Therapeutic Index: TI is a measure of drug safety.
- It is a qualitative parameter.

↓

A ratio that compares toxic plasma concentration to effective plasma concentration of a drug.

$$TI = \frac{TD_{50}}{ED_{50}}$$

TD_{50} → Dose required to produce toxicity in 50% of population. Marker of Drug toxicity

ED_{50} → Dose required to produce effect in 50% of population. Marker of drug potency

DRC: Dose Response curve

↓

is a graph plotted b/w log dose & response

Graded DRC: Drawn in one individual
- Can compare affinity, potency, efficacy.

Efficacy: Max Response = ht of DRC

Potency: Relative dose required to Produce a particular effect
$\propto \frac{1}{Dose}$

Affinity: Dose Required to Bind to receptor

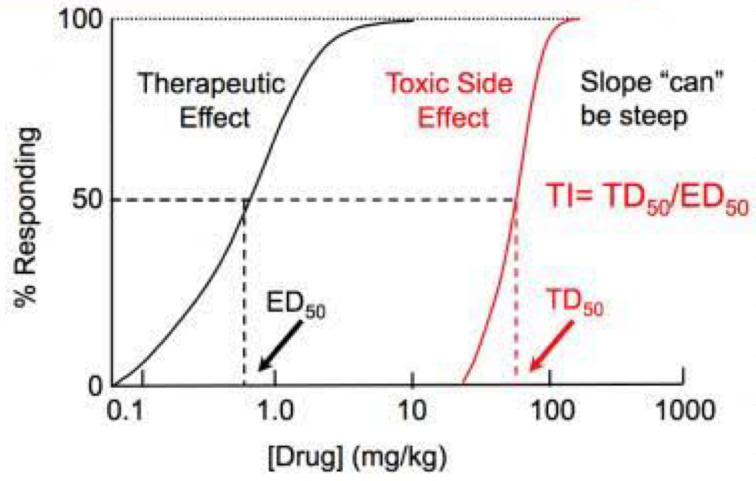
↓

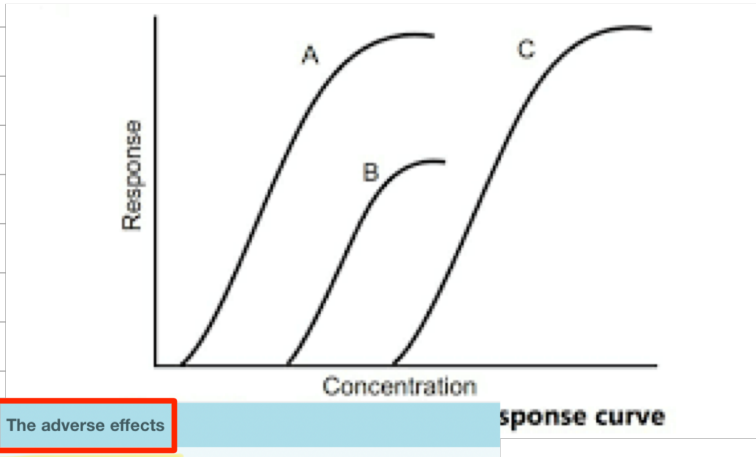
can be compared if DRC are parallel

Quantal DRC: Drawn in population.

↓

Used to calculate LD_{50}, ED_{50} & TI.





sponse curve

Anti-glaucoma Drugs & S/E :-

Anti-glaucoma drug	The adverse effects
Beta-blockers	Corneal hypoesthesia
	Systemic side effects
Sympathomimetics: Apraclonidine	Lid retraction, Mydriasis
Sympathomimetics: Brimonidine	CNS depression and apnea in infants and children (<2 years)
Prostaglandin analogs	Eyelash hypertrichosis
	Macular edema
	Iris pigmentation (Heterochromia iridis)
	Peri-orbital fat depletion
Miotics	Retinal detachment
	Cataract
Carbonic anhydrase inhibitors	Systemic side effects
	Corneal edema

Drugs Causing QT Prolongation:

Antiarrhythmics:

- Sotalol
- Amiodarone
- Quinidine
- Procainamide
- Dofetilide
- Ibutilide

Antimicrobials:

- Levofloxacin
- Ciprofloxacin
- Gatifloxacin
- Moxifloxacin
- Clarithromycin
- Erythromycin
- Ketoconazole
- Itraconazole
- Rilpivirine

Antidepressants:

- Amitriptyline
- Desipramine
- Imipramine
- Doxepin
- Fluoxetine
- Sertraline
- Venlafaxine

Antipsychotics:

- Haloperidol
- Droperidol
- Quetiapine
- Ziprasidone
- Thioridazine

Others:

- Cisapride
- Sumatriptan
- Zolmitriptan
- Arsenic
- Dolasetron
- Methadone

Phases of Clinical Trials:

