

Practical and clinical pharmacology for dentistry students

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Emergencies at the dentist's room

Hypoglycemia

- Predisposing factors :

1- delayed or missed meal

2- over treatment with insulin or oral hypoglycemic drugs (sulphonylureas and meglitinide)

3- Anxiety

4- infection

Signs and symptoms : hunger, sweating, dizziness, tremors , and visual and mental disturbances

- Ttt:
- Give the patient a glass of juice or sugar with water
- If the patient is unresponsive :
 1. Adminster glucagon 1mg IM
 2. 5% glucose IV
 3. Call EMS

Vasopressor Syncope

➤ Signs and symptoms

1) **Adrenergic component**

- Pallor
- Pupillary dilation
- Hyperventilation
- Tachycardia

2) **Cholinergic component**

- Sweating
- Salivation
- Bradycardia
- Hypotension
- Loss of consciousness

➤ **Treatment**

- 1) Place patient in a supine position with feet slightly elevated
- 2) Administer oxygen
- 3) Evaluate pulse rate, respiratory rate, and blood pressure every 10 minutes
- 4) If at any time the patient becomes unresponsive with no palpable pulse:
 - i. Call emergency medical service (EMS)
 - ii. Initiate CPR

Postural hypotension

- a decline of 20 mmHg or more in the systolic or a decline of 10 mmHg or more in the diastolic blood pressure following postural change from supine to upright position.

➤ **Prevention**

- Following treatment, allow susceptible patients to assume an upright position gradually



➤ Treatment

- 1. Return patient to supine position for 5 to 10 minutes
 - - Evaluate pulse rate, blood pressure, and respiratory rate
- 2. Allow patient to assume a sitting position for 2 minutes
- 3. Allow patient to stand for 2 minutes
- 4. If at any time the patient becomes unresponsive with no palpable pulse
 - a. Call emergency medical service (EMS)
 - b. Initiate CPR

▪ Hemorrhagic SHOCK

- Aspirin and cefoprazone increase bleeding tendency and result in this condition
- **Symptoms:** weak thready pulse, confused state, pale skin
- **Treatment:**
 1. Blood transfusion
 2. vital signs monitored.
 3. Once in the ER IV fluids where administered.

Hypertensive Crisis

➤ Hypertension:

- is defined as a systolic blood pressure greater than 140 mmHg or a diastolic blood pressure greater than 90 mmHg.

➤ Hypertensive emergency:

- is defined as a systolic blood pressure > 200 mmHg or a diastolic blood pressure > 120 mmHg.

➤ **Prevention**

- Identify high-risk patient
- Reduce anxiety
- Use local anesthetic agents containing a vasoconstrictor with caution but ensure profound local anesthesia

➤ **Treatment**

1. Elevate the patient's head
2. Hypertensive emergency (blood pressure greater than 200/120 mmHg):
 - Blood pressure should be reduced immediately: Administer nitroglycerin 0.4 mg, tablet/spray, sublingual (SL).
 - Evaluate pulse rate, blood pressure, and respiratory rate every 5 minutes
3. Call emergency medical service (EMS)
4. Same day referral to a physician

Angina Pectoris

➤ **Signs and symptoms**

- Mild-to-moderate substernal pain accompanying any effort.
- The pain may radiate to the left shoulder, arm, and jaw

➤ **Treatment**

- 1. Allow patient to assume a comfortable position
- 2. Administer nitroglycerin 0.4 mg, tablet/spray, SL
- 3. Administer oxygen
- 4. If pain is not relieved 5 minutes after the initial dose, repeat nitroglycerin 0.4 mg, tablet/spray, SL
- 5. Evaluate pulse rate, blood pressure, and respiratory rate
- 6. Chest pain lasting more than 10 minutes must be assumed to be myocardial infarction
- 7. Call EMS

Seizure

- is a sudden episode of cerebral dysfunction characterized by altered motor activity, sensory phenomenon, and unconsciousness
- **Predisposing factors**
 - Epilepsy
 - Head trauma
 - Hypoxia
 - Drugs or alcohol overdose or withdrawal
 - Hypoglycemia
 - Psychogenic “hysterical” seizures

