



OneShot 4.0

# Pharmacology

DBMCI · 2026



# PHARMACOLOGY

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“

There is no secret to success. It is the result of preparation, hard work, and learning from failure.

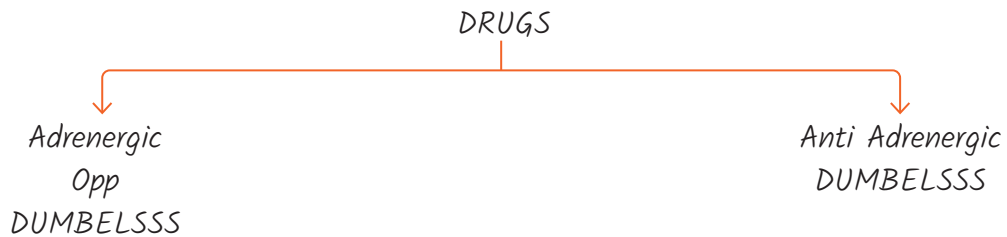
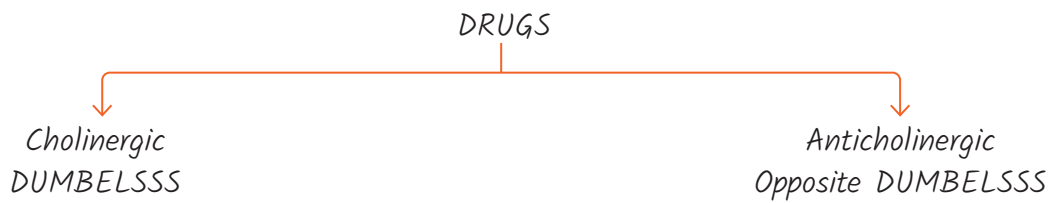
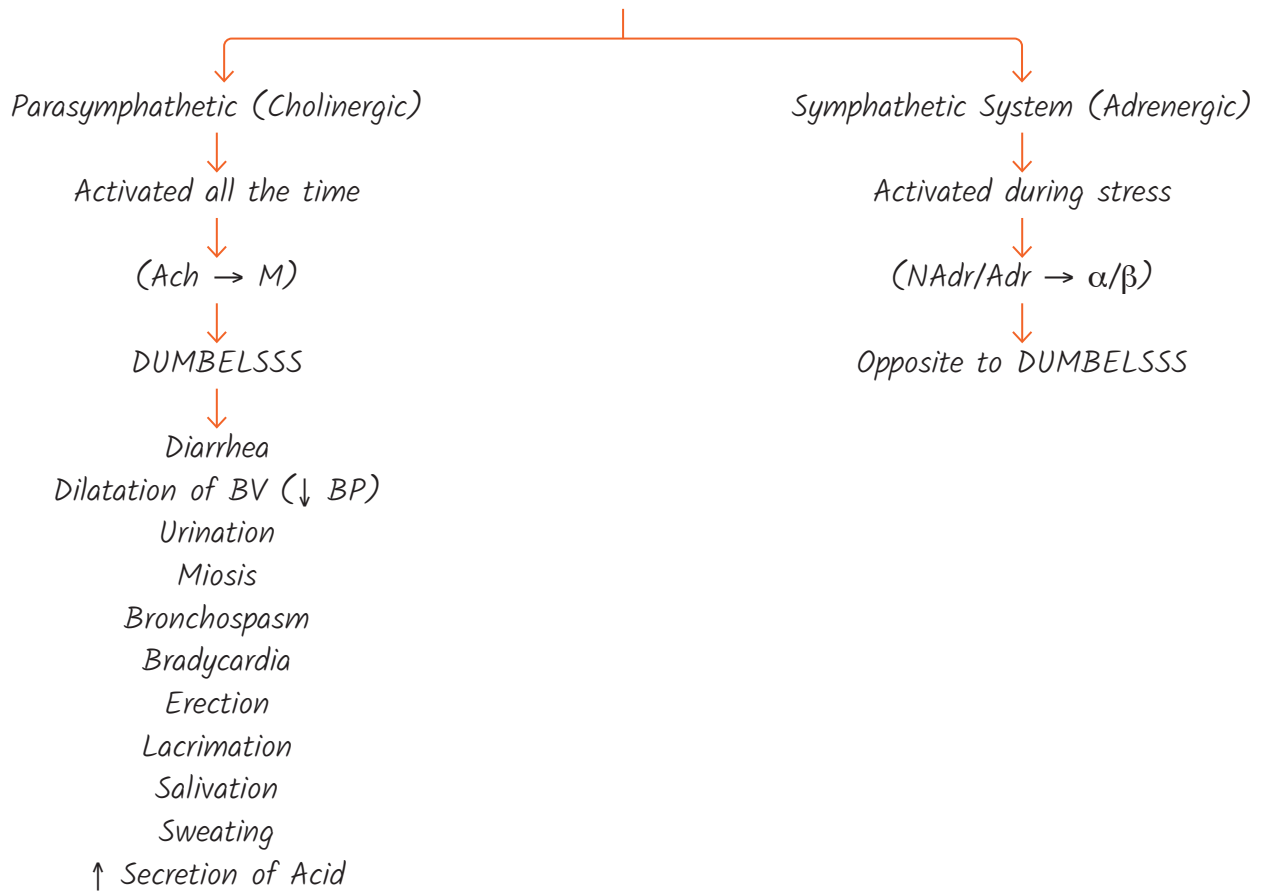
- Dr. Saurabh Bhatia

”