Phase I	Phase II	Phase III	Phase IV
10–100	50 - 500	500 - 3000	Large or according to study
Usually healthy volunteers	Patients with the target disease	Patients with the target disease	Real-world patients
Open-label study	Randomized and controlled trial or blinded	Randomized and controlled trial or blinded	Usually the observational or open-label
Human pharmacology and safety: The study aims at safety and tolerability; PK parameters	**Therapeutic exploration and dose-ranging**: Efficacy and dose-ranging	**Therapeutic confirmation/comparison**: Indications are finalized and guidelines for therapeutic use are formulated. Monitoring of adverse reactions	**Postmarketing surveillance/studies**: Drug interactions; long-term or rare side effects
Extends from Months to 1year	1–2 years	3–5 years	Unending, after drug approval

Q. Drug Toxicity is determined in which phase?

- Phase 1

Q. Maximum Tolerable dose is determined in?

- Phase 1 (Dose range)

Q. Efficacy is best in → Phase 3 (Confirmed) (due to large number of patient.

↳ Determined in → Phase 2

Contraindication of β-blockers

Mnemonic – ABCDE

A – Asthma
B – Block (Heart block)
C – COPD
D – Diabetes Mellitus
E – Electrolyte (Hyperkalemia)

Drugs used for HTN during Pregnancy:

Better – β-blocker (Labetalol)
Mother – Methyldopa
Care – Clonidine
During – Dipine (Dihydropyridine CCB)
HTNive – Hydralazine
Pregnancy – Prazosin

Drugs C/I in HTN during pregnancy

B – β-blockers (Non-Selective)
A – ACE⊖
N – Nitroprusside
D – Diuretics
A – Angiotensin 1 antagonists
R – Reserpine

Botulinum Toxin / botox

Botox causes relaxation of the muscle when injected. It can be used in the Rx of: Dystonia
Dyskinesia
Achalasia Cardia
Cosmetology
Migraine Prophylaxis: It ↓ the calcitonin gene related peptide (CGRP) release.

Sydenham's Chorea:

- Last manifestation of Acute Rheumatic fever (3 months after onset)
- Semi purposeful, jerky movements of Limbs resulting in abnormal co-ordination and abnormal posturing.

A/w manifestations: Hypotonia.
- Emotional Lability.
- Jerky speech.

Signs: • milkmaid grip sign: Alternate tightening and loosening of grip.
• Darting tongue sign: Unable to keep the tongue protruded out for examination.

• Self resolving
• if not resolving, treat with diazepam, Haloperidol.

Management: • Strict bed rest for 2 weeks
• Penicillin: inj Penicillin G (Benzathine) single dose / oral penicillin V 250 mg 4 times / day x 10 days.
• Allergic to penicillin: Erythromycin 250mg 4 times a day x 10 days

• Anti-inflammatory medications.
  • steroids
  • Asprin

Digoxin: used for symptomatic management of CHF (Does not reduce mortality)

Source: Derived from a plant known as Digitalis Lanata (White foxglove plant)

(Digitalis Lanata)

Pharmacokinetics: • Good oral absorption.
• High volume of distribution (Loading dose)
• Half-Life: 36-48 hours.
• Time taken for digitalization (Digoxin effects) → 7-10 days (4-5 half lives)

Its a substrate for P-glycoprotein pumps.

Mechanism of Action → Cellular level mechanism
→ Organ level mechanism

1. Cellular Mechanism (Mycardial cell): ⊖ Na^+-k^+ ATPase pump

• Digoxin blocks Na^+-k^+ ATPase pump leading to accumulation of k^+ outside the cell (Hyperkalemia) and Na^+ inside the cell.

• Function of Na^+-k^+ ATPase pump: Reverse depolarization.
• They throw Na^+ out of the cell and take k^+ in.

• k^+ Limits binding of digoxin to Na^+-k^+ ATPase pumps. If the level of k^+ are depleted due to diuretics: Extra binding of digoxin to these pumps results in digoxin toxicity.

- Hypokalemia causes digoxin toxicity and digoxin toxicity causes Hyperkalemia.

- ↑ Na^+ inside the cell : Dysfunctioning of Na^+/Ca^{2+} exchanger
  - The function of this pump is to throw Ca^{2+} out and take Na^+ in whenever the cell needs Na^+.
  - as there is ↑ Na^+ inside the cell, no calcium moves out. Intracellular Ca^{2+} ↑ which ↑ contraction of myocardium.

- Gradual ↑ in intracellular calcium : causes delayed after depolarization.
  - if further ↑↑ → it causes extra abnormal contractions known as Extrasystoles.
- if extrasystoles are repetitive in nature : Ventricular bigeminy >> trigeminy (Benign Arrythmia).
- if further ↑ in intracellular calcium → Vent. Tachycardia → Vent. fibrillation.

Rx : Benign arrythmia : Potassium. (K^+ binds to Na^+/K^+ ATPase pump and prevents binding of digoxin to it and prevents worsening of benign arrythm.
- K^+ is C/I in: VT and VF
  - Doc: Lidocaine
- Alternatives : Amiodarone, Digibind (antidote for Digoxin)

S/E : m/c & earliest → Nausea/vomiting (it can be a sign of impending toxicity)
- Xanthoma (Yellow vision)
- Gynaecomastia
- Hyperkalemia.

