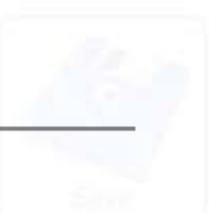


Pharmacology

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Product (long) $\Rightarrow$ Human
 $\rightarrow$ GH
 $\rightarrow$ Enzyme
 $\rightarrow$ Monoclonal

AIIMS 2014 $\rightarrow$

* Paclitaxel is derived from ? genetic

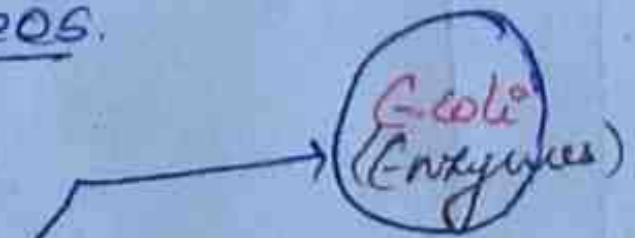
Taxanes



Yew Trees



Gene



Concentration

$\uparrow \uparrow \uparrow$

D

D

C
A
R
R
I
E
R
S

Absorption

T_u

pH of the

DRUG

(i) Acidic

(ii) Basic

M/c Site of unionization $\Rightarrow$ STOMACH

M/c Site of Absorption $\Rightarrow$ Small

→, Urine Acidification for

(i) Amphetamine d

BIOAVAILABILITY

- unchanged ~~amt~~ of drug co
systemic circulation

→ Depends on

(i) Amount of drug

(ii) First pass Metabolism

II.) DISTRIBUTION;

$$avd \Rightarrow \frac{D}{C}$$

→ Apparent Volume distribution (Imaginary)



It is the total plasma
that is required for

TOTAL
PLASMA

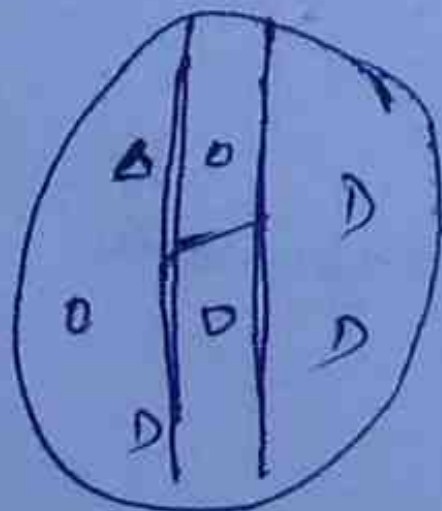
total drug in whole body
at total plasma concentration.

UNIT OF VOLUME distribution ⇒ LITRE

$$avd = \frac{D}{C}$$

* D - Drug
* C - Concentration

$$\Rightarrow D = \uparrow avd \times C \text{ (specific)}$$



Rx = Dialysis

* INFERENCE

(i) Drugs with High V_d

(ii) Irreversible binding

↓

a) Organophosphates

b) Carbamates

- C → Cyclization
- H → Hydrolysis
- A →
 - Aliphatic hydroxylation
 - Aromatic
- D → Deamination

Phases

PHASE I:

CYP450

* CYP1A2

Gene locus in particular
Chromosome No.

Family subfamily

* CYP2B6



VP 3 H4

→ (Metabolise > 50% of dose)



I.) PROTEASE INHIBITORS: (i) not only me
(ii) Enzyme inhib

Mezet
RITONAVIR

II.) STATINS:

III.) CALCIUM CHANNEL BLOCKERS

IV.) BENZODIAZEPINES

V.) ESTROGEN/TESTOSTERONE

a.) 6 MP

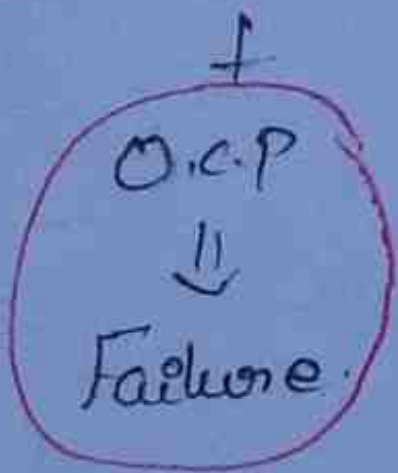
b.) Methyl dopa

⑤ SULFATION →

a.) Steroids

CYP3A4 > CYP3D6 > CYP2C9 >

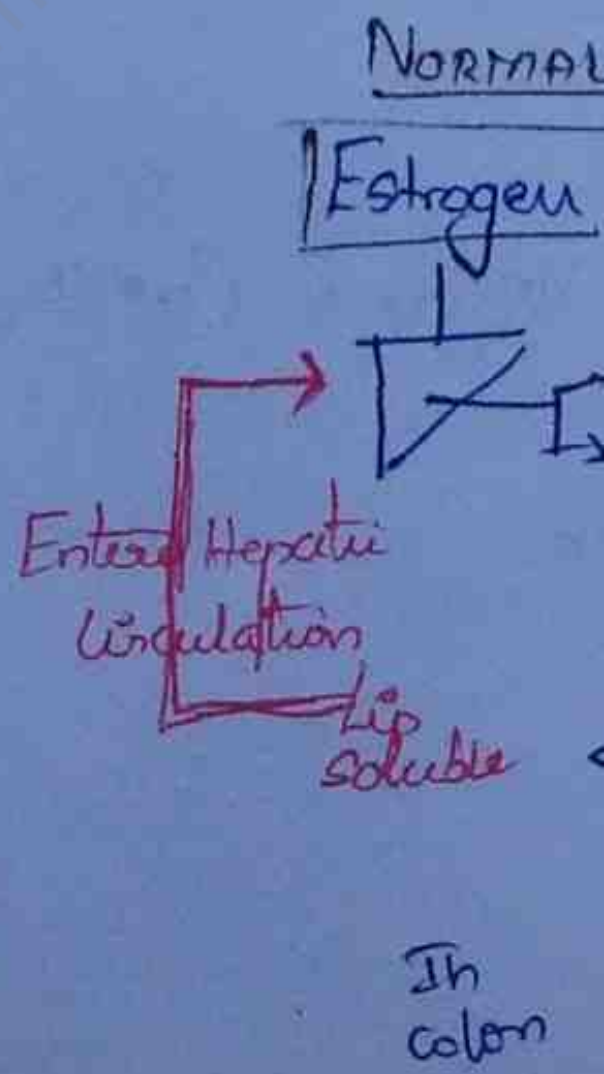
ADC ABC.



OCP Failure Can be also seen in:

I) ANTIBIOTICS:

↓
Inhibition of
Enterohepatic
circulation of
Estrogen.



