

Anthelmintics

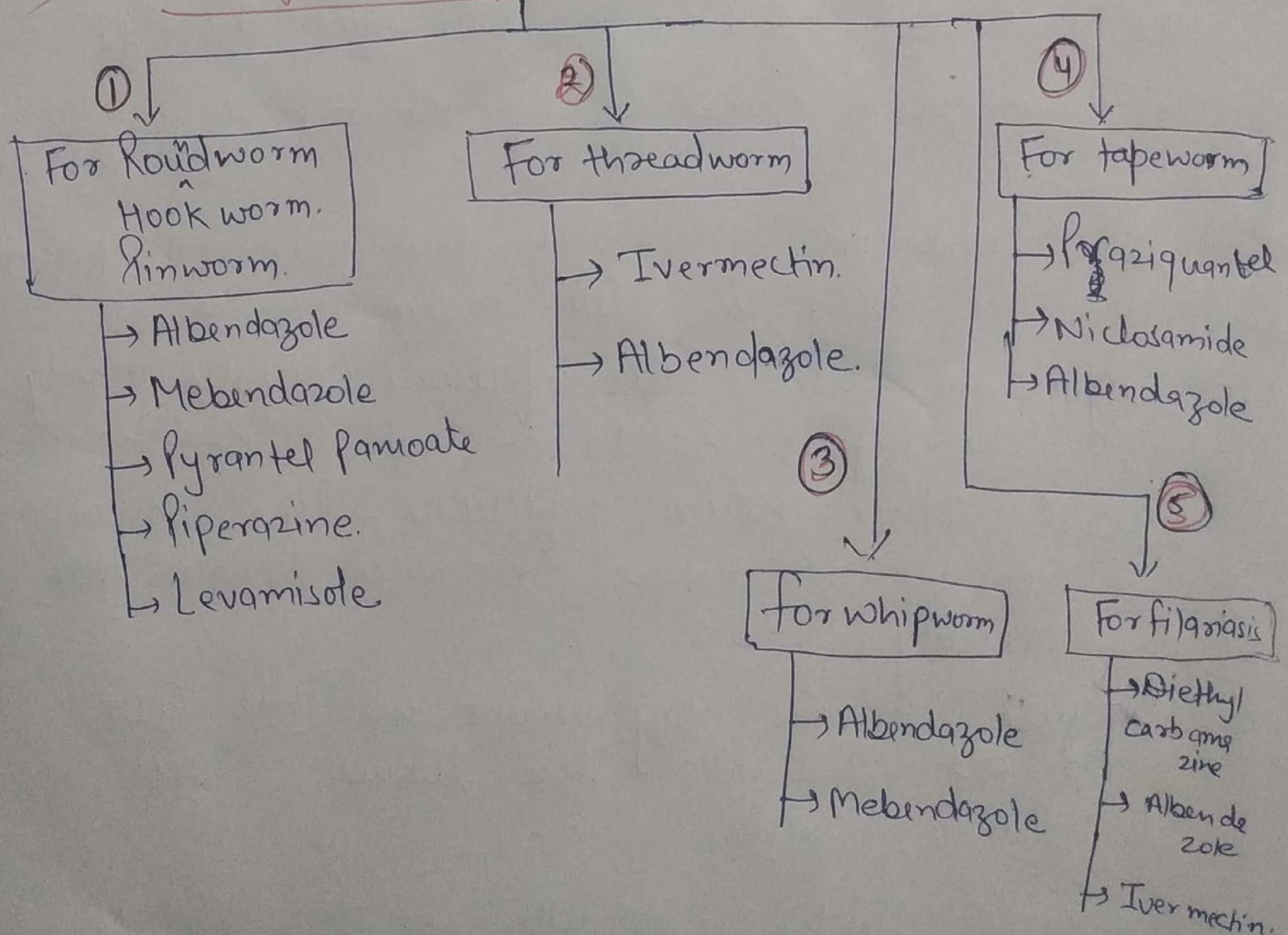
- ↳ Anthelmintics are the drugs that either kill or expel infesting helminths.
- ↳ Anthelmintics which kill helminthal worms are called vermicide. & those which expel the helminthal worm are called Vermifuge.
- ↳ There are 3 types of Hel^{min}thal worm:-
 - 1) Cestode — tapeworms (3 segmented body)
 - 2) Nematode — roundworms (Non-segmented body)
 - 3) Trematode — flukes (segments & hooks for sucking blood)
- ↳ The condition in which these helminths present in the body is called Helminthiasis.
- ↳ In some cases, these infections results mainly in discomfort & do not cause ill health.
- ↳ But other worm infections like schistosomiasis & hookworm disease produces serious morbidity.
- ↳ These worms may present in the GIT or ~~are~~ penetrate the tissues, causes systemic infection.
- ↳ Worms which are parasitic for man belongs to widely different zoological species & vary