2. Organ Mechanism : Effect on heart → Dose dependent

At Normal Dose : Parasympathomimetic effect → Blocks both SA and AV node
- Combining this with cellular effects :

There is ↑ level of Ca^{2+} in the atrial cells and the SA node is blocked which leads to Atrial tachy. But, this is resisted by AV nodal block.

Most characteristic Digoxin induced arrythmia → Atrial tachycardia with AV nodal block.

Use : To convert Atr. flutter to fibrillation (easier to control)

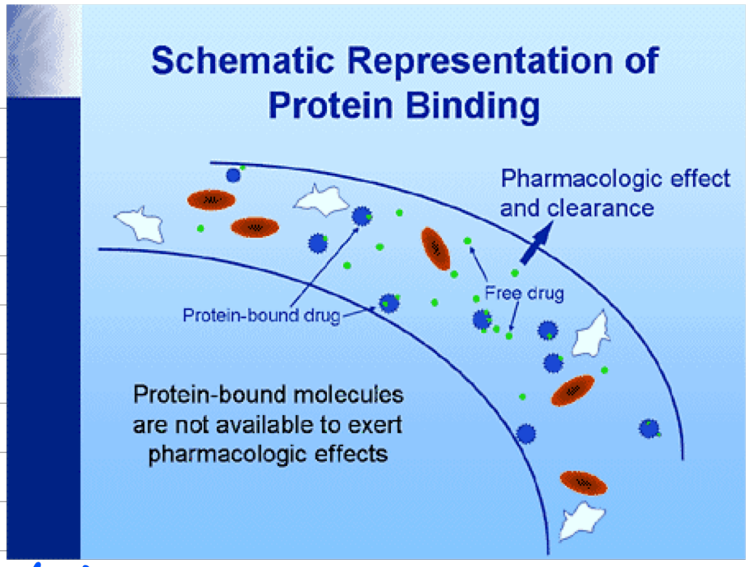
At Higher Dose : Sympathomimetic effect → Tachyarrhythmia.

- Safe range : 0.5–2.0 ng/ml
- Therapeutic Range : 0.5–0.9 ng/ml
- Toxicity : seen with range more than 2.0 ng/ml

Contraindications:
- WPW syndrome
- HOCM
- Conditions which ↑ the risk of digoxin toxicity (intracellular calcium)
  - Hypercalcemia
  - Hypomagnesemia
  - MI, Hypokalemia, Renal f.

Plasma Protein Binding :

Drug
↓ Absorption
Circulation
↓
Plasma Protein
↓
Bound form (inactive)
⇓
Free form (active)



- Acidic Drugs binds to Albumin (Basic plasma protein)
- Basic Drugs binds to α, acid glycoprotein (Acidic plasma Protein)

- **Clinical imortance:**
  - Favours drug absorption.
  - Highly bound → Low volume of distribution.
  - Delays metabolism and excretion of the drug.
  - plasma protein bound drug has Longer duration of action.
  - Difficult to remove by Hemodialysis.
  - Anemia, CKD, CLD → ↓ Albumin in Systemic Circulation.

⇓

∴ ↑ free form of Drug
↳ causing Drug toxicity

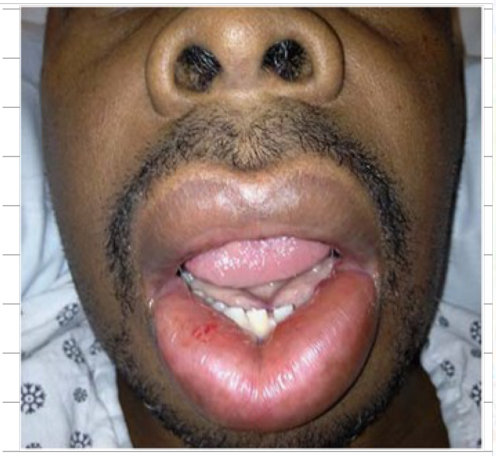
Drugs highly bound to plasma protein	
To albumin	*To α_1-acid glycoprotein*
Barbiturates	β-blockers
Benzodiazepines	Bupivacaine
NSAIDs	Lidocaine
Valproic acid	Disopyramide
Phenytoin	Imipramine
Penicillins	Methadone
Sulfonamides	Prazosin
Tetracyclines	Quinidine
Tolbutamide	Verapamil
Warfarin	