* $\boxed{RDE \Rightarrow \text{PLASMA Conc}}$

* $\boxed{\text{Maintenance Dose} \Rightarrow \text{Rate of Elimination}}$

$\downarrow$
 $\boxed{\text{PLASMA Conc}}$

$\Rightarrow \boxed{\frac{D}{V_d}}$

$\therefore RDE = \frac{D}{V_d} \times 0.693 \times \frac{1}{t_{1/2}}$

$\boxed{RDE = \frac{D \times 0.693}{t_{1/2}}}$

$\boxed{\text{MAINTENANCE DOSE} \Rightarrow 0.693 \times \frac{D}{t_{1/2}}}$

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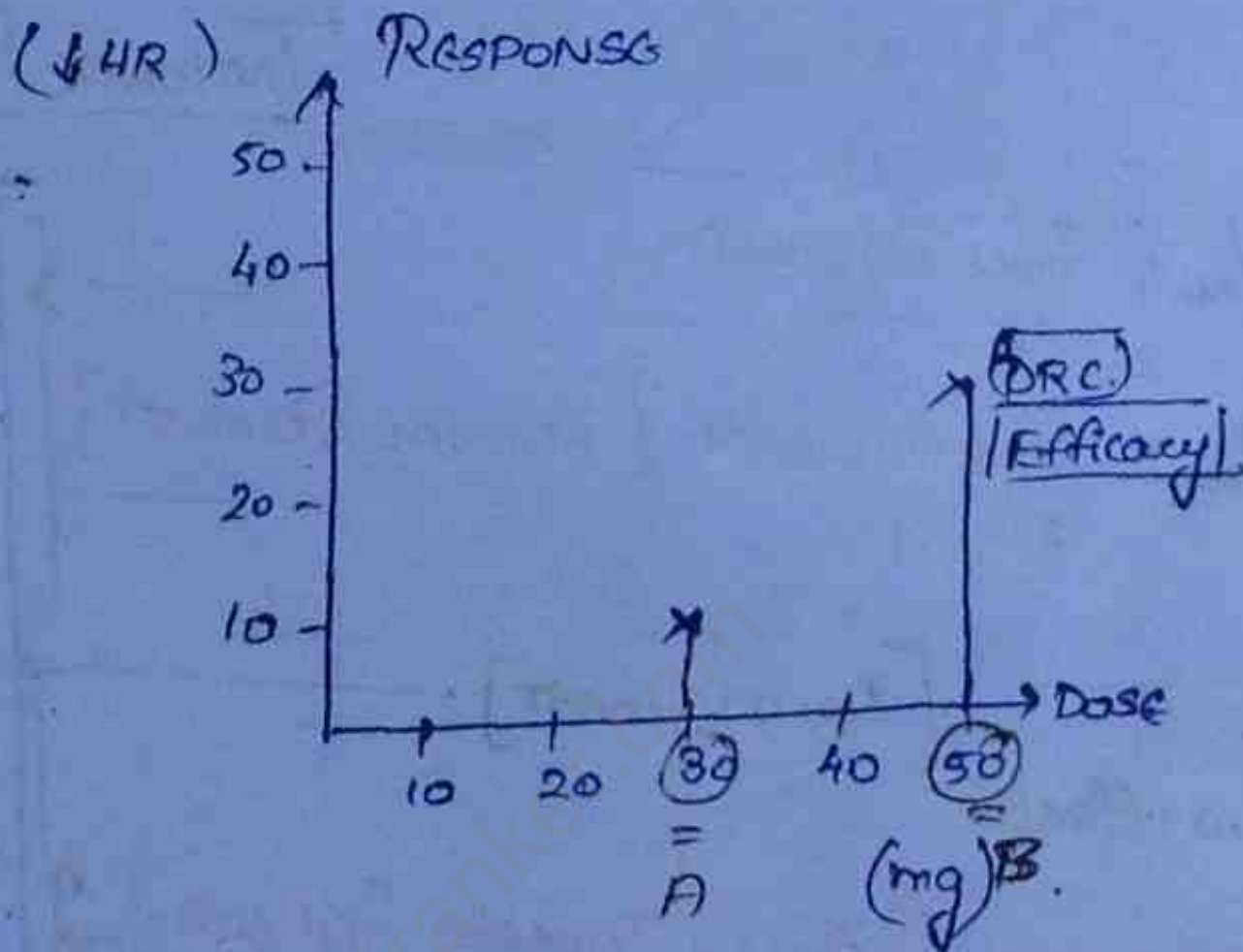


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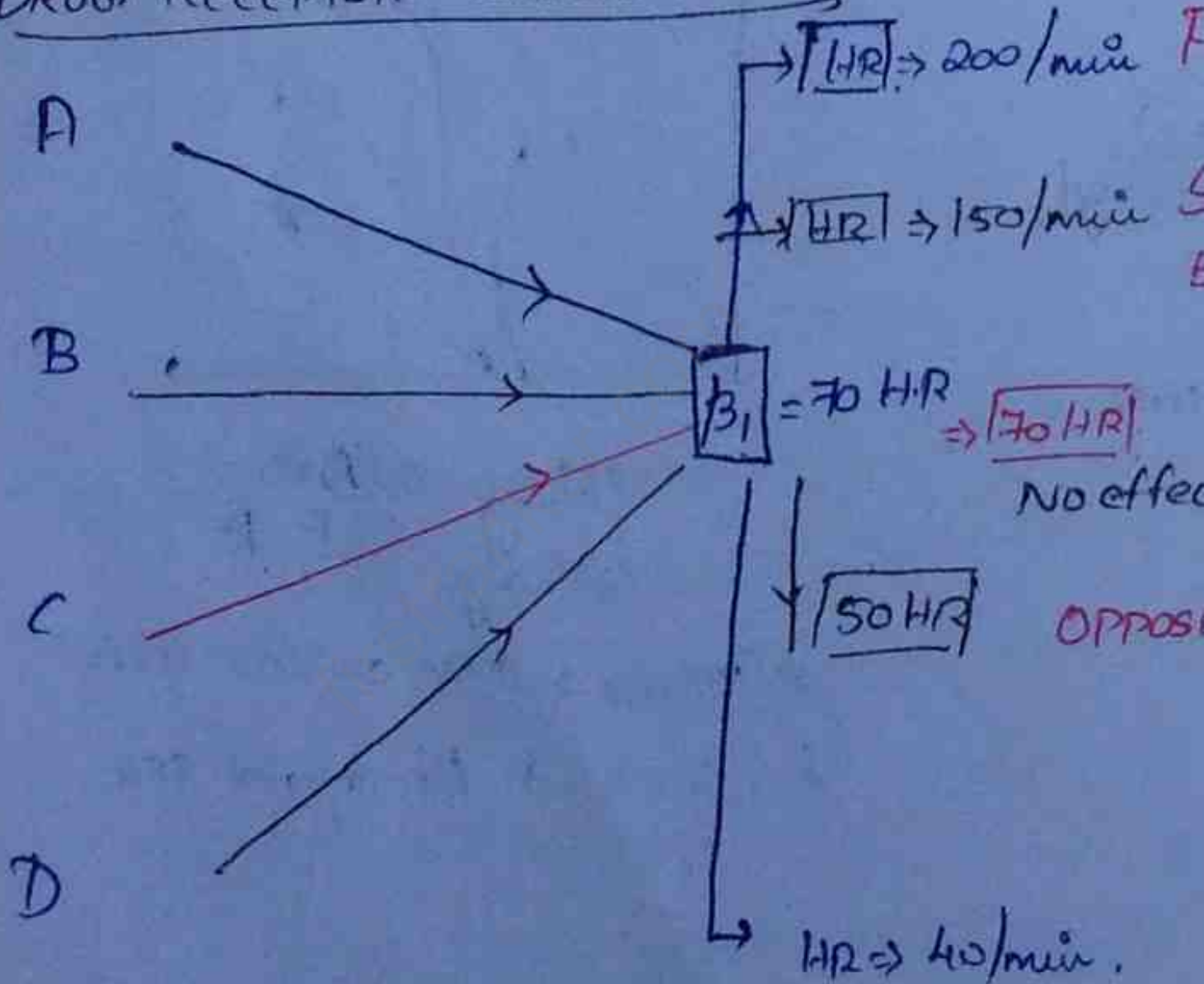
Dose Response Curve



⇒ ↓ Potency.

⇒ Same Efficacy.