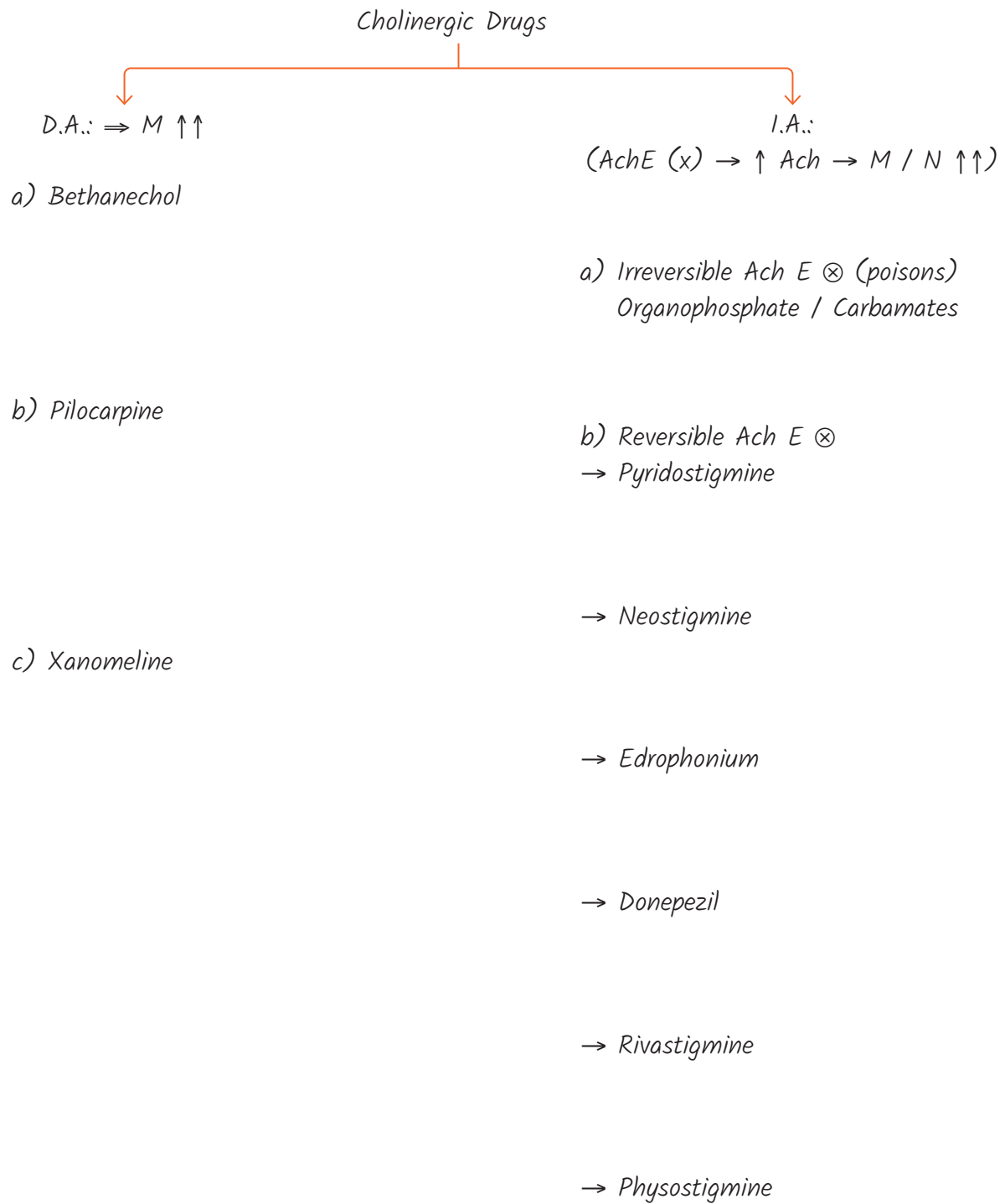




# AUTONOMIC NERVOUS SYSTEM (ANS)

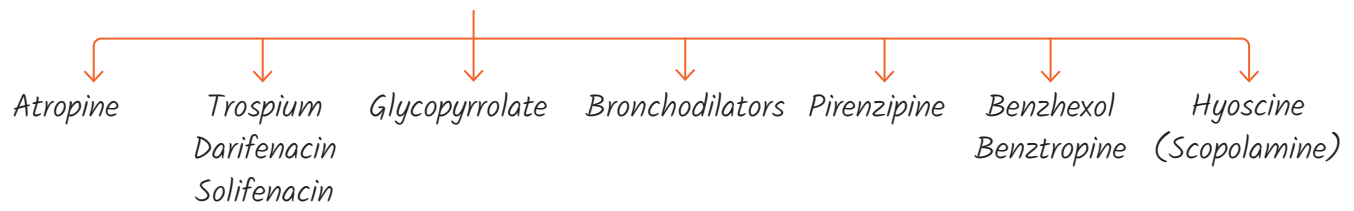


CHOLINERGIC DRUGS

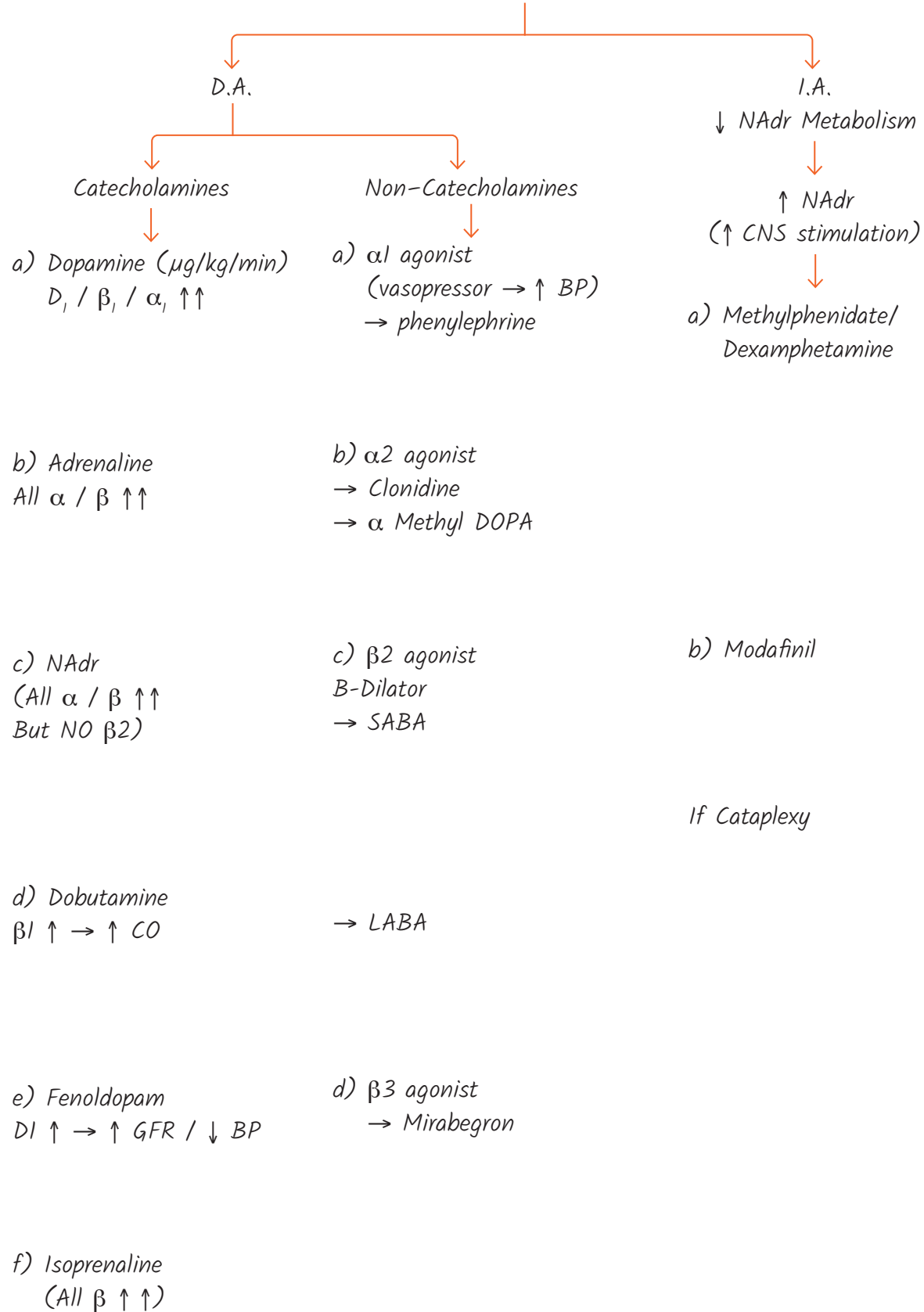


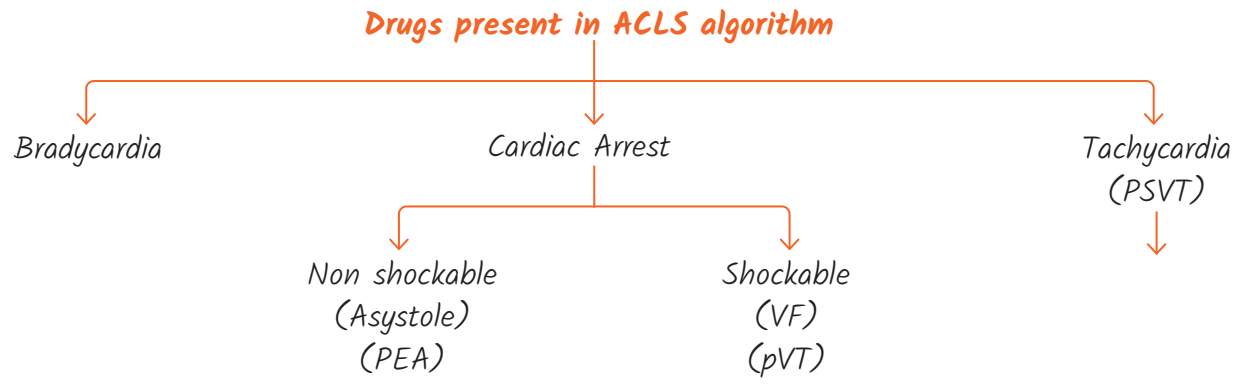


*Anticholinergic Drugs (opposite to DUMBELSSS)*



**Adrenergic Drugs**  
(Opposite: DUMBELSSS)





## **DOC — Medical Emergencies**

1) *Cardiogenic shock* → *DOC*

*With Oliguria :*

*With Low BP (SBP < 80-90) / MBP < 60 :*

*With Maintained BP (SBP > 80-90) / MBP > 60 :*

2) *Septic Shock*

*Neurogenic (Spinal) Shock*

*Hypovolaemic Shock*

*Hypotensive Shock (<90/60)*

3) *Anaphylactic shock :*

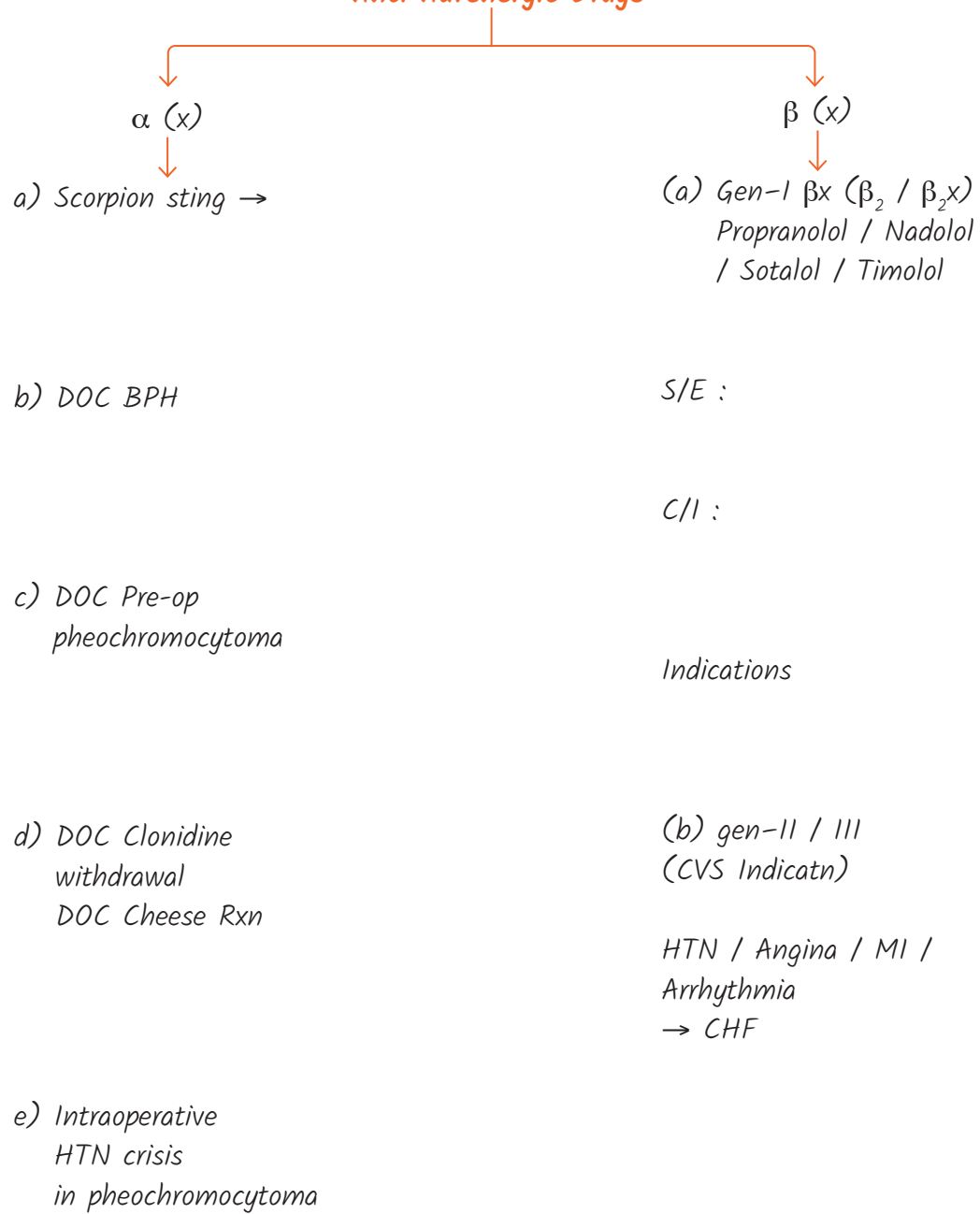
4) *Heart Block :*

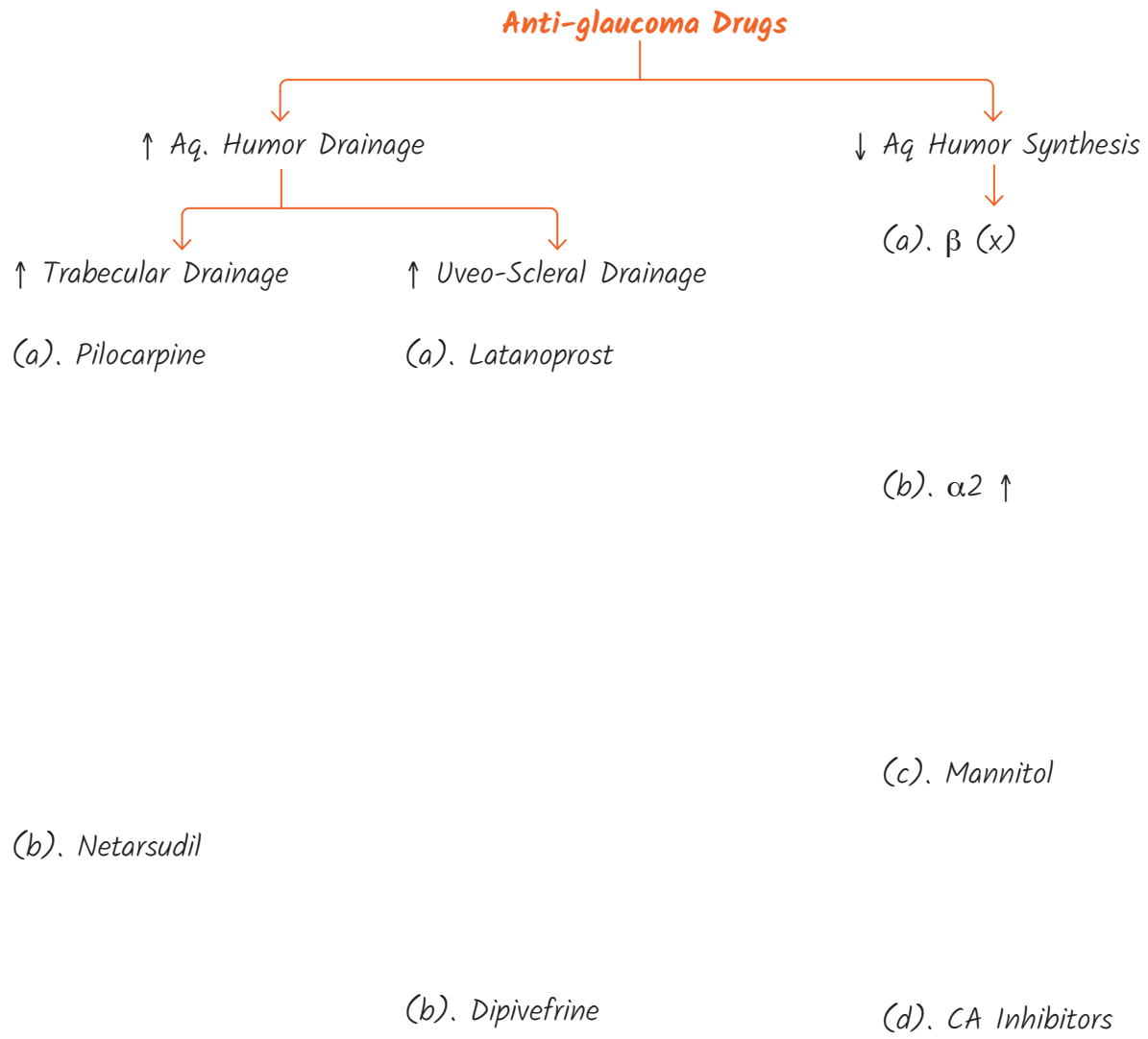
5) *Acute hypotension (<90/60) : DOC*

*IF ↑HR / Arrhythmia →*



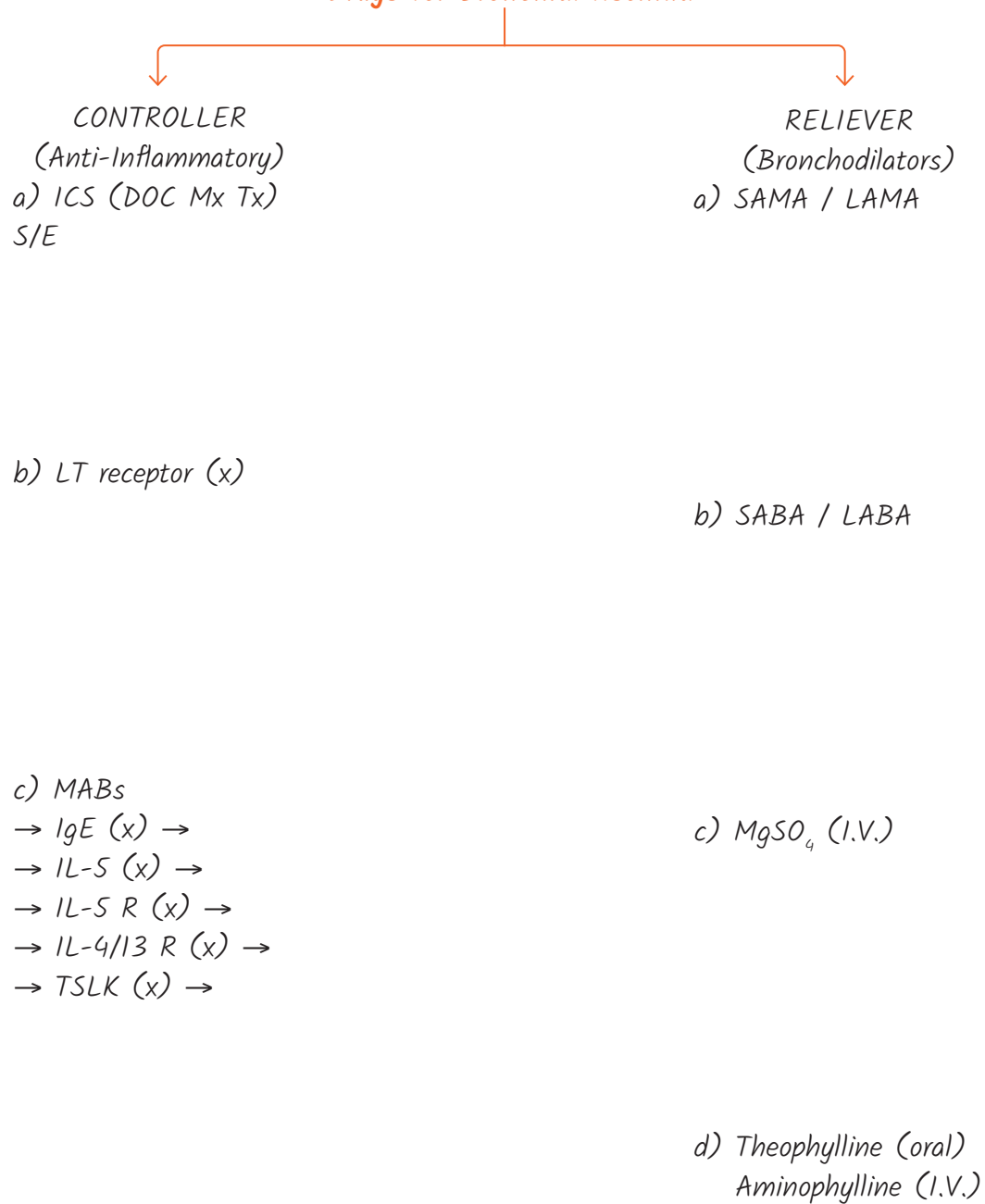
### Anti Adrenergic Drugs







### Drugs for Bronchial Asthma







## DIURETICS

<i>Tubule</i>	<i>DRUGS</i>	<i>T/t Edema</i>	<i>Other Indications</i>	<i>S/E</i>	<i>C/I</i>
<i>1. PCT</i>	<i>CA (X) (Acetazolamide)</i>				
<i>2. PCT</i>	<i>2. SGLT-2 (x) (-gli flozin)</i>				
<i>3. PCT &amp; Descending LH</i>	<i>3. Mannitol (I.V)</i>				



Pharmacology

<i>Tubule</i>	<i>DRUGS</i>	<i>T/t Edema</i>	<i>Other Indications</i>	<i>S/E</i>	<i>C/I</i>
<i>4. Ascending LH</i>	<i>Furosemide Torsemide</i>				
<i>5. Early DCT</i>	<i>Thiazide chorthalidone Indapamide HCTZ</i>				



<i>Tubule</i>	<i>DRUGS</i>	<i>T/t Edema</i>	<i>Other Indications</i>	<i>S/E</i>	<i>C/I</i>
6. Late DCT & Cortical CD (K <sup>+</sup> sparing Diuretics)	ARA i. Spironolactone				
	ii. Eplerenone				
	iii. Finvenone				
7. CD DCT (Madullary + Cortical)	ADH Drugs i. Terlipressin				
	ii. Desmopressin				
	iii. Tolvaptan				



*Drugs for DKD (Reduce albuminuria/proteinuria)*

(1).

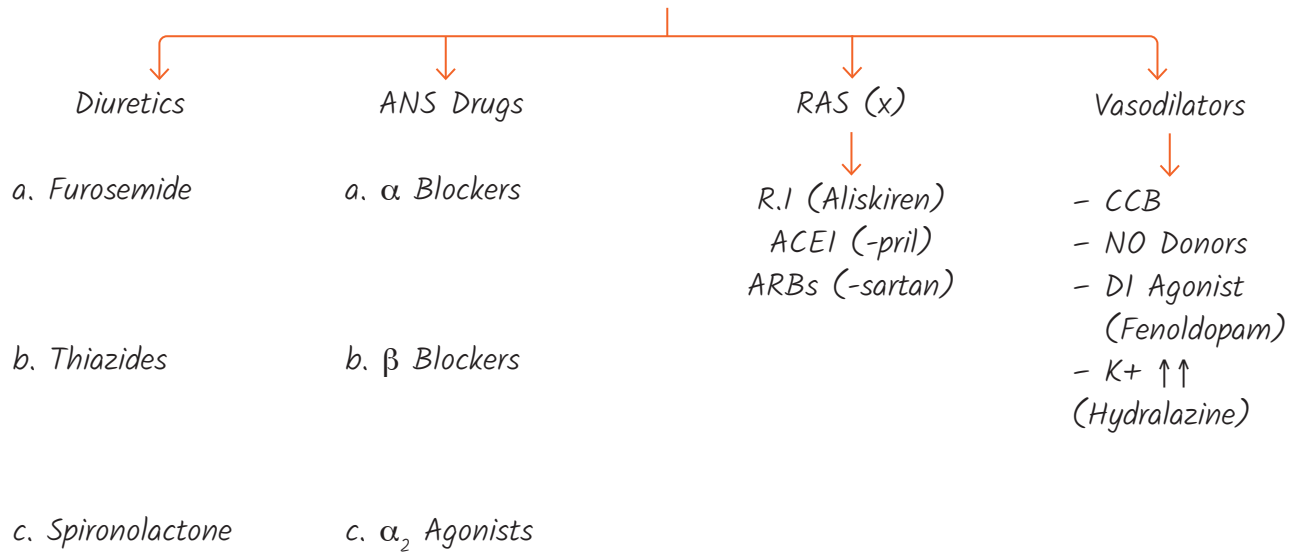
(2).

(3).

(4).