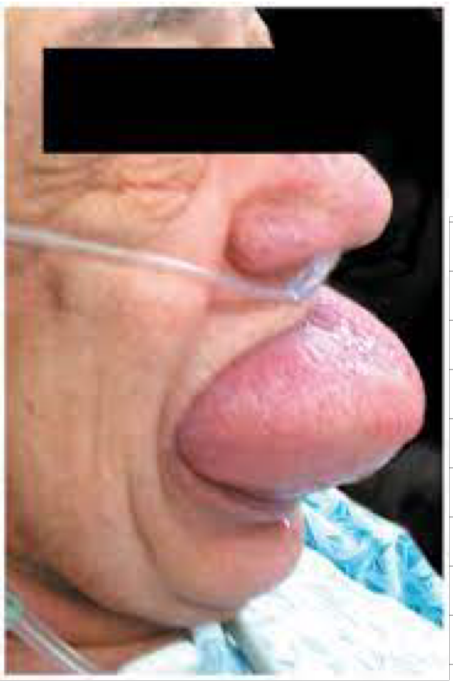
Drugs inducing Angioedema

Causative agents

- Antibiotics (particularly penicillins, and especially when given by the parenteral route)
- Barbiturates
- ACE inhibitors
- Angiotensin receptor blockers
- Levamisole
- NSAIDs and Opiate analgesics (both of which lower the threshold for mast cell degranulation)

- Sulphonamides
- Thiopental
- Vancomycin
- Phenolphthalein
- Quinine
- Rifampicin

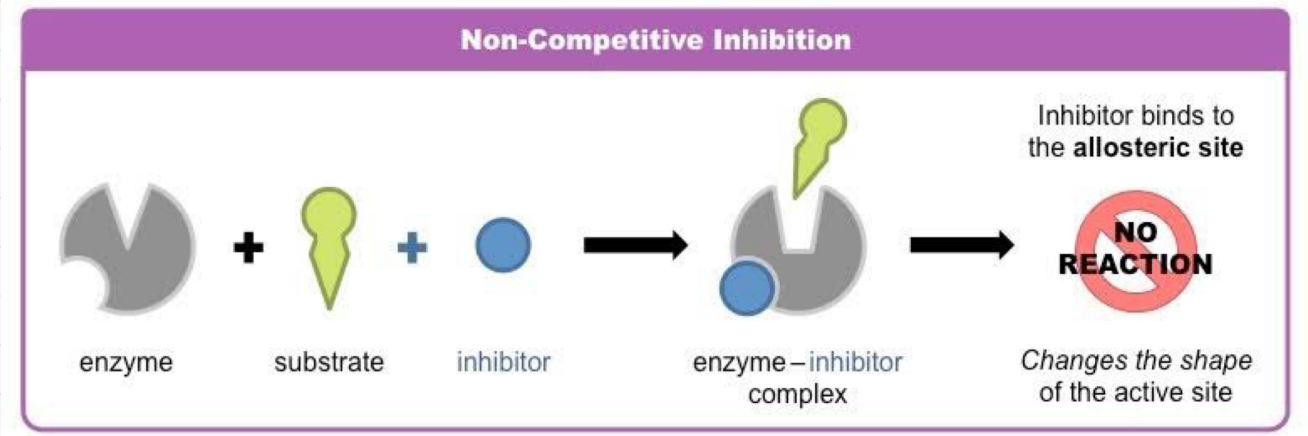




pka: is the pH at which concentrations of ionized and unionized forms are equal.
- pka is the pH at which 50% of drug is ionized and 50% is unionized.

Pirenzepine: is a Muscarinic Antagonists.
↓
and Telenzepine used in gastric ulcer as they ↓ HCL secretion.

Tamsulosin: α_{1a} Blocker
↳ (Also blocks α_{1d})
DOC: BPH
S/E: Ejaculation abnormality
- Floppy iris

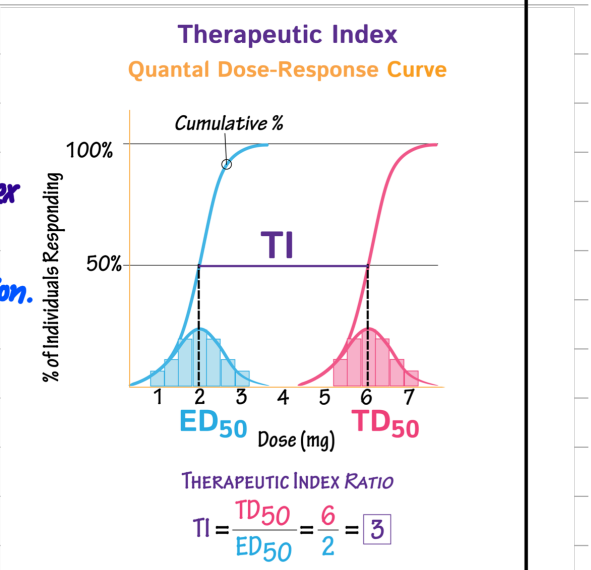


Quantal DRC

- Response is binary and drawn in population.
- Used to calculate LD_{50}, ED_{50} and Therapeutic index

ED_{50} – Dose required to produce effect in 50% of population. Marker of drug potency.

TD_{50} – Dose required to produce toxicity in 50% of population. Marker of drug toxicity.