➤ **Prevention**

- Eliminate causative or precipitating factors
- Ensure compliance with anticonvulsant therapy
- Reduce anxiety
- Ensure profound local anesthesia

➤ **Treatment**

- 1. Protect patient from injury:
 - It may be safer to leave patient in the dental chair
Otherwise, lower patient to the floor
 - Guide the extremities during seizure, but do not restrain
- 2. After the seizure is complete:
 - Suction if needed
 - Position patient on his or her side (recovery position)
- 3. Call EMS

Bronchial Asthma

- a clinical syndrome characterized by reversible bronchial constriction and/or excessive mucous secretions as a result of an inflammatory response to a variety of stimuli.
- **Signs and symptoms**
 - Coughing, wheezing, shortness of breath (dyspnea)
 - Anxiety, restlessness, agitation
 - Pallor and/or cyanosis of the lips
 - Noticeable use of the accessory muscles of respiration

➤ **Prevention**

- Reduce stress
- Ensure profound local anesthesia
- Avoid respiratory depressants
- Use cyclooxygenase-inhibitors (NSAIDs) with caution

➤ **Treatment**

- 1. Place patient in a sitting position
- 2. Administer a short-acting beta2-agonist by inhaler
- 3. Call EMS

Anaphylactic Reaction

➤ **Signs and symptoms**

- 1 to 15 minutes following exposure to a specific allergen:
 - i. Coughing, sneezing, wheezing
 - ii. Skin flushing, urticaria, angioedema
 - iii. Unresponsiveness, convulsion, shock

➤ **Prevention**

- Take a careful medical history

➤ **Treatment**

- 1. Place patient in a recumbent position with legs elevated
- 2. Immediately treat with epinephrine (1:1000), 0.5 ml intramuscular (anterolateral thigh); may be repeated in 20 minutes if necessary.
- 3. Hydrocortisone 100-200 mg i.v. to inhibit antigen-antibody reaction.
- 4. Antihistamine (e.g. chlorpheniramine) i.v.
- 5. Maintain the airway and administer 100% oxygen
- 6. Call EMS

Moderate allergic reaction)

- Symptoms: systemic pruritus, urticarial, angioedema of eyes, lips and larynx, dyspnea, hypotension, bradypnea
- Treatment:
 1. Administer Antihistamine IM
 2. monitor vital signs.



Dental caries
and flouride



Dental caries

- Prevention :
 1. Regular brushing
 2. Periodic dental check up

Ttt :

- 1. Ammonium ions
- 2. Urea

Action of ttt :

- 1- ↓acid producing pathogen
- 2- ↓acidity of oral cavity
- 3- dissolve dental plaques

Flourides

- Mech of action
 - 1) 1-Flourine is highly reactive anion
Flouride + dental components during teeth development è flourapatite *more acid resistant than hydroxyapatite)
 - 2) local antibacterial effect

S.E:

- 1- Exceesive use during teeth development è dental flourosis (brown, spotted, and hypoplastic teeth)
- 2- High systemic levels è nephrotoxic, neurotoxic, skeletal deformities, & bone exostosis