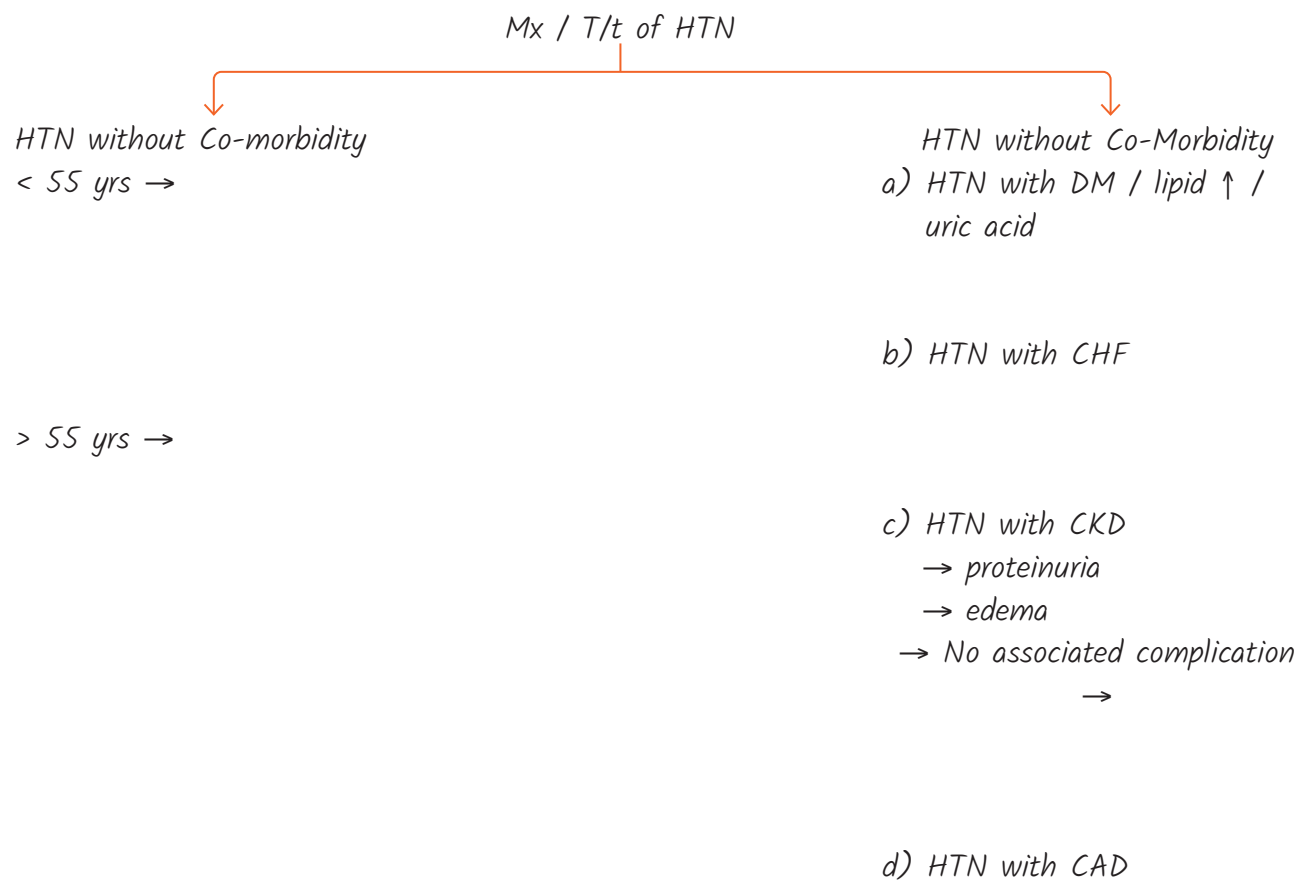
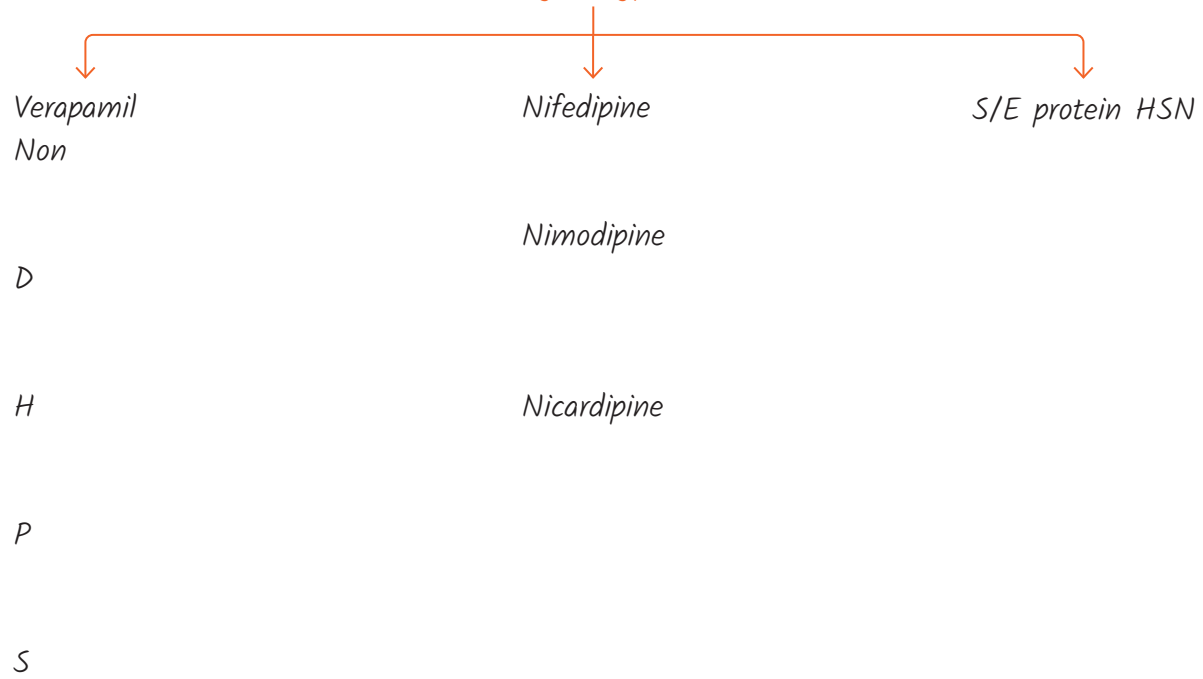
## ANTI HTN DRUGS

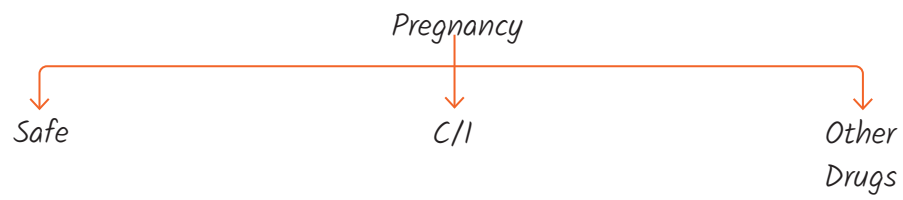
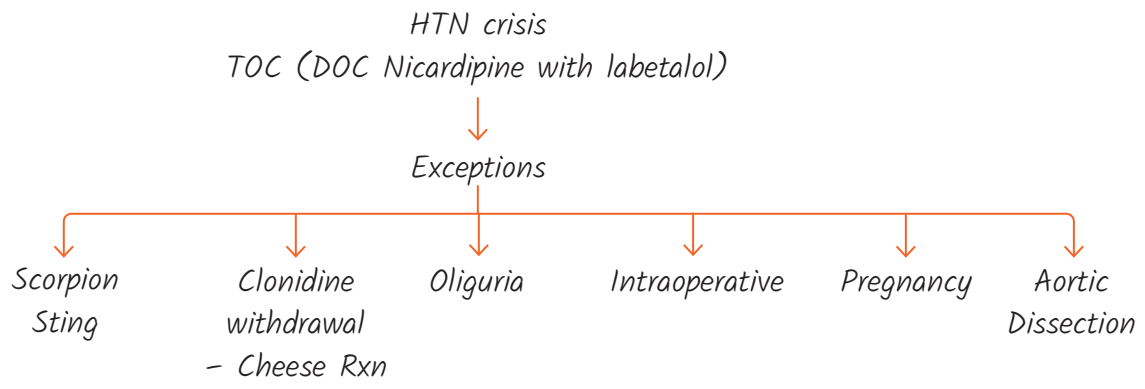


### ACEI / ARBs :

- All are prodrugs except:
- ACEI / ARBs safe in CKD (↓ ↓ dose)
- ARB with Antiplatelet & uricosuric property;
- ARB approved for Migraine;
- ARB with ↑ glucose uptake;
- S/E & C/I: CAPTOPRIL S

**CCB (Block mainly T-type Ca<sup>2+</sup> channels)**



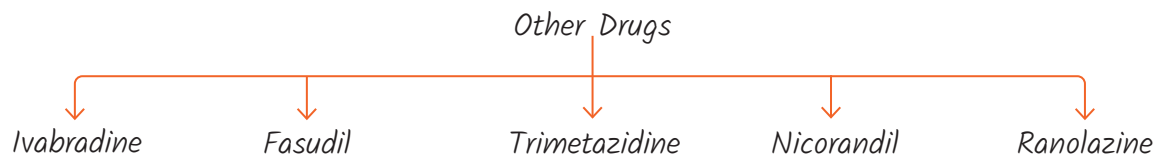
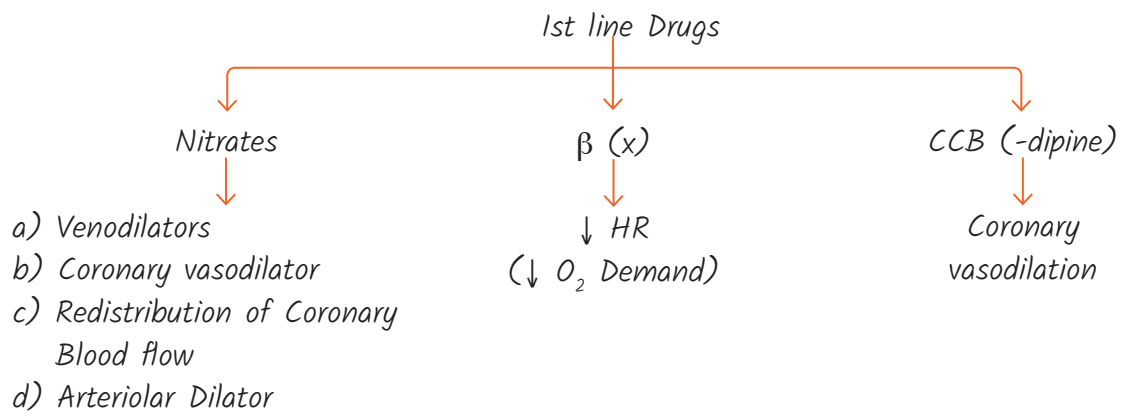




NOTES



# ANGINA



**T/x CHF**

A) Acute CHF with Pulm. edema

I) ↓ pre-load (venodilators)

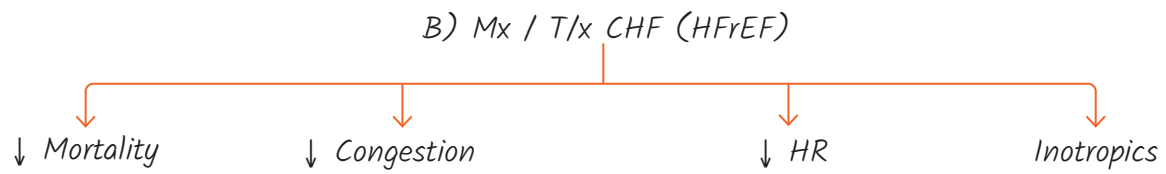
DOC :

II) If EF ↓ (EF < 35-40%), Add Inotropics

DA / Dobutamine / NAdr / Digoxin

III) If BP ↑ ↑, Add: Vasodilators

Nitroprusside / Hydralazine





DIGOXIN

D

I

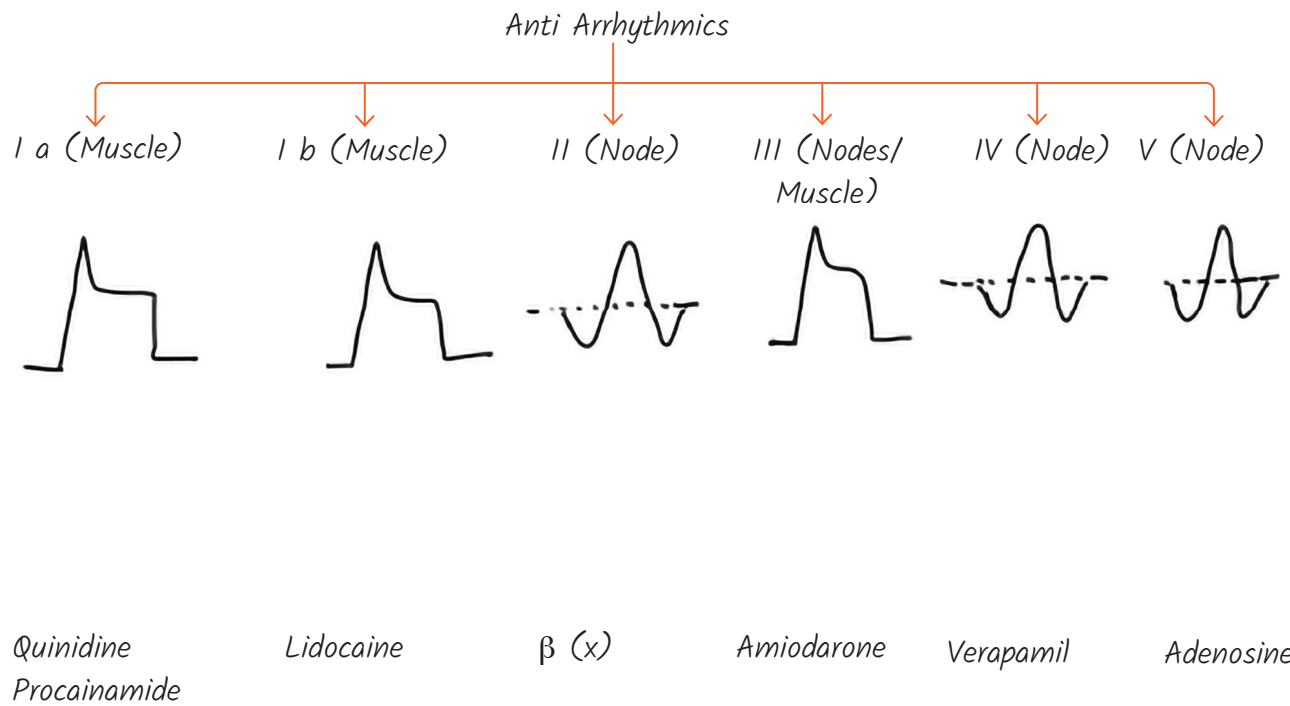
G

O

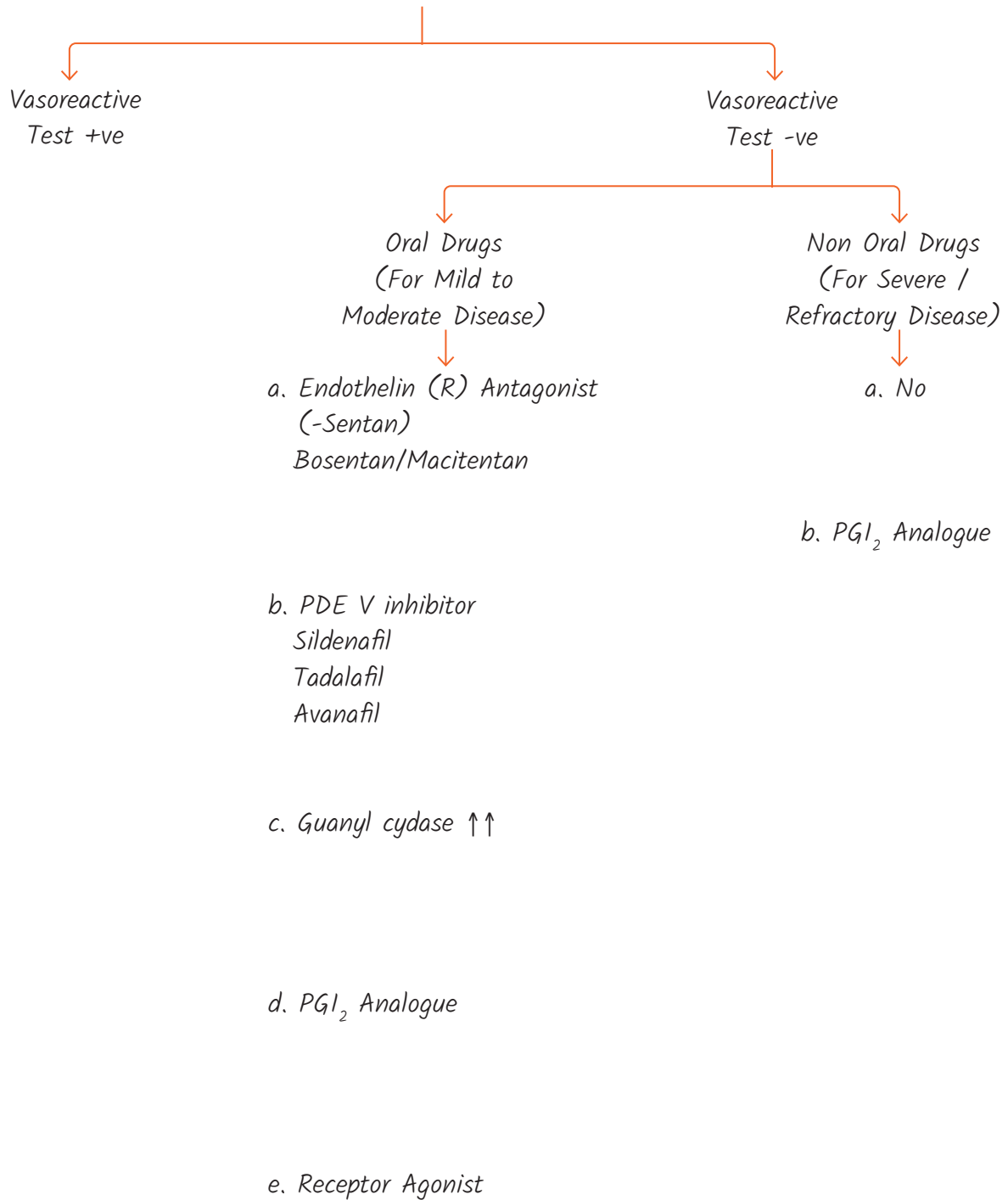
X

I

N



### T/t Pulmonary Artery Hypertension

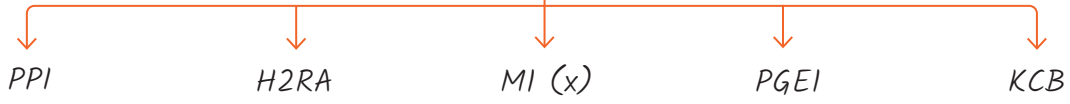




# GIT

## Drugs for PUD

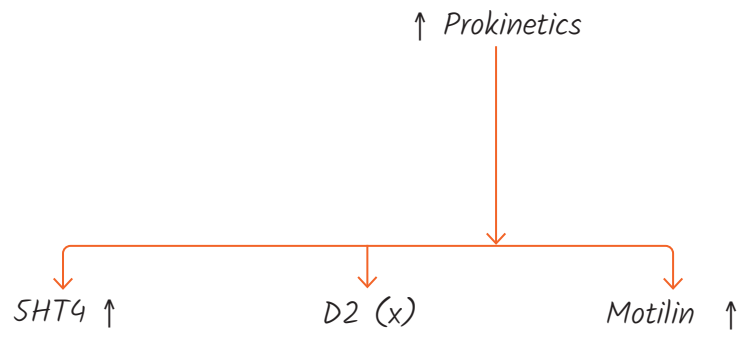
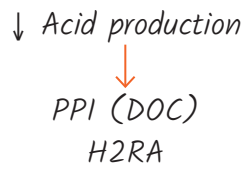
### 1. ↓ Acid production