with respect to their body structure, physiology & habitat in the human host & sensitive to drug.

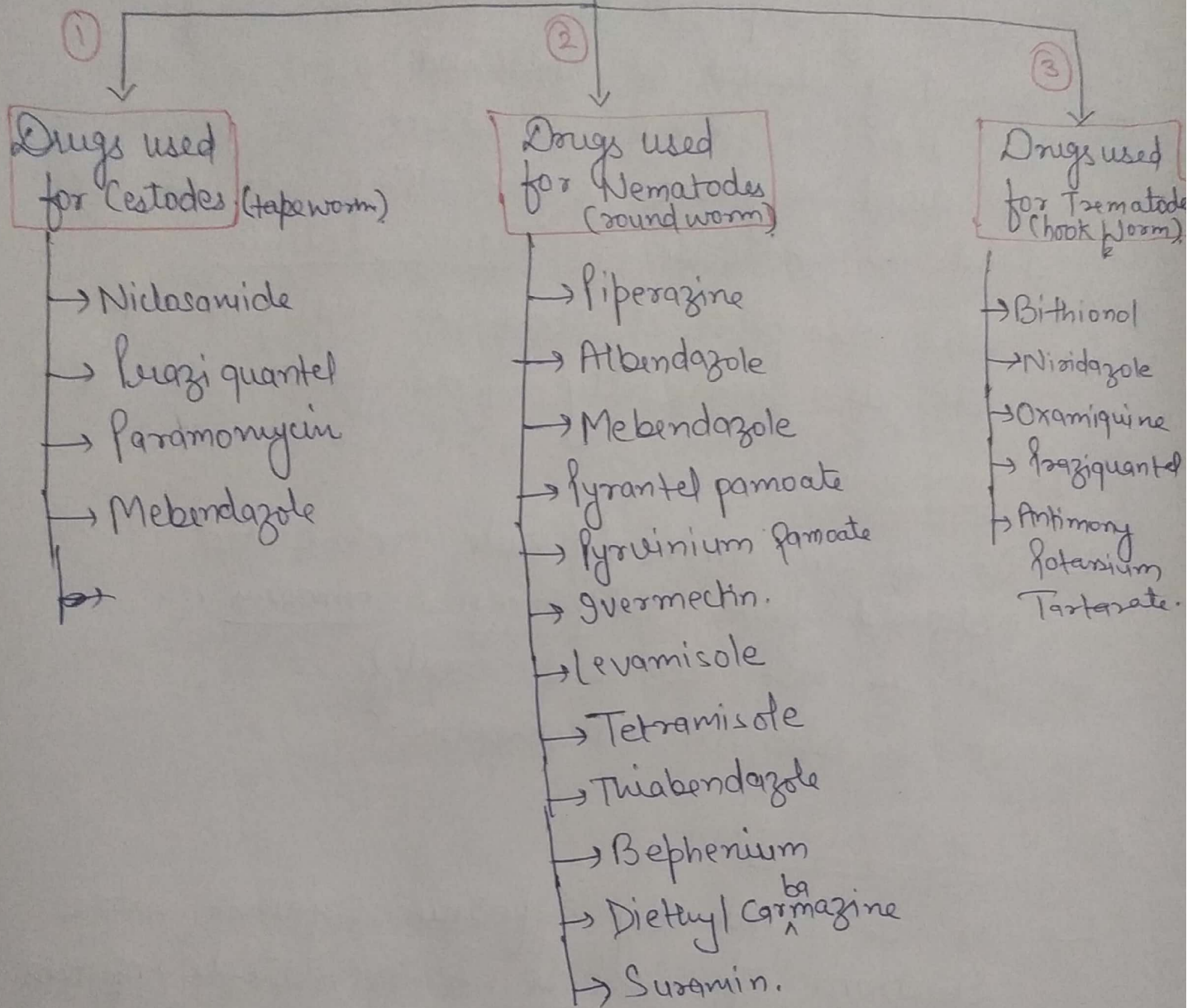
⇒ An ideal anthelmintic should :-

- 1) Have broad spectrum of action.
- 2) Achieve high % of cure preferably with a single dose.
- 3) Should not need administration of purgative before or after.
- 4) Should not get absorb.

⇒ Classification of Anthelmintics :-



⇒ Anthelmintics can also be classified as:-



- 1) Niclosamide :- It is the drug of choice for tapeworm infection. It makes the worms more susceptible to proteolytic enzyme.
- ↳ The Scolex (head) & proximal segment (tail) are partially digested so that the worm loses its attachment.
 - ↳ MOA - Niclosamide acts by inhibiting oxidative

Phosphorylation in mitochondria & interfering anaerobic generation of ATP by the tapeworm. This results in detachment of worm from the intestinal wall & ultimately expelled out from the body.

↳ The drug should be followed by a cathartic in 1 hr or 2 hr to clear the bowel of all dead segments before they can be digested as in case of Taenia solium.

↳ The absorption of drug is negligible & it is practically free from side effects.

2) Paromomycin:-

↳ It is an aminoglycoside antibiotic obtained from Streptomyces rimonus.

↳ It is not absorbed orally.

↳ It is also an antamoebic.

3) Meziquantel:-

↳ It is clinically effective against wide spectrum of Cestode & Trematode infections.

↳ It causes dislocation of the worm in the intestine.

↳ It is rapidly absorbed orally.

Dose- Single oral dose of 40mg/kg.

S.E- abdominal discomfort
headache
dizziness

B.N - DRONCIT

4) Albendazole :-

MOA - It acts by inhibiting microtubule synthesis in nematodes, thus impairing glucose intake.