DRUG RECEPTOR INTERACTIONS:



Gg:-
GLUTAMATE → NMDA
 → AMPA
 → KAINATE

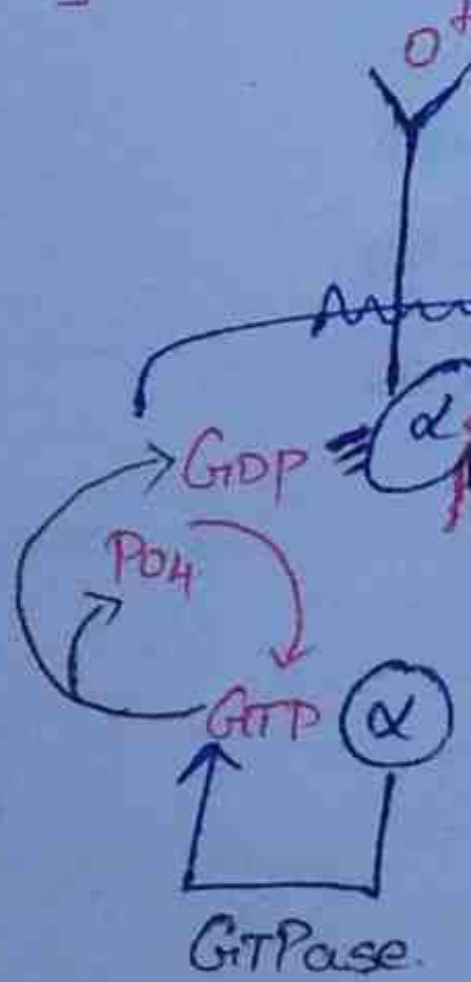
Gg :- Nicotinic Receptors

IV) G-PCR [serpentine / 7 helical]
[Metabotropic]



Two active components :-

- ① GTP α
- ② β γ



I.)



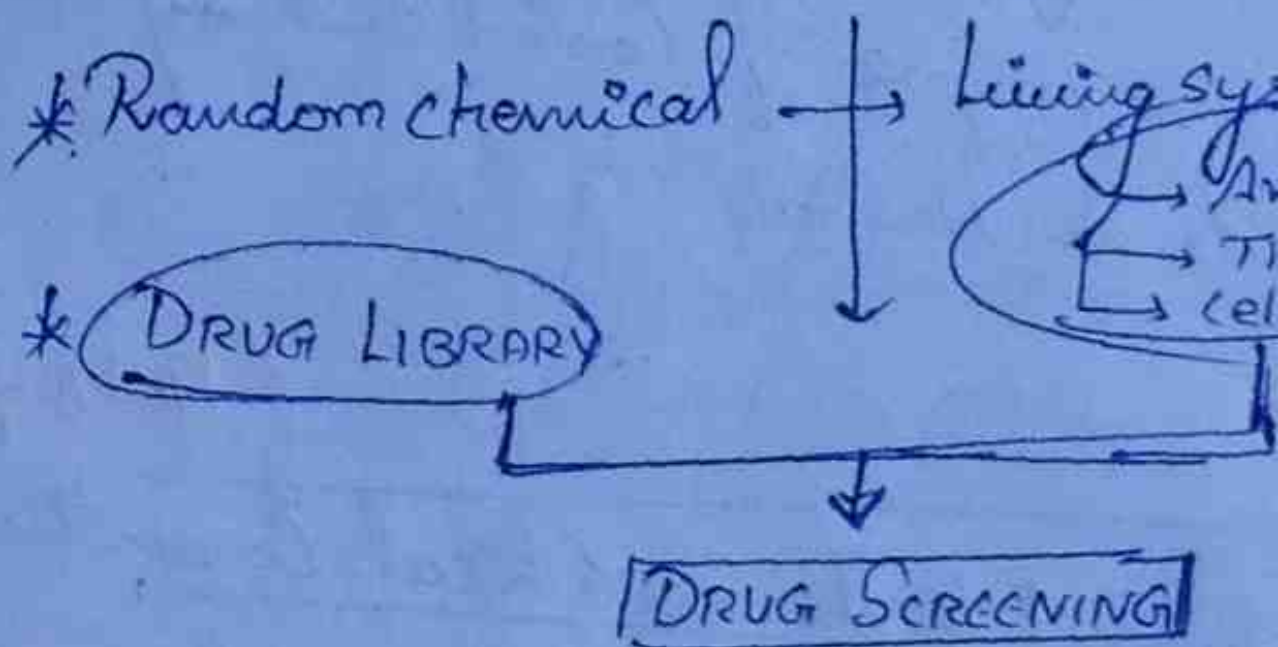
① Adenylate cyclase
↓
↑ cyc AMP
↓
PKC

II.)



① Phospholipase
↓
↑ PIP₂

Conventional Drug discovery: [Hit]



II) Rational Drug designing:

(a) Structure Based

Ligand Based

(i) Select the d/s (HTN)

(ii) Study pathophysiology of HTN

(iii) Select a target (ACE)

(iv) Determine structure of target

↓ ACE

Chemical synthesis

(100,000 chemicals) [Drug]

↓
↓ C.P.C.S.E. A guide

* Committee for the purpose
of experiments in An

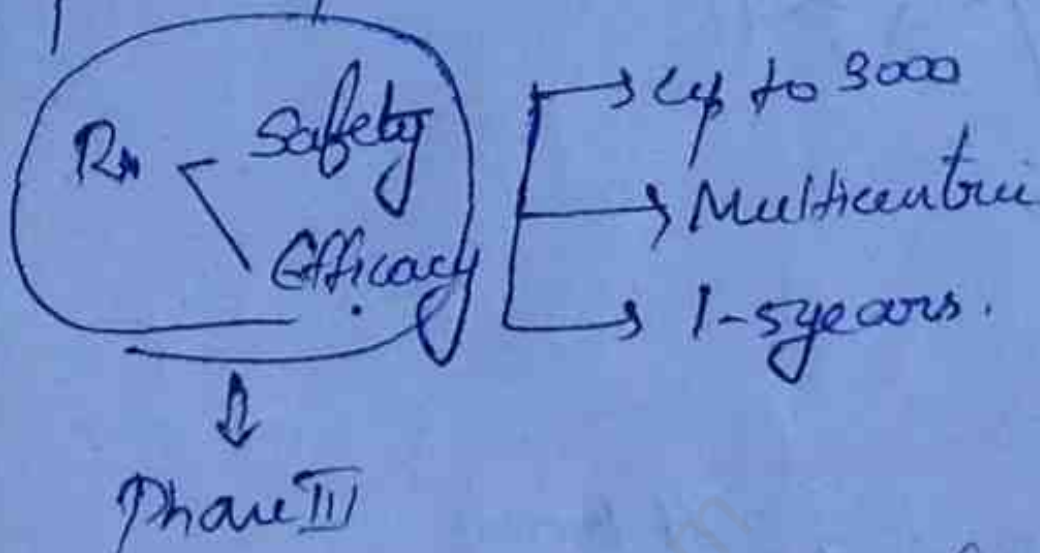
Phase IV

C.T [Humans]

make a protocol →

Submit to

Phase III: [Therapeutic Confirmatory trial]
 ⇒ (Replica of phase II in new use of Rx)



Efficacy of new drug is compared to



In case of generic drug



Abbreviated New drug

★ [Centre for Drug

PHARMACO VIGILANCE

Bill $\Rightarrow$ 2009

2010 $\rightarrow$ passed

$\Downarrow$
* AIIMS
then
* Ghazipurabad.

Med. colleges }
Hospitals } $\rightarrow$ Govt
Pharmacies }

ADR

Report ADR to a

Vigi Flow.

