

# Department of anesthesia

Practical pharmacology

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**Route of Drug Administration**

# Goal of drug therapy

- Prevent , cure or control various disease states

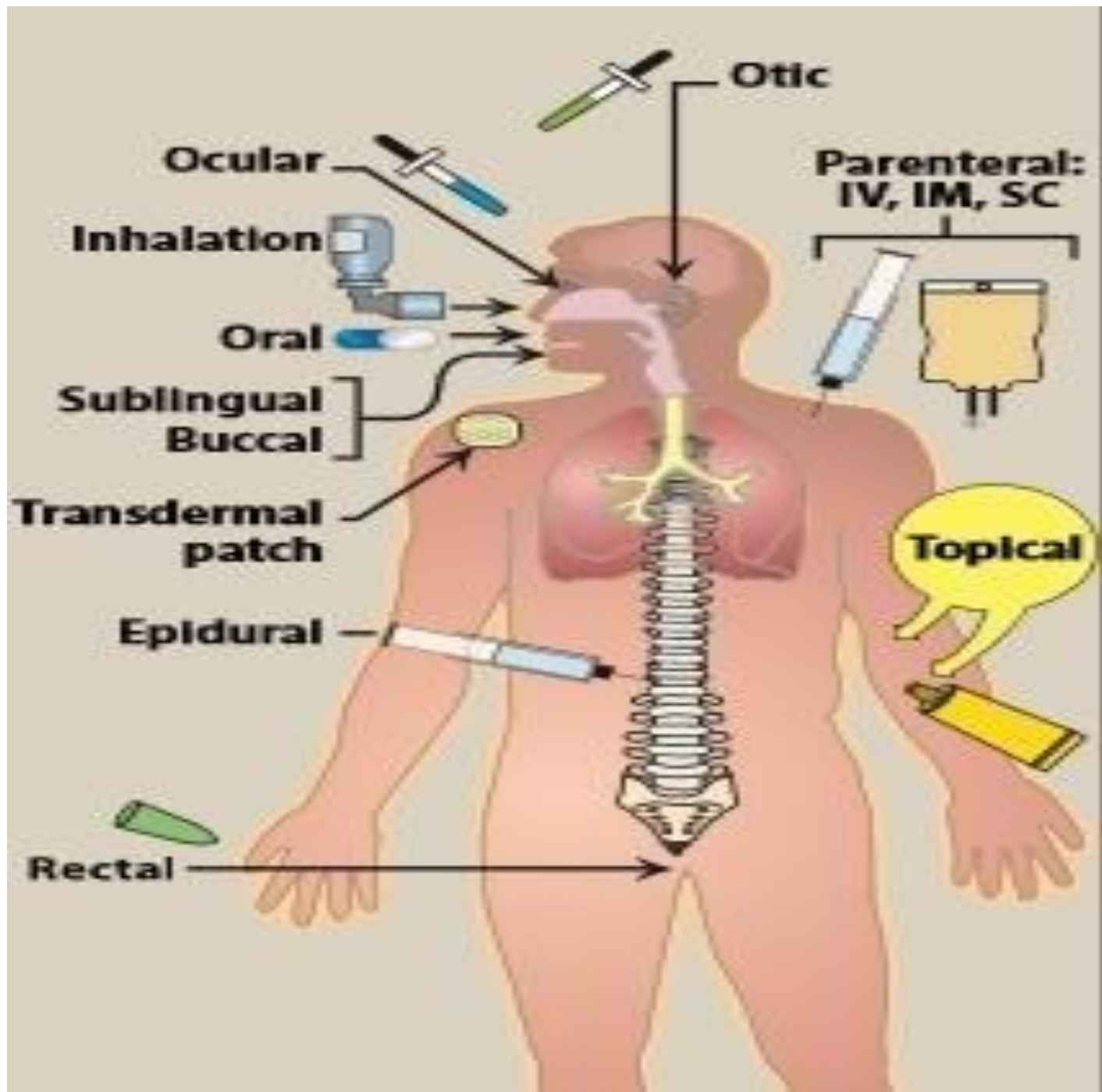
This done by :

1. Adequate drug doses must be delivered to the target tissues .
2. The dose Should be at therapeutic level and not reach the toxic level.

pharmacological and toxicological action of drugs are primarily related to the plasma concentrations of drugs.

