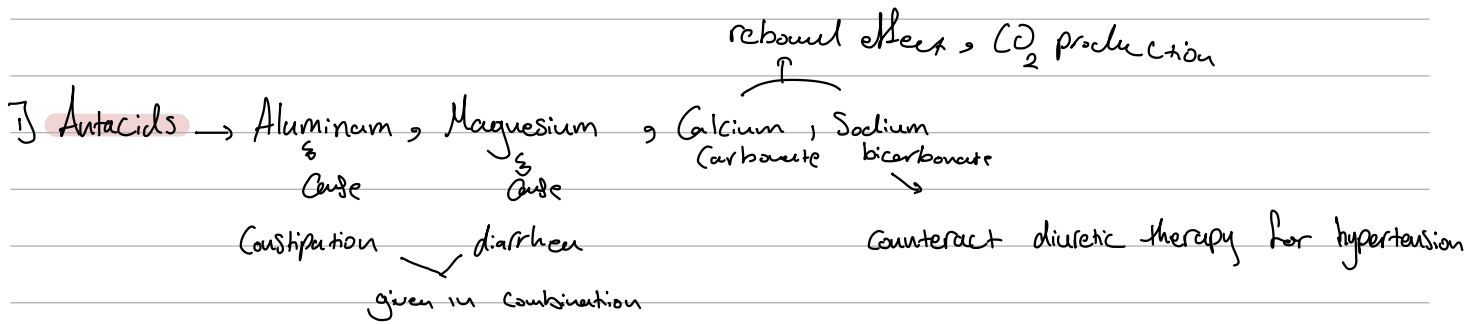


GI Pharma



50% first-pass metabolism

2] H_2 -receptor Antagonist → Cimetidine, Ranitidine, Famotidine, Nizatidine

GERD, Non-Ulcer dyspepsia, Stress Related Gastritis, Peptic Ulcer

IV H_2 X H. pylori

X NSAID is continued

IV Cimetidine

Adverse effects & GI symptoms (diarrhoea, headache, fatigue ...), CNS (confusion, hallucinations)

\ominus estradiol metabolism, \uparrow prolactin levels, cross placenta, bradycardia and hypotension

\hookrightarrow Cimetidine

Drug interactions & Cimetidine → \ominus Cytochrome P450 enzymes ($\uparrow + \frac{1}{2}$ of many drugs)

Ranitidine → bind 4-10 times less

3] PPI → Omeprazole, Rabeprazole, Lansoprazole, Pantoprazole, Esmoprazole
 (prodrug formulation)

oral / oral + IV

GERD, Non-Ulcer Dyspepsia, Stress-Related Gastritis, Gastrinoma, Peptic Ulcer disease

oral PPI (omeprazole) by nasogastric tube

X Nasogastric tube

IV H_2 antagonist

\downarrow H. pylori

(Triple & PPI + Clarithromycin + Amoxicillin or Metronidazole)

\checkmark NSAID associated ulcers

Synthetic form of vitamin B12

\checkmark Rebleeding ulcers (oral or IV)

Adverse effects & Diarrhoea, headache, \downarrow Cyanocobalamin absorption, \uparrow gastrin levels

Chronic inflammation in gastric body, Atrophic gastritis (Hyperplasia of ECL Carcinoid tumors)

Drug interactions & Effect

absorption → digoxin, ketocazole

metabolism → diazepam, phenytoin

Omeprazole

Laxatives

1] **Bulk forming laxatives** → Natural plant products & Psyllium, Sterculia, Methylcellulose
→ Synthetic fibers & Polycarbophil

* Can cause bloating and flatulence

2] **Stool softening agents** → Docusate, Glycerin suppository, Mineral oil
→ Aspiration can cause lipid pneumonia → can impair absorption of fat-soluble vitamins

3] **Osmotic laxative (Purgatives)** → Magnesium Oxide, Sorbitol, lactulose, balanced polyethylene glycol
Can cause rapid bowel evacuation within 1-3 hrs → purgation which may lead to volume depletion
cause severe flatulence and cramps

4] **Stimulant laxatives (Cathartics)** → enteric system activation → neurologically impaired patients
→ bed-bound patients

Anthraquinone derivatives (Aloe, Senna, Cascara)
Cause brown pigmentation of colon (Melanosis), poorly absorbed
Castor oil
↓ hydrolyzed
ricinoleic acid (local irritant)
clean colon before procedures

5] **Tegaserod** → Serotonin 5-HT₄ Partial agonist → Presynaptic receptor & IPANs → neurotransmitter release
→ Chronic constipation, Nausea, dyspepsia, Gastroparesis, IBS
Adverse effects & diarrhea (9% of patients) → hypomotility of GI
proximal bowel contraction and distal relaxation

Antidiarrheal Agents → Mild to moderate acute diarrhea, Chronic diarrhea, IBS, inflammatory bowel syndrome

1) **Opioid agonists** → ⊖ Cholinergic nerves, ↑ Colonic transit time (constipating effects)
* Can have CNS effects and addiction potential (+ Atropine to reduce dependence)

→ Loperamide, Diphenoxylate
↳ analgesic or addiction potential
(Doesn't cross BBB) → Can have CNS effects

2) **Kaolin and pectin** → Combined w/ Kaopectate
↳ Aluminum ↳ indigestible carbohydrate (from apples)
Silicate

3) **Bile salt-binding resins**: Cholestyramine, Colestipol
Can cause bloating, flatulence, constipation and fecal impaction

4) **Octreotide** is synthetic octapeptide (similar action to Somatostatin)
→ ⊖ of endocrine tumor effects
→ Diarrhea due to vagotomy or dumping syndrome
→ Pituitary tumors and GI bleeding
→ Can stimulate motility in small bowel bacterial overgrowth, intestinal pseudo-obstruction (IPO)
↳ in low doses! (it typically slow down GI motility) at higher doses
↳ not physical → caused by Scleroderma