[N.C.C-P.V]

$\Downarrow$
Ipc build

② Health Volunteer

↓
Samples ↗ PK
↘ P.D

PHASE II:- [Pharmacovigilance]

I) NCC - P.V. [Ghaziabad (UP)] ⇒ I

II) CDSCO [Centre for drug standards]

III) IC-PV → International Centre for p

IV) CDRI → Central Drug Research C

Wanfarin f

ITBM is not used in which drug:

② Drug with Lower Therapeutic Index

Therapeutic Index $\Rightarrow$ (



Measure
Potency,

Eg:-

→ Lithium
→ Theophylline
→ Digoxin

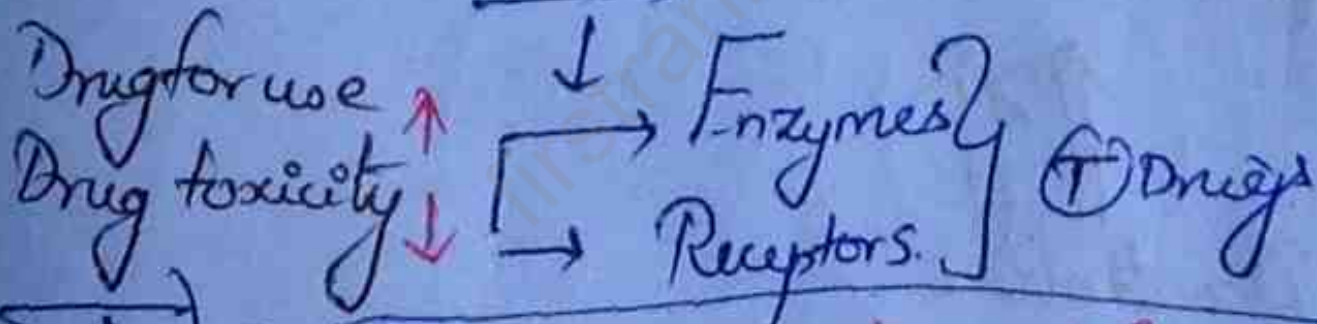
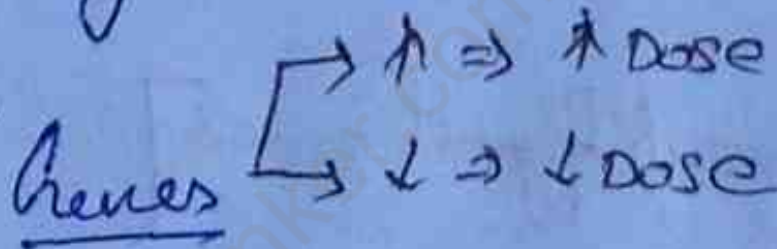
→ Psy
→ Am
→ Am

*
Aims
DNB
JUNGE
AIPSC
NEET

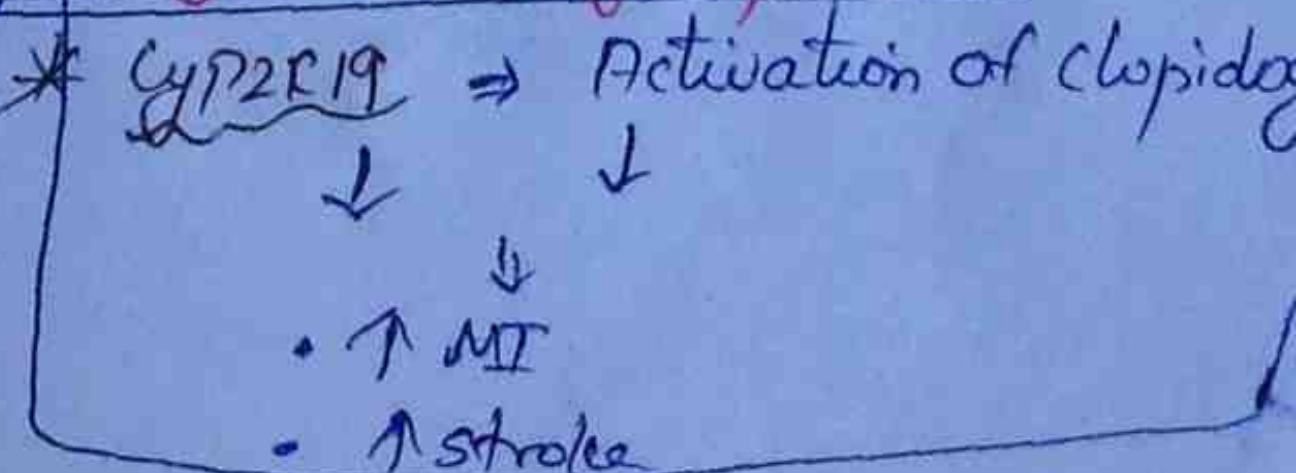
PHARMACOGENETICS & PHARMACOGENOMICS

Pharmacogenetics

* Effect of genes on drugs



Eg: CYP450 Polymorphism



⇒ Black Box Warning

↓
Carboxylation
of Factor

II; VII; IX; X

II) R_v gene polymorphism | Sch/Lidocaine

Passive process



R_v: Dantrolene

~~Drug Interact~~

P - Glycoprotein Inhibitors

- 1.) Quinidine
- 2.) Amiodarone
- 3.) Verapamil (c)
- 4.) Cyclosporine
- 5.) Erythromycin
- 6.) Itaconazole

Essential Drugs?

- a.) Haloperidol
- b.) Diazepam
- c.) Morphine

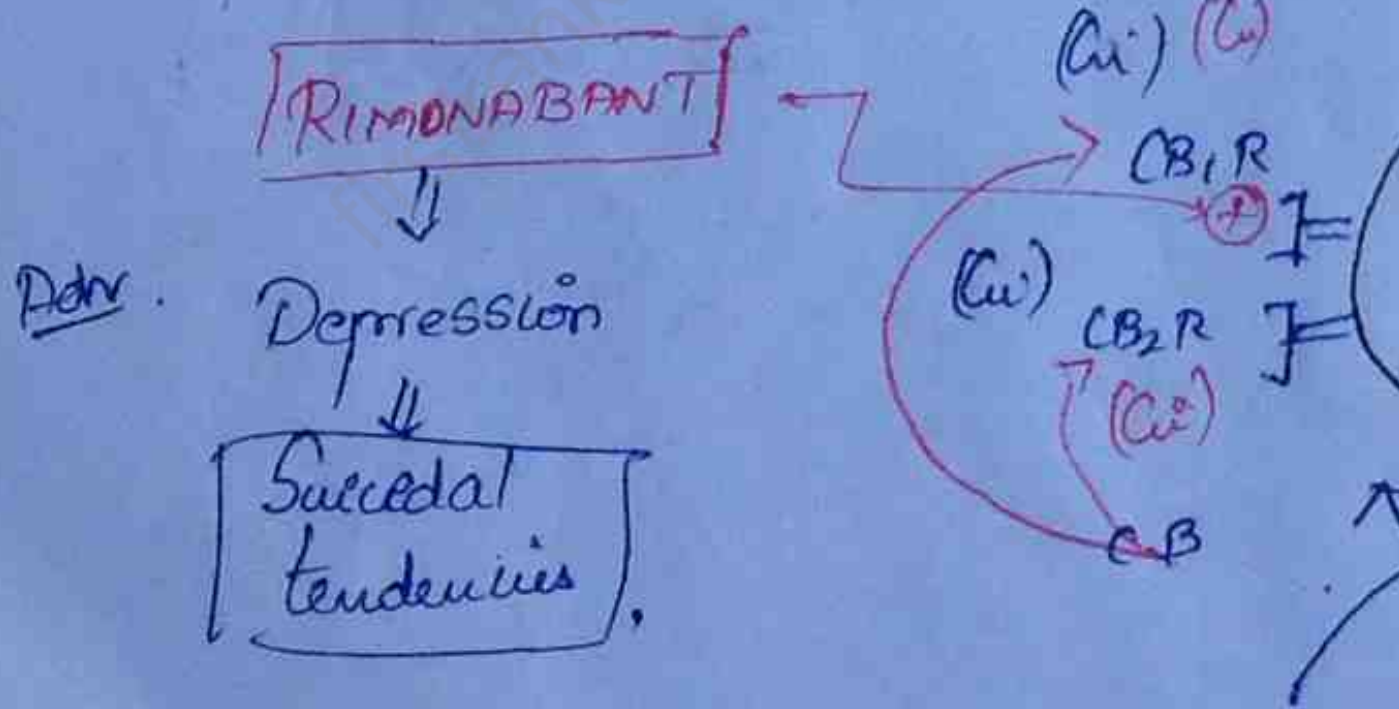
(2) NK-1C → Aprepitant (1st) (2nd)