1. Topical sol or gel every 6 m → 26% decrease of decay

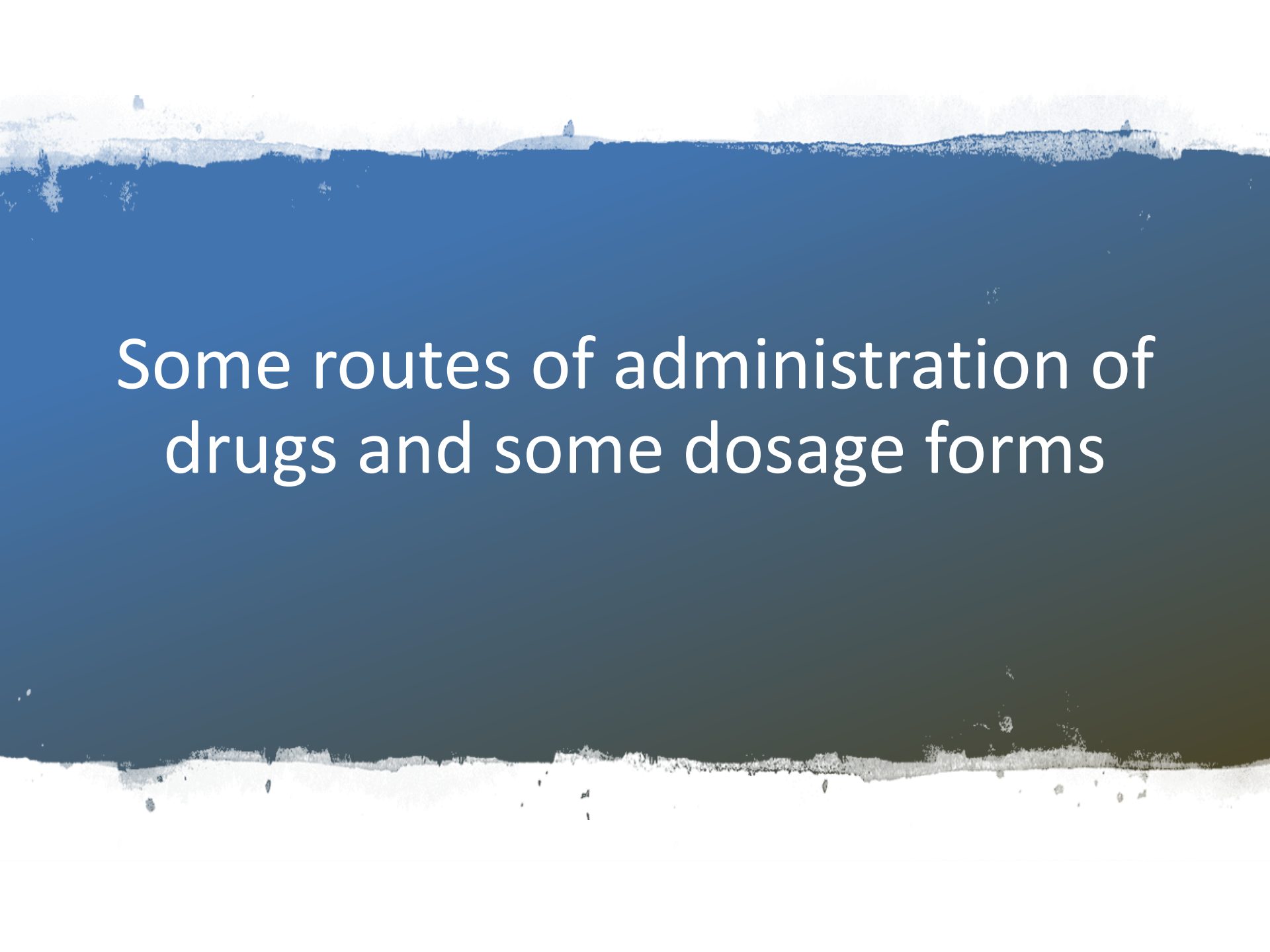
2. Systemic Tab: at age of 5-9 ys daily → permanent teeth resistant to caries

C.I :


1. Adults
2. Pregnancy
3. Infants < 6m

**Uses in
dentistry**

:



Some routes of administration of drugs and some dosage forms



Transdermal patches

*Transdermal
delivery system

- Application of the drug to the skin for systemic effects (drug pass through a rate controlling memb to the skin and then to blood stream).
- Composed of 3 compartments: Protective seal, a compartment that holds the medication with adhesive backing and a rate controlling memb.
- e.g: [?] Nitroglycerine patch [?]
Nicotine patch

Targeted drug delivery systems

Carrier system that deliver the drug to the target site.

Aim : maximum effect with minimal dose i.e; minimal side effects.