Congestive Heart Failure (CHF)

Acute CHF

AIM

↑ Heart contraction
- DOC: Dobutamin
- PDE-3⊖
  - aka: inodilators

Treat Pulmonary Edema
- DOC: Furosemide
- I/V NTG
- BNP analog (Nesiritide)
  - Route: I/V
  - Metabolized by ↓
    - Neutral endopeptidase (Neprilysin)

Chronic CHF

AIM

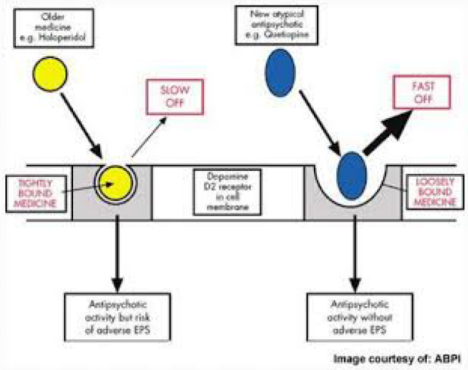
↓ Mortality ↓
- S - Spironolactone, $SGLT_2$⊖
- H - Hydralazine
- I - Ivabradine
- V - Vericiguat
- A - ACEI/ARB
- Beta - Beta blockers

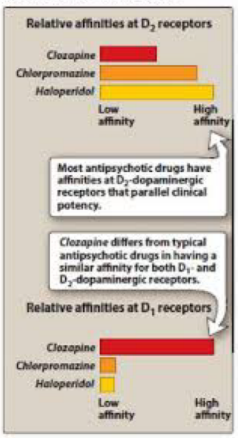
- Digoxin: Does not ↓ mortality.

ATYPICAL ANTIPSYCHOTICS

Mechanism of action

- Most of the second generation agents appear to exert part of their unique action through inhibition of serotonin receptors (5-HT), but they are also a weak dopamine D2 receptor antagonist





atypical antipsychotics

CROZAQ
C- Clozapine
R-Risperidone
O-Olanzapine
Z-Ziprasidone
A-Aripiprazole
Q-Quietapine

Antiarrhythmic Drugs

Class Ia

1 Double Quarter Pounder

Disopyramide

Quinidine

Procainamide

Class Ib

with Lettuce, Mayo & Tomato

Lidocaine

Mexeletine

Tocainide

Class Ic

and More Fries Please!

Moricizine

Flecainide

Propefanone

Class II

Beta blockers? Lol

Propanolol

Atenolol

Metoprolol

Class III

This is SAD

Sotalol

Amiodarone

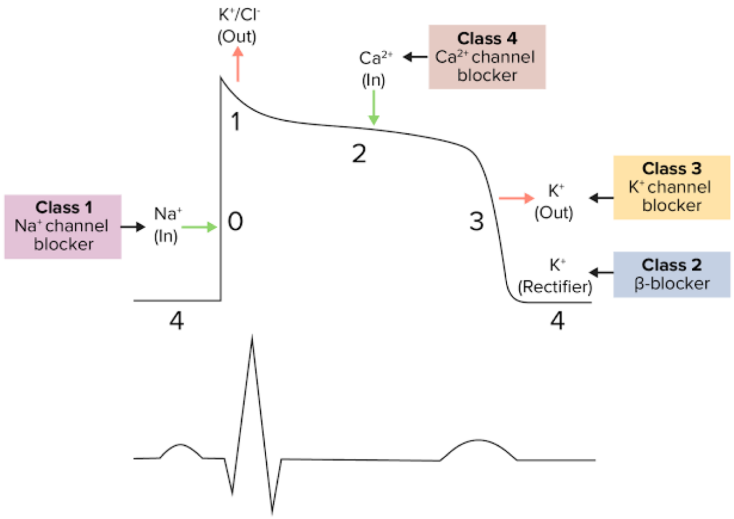
Dofelitide

Class IV

I and V in Class IV?

Diltiazem

Verapamil



Ranolazine : is an active piperazine derivative.
It acts by blocking the late inward Na^+ channels in the myocardial cells thus indirectly activating Na^+/Ca^{2+} exchanger.
It ↓ the Ca^{2+} Levels in the myocardium leading to ↓ contraction and O_2 demand.
- It also acts by inhibiting PFOX enzyme.
- used in resistant cases (when the patient is not responsive to any other drug).

- Adverse effects: Mild QT prolongation. Torsades de points is not usually seen.
- C/I in Heart failure

Lithium Toxicity

Mannitol

- Site of Action : PCT and Loop
- MOA: Osmotic Agent
- Use : DOC - Cerebral edema
  DOC - Acute Congestive Glaucoma
- S/E :
  - Hyper / Hypokalemia
  - Hyper / Hyponatremia
  - Metabolic Alkalosis / Acidosis
  - Pulmonary edema

C/I : Active intracranial bleed

Antiparkinsonian Drugs

1. Levodopa
   - DOC - PD in >65 years
   - Always combined with Carbidopa to inhibit peripheral decarboxylation

S/E : Dyskinesia, Orthostatic Hypotension
- Psychosis, Anorexia / Nausea / Vomiting
- Mydriasis

C/I : Glaucoma, Psychosis

2. MAO-B inhibitors

- Drugs - Rasagiline, Selegilline, Safinamide
- Use - DOC - Early onset PD
- On-off phenoma.