(3) CB1C → Dronabinol
→ Nabilone

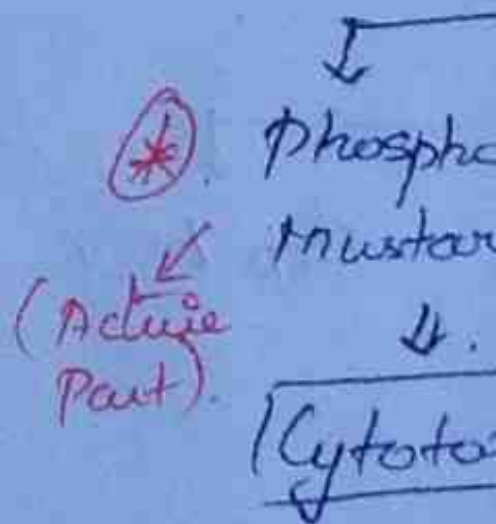
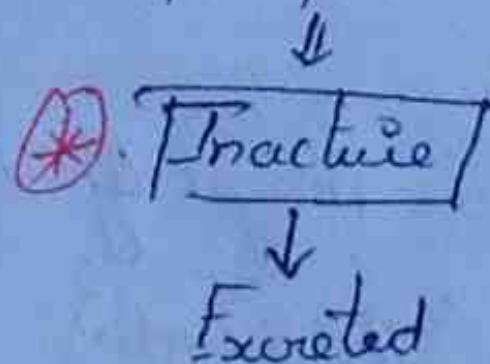
(4) metoclopramide → Not only a D2 blocker
[Domperidone]

(5) Dexamethasone

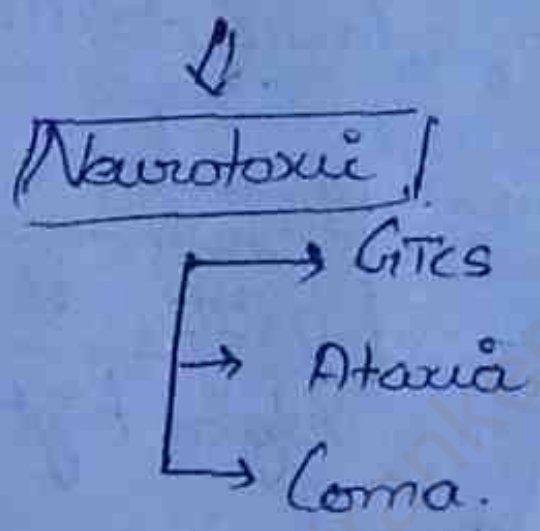
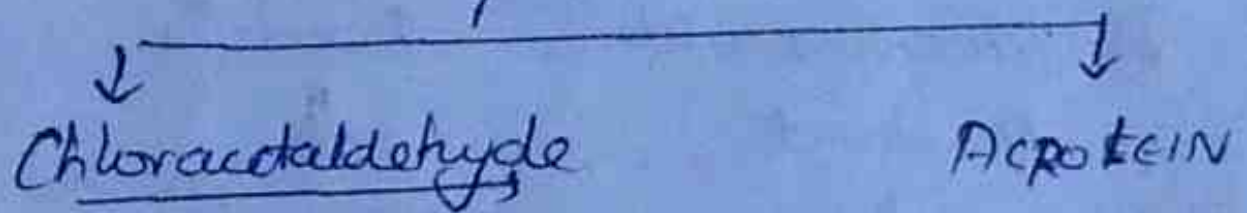
* Parameter to be monitored in Cannabis



4-hydroxy
Cyclophosphamide



B.) IFOSFAMIDE



↓

[Most neurotoxic alkylating agent]

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* Dacarbazine

* Temozolamide Doc:- Brain

S/E:- Pseudoprogression of Brain

IV MISCELLANEOUS DRUGS

* BUSULFAN:-

- AML

S/C → Pulmonary fibrosis

* BENDAMUSTINE:-

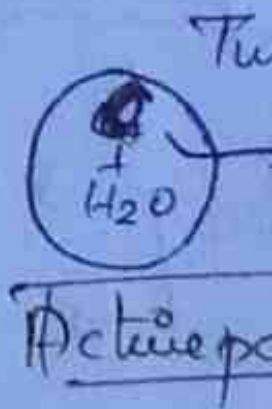
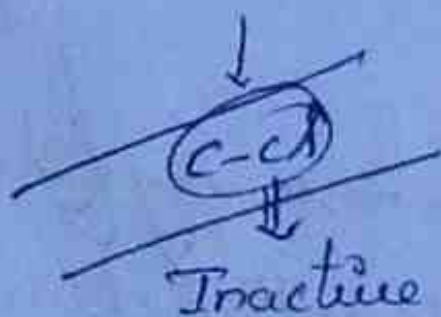
Use:- CLL

No cross resistance to other B-cell



S/E:

★ NEPHROTOXIC



↓

Prevention

★ Rehydrate 1-2 L NaCl saline

★ Cisplatin + 5% D + Mannitol

↓
(Diuretic of choice)

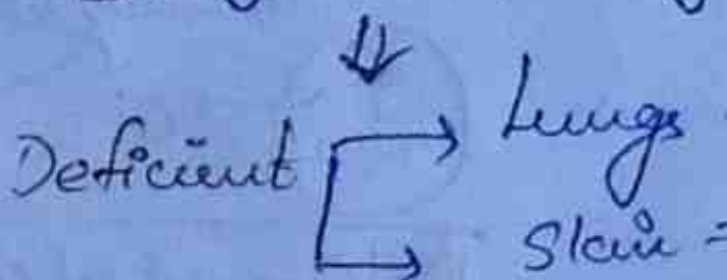
★ Fusaric acid + cisplatin

★ Max < Nausea
Vomiting

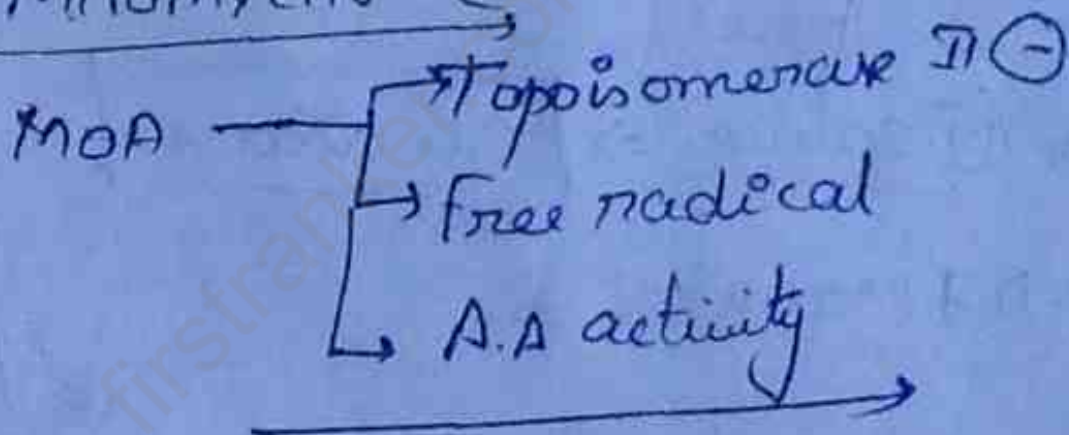
Most

Pharmacokinetics:

Metabolism by Bleomycin hydrolase



$\rightarrow$ Mitomycin C



$\rightarrow$ Toxic drug on Systemic

$\Downarrow$
TOPICAL

1 month

→ ANTHRACYCLINE group

MOA:-

→ Topoisomerase II ⊖

→ Free Radical formation

Dependson
(Fe²⁺) atoms



Chelation

deform amine

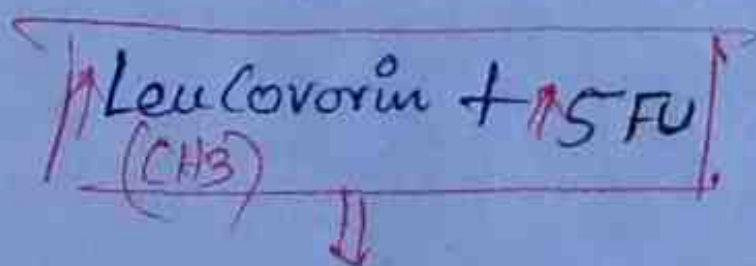
3/4 Cor

↑
Breast

a) Anti Folate Anticancer drugs

- METHOTREXATE
- Pemetrexed

* MOA $\Rightarrow$ DHFR $\ominus$.