# Route of drug administration

- There are two major routes of drug administration
  1. Enteral
  2. Parenteral



# Route of drug administration

- (A ) Enteral : by this route drug administered by mouth
- The drug either was swallowed so this name oral administration, or it may be placed under the tongue so this name sublingual

**Oral administration** : the most common used

- **Advantage**

- ❖ Easily self-administered

- ❖ Limit the number of systemic infections

- ❖ Toxicity or over dose could be controlled by antidotes such as activated charcoal.

# Oral route

- **Disadvantage**

- ❖ The drug is exposed to harsh gastrointestinal environment that may limit its absorption
- ❖ Most drug by oral route enter the portal circulation and encounter the liver before they are distributed into the general circulation, the liver are metabolized these drugs so it may be limit the efficacy of many drugs ex. 90% of nitroglycerin is cleared during the pass through the liver
- ❖ Ingestion of drugs with food or with other drugs ,can lead to decrease drug absorption

- ❖ Many drugs could be destroyed by acid media in stomach ex. Penicillin
- many drugs was coated to prevent gastric environment or protect the stomach from drug irritation ex. Aspirin

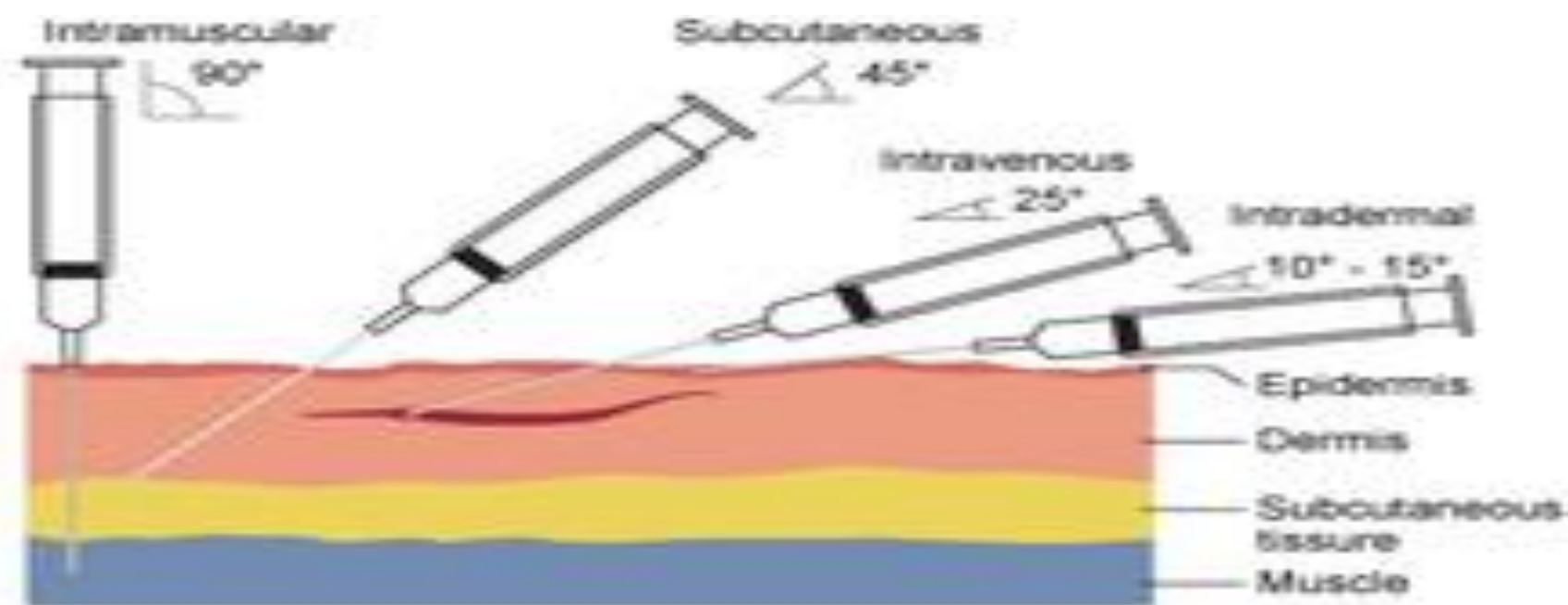


- **Sublingual** : placement under the tongue
- ❖ Advantage :
  - drug diffuse directly into the systemic circulation
  - Rapid absorption than oral
  - Convenience and easily administered
  - Low incidence of infection
  - Avoidance of the harsh GI environment
  - Avoidance first liver metabolism  
ex. Nitroglycerin

