

Routes of administrations of drugs

Describe the various routes of drugs administration. Explain advantages and disadvantages of each routes of drugs administration and select a suitable route of drug administration;

Drugs can be administered;

- Locally
- Orally or enterally
- Parenterally, by injection or by inhalation

Selection of suitable routes is dictated by consideration as follows;

- Convenience for the patient
- The patient condition degree of illnesses type of illness
- Action required – quick action local action systemic action
- Achievement and maintenance of an adequate drug concentration of the requisite site eg getting the right concentration of a drug in the meninges
- Drug formulation that is available

Local application of drugs

This is when drug is administered directly at the site where it is produce effects eg of dusting powder, paste, lotions creams, drops, ointments, vaginal pessaries

Advantages of local application

- Convenient to the patient
- Encouraging to the patient
- Easy to apply
- Does not require skill
- Acts at site of application
- Self application is possible
- No gastric irritation

Disadvantages of local application

- May be absorbed and produce adverse systemic effects especially solutions applied to mucus membrane eg eye drops
- May be messy on the skin some might dirty the clothes

Orally or enterally route

This means taking drug into the body via the alimentary tract. It is the most commonly used route of drug administration. It includes;

- Swallowing drugs (oral administration)
- Sublingual administration of drugs
- Rectal administration of drugs

Drugs are taken by mouth for absorption in the gastro intestinal tract (oral administration)

Advantages of oral administration

1. Safe
2. Convenient to the patient self administration at home
3. Economical
4. Complications of parenteral therapy are avoided

Disadvantages of oral administration

1. The onset of the drug action is slow
2. Irritant and un palatable drugs con not be administered by this route
3. Route may not be useful in the presence of vomiting
4. The route cannot be employed in unconscious patients
5. The route cannot be used in uncooperative patients
6. Drugs likely to be destroyed by gastric juices cannot be administered by this route eg insulin
7. Can produce gastric irritation (acidity)

8. May be inconsistently absorbed due to the presence of food

Sub-lingual administration of drugs

A tablet containing a medicament is placed under the tongue and allowed to dissolve in the mouth.

The active ingredient gets absorbed through the buccal membrane directly into the system circulation

Advantages of sublingual

1. Rapid onset of actions
2. Quick termination of drug effect by splitting the tablet
3. Degradation of the drug in the stomach is avoided

Disadvantages of sublingual

1. Inconvenience if use has to be frequent
2. Irritation of the mucus membrane and excessive salivation which promotes swallowing so losing the advantage by passing pre- systemic elimination

Examples of drugs given sublingual

1. Nitroglycerine tablet in angina pectoris
2. Isoprenaline sulphate in bronchial asthma
3. Nifedipine in hypertention
4. Ergotamine in migraine

Rectal administration of drugs

The rectum has a rich blood and lymph supply and the drugs can cross the rectal mucosa like the other lipid membranes thus- ionized and lipid soluble substances are readily absorbed from the rectum.

The portion absorbed from the upper rectal mucosa is carried by the superior haemoirhoidal vein into the portal circulation.

The portion absorbed from the lower rectum enters directly into the systemic

circulation via the middle and inferior haemorrhoidal veins.

Advantages of rectal administration of drugs

1. Gastric irritation is avoided
2. Use of a suitable solvent in that duration of action can be controlled
3. It is convenient route to use in the long term care of geriatric and terminally ill patients
4. Administration of a rectal suppository or a capsule is a simple procedure which can be undertaken by the unskilled personnel and the patient himself
5. Suitable in vomiting and motion sickness
6. Suitable for emergencies when intravenous line cannot quickly be established

Disadvantages of rectal administration

1. Rectal inflammation may occur in repeated use
2. Absorption may be unreliable if the rectum is full of faeces
3. Psychological embarrassment

Examples of drugs that can be given rectally

- Indomethacin in rheumatoid arthritis
- Aminophylline for bronchospasms
- Chlorpromazine for vomiting
- Diazepam for convulsions

Enemata

Administration of a medicament in a liquid form into the rectum is called enema, enemata are of two types;

- Evacuant enema
- Retention enema

- **Evacuant enema**

The aim is to remove fecal matter and flatus. In soap and water enema the water stimulates the rectum by distension while the soap acts as a lubricant.

The quantity of fluid administered at a time is about 600ml. An evacuant enema is often administered before delivery surgical operation and radiological investigation of the gastro intestinal tract.

- **Retention enema**

Here the drug incorporated into the enema may act locally or may act systematically after absorption through the mucus membrane.

The quantity of fluid administration in the retention enema is usually 100- 120ml

It can be used for diagnostic purpose eg barium enema

Enteric coating of pills and tablets