$\longrightarrow$ 5FdUMP

Competi

* To $\uparrow$ 5Fu sensitivity

dump.

T.S $\ominus$

T.Mp

CH₃

MOA to Mtx:

DHFR

Enzyme $\Rightarrow$ Induction

takes place

Gene $\Rightarrow$ Mutation
 $\hookrightarrow$ Amplification

$\Rightarrow$

5Fu

MDR

POSSIBLE MECHANISM OF RESISTANCE : ① =
② =

FUNCTION OF MDR PUMPS : Drug Efflux

USES OF MTX:

Neoplastic

* Doc $\Rightarrow$ Choriocarcinoma *

* Osteosarcoma *

• Ifosfamide

• Doxorubicin

• Cisplatin

* Leukemia (CNS-Intrathecal route)

* Cutaneous T-cell lymphoma

Non neoplastic

* Doc $\rightarrow$

* Ectopic

* Graft

* MULTIPLE

* Psori

* Dihydroornithine
* Thymidine phosphate

uses:
→

I.) Colorectal Cancer

Regimen = $\left\{ \begin{array}{l} \rightarrow \text{Folinic Acid} \\ \rightarrow \text{Folinic Acid} \end{array} \right.$

II.) Head and Neck Cancer.

→ 5FU + cisplatin

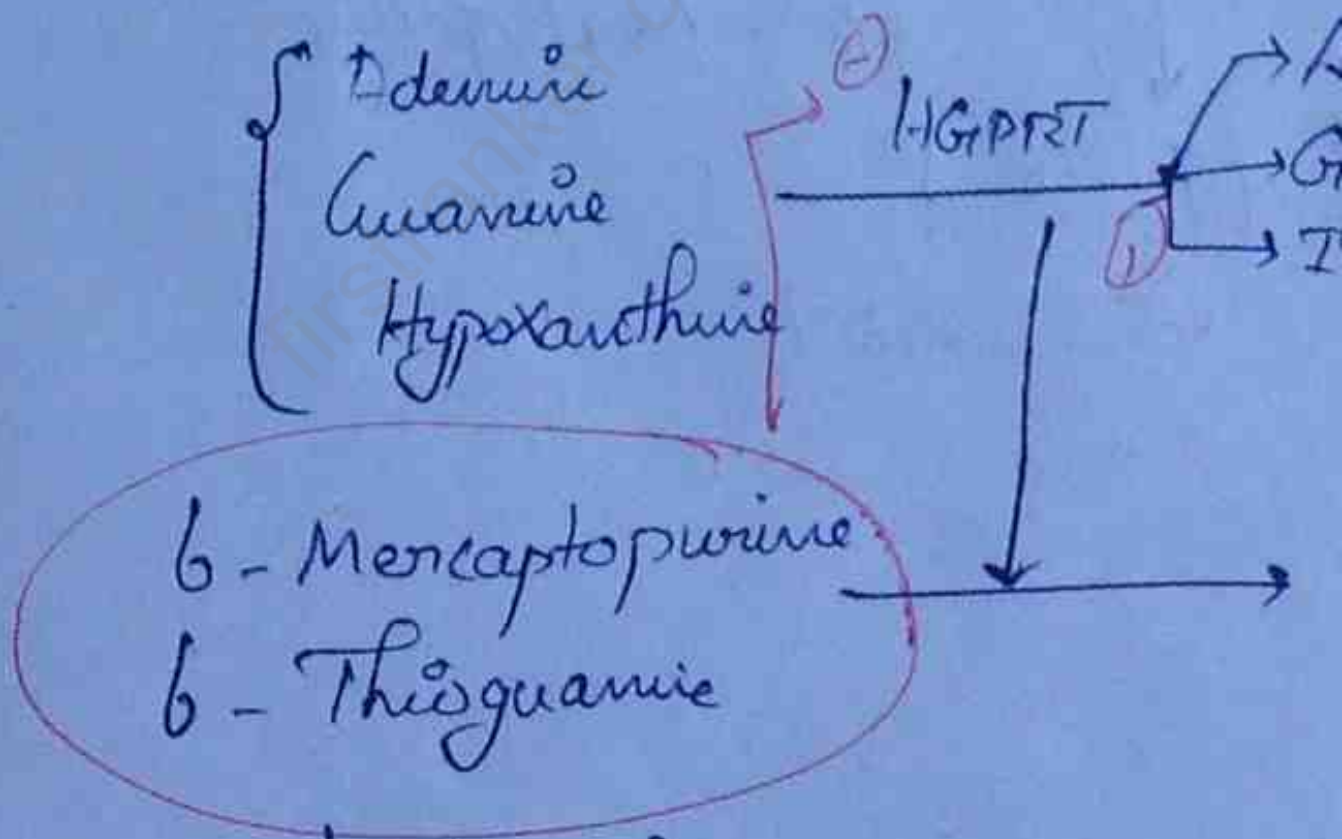

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 FirstRanker's Choice
 www.FirstRanker.com

* Decetabine

MOA → Demethylation

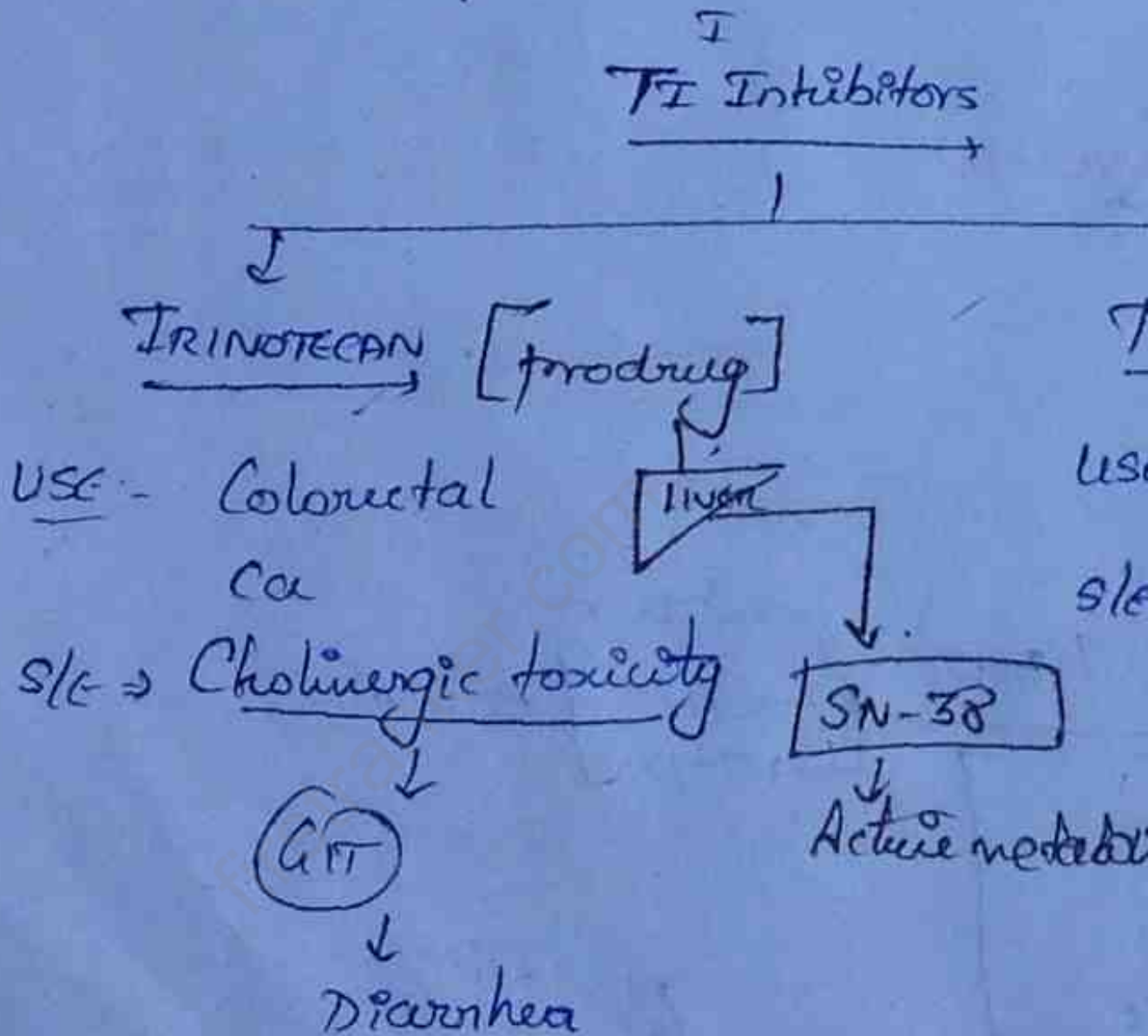
use :- Myelodysplasia (DNB -15)