3. COMT inhibitors

- Drugs - Entecapone, Tolcapone
  Opicapone
- Use - On-off phenomena

Ketamine → Dissociative anesthesia

Chemical structure & availability →
- Phencyclidine derivative
- Available in racemic mixture formation (S+): Less amount of psychotropic actions.

MOA → Acts on NMDA receptors (excitatory receptors): Suppresses the excitatory symptoms

---

Etomidate → Most cardiostable agent

Chemical structure and availability →
- Imidazoline Derivative.
- Concentration: 0.2%
- Contains propylene glycol (35%)
- Oily preparation: very painful injection

MOA → Acts on GABA receptors: ↑ chloride conductance.

→ One of the preferred agents for DC cardioversion. Not to be used for continuous infusion.

Tolvaptan, Mozavaptan

- Oral Route
- Used in long term management of SIADH
- S/E – Tolvaptan is Hepatotoxic (Max duration of use – 1 Month)

Metronidazole

- MOA – Nitroimidazole drug – Produces nitro anion free radicals
- Uses – DOC
- ✓ S – Supradiaphragmatic Anaerobes
- ✓ A – Amoebiasis
- ✓ T – Trichomoniasis, Tetanus

In
B – Bacterial vaginosis
G – Giardiasis
Metro

S/E – Disulfiram like reaction
C/I – With alcohol

Scrub Typhus Management

- Agent : Orientia tsutsugamushi
- Presentation is similar to Leptospirosis.
- Eschar is characteristic.

Rx: Doxycycline 100mg BD for 7 days or
Azithromycin 500mg SD for 5 days.

As per the latest recommendations from **National Tuberculosis Elimination Programme (NTEP)**, treatment of TB is now based primarily on **drug susceptibility testing**. This is irrespective of new cases, previously treated cases or recurrent TB cases.
All cases of TB are treated with Drug Sensitive TB Regimen, as long as the patient is sensitive to isoniazid and rifampicin. (**No classification into category I or II**)

Type of TB Case	Intensive Phase	Continuation Phase
New and previously treated cases (H and R sensitive)	2 months H R Z E	4 months H R E

Classification based on drug resistance.

The cases are classified as:

- **Mono-resistant (MR):** A TB patient, who is resistant to one 1st line anti-TB drug only.
- **Poly-Drug Resistant (PDR):** A TB patient, who is resistant to more than one 1st line anti-TB drug, other than Rifampicin.
- **Rifampicin Resistant (RR):** A TB patient, who is resistant to **rifampicin** with or without resistance to other drugs. Patients, who have rifampicin resistance, should be managed as if they are an MDR TB case.
- **Multi-Drug Resistant (MDR):** A TB patient, who is resistant to **both isoniazid and rifampicin.**
- **Extensively Drug-Resistant (XDR):** A MDR TB patient who is additionally resistant to a **fluoroquinolone** (ofloxacin, levofloxacin, or moxifloxacin) and at least one additional group A drug (as of 2021, these are bedaquiline and linezolid)

Standard DR TB regimen

Regimen class	Drugs	Comments
H mono-resistant/ poly-drug resistant TB regimen	Lfx R E Z for 6 months	6 months long Oral drugs only
Shorter MDR TB regimen	**Intensive Phase:** Mfx Bdq(6 months) Cfz Z Hh E Eto for 4-6 months **Continuation phase:** Mfx Cfz Z E for 5 months	9-11 months long totally Injectables used in Intensive phase.
Longer MDR TB regimen	Bdq(6 months or longer) Lfx Lzd Cfz Cs	18-20 months long Oral drugs only This regimen is used for XDR TB patients for 20 months.

Criteria for patients to receive standard Drug Resistant TB regimen:

Standard Drug Resistant TB regimen	Inclusion criteria	Exclusion criteria
H mono-resistant/poly-drug resistant TB regimen	**Isoniazid resistant** TB with **rifampicin sensitive**	No specific criteria
Shorter MDR TB regimen	Patient with **rifampicin resistant** pulmonary or extra pulmonary TB	Non drug sensitivity test based criteria: • Pregnancy • Any extra pulmonary disease in PLHIV • Disseminated meningeal or central nervous system TB • Intolerance to any drug in the shorter MDR TB regimen Drug sensitivity test based criteria: • If DST/DRT result for FQ or SLI is resistant (XDR TB) • Presence of InhA mutation • Resistant to Z
Longer MDR TB regimen	Patients in whom **shorter MDR TB regimen cannot be considered** due to any reason	None

Oseltamivir/Zanamivir

MOA – Block neuraminidase - Block viral release

Oral Oseltamivir – DOC Influenza A/B and Bird flu

Inhalational Zanamivir – DOC in oseltamivir resistance

Drugs Used in SIADH

1. Conivaptan
   - IV Route
   - Used in emergency management of SIADH
2. Tolvaptan, Mozavaptan
   - Oral Route
   - Used in long term management of SIADH
   - S/E – Tolvaptan is Hepatotoxic (Max duration of use – 1 Month)

Emergency Contraceptives: MOA

- Delays ovulation (not anovulation)
- inhibits implantation (second best answer)

- Never act after implantation i.e. they are not abortifacient.
- Ideally used with in 72 hrs of unprotected intercourse but can be used uptill 120 hrs i.e. 5 days.