Types :

- Carrier system for macromolecules:(ptn) e.g; Interferon attached to PEG
- Particulate drug delivery system:

S.R tablets or capsule

- Advantage

1. Improve pt compliance (ability of the patient to follow your instruction)
2. suitable for a lonely old age patient

Or patient with poly pharmacy

3. Reduce S.E

Tab is formed of layers , each layer is dissolved at certain PH → constant rate over long period

- e.g; Diamicron M.R.tab
- voltarin capsules

Oral route

Advantages:

- Safe ,easy, and selfuse
- no need for sterilization

Disadvantages

1. Delayed onset (not suitable for patients in emergencies).
2. Drug may be destroyed by gastric HCl or digestive enzymes.
3. Drug may undergo extensive first-pass metabolism.
4. Cannot be used in unconscious patient.
5. Can cause gastric irritation and GIT upset.

- **Gastric gavage:**
 - it is administration of food or medicine into stomach by use of flexible tube.
- **Gastric lavage:**
 - it means wash of the stomach

Sublingual routes

- Advantages

1. Rapid absorption and rapid effect
2. No first-pass hepatic metabolism.
3. The tablet may be taken out in cases of overdose

e.g: s.L tabs

isoprenalin sulfate(bronchodilator)

nitroglycerin (antiangina)

Rectal route

Forms used:

a- suppository

b- enema

Advantages :

1. suitable for unconscious and non-cooperative patients (children).
2. No first-pass metabolism

Disadvantages:

1. Irregular absorption
2. may cause irritation or bleeding of rectal mucosa

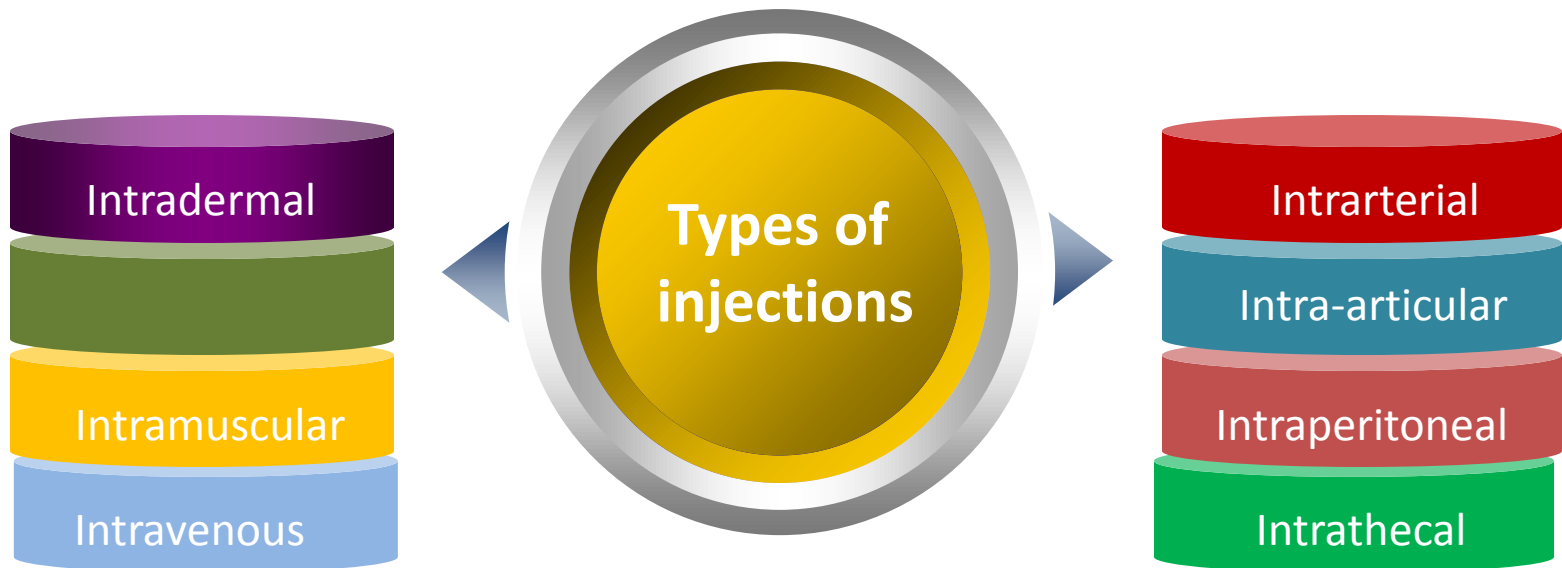
Types of enemas :