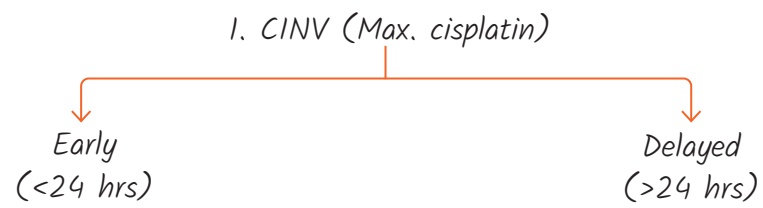
### 2. Other Drugs



GERD



## ANTIEMETICS



### **Other Antiemetics**

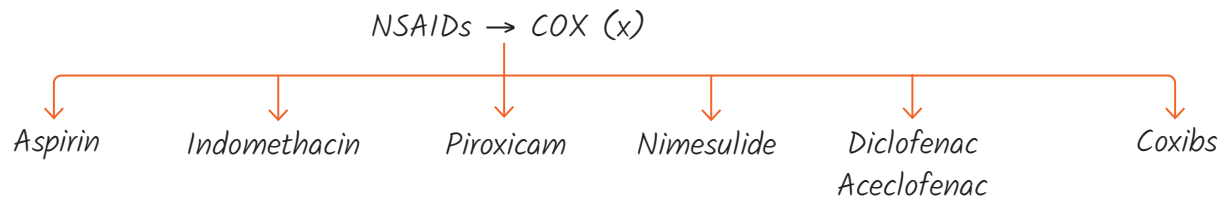
- a) Doxylamine + Vit B6
- b) Hyoscine > Promethazine
- c) Metoclopramide / Domperidone (D2 x )



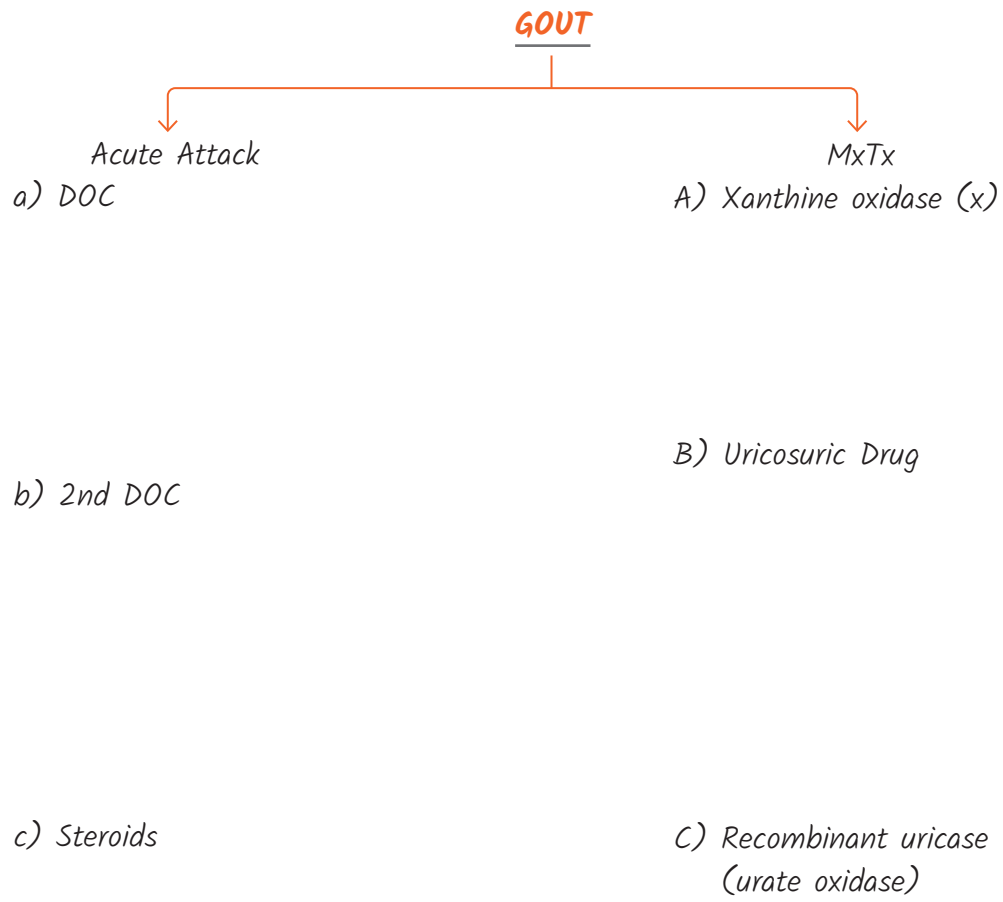
NOTES



## AUTACOIDS



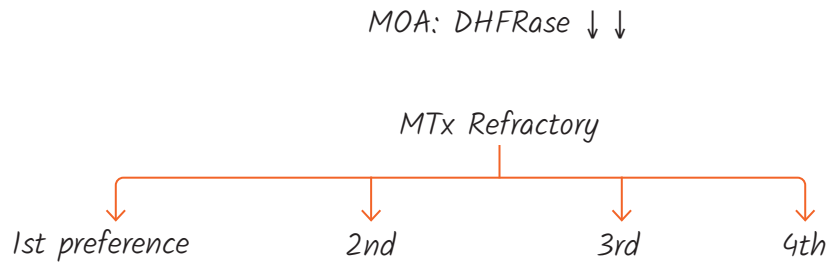
- *PCM toxicity*
- *Closure of DA*
- *To maintain patency of DA*





R.A (DMARDS)

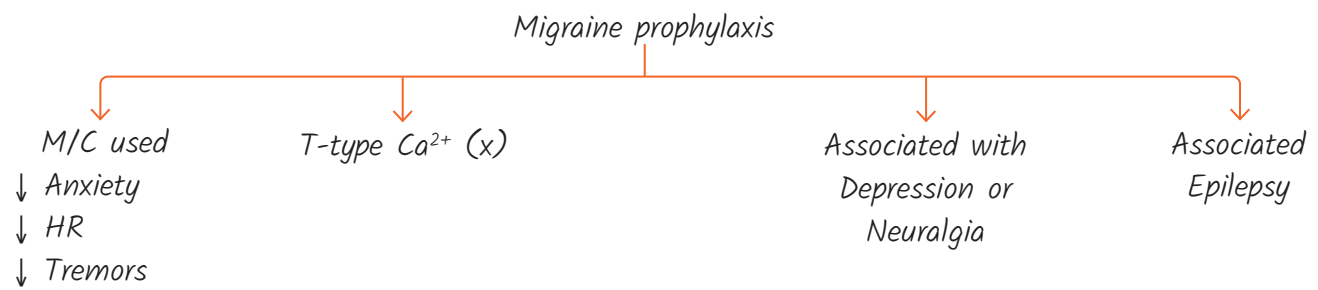
DOC MTx



## T/t Migraine

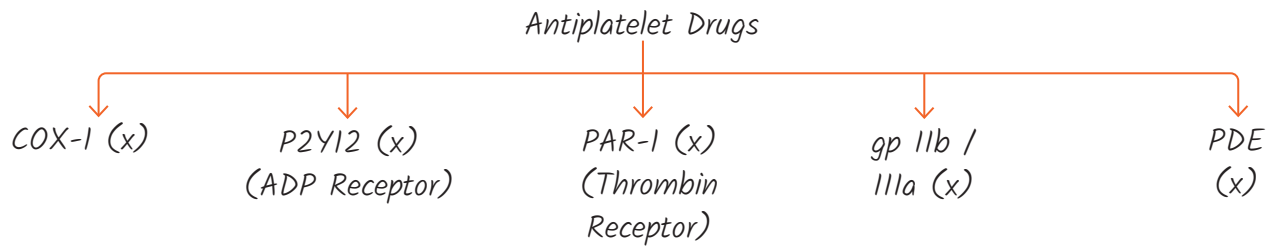
### Acute Attack

- a. PCM
- b. NSAIDS
- c. Triptans
- d. Ergotamine
- e. Lasmiditan
- f. CGRP Inhibitors

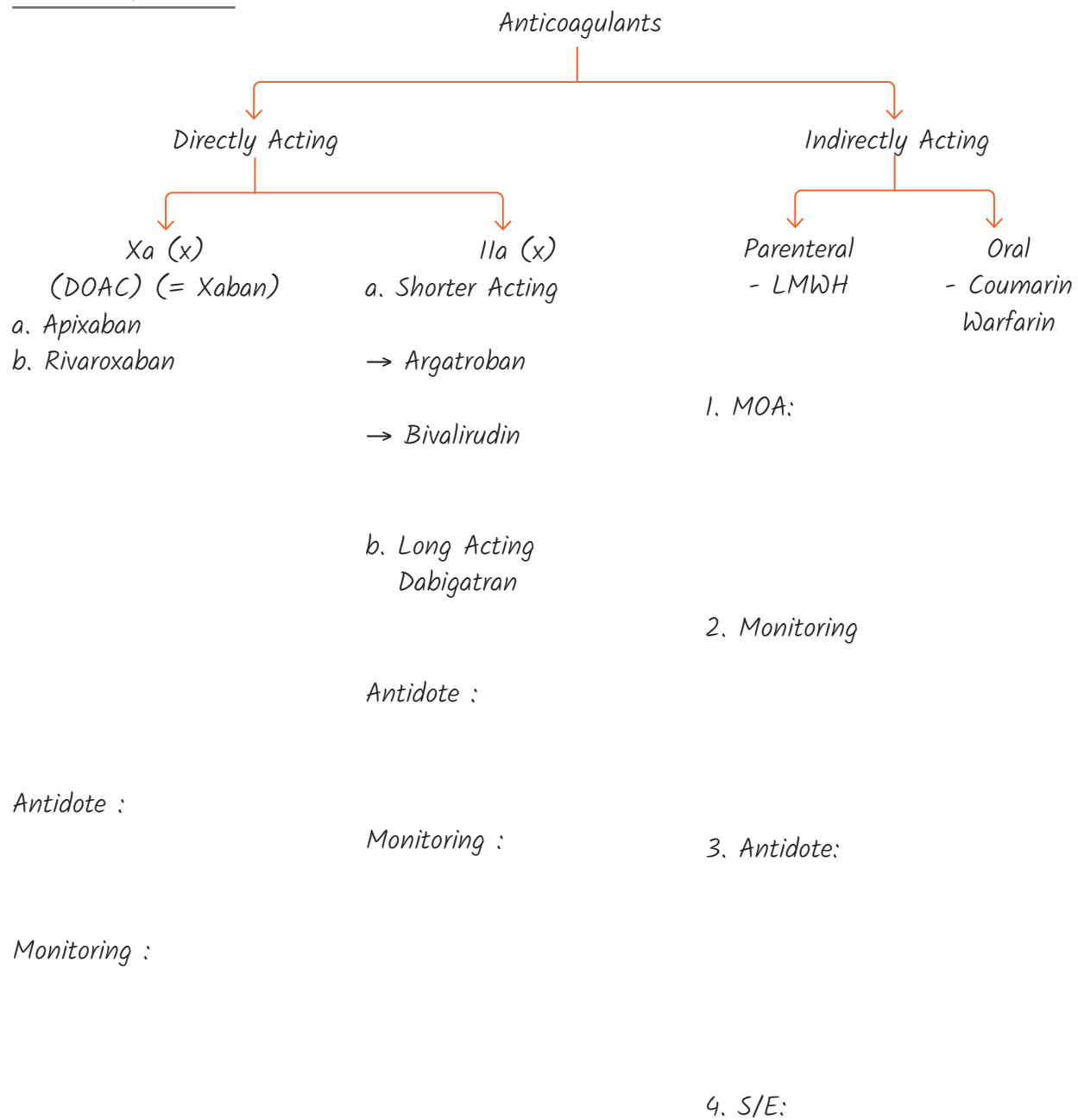




# HEMATOLOGY



ANTICOAGULANTS





**VTE**

*Acute Em / Hospitalised pt*

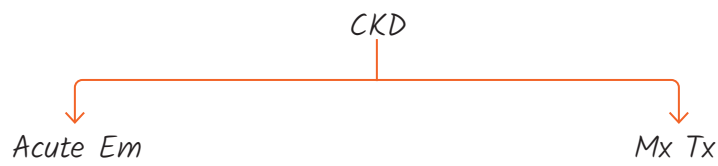


*Mx Tx / Stable pt:*

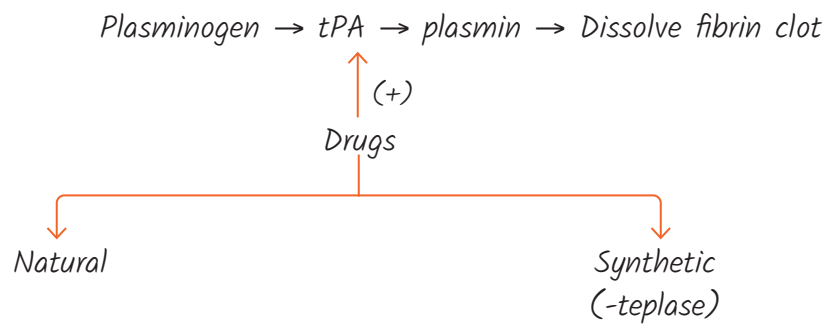
*Major Sx / PE / DVT / AF:*

*Prosthetic valve / APS / AF with MS:*

*Pregnancy:*



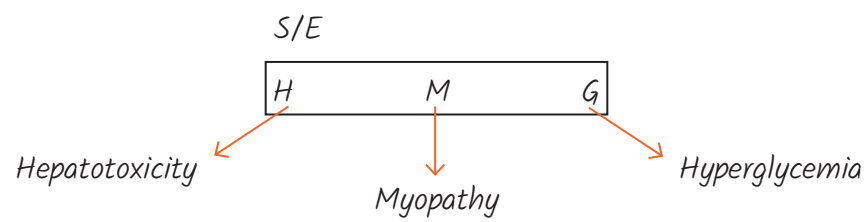
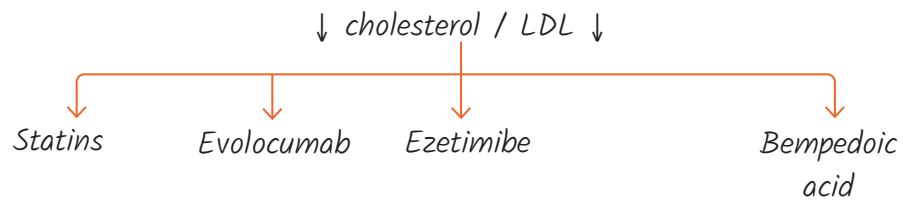
### Fibrinolytic Drugs