- most effective emergency contraception: CuT
- most " " " on 5th day: Cu IUCD

- most effective hormonal emergency contraceptive:

Ulipristal > Mifepristone > Levonogestrol

- Ulipristal: 30 mg single dose
- Mifepristone: 10-50 mg single dose
- Levonogestrol: 1.5 mg single or two divided doses 12 hrs apart.

- mc emergency contraceptive used: Levonogestrol

ANTIDIABETIC DRUGS

Drugs Releasing Insulin

GLP-1 Related Drugs

GLP-1 Agonists

- Liraglutide – OD
- Albiglutide – OW
- Dulaglutide – OW
- Semaglutide – OW

Route – Subcutaneous

Note: Semaglutide can also be given by oral route.

S/E –
- Pancreatitis
- Nausea/ vomiting
- Weight loss

Note: Semaglutide > Liraglutide – DOC for obesity

DPP-4 Inhibitors

- Sitagliptin
- Saxagliptin
- Linagliptin
- Vildagliptin

Route – Oral

S/E –
- Pancreatitis
- Angioedema
- Weight Neutral
- Infections

Inhibitors of ATP Sensitive K Channels

Sulfonylureas

- Glyburide (Glibenclamide)
- Gliclazide
- Glimepiride
- Glipizide

S/E –
- Hypoglycemia
- Weight gain

C/I –
- Renal failure
- Hepatic failure

Note: For hypoglycemia to be a side-effect, the drug must be insulin or must act by releasing insulin.

Meglitinides

- Repaglinide
- Nateglinide
- Mitiglinide

S/E –
- Hypoglycemia
- Weight gain

Note: Dose reduction required in renal and hepatic failure

Drugs Decreasing Hepatic Glucose Production

Biguanides (Metformin)

MOA – Stimulates AMPK – Blocks gluconeogenesis

Use-

- DOC – Rx and Prophylaxis of DM-2
- PCOS – Ovulation
- Nonalcoholic fatty liver

S/E –

- Decreased Vitamin B-12 absorption
- Lactic acidosis

C/I – Conditions that can increase risk of lactic acidosis –

- Elderly
- Renal/Liver failure
- Chronic alcoholics
- Severe lung disease

Drugs Decreasing Insulin Resistance

Thiazolidenidiones (Pioglitazone/ Rosiglitazone)

MOA – Stimulates PPAR-γ

S/E –

- Stimulates ENaC – Na and Water retention – Edema, CHF and weight gain
- Bone fracture in females
- Hepatotoxicity
- Macular edema
- Bladder cancer

Note:

Thiazolidenidiones stimulate PPAR-α also and hence, decrease triglycerides

α – Glucosidase Inhibitors

Acarbose/Voglibose/ Miglitol

MOA – Block break down of starch and polysaccharides

Use – Postprandial hyperglycemia – Taken after few bites of food

S/E –

- Flatulence – M.C
- Osmotic diarrhea

SGLT-2 Inhibitors

Canagliflozin/ Dapagliflozin/ Empagliflozin

S/E –

- Common – Vaginal infections (M.C), UTI, Hypotension, Dehydration
- Rare – DKA, Osteoporosis

Canagliflozin – Increases risk of limb amputation

Dapagliflozin – Increases risk of bladder and breast cancer

Miscellaneous Drugs

1. **Pramlintide:**

MOA – Amylin analog - Delays gastric emptying

Use – S/C – Postprandial hyperglycemia

S/E –

- Nausea/Vomiting
- Weight loss

2. Bromocriptine
3. Colesevelam

Note: GLP1 Agonists and SGLT-2 Inhibitors use is associated with a decreased cardiovascular mortality.

