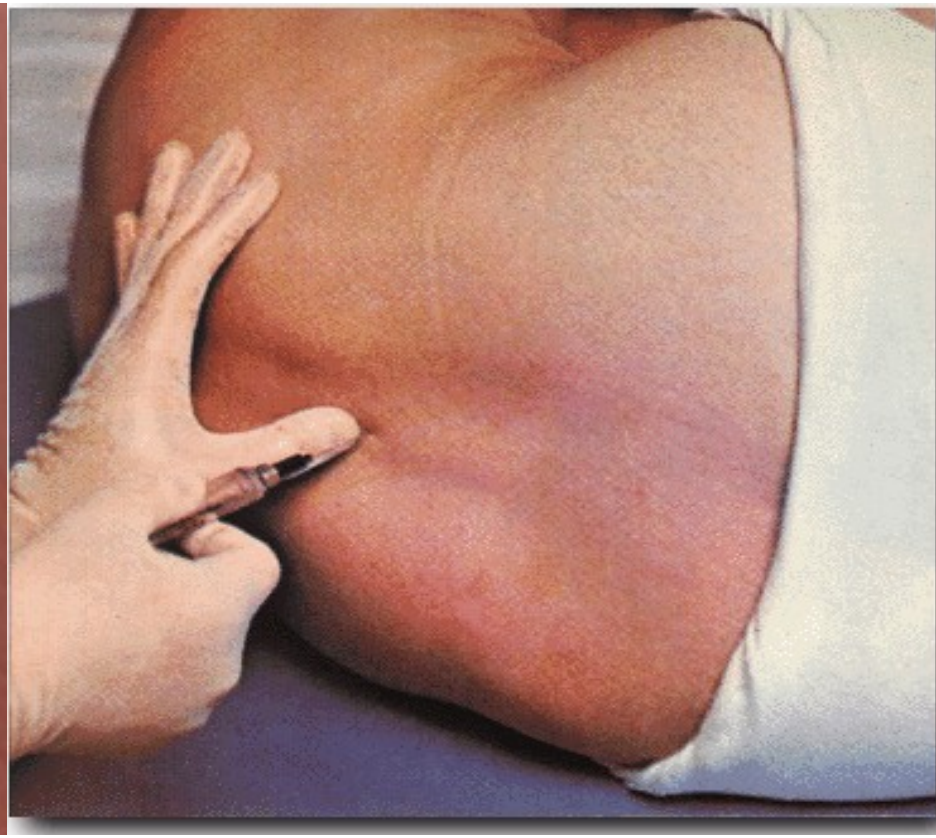
Epidural anaesthesia

by A plastic catheter is inserted into the epidural

- space via the (Tuohy) needle and either repeated injections or a constant infusion of local anaesthetic drug is used.
- uses larger doses of anaesthetic infused through an indwelling catheter.
- epidural (injection outside of the subarachnoid space into the epidural space)
- not affect on muscle control.

Spinal V.S Epidural Anaesthesia





Caudal Block

- is produced by injection of local anaesthetic into the caudal canal.
- This produces block of the sacral and lumbar nerve roots.
- This technique is popular in pediatric patients.
- caudal (injection into the cauda equina or tail end of the spinal cord).

Local anaesthesia

- **is administration of an anaesthetic agent to one part of the body by infiltration or topical application.**
- **It is usually administered by the surgeon.**
- **Used for minor procedures.**

infiltrative anesthesia

- small amount of local anesthetic is injected in a small area to stop any sensation .
- such as //

-during the closure of laceration

-continuous infusion

-"freezing" tooth



Surface (Topical) anesthesia

- is application of local anesthetic spray, solution or cream to the skin or a mucous membrane.
- give a thin layer of analgesia to an area (e.g. EMLA patches).


THANK YOU

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[4]. STANLEY F. MALAMED, ''Handbook of Local Anesthesia'', sixth Ed.

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