Antidote:



## Hypolipidemic Drugs



**Miscellaneous :**

a) Iron overload →  
Symptomatic :

Asymptomatic :

b) BM suppression



c) Sickle cell Anemia  
(Disease Modifying Drugs)

D) ITP

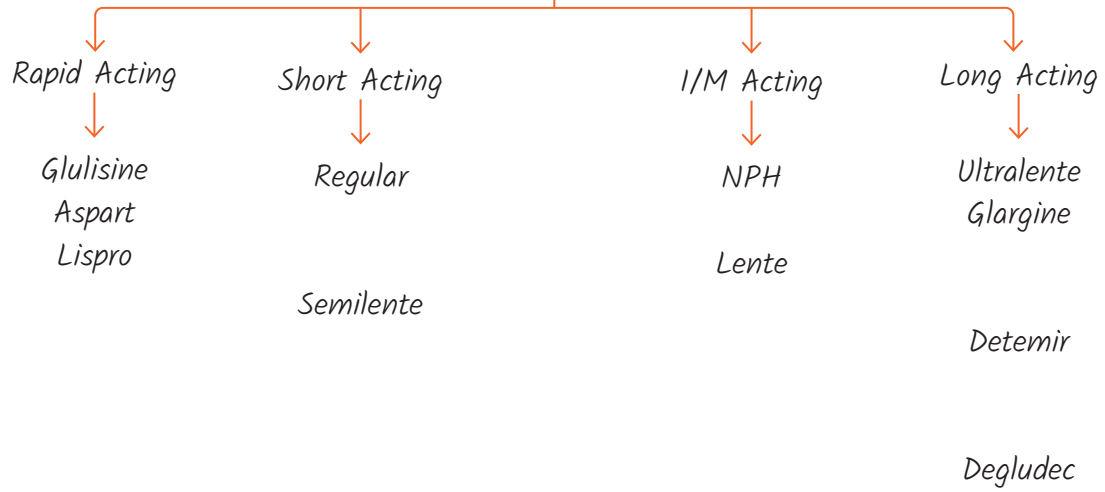
1. DOC steroids / I.v.Ig
2. Platelet stimulator
3. SpleenTyrosine kinase (x)
4. Spleen bruton kinase (x)



# ENDOCRINE

## Anti DM

### I. Insulin



MC site for S.C. Inj

## 2. Insulin Secretagogues

I)  $K^+$  (x) → Sulfonylureas  
Meglitinides } S/E

II) GLP-1 analogue (-glutide)  
DPP-4 (x) (-gliptin)

	GLP-1 analogue	DPP-4(x)
a) Route ⇒		
b) Fed state ⇒ fasting state ⇒ GLP-1 & GIP level ⇒		
c) obesity		
d) ↓ Macro & ↓ Micro angiopathy		
e) Safety in CKD		
f) S/E		
Tirzepatide		



3. ↓ *Insulin Resistance*  
(↑ *glucose uptake*)

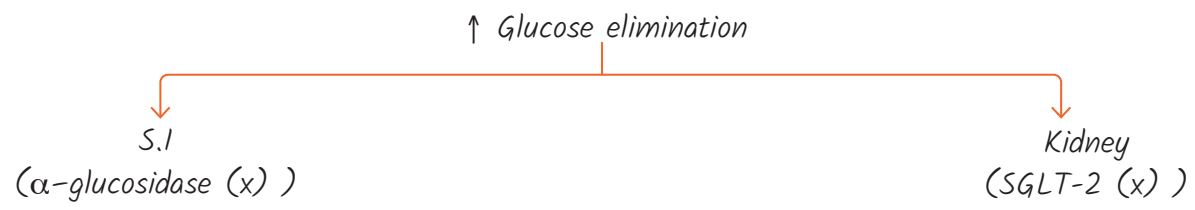
a) *Pioglitazone*

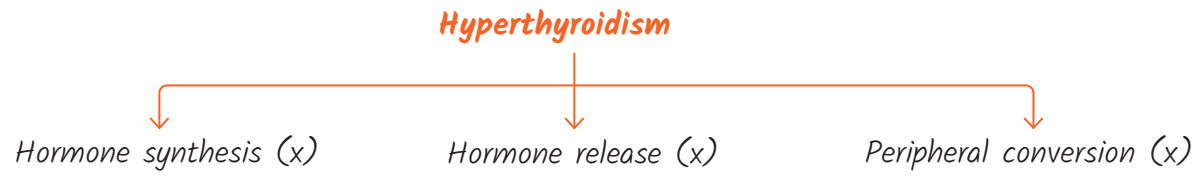
b) *Metformin*

- *Skeletal muscle*
- *Liver*
- *S.I*

*S/E : BLAND*

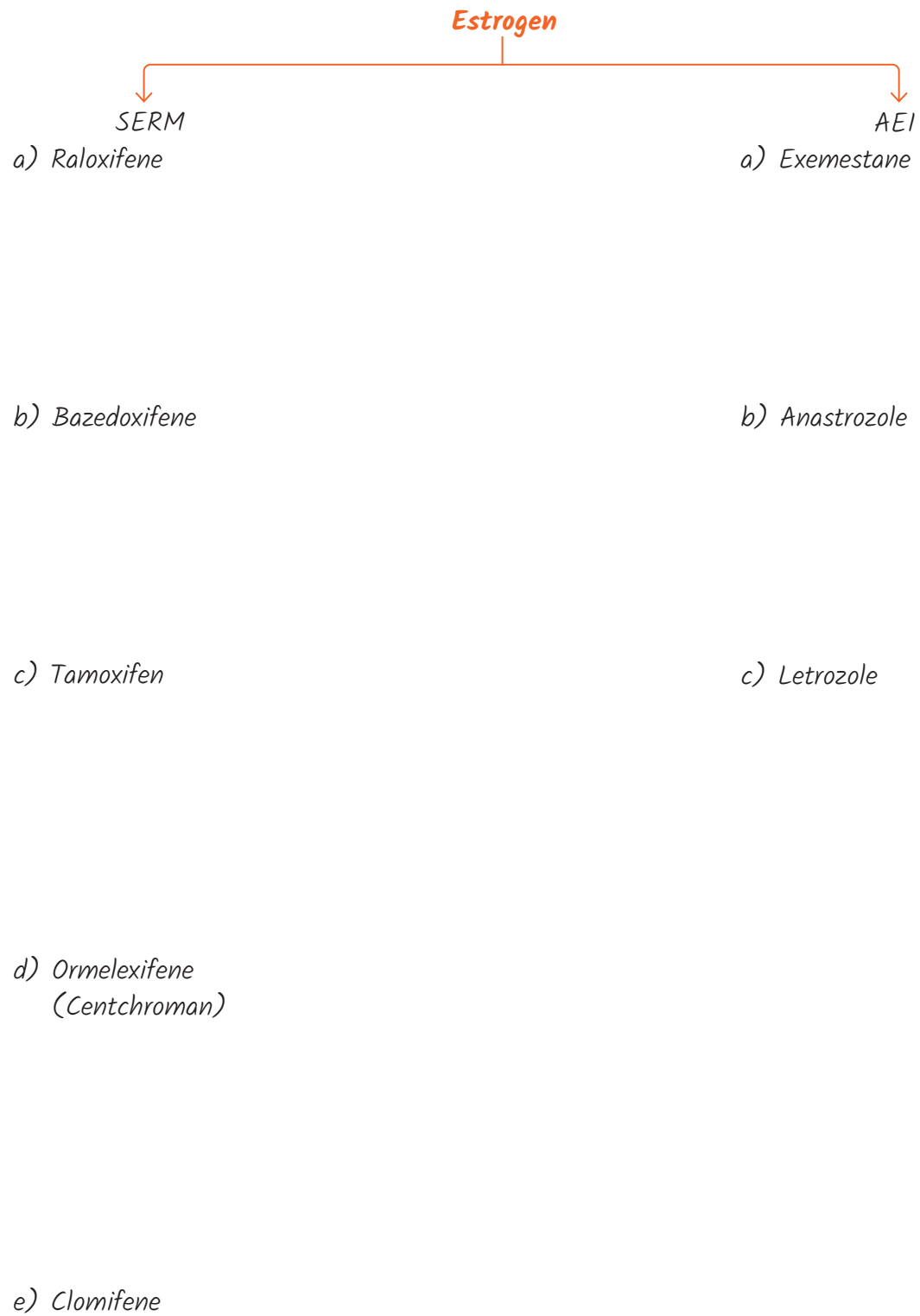
4. ↑ *Glucose elimination*

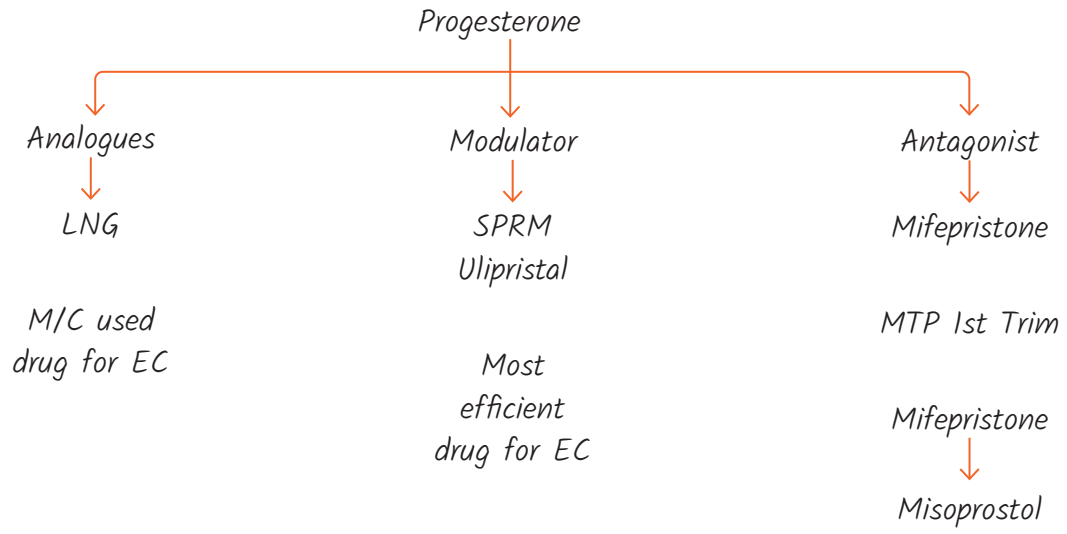




*TIt of thyrotoxicosis*









*GH (Acromegaly)  
(Monitor with IGF-1 level)*

→ ↑ *prolactin*

→ *Cushing's Disease*

→ *Addison's Disease*



## NOTES



## GENERAL PHARMACOLOGY

Drug - Absorption  
(Bioavailability  $\Rightarrow$  AUC)