III Purine Analogues :-

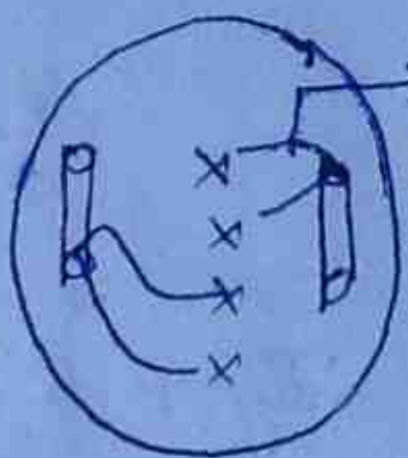


* use :- Leukemia

* s/e :- Bone Marrow Suppression
 Hepatotoxicity



M PHASE INHIBITORS :-



MICROTUBULES

↑
Polymerization

α-tubulin ⊖ β-tubulin →

[SIADH]

[P.N.]

Gle ⊖

* CNS } Phagocytosis
 * PNS } Axonal transport

MoA :-

- * VINCA ALKALOIDS ⇒ ⊖ β tubulin
- * TAXANES ⇒ ⊖ β tubulin + ↑
- * Ixabepimone ⇒ Stabilizes M.T.

→ Inj τ Castor oil

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$\downarrow$
S/C $\rightarrow$ (M/C) $\Rightarrow$ Hypersensitivity
to) Peripheral Neuropathy

* DOCETAXEL

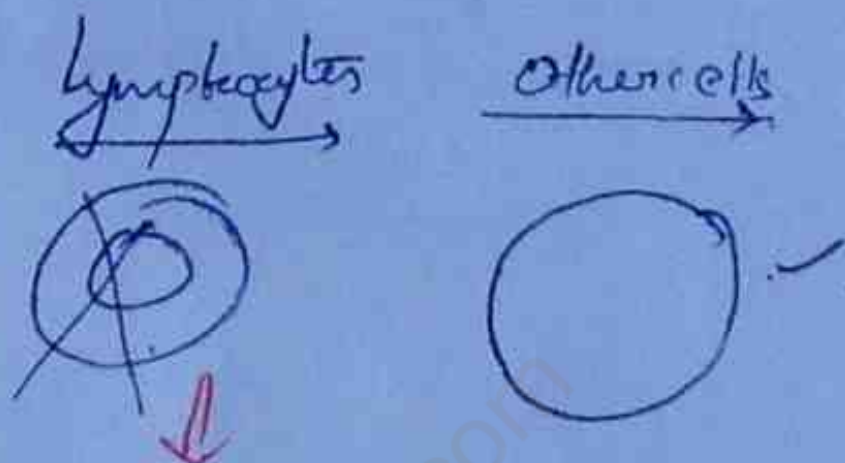
Can cause H₂O retention

③ IXABEPIMONE :-

use: Breast Ca

① L-Asparaginase $\Rightarrow$ Intravenous route

$\Downarrow$
In systemic circulation
into Aspartate



Use: * Leukemia
* Lymphoma

Side effects:

- * $\downarrow$ protein synthesis
- * $\downarrow$ Insulin synthesis $\Rightarrow$ Hypoglycemia
- * Hyperlipidemia $\Rightarrow$ Pancreatitis
- * $\left. \begin{array}{l} \text{CF} \\ \text{A.C.F} \end{array} \right\} \Rightarrow \downarrow \text{ed} \left\{ \begin{array}{l} \text{Hemolysis} \\ \text{Thrombocytopenia} \end{array} \right.$
- * Hypersensitivity

use: Multiple Myeloma. $\Rightarrow$ [Best drug]