- ↳ The intestinal parasites get immobilized or die slowly
- ↳ They are cleared from the body in several days
- ↳ It is related to mebendazole.
- ↳ It has advantage that it is effective in single dose
- ↳ effective in pinworm infection, ascariasis & hookworm infection.
- ↳ Single dose of 400 mg orally is repeated after 2 weeks is useful in achieving 100% Cure rate.
- ↳ It should not be given in pregnancy.

S.E :- Epigastric distress
diarrhoea
Nausea
Headache
Dizziness
Insomnia

TN :-

ZENTAL

5) Piperazine:-

MOA- Act by blocking neuromuscular transmission in round worm by preventing axn of Acetylcholine & causes ~~paralysis~~ hyperpolarization & used for the t/t of round worm & pinworm infections.

↳ It causes paralysis of worm muscle which is then expelled by peristalsis.

↳ It is readily absorbed from GIT.

↳ Excreted through urine

↳ has wide margin of safety

↳ S.E:- GI upset

Urticaria.

Muscular incoordination.

Nausea

Vomiting

Diarrhoea.

6) Mebendazole:-

↳ MOA:- It inhibits microtubule synthesis in nematodes. thus impairing glucose uptake.
↳ The parasite become immobilized & it causes death of worm slowly & clearance from the GIT may not be complete upto 3 days after treatment.

↳ Poorly absorbed orally.

↳ No systemic S.E

↳ But has teratogenic effect so it is contra-indicated in pregnancy.

Dose:- 100mg orally morning & evening on three consecutive days. (4)

Uses:-
↳ Used in thread worm, round worm hookworm infection.

↳ If the patient is not cured then the second course can be given after 3 weeks.

↳ fasting & purgatives is not necessary

7) Pyrantel Pamoate:-

↳ It is used for the treatment of pinworm, roundworm & hookworm infections.