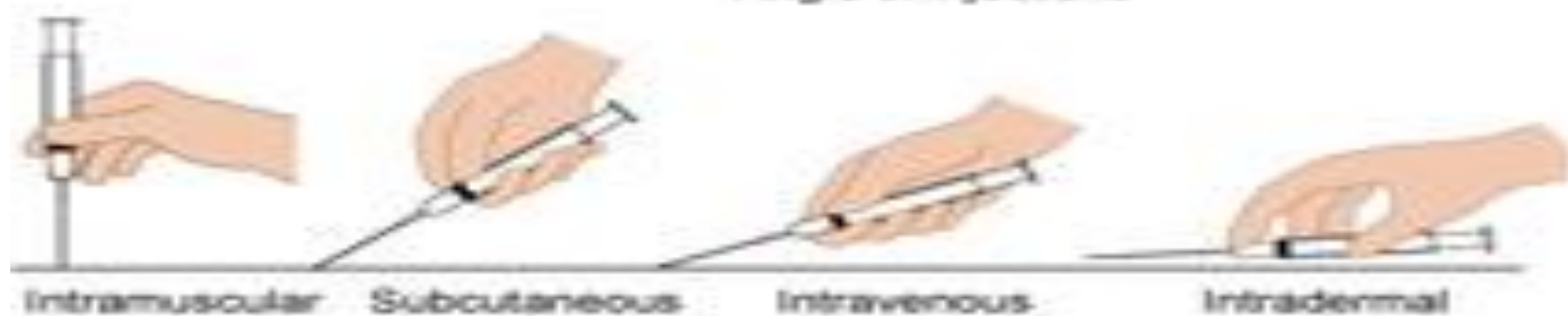
## B ) Parenteral route

This route introduces drugs directly across the body barrier defenses into the systemic circulation or other vascular tissue

- Use for drugs that are poorly absorbed from GI tract ex. Heparin
- Agent are unstable in GI tract ex. Insulin
- Use for unconscious patient
- For pt. that require a rapid onset of action
- Drugs by this route was not effect by first liver metabolism or harsh GI environment, so provide high efficacy



Angle of injections



- **Disadvantage**

- ❖ This route are irreversible and may cause pain, fear and infections

- can be divided into three routes :

# 1. Intravenous (IV)

- Most common for drugs that not absorbed by oral route ex. Neuromuscular blocker atracurium
- This route permits a rapid effect and a maximal degree of control
- Not recalled by emesis or by binding to activated charcoal
- IV injection may introduce bacteria through contamination at site of injection

# Intramuscular (IM)

- This route are slowest than IV
- Drugs can be aqueous solution or suspension  
drug in non aqueous vehicle  
absorption of drugs in an aqueous solution is fast ex. tramadol, whereas that from suspension is slow ex. Depomedrol .

## 3. Subcutaneous (SE)

- This route like IM requires absorption and is somewhat slower than the IV route
- Minimizes the risks associated with intravascular injection ex. inject of epinephrine SE to decrease removal of local anesthesia such as lidocaine

# Other

## 1. Inhalation

- This provides rapid delivery of drug across large surface area of the mucous membrane of the respiratory tract , its as rapidly as IV route
- This route is use for gas drugs ex. Some anesthetics isoflurane
- This route is particularly effective and convenient for PT. with respiratory complaints (such as asthma) ex. Albuterol and fluticasone .