Classification of Bisphosphonates (mainly based on potency)

DOC : Osteoporosis
S/E : esophagitis

First generation

- Etidronate (least potent)
- Clodronate
- Tiludronate

Second generation: 10-100 times more potent than the first generation

- Alendronate
- Pamidronate
- Ibadronate

Third generation: 10,000 times more potent than the first generation

- Risedronate
- Zoledronate → most potent, C/I : Renal failure

1. **Bisphosphonates**
   - Oral – Alendronate, risedronate
   - IV – Pamidronate, Zoledronate

Note: Zoledronate is most potent and longest acting

- MOA – Block farnesyl pyrophosphate synthase – Induces osteoclast apoptosis
- Use –
  - ✓ DOC – Osteoporosis (Oral drugs)
  - ✓ DOC – Paget's disease and Hypercalcemia of malignancy (IV drugs)
- S/E –
  - ❑ Esophagitis – Prevented by – Taking drugs with a full glass of water on empty stomach – Not lie down for 30 minutes
  - ❑ Osteonecrosis of jaw
  - ❑ Bone fracture – Femoral chalk stick fracture
- C/I – Renal failure

Drugs used in Gout

1. **Acute Gout**

AIM – To treat active inflammation

- ✓ DOC – Indomethacin
- Steroids
- Colchicine – MOA – Blocks Microtubules – Blocks chemotaxis or leucocyte migration

2. **Chronic Gout**

AIM – To prevent acute gout – By decreasing uric acid

A. **Xanthine Oxidase Inhibitors**

- **Allopurinol**
- ✓ DOC Chronic gout
- ✓ DOC Tumor Lysis Syndrome (Solid Tumors)
- ❑ S/E – Hypersensitivity
- **Oxypurinol** – Used in chronic gout in Allopurinol hypersensitivity
- Febuxostat – Used in chronic gout if allopurinol is ineffective
- Common S/E – Xanthine stones

Rheumatoid arthritis

✓ DOC – Methotrexate (MOA – Increases Adenosine)

+

NSAIDs or Steroids

↓Inadequate

Add

1. HCQ + Sulfasalazine

or

2. Leflunomide

or

3. Biologicals

A. **TNF-α Inhibitors -**
- Infliximab
- Adalimumab
- Golimumab
- Etanercept
- ❑ C/I – CHF, Hep-B

B. **IL-6 Blockers –**
- Tocilizumab
- Sarilumab

C. **IL-1 Blocker –** Anakinra

D. **CD-20 Blocker –** Rituximab

E. **CD 80/86 Blocker** – Abatacept

Note:

- In case of no response to one biological, use another biological or a JAK Inhibitor (Tofacitinib, Baricitinib, Upadacitinib).
- Biologicals and JAK Inhibitors cause immunosuppression and hence, should not be combined.

ANTIFUNGAL DRUGS

1. Amphotericin B
- MOA – Sequesters ergosterol in cell membrane
- Route – IV with 5% D (Carrier)
- Use – DOC
- ✓ Systemic fungal infections
- ✓ Kala Azar
- ✓ Mucormycosis
- ✓ Cryptococcal meningitis
- ✓ Talaromyces
- S/E -
- ❑ Hypokalemia – Prevented by KCl
- ❑ Nephrotoxicity – Prevented by preloading NaCl and combining liposome.

2. Azoles
- MOA – Inhibit ergosterol synthesis in cell membrane – By inhibiting 14-α-Sterol demethylase
- Uses-
- ❑ Fluconazole – DOC – Candida (Only mucocutaneous infection e.g., vaginal and only against albicans species)
- ❑ Itraconazole – DOC – Endemic mycoses, Dermatophytes, Sporotrichosis
- ❑ Voriconazole – DOC Invasive Aspergillosis
- ❑ Posaconazole – Mucormycosis, GVHD
- ❑ Isavuconazole – Mucormycosis, Invasive Aspergillosis

3. **Terbinafine**
- MOA – Inhibits ergosterol synthesis – By inhibiting Squalene Epoxidase
- Use – Dermatophytes

4. **Echinocandins (Caspofungin, Micafungin, Anidulafungin) –**
- Block β-Glucan-Synthase
- Use – Aspergillus, Candida

5. **Griseofulvin** – Blocks microtubules
- Route – Oral – With fatty food
- ✓ DOC – Tenia Capitis

6. **Flucytosine** –
- Prodrug of 5FU –Blocks DNA synthesis
- Use – Cryptococcal Meningitis

ANTIEMETICS

1. 5HT-3 Blockers
   - Ondansetron – DOC Chemo-induced nausea, vomiting
2. NK1 Antagonists – Aprepitant
3. Cannabinoid Receptor Agonists – Dronabinol, Nabilone – S/E- Hypotension
4. D2 Blockers
5. Dexamethasone

Note: 2, 3, 4 and 5 can be used as add on to ondansetron.

3. Anti-Hepatitis Drugs

A. Hepatitis B

- Specific drugs (Used only in Hepatitis B) - Entecavir, Adefovir dipivoxil
- Non-Specific Drugs (Anti-HIV drugs used in Hepatitis B) - Tenofovir, Clevudine, Telbivudine, Lamivudine/ Emtricitabine – Both should not be used together

B. Hepatitis-C

- Interferon-α
  - ✓ DOC – Hepatitis B with D
  - ❑ Not preferred for hepatitis C due to S/E – Bone marrow suppression
- Ribavirin
  - ❑ MOA – Blocks RNA Polymerase
  - ❑ Use –

Oral – Hepatitis C

IV – Severe Influenza

Q. oral Xa inhibitor → Andexanet alpha

Q. DOC for Acute mountain Sickness : Acetazolamide.