### **Factors**

(i)  $\uparrow$  lipid solubility

(ii)  $\downarrow$  size of molecule

(iii)  $\uparrow$  surface area

(iv)  $\uparrow$  vascularity

(v) After food

(vi) GIT mobility  $\uparrow$

(vii)  $\uparrow$  FPM

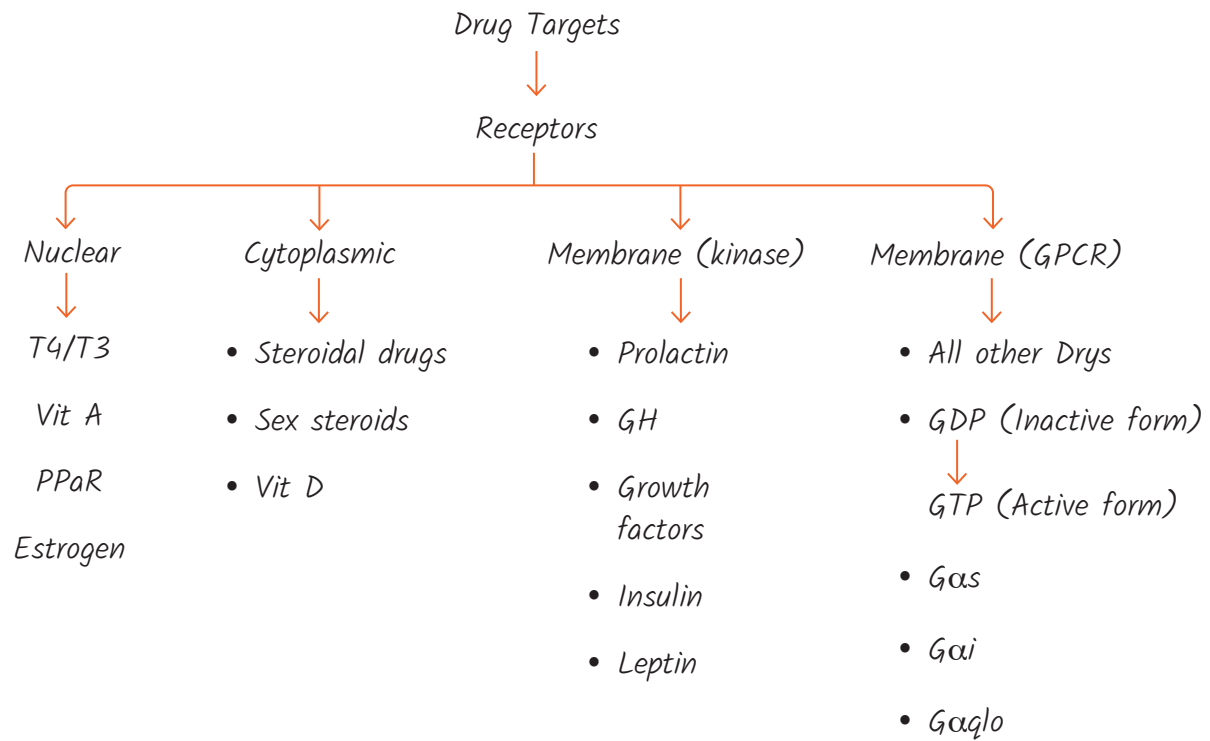
(viii) pH of media

### Drug Distribution

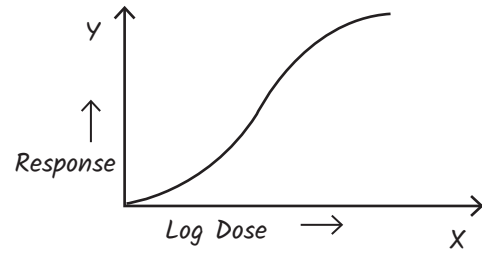
$V_d =$

Dose =





**Drug Action Log DRC**



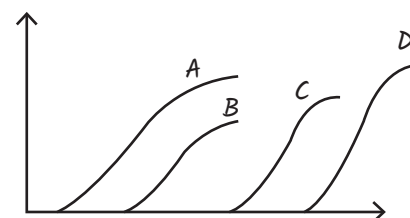
1. Dose is plotted in log scale

2. Middle part is the straight line

3. Therapeutic Index

4. Therapeutic Range

5. Potency





6. *Efficacy*

8. *Slope*

a) *Steep slope*

b) *Flat slope*

9. *Competitive blocker*

10. *Non Competitive blocker*

11. *Analogue*

## *Drug Metabolism (Liver)*

→ *Liver's enzyme Inducer / Inhibitors*



## *Drug elimination*

1. *Net elimination = filtration + secretion - reabsorption*

2. *CL =*

3. *t<sub>1/2</sub> =*

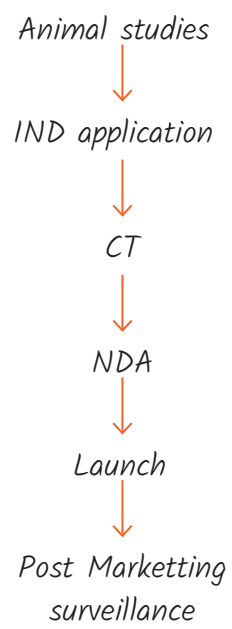
4. *Steady state level =*

$$ROE = ROA$$

5. Loading Dose =

6. Mx Dose =  
(per hour)

### Drug Discovery





*Drug & cosmetic Act, 1940*

*Schedule A-Y*

*Schedule H*

*Schedule X*

*Schedule C*

*Schedule P*

*Schedule G*

*Schedule Z*

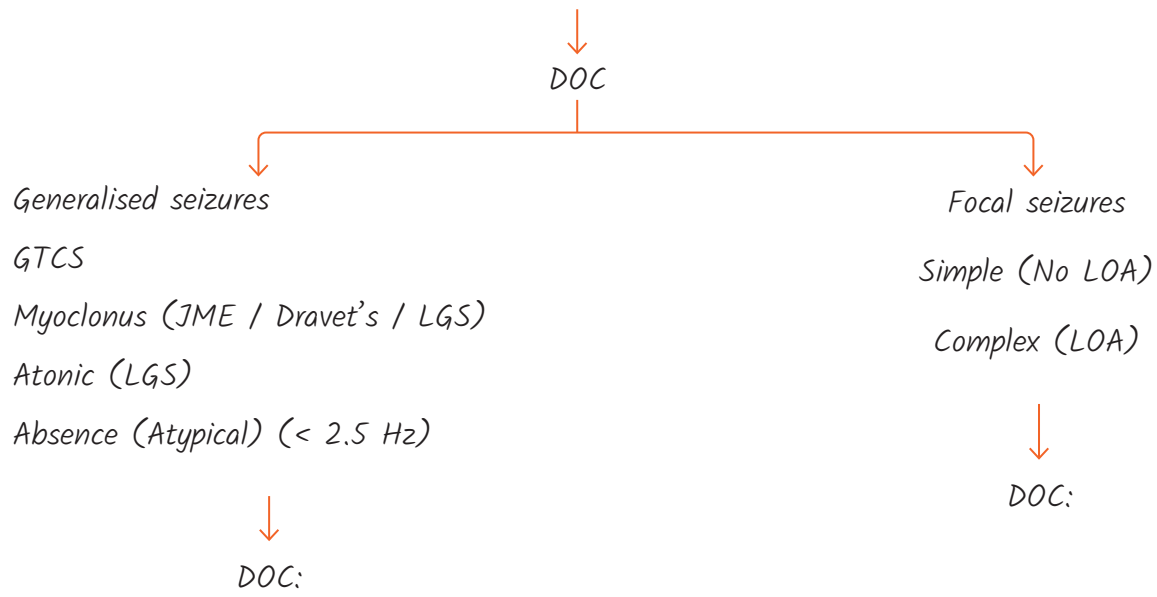
*Schedule W*



NOTES



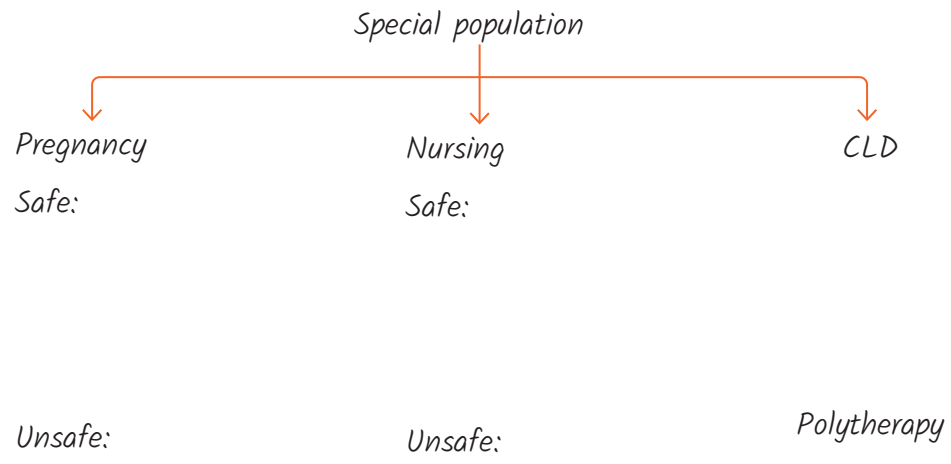
## ANTIEPILEPTIC DRUGS



Typical Absence seizure

### *Status epilepticus*

- (I) For stabilisation
- (II) For Mx
- (III) Refractory case



**S/E OF ANTIEPILEPTIC DRUGS**

<b>Valproate</b>	<b>CBZ</b>	<b>Phenytoin</b>	<b>Topiramate</b>	<b>Lamotrigine</b>
a) Weight gain	a) Cerebellar ataxia	a) Gum hypertrophy	a) wt. loss	a) Meningitis (aseptic)
b) PCOD	b) Agranulocytosis	b) Vit ↓↓ DK-9	b) Renal Stone	b) ↓ Cardiac Conduction
c) Hepatotoxicity	c) SIADH	c) Hirsutism	c) ↑ Cl- Met. Acidosis	c) HSN Rxn
d) ↓ platelets	d) HSN Rxn	d) Hyperglycemia (Not useful for Absence seizure)	d) Anticholinergic S/E	d) Myoclonus
e) Pancreatitis	e) Myoclonus		e) Speech & language problem	e) DIC
f) Tremors				



NOTES



## SLEEP DISORDERS

### **Insomnia**

a) DOC:

b) Orexin (R) (x)

c) BZD

d) MT Receptor ↑↑

### **BZD :-**

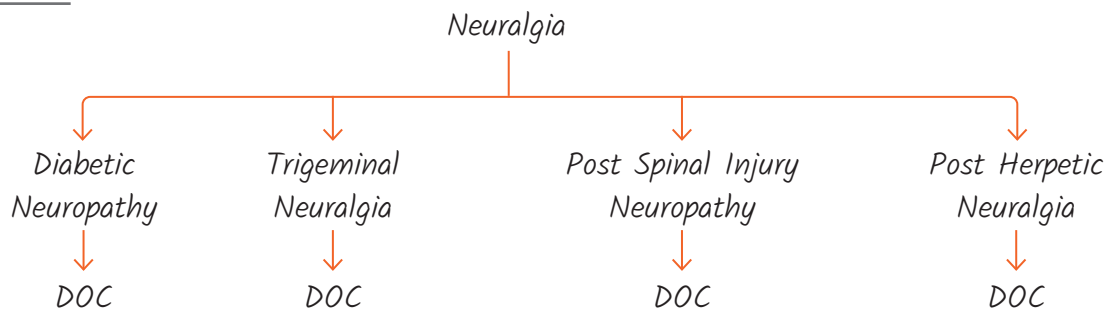
a) Short Acting (Preferred in Day Care Sx):

b) Safe to use in CLD:

c) DOC Alcohol withdrawal syndrome:

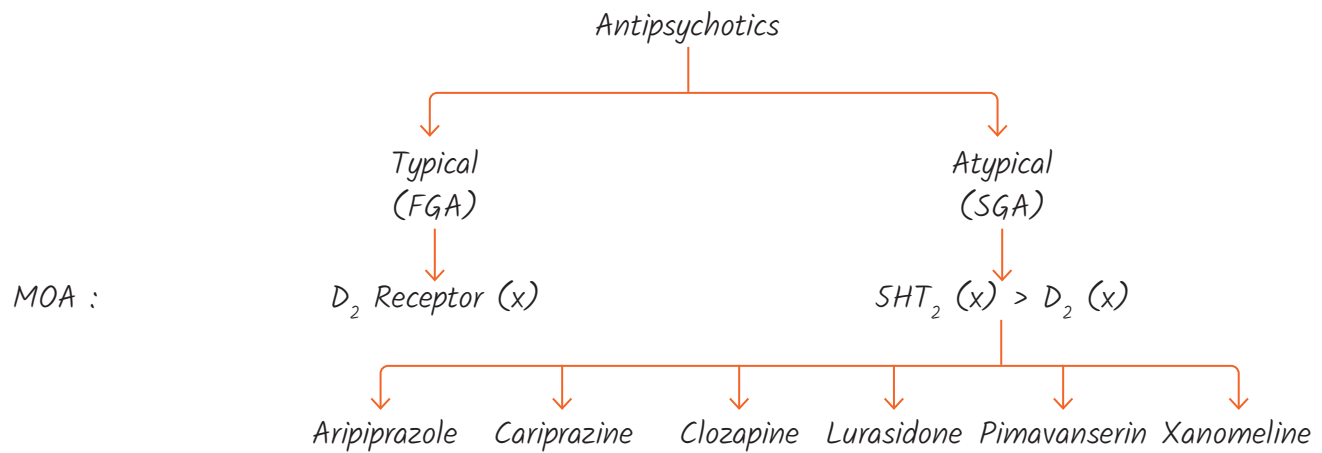
d) Muscle Relaxant:

**NEURALGIA**





## ANTI-PSYCHOTICS



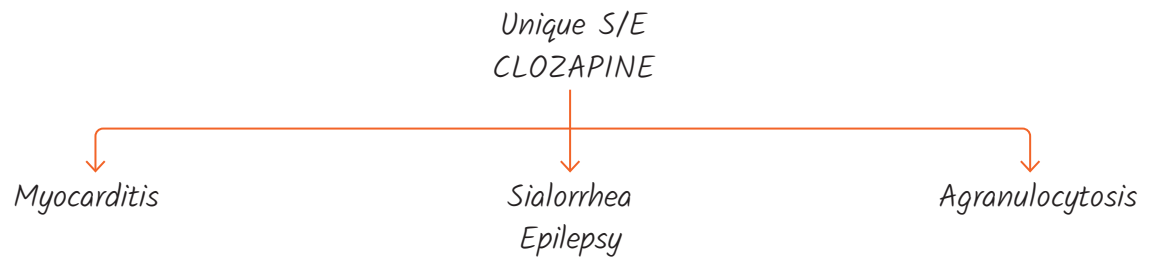
### INDICATIONS :

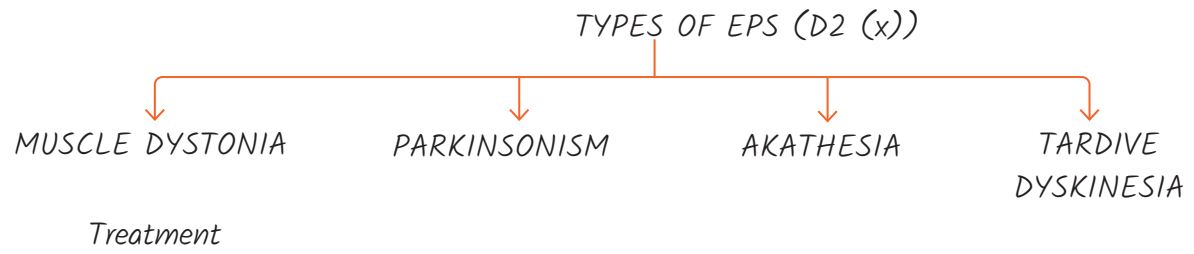
#### **ROA**

- a) I.M. Depot
- b) S.L: tablets & skin patch
- c) To be taken after food
- D) Elimination : Dose ↓ ↓ CLD except:

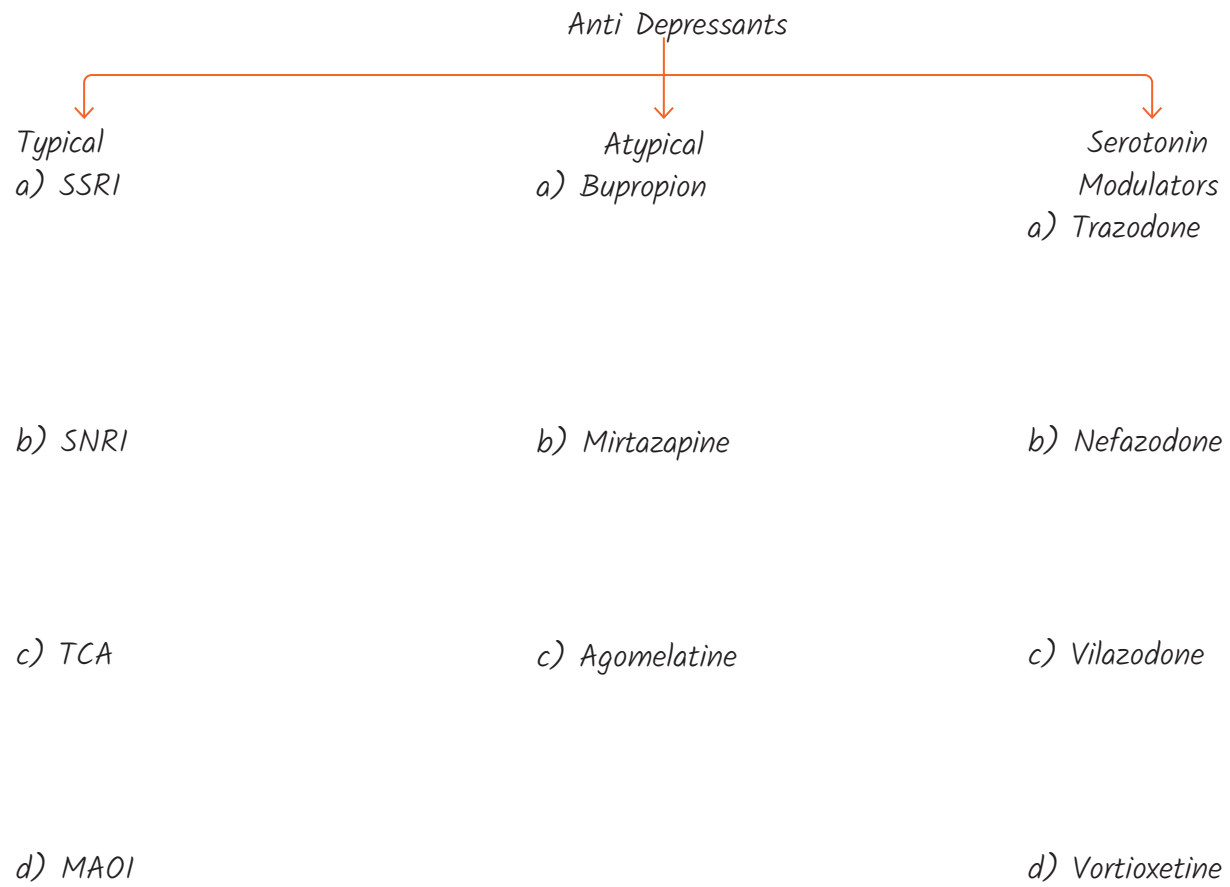
**Common S/E**

		Max.	ATYPICAL	Min.
1. $D_2$ (x)	EPS ↑ Prolactin			
2. $H_1$ (x)	Sedation Drowsiness			
3. $H_1$ (x) $5HT_2C$ (x)	Metabolic S/E			
4. $\alpha_1$ (x)	↓ BP			
5. M (x)	Anti-cholinergic			
6. QT ↑	TDP			
7. Seizures				