1) Diagnostic enema (barium enema):

- introducing barium dye as a contrast medium to take an X-ray of the colon.

2) Therapeutic enema:

- i. Retention enema: the drug is introduced in the bowel and retained inside it e.g. corticosteroids to ttt ulcerative colitis.
- ii. Evacuant (cleansing) enema: to wash the colon e.g. after GIT hemorrhage.



- A. Intradermal >> BCG vaccine and hypersensitivity test
- B. Subcutaneous route: **e.g. insulin and heparin**
- C. Intramuscular route **injection in the gluteal or deltoid ms or quadriceps muscle**
- D. **Intravenous route :**

Advantages of IV route:

1. Immediate effect.
2. No first-pass metabolism.
3. Suitable for large volumes (e.g. solutions) and irritant drugs.

Disadvantages of IV route:

1. Pyrogenic reactions and anaphylaxis.
2. Rapid i.v. injection is dangerous in some drugs e.g. aminophylline.
3. Phlebitis and air embolism.

What are the routes that can be used in emergency ?

1. sublingual
2. Intravenous
3. Inhalation

Important drugs you may prescribe
to your patient to prevent gastritis

Drugs that Neutralize HCl = Antacid

- Symptomatic ttt
- Not for long time use

Sod Bicarb	Ca carbonate	Mg hydroxide & Aluminium hydrox
Onset : rapid	moderate	slow
Systemic abs : yes → systemic SE Na → salt and water retention HCO ₃ → metabolic alkalosis	partial → hypercalcemia & renal stone	Poor → no systemic SE
Cl in HTN and HF	Hypercalcemia and renal stones	Why they are mix ?

Decrease HCl secretion

1. H₂ blockers (cimetidine, Ranitidine., Famotidine)
2. Proton pump inhibitors (PPIs) = (omeprazole, lansoprazole, & pantoprazole)

MOUTH WASH

- These are mechanical agents used for gargles.
- Types:
 - Therapeutic: to reduce plaque, gingivitis, dental caries and stomatitis.
 - Cosmetic: are used to reduce bad breath

THERAPEUTIC MOUTH WASH

HYDROCORTISONE, NYSTATIN, ANTIHIAMINE AND TETRACYCLINE	Stomatits
Pilocarpine	xerostoma
Tranexamic acid	prevention of bleeding after oral surgery
Amphotericin B	oral candidiasis
Chlorhexidine gluconate	plaque control

Categories of controlled substances

- Schedule I** Drugs that are not approved for medical use and have high abuse potentials e.g. flunitrazepam (Rohypnol), heroin, lysergic acid diethylamide (LSD), marijuana, methamphetamine (MDMA or ecstasy).
- Schedule II** Drugs that are used medically and have high abuse potentials: opioid analgesics (e.g., codeine, methadone, meperidine, morphine, oxycodone), CNS stimulants (e.g., cocaine, methamphetamine, methylphenidate), and barbiturate sedative-hypnotics
- Schedule III** Drugs with less potential for abuse than those in Schedules I and II, but abuse may lead to psychological or physical dependence e.g. benzodiazepines, androgens, anabolic steroids, and ketamine.
- Schedule IV** Drugs with some potential for abuse e.g. some appetite suppressants (e.g., mazindol, phentermine).
- Schedule V** Products containing moderate amounts of controlled substances e.g. antidiarrheal drugs, such as diphenoxylate and atropine (Lomotil®).

Thank
you.