## 2. Intranasal

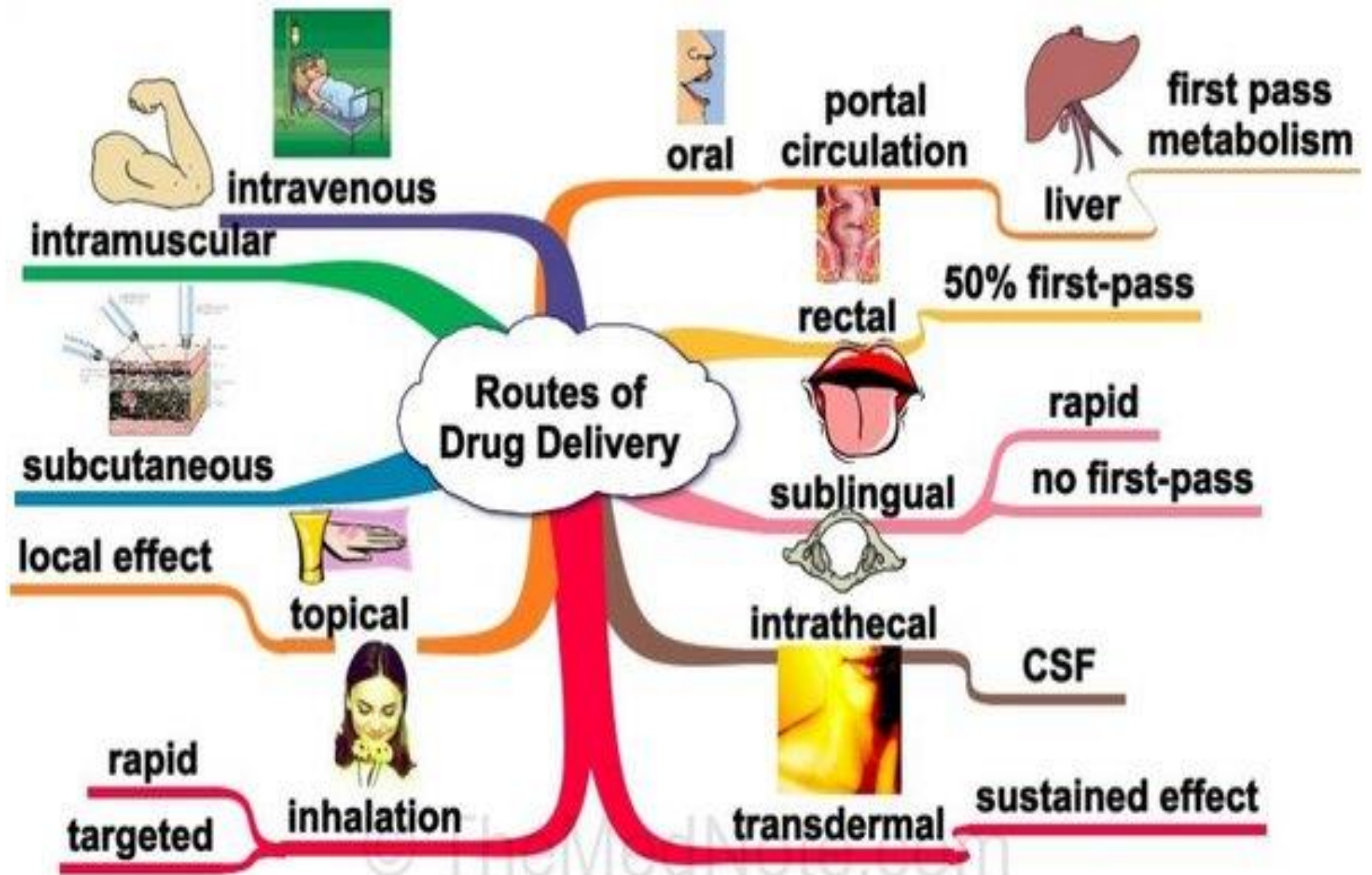
- This route involves administration of drugs directly into the nose ex. Nasal decongestant drops

**3. Intrathecal** : this route delivered the drug directly into the cerebrospinal fluid ex. Amphotericin B used in treating cryptococcal meningitis

**4. Topical** used when local effect of drug is desired ex. Clotrimazole

**5. Transdermal** used when need the long time of action ex. Nitroglycerin patch for angina .

**6. Rectal** advantage this route prevent destruction of drug by GI environment , also used for drugs induce vomiting when given orally and for unconscious PT. ex. Biscodyl supps.



**Thank you**