*Rare, Neuroleptic Malignant Syndrome (Genetic Association)*





NOTES



## ANTI-DEPRESSANTS

TYPICAL

SSRI

SNRI

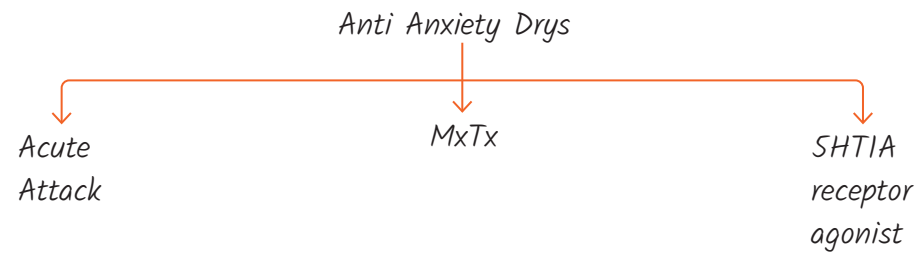
TCA

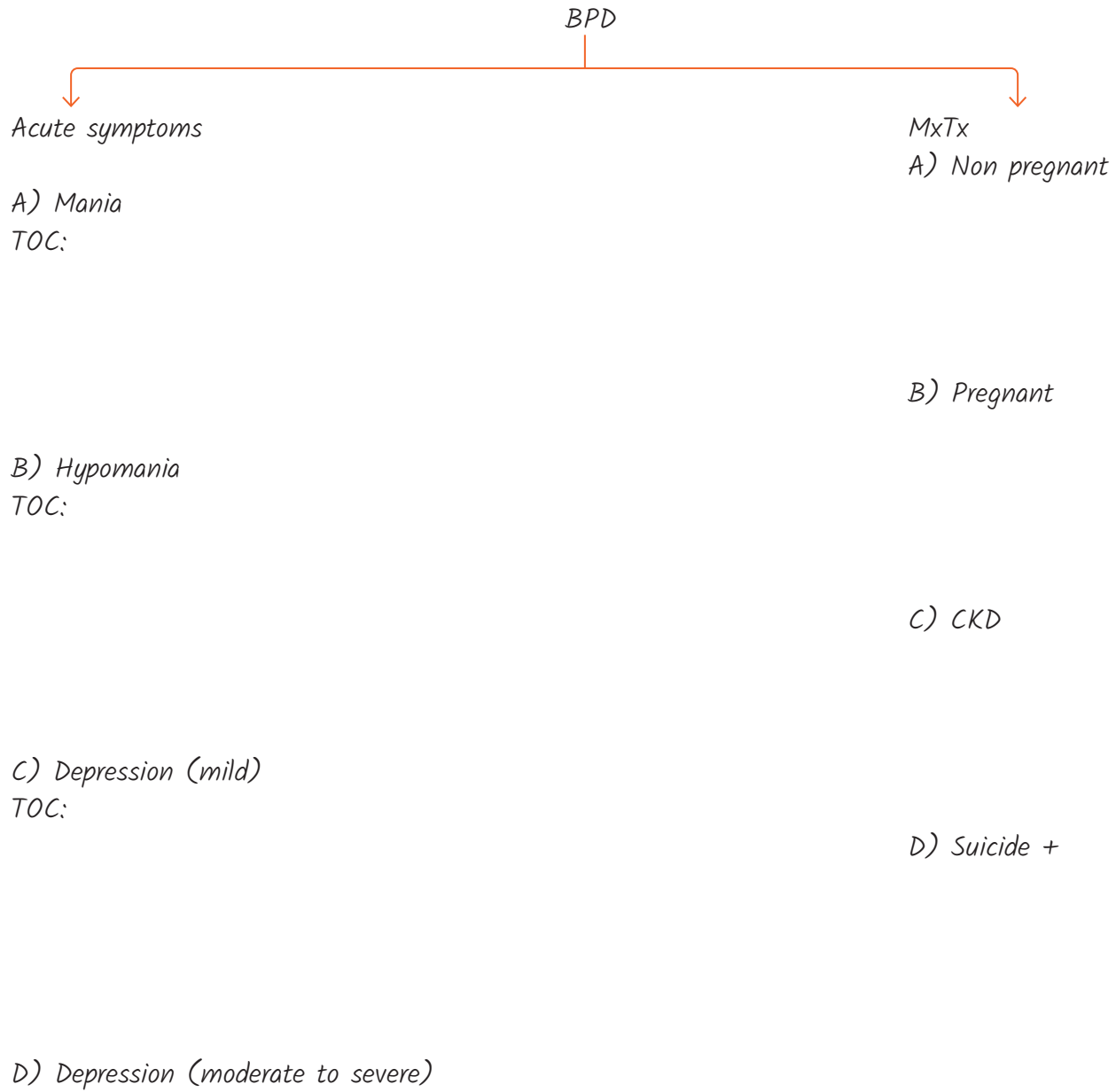
*Elimination*

*Duration of Action*

*Pregnancy*

*S/E*







NOTES



## LITHIUM

A)  $Li^+$  =

B) Less lipid soluble =

C)  $t_{1/2}$  =

D) Sampling after change of dose =

E) Best fluid for monitoring

F) Drugs cause toxicity

G) Drugs cause T/t failure

H) S/E

J) Toxicity



NOTES



# OPIOIDS



ROA:

Receptors:

S/E:

**FULL AGONISTS**  
**HIGH CEILING**

*Morphine* —→ Useful for  
—→ S/E  
—→ C/I

*Methadone* —→ Useful for  
—→ S/E

*Meperidine (pethidine)* —→ Useful for  
—→ S/E  
—→ C/I

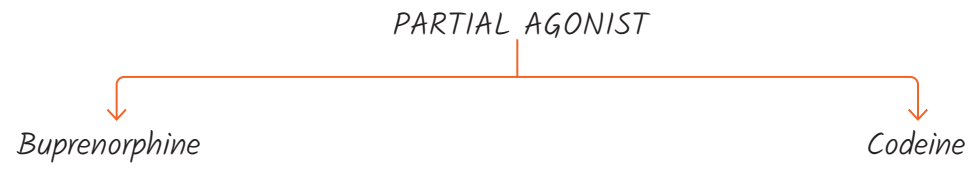
*Sufentanil*

*Remifentanil*

*Fentanyl*

*Alfentanil*

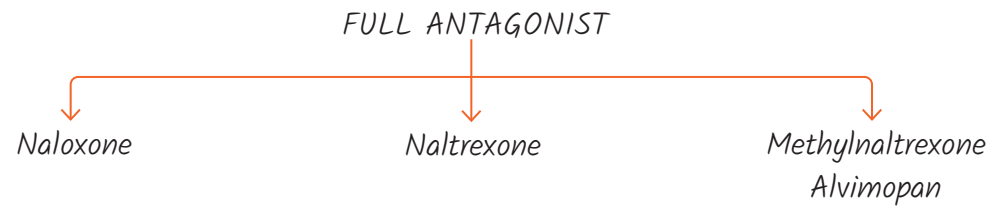
*Loperamide* —→ Useful for  
—→ S/E

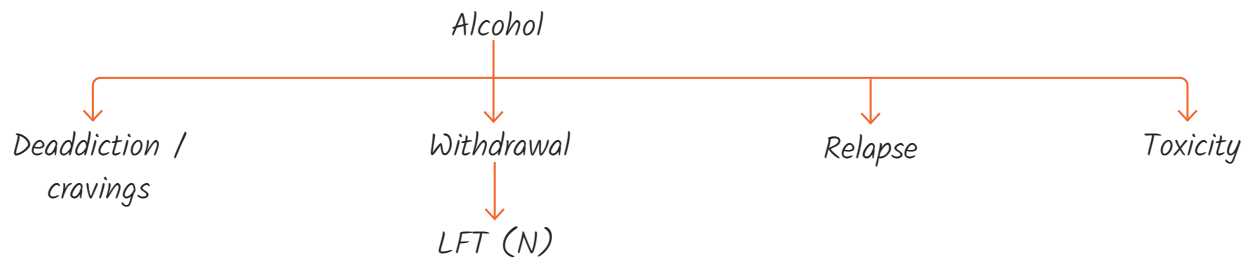
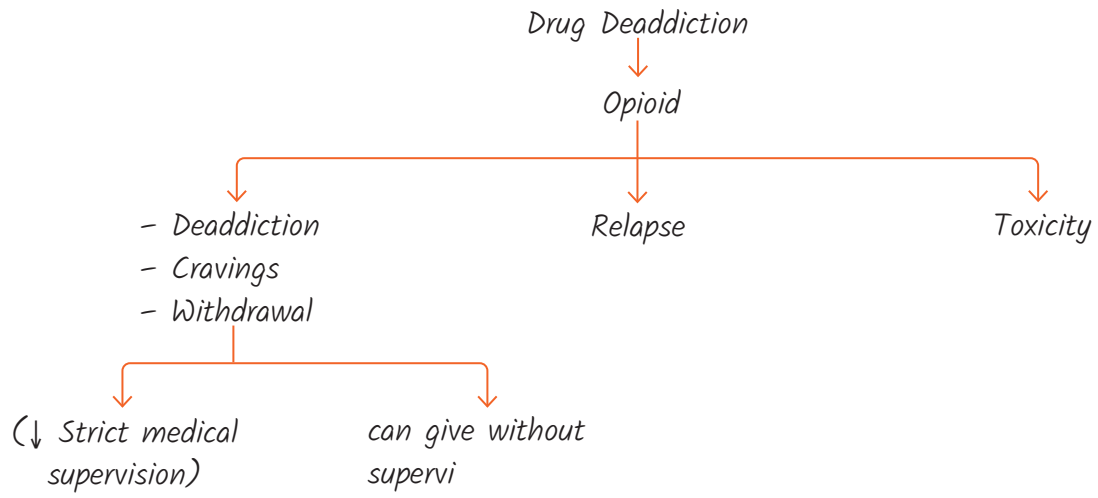


### OTHER DRUGS

A) Tramadol / Tapentadol

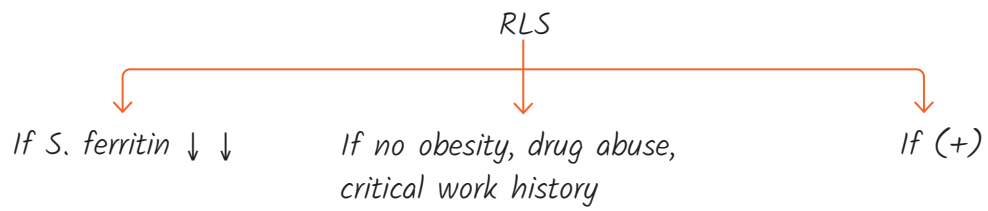
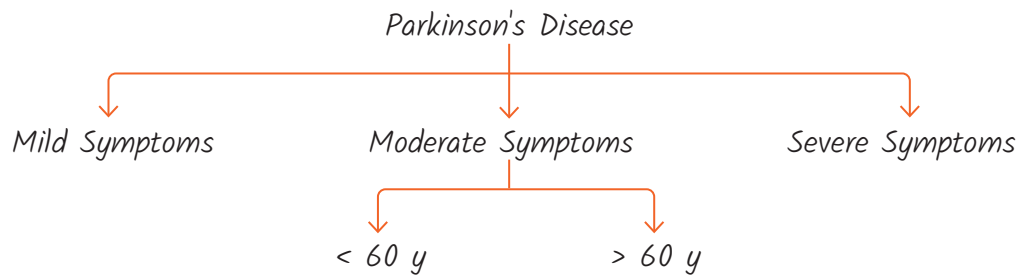
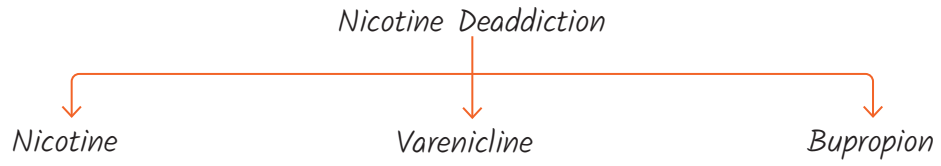
B) Dextromethorphan





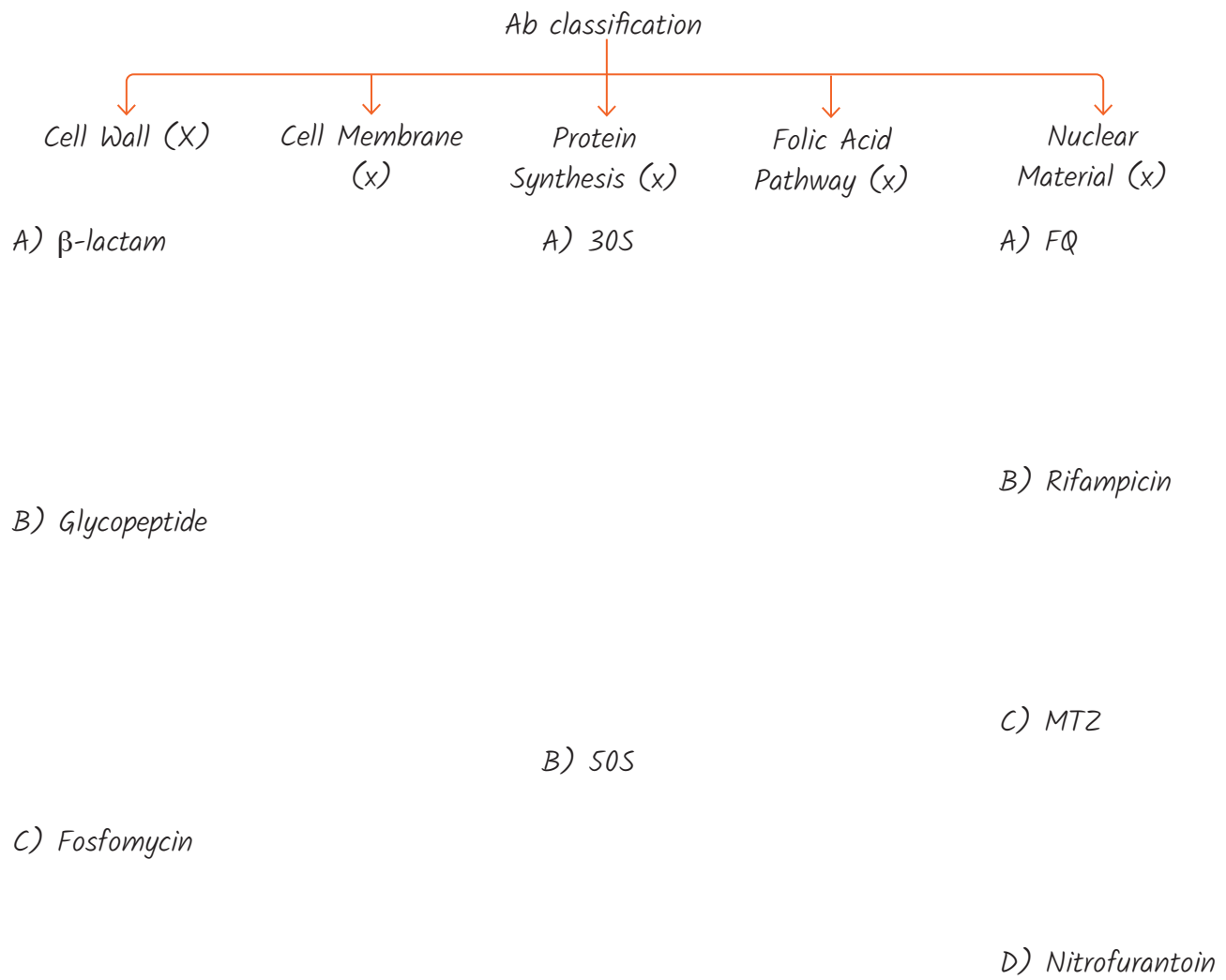
LFT  
AbN

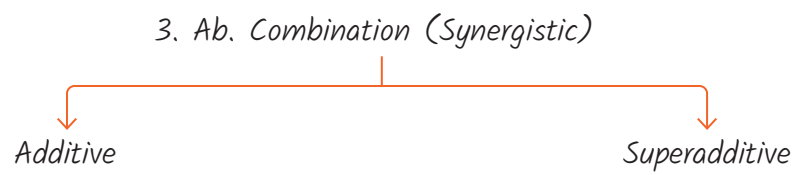
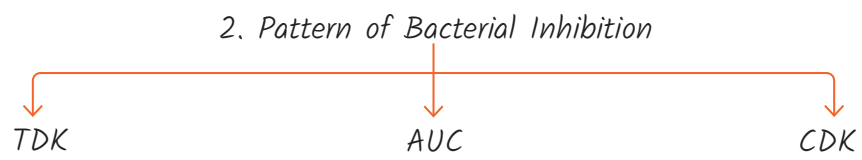
Delirium  
Tremens