MOA- It works by paralyzing the worm so that the body can remove them naturally in the stool.

↳ S.E:-
Nausea
Vomiting
diarrhoea
Abdominal Cramps.
headache
drowsiness
dizziness
insomnia
loss of appetite
Allergic Rxn.

↳ No Purgation is required.

8) Pyruvium Pamoate:-

↳ It is mainly used for pinworm infections.

MOA - ↳ It is believed to interfere with glucose uptake by pinworms.

↳ It inhibits the mitochondrial ~~com~~ respiration complex & suppress the unfolded protein response.

↳ Not significantly absorbed from GIT.

↳ Pyoverdine is a red coloured dye so it makes the stool red & is not harmful & will disappear after few days.

9) Ivermectin :-

↳ It is used to treat round worm infections.

↳ MOA - It works by paralyzing & killing the parasites.

↳ Absorbed orally

↳ Taken ~~be~~ 1hr before meal.

↳ effective especially against Scabies.

S.E :-

Headache

Dizziness.

Muscle pain

Nausea

Diarrhoea.

Joint pain

Swollen lymph nodes

Vision changes

itching

seashes.

10) Levamisole:-

(5)

↳ It is specifically used for ascariasis & hookworm infection.

MOA - Levamisole can stimulate formation of antibodies to various antigens, enhance T-cell activation & proliferation, potentiate monocyte & macrophage functions including phagocytosis & chemotaxis & ↑ neutrophil mobility. Beside these, it also inhibits alkaline phosphatase & cholinergic activity as a result of which paralysis of worm muscles takes place.

S.E -

Nausea

Vomiting

Diarrhoea

Headache

Hypersensitivity Rxns.

Hematological Rxns.

11) Tetraamisol:- Action similar to levamisole.

↳ Useful in round worm, hookworm infection.

12) Thiobendazole:-

MOA:- It act by interfering with Carbohydrate metabolism in worms.

↳ has broad spectrum activity

↳ Effective against round worm, hookworm, pinworm, threadworm & whipworm infection.

- ↳ Only used in Condition when other safer drugs are not available.
- ↳ absorbed by oral route.
- ↳ excreted in urine.
- ↳ has anti-inflammatory, analgesic & anti-psychotic properties.

S.E:- Nausea
 Vomiting
 Anorexia
 Vertigo
 drowsiness.
 Diarrhoea.
 Headache
 Pruritis.
 Tinnitus.
 Numbness.
 Enuresis.

13) Bephenium:- Its hydroxy naphthalete salt is used.

↳ Cholinergic agent Causes neuromuscular blocking.

↳ The worm loses their attachment & are expelled.

↳ poorly absorbed orally & has no. serious S.

14) Diethylcarbamazine:-

⑥

- ↳ It is piperazine derivative.
- ↳ Readily absorb from GIT.
- ↳ Excreted in urine
- ↳ S.E not severe - Nausea
Vomitting
Headache
Weakness
Anorexia.
- ↳ It also has muscle paralyzing activity on worms $\therefore$ helps in dislodging from their sites.

15) Suramin:-

- ↳ Non-metallic compound
- ↳ Useful in filariasis.
- ↳ Used after a course of diethyl carbamazine.
- ↳ administered i.v
- ↳ S.E: 1) Nausea
2) Vomiting
3) Shock
4) loss of consciousness
5) Acute urticaria.
6) Photophobia
7) Lacrimation.
8) Hematuria

16) Bitthionol:- Cause photo sensitivity Urticaria GI distress.

17) Nitidazole:- $\rightarrow$ Slowly absorbed orally $\rightarrow$ Excreted in urine & faeces.

- ↳ Urine becomes dark in colour
- ↳ Unpleasant body odour.

S.E:- GI disturbance

Arrhythmias.

Neuropsychiatric disturbances.

18) Oxamiquine:- Rapidly absorbed orally.

Dizziness, drowsiness are minor S.E.

19) Antimony Compound:-

- ↳ Slowly absorbed orally
- ↳ given parenterally.
- ↳ Excreted through urine
- ↳ effective in schistosomiasis.