Drug used for Irritable bowel syndrome (IBS) (crabbi isgeri)

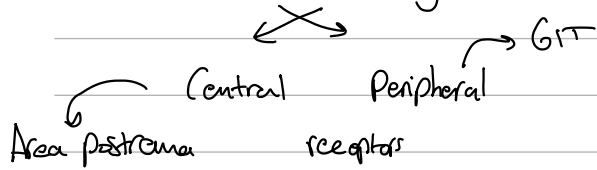
5) **Antispasmodic or Anticholinergic** → Dicyclomine, Hyoscyamine

6) **Serotonin 5-HT₃-Receptor antagonist** → Alosetron → Women with severe IBS and diarrhea is the prominent symptom
↳ extrinsic sensory neurons (gut → CNS) ↳ terminal of enteric cholinergic neurons
↓
Can cause ischemic colitis

7) **Serotonin 5-HT₄-Receptor agonist** → Tegaserod → Constipation

Antiemetic drugs

1] **Serotonin 5H-3 Antagonists** (Ondansetron, Granisetron)



→ acute chemotherapy-induced nausea and emesis and postoperative nausea and vomiting (combined with dexamethasone and NK1-receptor antagonist)

Adverse effect : Headache, dizziness and constipation

2] **NK1 Receptor Antagonists** (Aprepitant)

area postrema

→ prevention of acute and delayed nausea and vomiting (combined with 5 and corticosteroids)

3] **Cannabinoids** (Dronabinol, Nabilone)

→ Chemotherapy-induced vomiting
→ psychoactive agents

Adverse effects : Euphoria, dysphoria, Sedation, hallucinations, dry mouth, increase appetite

4] **Antipsychotic drugs** (Prochlorperazine, Promethazine, Droperidol)

→ block dopamine and muscarinic receptors

→ Can block H1 receptors → Antihistamine activity → Sedative effects

5] **Benzodiazepines** (Lorazepam, Diazepam)

Reduce vomiting caused by anxiety

Antiprotozoal drugs → Antimalarial drugs (Chloroquine, Quinine, Artemisinin, Doxycycline, Primaquine)
→ miscellaneous antiprotozoals (Metronidazole, tinidazole, nifuratel)

→ Metronidazole → extraluminal amebiasis (Kill trophozoites but not cysts), anaerobic bacteria inactive → activated by reduction → disrupt replication and transcription and ⊖ DNA repair
↓
pyruvate-ferredoxin oxidoreductase enzyme (in anaerobic organisms)

Adverse effects: Common: Nausea, headache, dry mouth, metallic taste, Vomiting, diarrhea, insomnia, weakness, dizziness
Infrequent:
Rare: Pancreatitis, CNS toxicity (Tinidazole is better tolerated)

≠ best avoided in pregnant or nursing women

→ Tinidazole → Similar but better toxicity profile, Can be given in a single dose

→ Nifuratel → Alternative to metronidazole or tinidazole in treatment of trichomoniasis

→ Amebiasis → Asymptomatic → luminal amebicide (Diloxanide furoate, Iodoquinol, Paromomycin)

Amebic Colitis → luminal amebicide + Metronidazole

→ Tetracyclines + erythromycin (X extraintestinal disease)
→ Dehydroemetine or emetine (best to avoid due to toxicity)

Metronidazole
is not effective
against luminal parasites

→ Giardiasis → Metronidazole → 90% efficacy after a single treatment, Tinidazole is equally effective

→ Trichomoniasis → Metronidazole → Single dose of 2g

→ Chloroquine → acute attack (Oral, IV, IM), Resistance develops

Adverse effects: Nausea, headache, teratogenic

→ Quinine → Oldest drug (from Cinchona tree), toxic, No resistance

→ Artemisinin → New drug (from Sweet wormwood (Zizania))

→ Doxycycline → Antiprotozoal but is also used for treating bacterial infection

→ Same thing to Metronidazole

Anthelmintics → exert their antiparasitic effect by interference with

- 1) energy metabolism
- 2) neurovascular coordination
- 3) microtubular function
- 4) cellular permeability

For nematodes :

1) Piperazine (Vermizine) → heterocyclic ring → hyperpolarization
→ agonist at chloride gated channels on the parasite muscle → reversible flaccid paralysis → expulsion of the worm

→ Prolonged treatment and might need a purgative
↳ so that paralyzed worms are quickly expelled

2) Diethylcarbamazine

→ interfere with the metabolism of arachidonic acid and block the production of prostaglandins
→ resulting in capillary vasoconstriction and impairment of the passage of the microfilaria
↳ treat Filariasis

3) Mebendazole (Vermox) → wide spectrum, safe drug

Threadworm (Enterobius vermicularis) → Hookworm (Ankylostomiasis) → Roundworm (Ascaris lumbricoidis)
2 tablets for 3 days
Single dose, can be repeated after 3 weeks

For cestodes (Platworms) :

1) Niclosamide (amchlorinate salicylamide)

→ ⊖ anaerobic incorporation of inorganic phosphate into ATP → ↓ ATP production
→ detachment of the scolex from intestinal wall → evacuation of cestodes

For trematodes

1) Praziquantel (Biltricide)

↑ Ca^{2+} permeability through parasite specific ion channels → muscle cell accumulate Calcium → ↑ parasitic motility
hidden antigens are exposed ← the drug alters the parasite's surface structure ← spastic paralysis ←
↳ disruption of lipid bilayer
(segmental antigens, lipid anchored protein, actin) → Host immune recognition → Antibodies and complement-mediated assault