# ANTI MICROBIALS







*Pk (kidney elimination) (safe in CKD)*

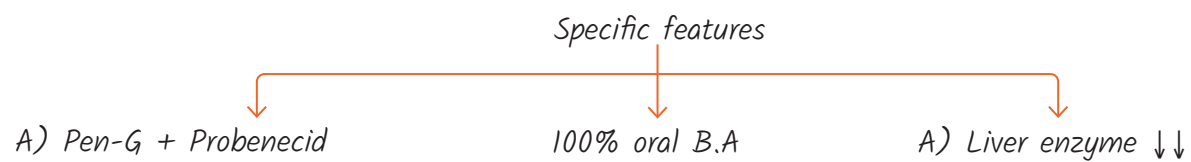
↓  
*exceptions*

1. *β-lactams* →

2. *Tetracyclin* →

3. *FQ* →

4. *P.S (x)* →



B) *Imipenem + cilastatin*

B) *Liver enzyme ↑↑*

C) *Interaction with Cations*

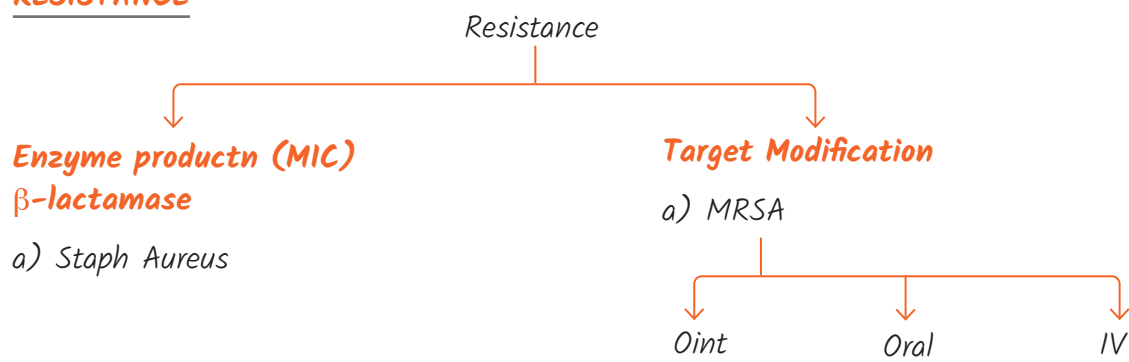


D) FQ + NSAIDs / Theophylline

E) MTZ + Warfarin



## RESISTANCE



b) Other Bacterias

b) VRSA

c) ESBL

c) VRE

d) Metalloenzymes

e) amp-C

**Indications**

A) Ab Group wise





B) Infection wise  
(empirical T/t)



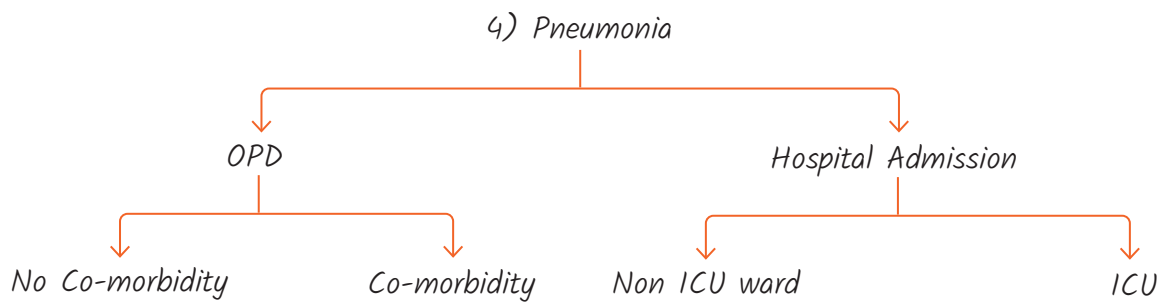
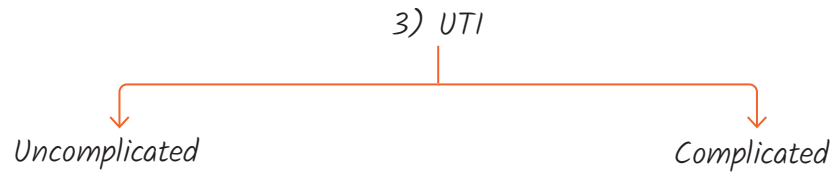
A) Meningitis  
I) Immunocompetent  
< 55 yr Age

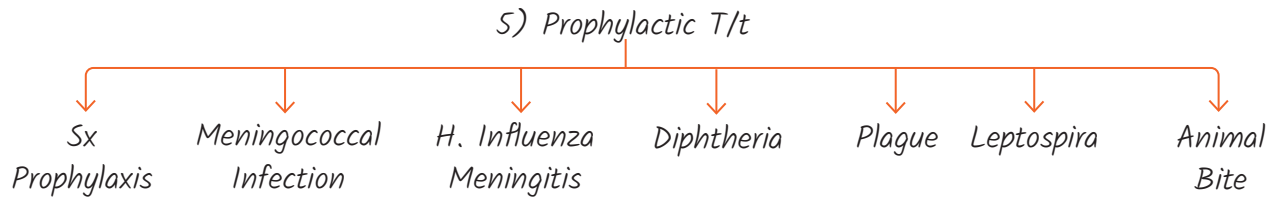
> 55 yr Age

II) Immunocompromised  
H/o Neuro Sx  
RTA

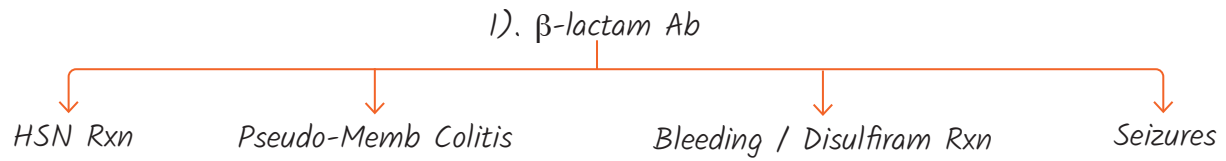
B) Skin Infection

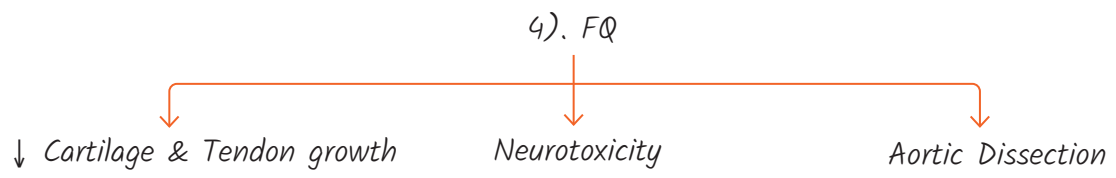
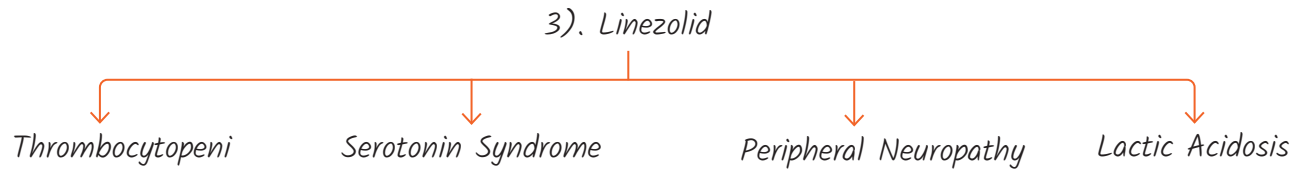






### S/E & its Management

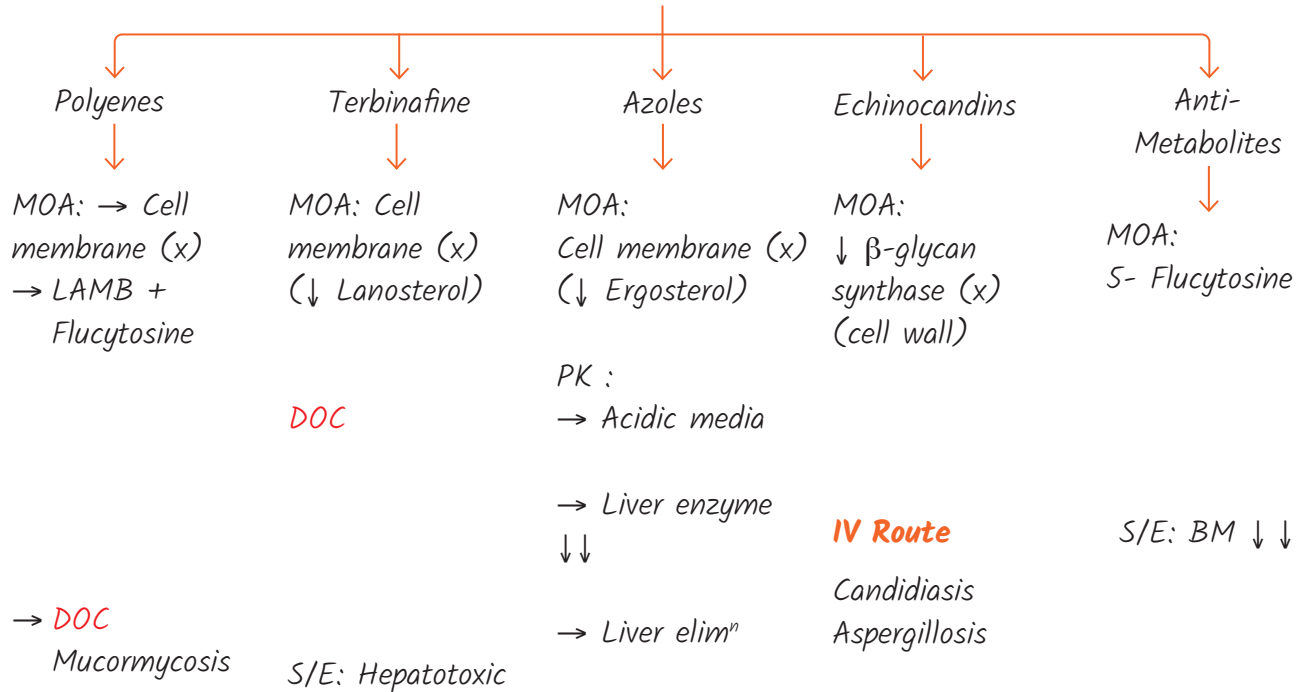




5). Tetracyclin  
(Bind to  $Ca^{2+}$ )



# ANTIFUNGAL DRUGS

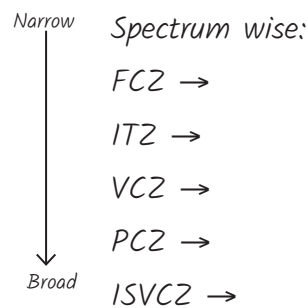


→ **DOC** all other serious fungal infections except: Coccidial Meningitis

Invasive Aspergillosis

→ **DOC** Visceral Leishmaniasis

= Ibrexafungerp (for all candidian) (ORAL)



S/E:

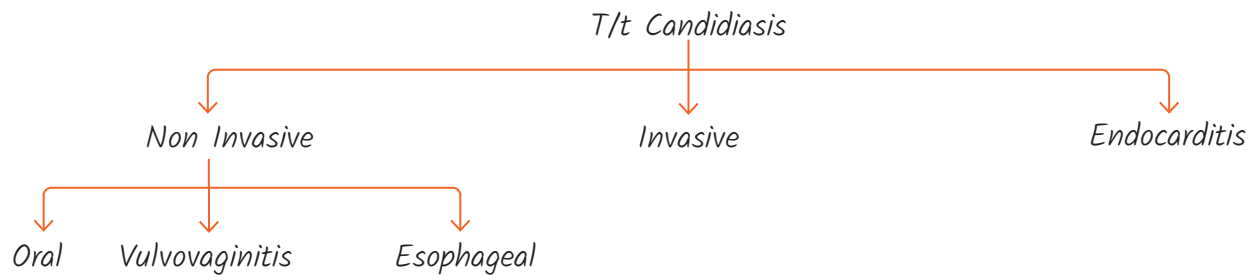
- a) Nephrotoxicity (NaCl)
- b) Ototoxicity
- c) HSN Rxn
- d) ↓ K +/ ↓ Mg<sup>2+</sup>

S/E:

- Liver toxicity
- Vision ↓
- Sexuality ↓↓
- ↓ Cortisol
- ↓ Aldosterone

**Gresiofulvin :**

↓ Tubular protein  
T. Capitis  
S/E Disulfiram Rxn





# ANTI HIV DRUGS

## 1). Virus Entry Inhibitor



## 2). Virus Enzyme Inhibitors



S/E

↓  
 Lipo-dystrophy  
 P. Neuropathy  
 Pancreatitis

Megaloblastic Anemia  
 Nail bed pigmentation

Palm pigmentation

HSN Rxn

S/E

↓  
 HSN Rxn

Hepatotoxicity

CNS toxicity

QT ↑↑

S/E

↓  
 A) CNS ↓↓  
 Mood swings

B) Rhabdomyolysis

C) Hepatotoxic  
 Insomnia  
 wt gain

S/E

↓  
 Lipodystrophy

Renal stone  
 ↑ Bilirubin

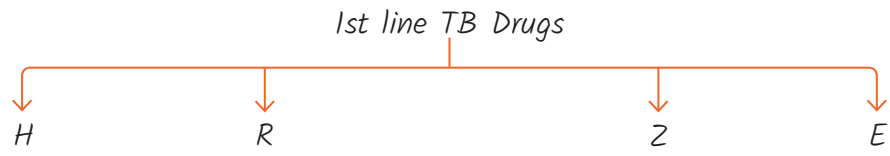
Cholelithiasis  
 ↑ Bleeding

Hepatotoxicity





# TB DRUGS

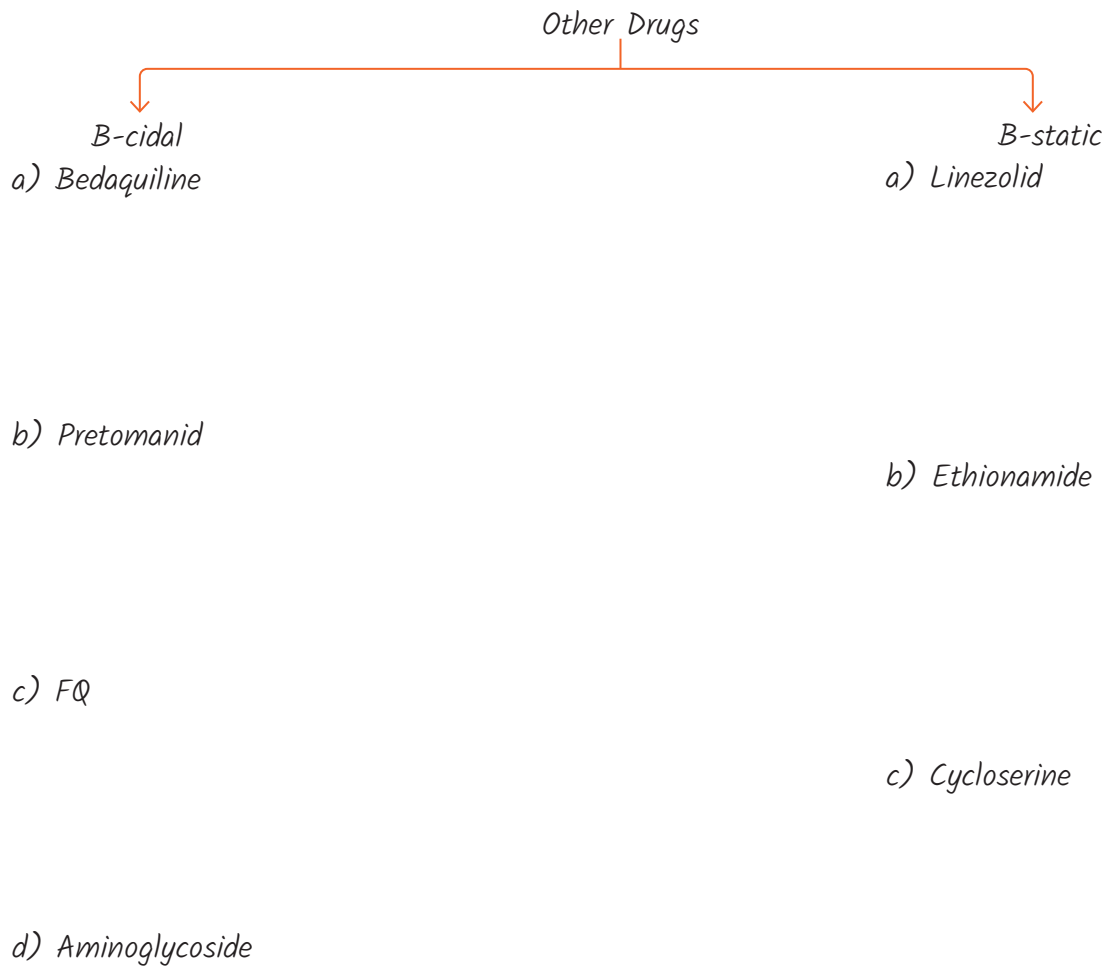


MOA →

Cidal/static →

Resistance →

S/E →



**Treatment**

2 H R Z E + 4 H R E

**Prophylaxis**

(3) H P (weekly) > (6) H (daily)



- *Swine flu* → *Neuraminidase (x) & endonuclease (x)*

- *Hep-B* → *DNA polymerase (x)*

- *Doc* →

- *Herpes virus* → *DNA polymerase (x)*

- *Doc* →

- *Refractory case* →



NOTES