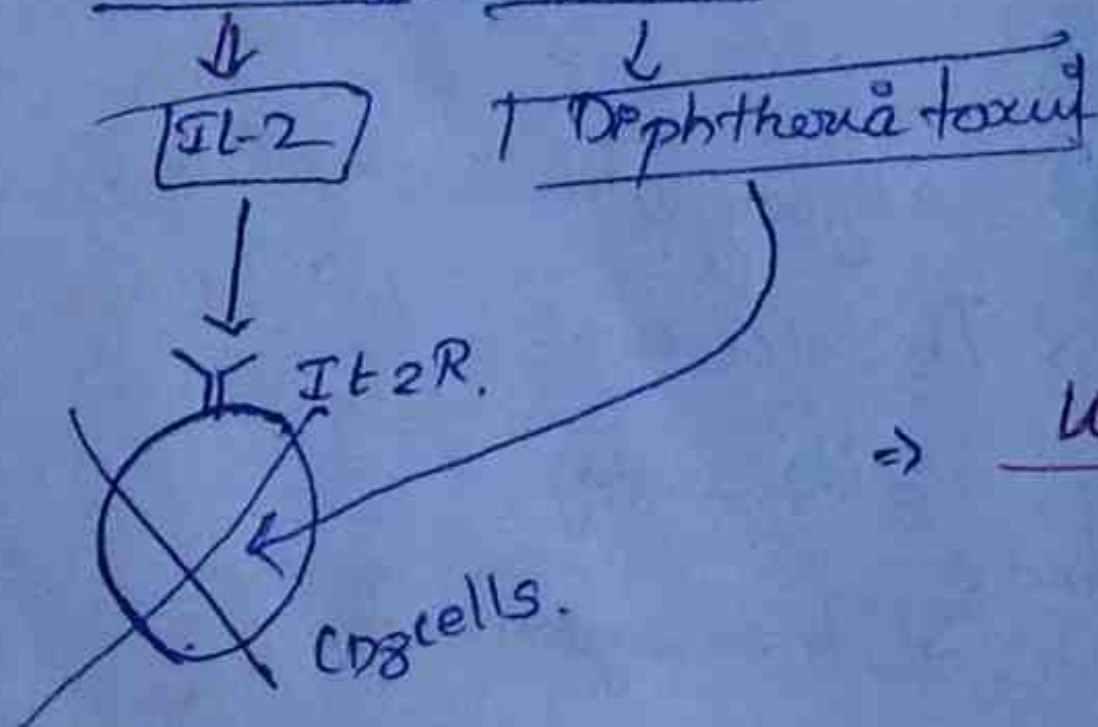
Toc: BORTEZOMIB + LENALIDOMIDE +

S/e: * Thrombocytopenia

④ IMMUNOTOXINS

Carrier of

① Dexamethasone Diphosphate



* DASATINIB

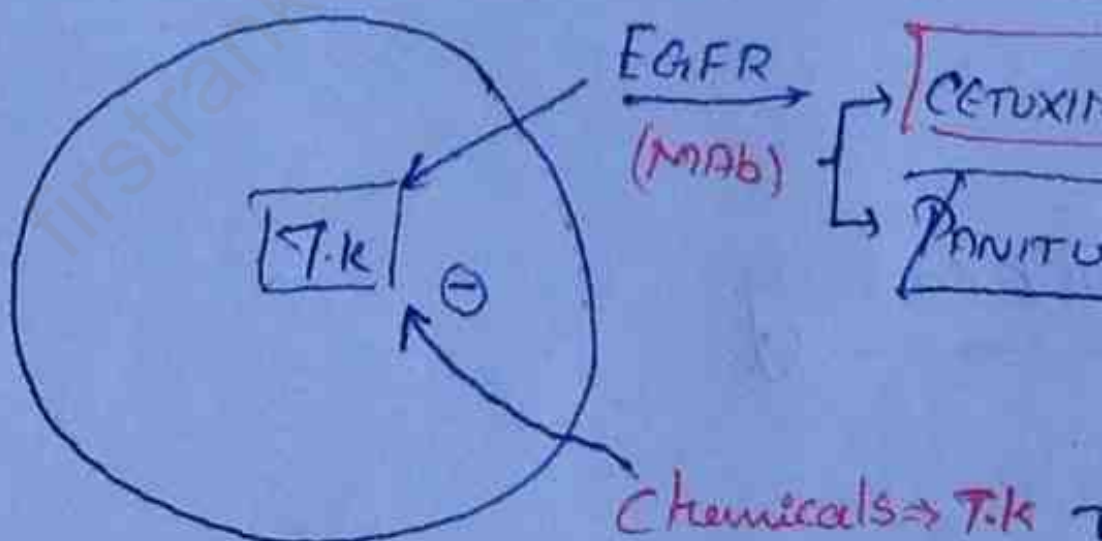
* BOSUTINIB

* PONATINIB

① * CABOZANTINIB : • Doc for Medullary Thyroid

* REGORAFINIB : • GIST

② E.G.F.R (Her-1) $\begin{matrix} \nearrow T.k \ominus \\ \searrow R \ominus \end{matrix}$



- * SORAFINIB $\Rightarrow$ DOC $\Rightarrow$ H.C.C. ✓
- * PAZOPANIB $\Rightarrow$ Soft tissue Sarcoma
- * SUNITINIB $\Rightarrow$ GIST
pancreatic Cancer.

RAMACIR

use:-

SIDE EFFECTS:-

I.) Delayed Wound healing $\Rightarrow$ Stopped

⑤ HGFR T-K $\ominus$

* CRIZOTINIB use:- NSCLC lung.

⑥ TGK T-K $\ominus$

* Roxelotinib use: Myelofibrosis

→ M.S

→ TTP

→ AIHA

m/c side effect →

INFUSION REACTIONS



Medullary CF
Medullary CF
resistant to
active

(8) Anti IL-17 Ab (13)

* Secucinumab $\Rightarrow$ PSORIASIS

(9) Anti GD2 ganglioside Ab

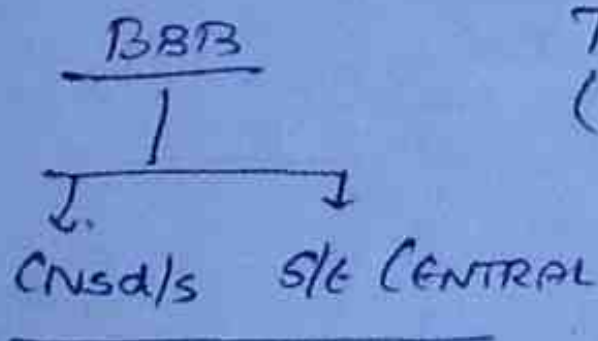
* Dinutuximab $\Rightarrow$ Highrisk Neuroblastoma

↓
↓ Ach release

* CHOLINERGICS :

- a) Direct
- b) Indirect

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* PILOCARPINE

uses: I) Glaucoma
(closed angle)

II) Xerostomia

I) In Acute attack of glaucoma + closed angle

Doc :- I/v Acetazolamide

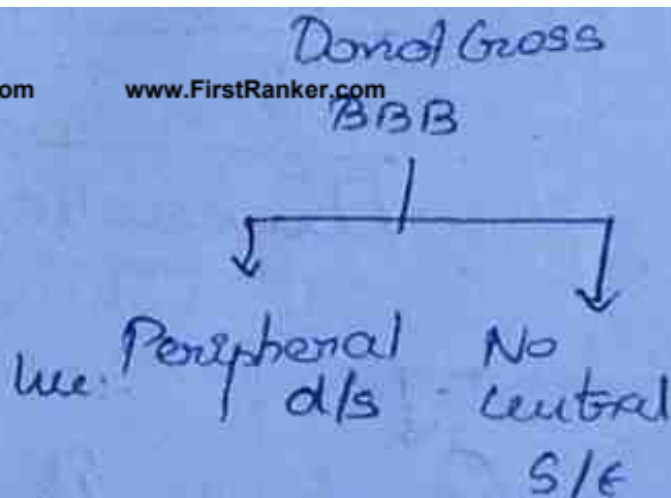
↓
Normal IOP

↓
Topical → Pilocarpine

II) chronic glaucoma (Open angle)

* PG Analogues.

↓
TOPICAL
(ocular)



Reversible

Tertiary amines

Quaternary

* Physostigmine

uses:

- Glaucoma (closed angle)
- DOC $\Rightarrow$ Anticholinergic Poisoning
 - Belladonna Poisoning
 - Atropine (3rd line)

(M/C)

* Donepezil }
* Rivastigmine } DOC
* Galantamine } (ALZHEIMER'S)

* Tacrine (Hepatotoxic)

2nd NMDA $\ominus$

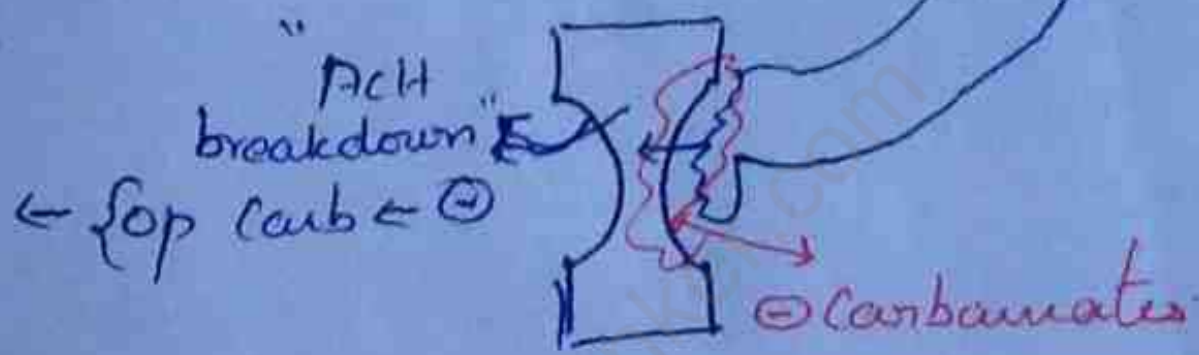
Amantadine

Organic
Phosphates
not in
Carbamates

- * Pralidoxime
- * Obidoxime
- * Diacetyl monoxime

Doc for

AChE



→ BA (B₂ Agonist) Doc

AIMS

ATROPINE

* Ipratropium

* Tiotropium → Doc [Long]

* Oxitropium

* Ceneclidium

S/E :- Urine Retention (worsen P)

• HEART :-

↑ HR

↑ Conduction

↑ Force of Contraction

used in Rx of Bradycardia

Drugs:-

α_1 Agonist :- $\uparrow$ NE $\Rightarrow$ SNRT $\Rightarrow$ DULOXETINE

II) β_3 $\oplus$ $\Rightarrow$ urge incontinence

Drugs:-

β_3 Agonist:

MIRABEGRON

ADPG 16.



- $\circledast$ TROSPIMUM
- $\circledast$ Darifenacin
- $\circledast$ Solifenacin

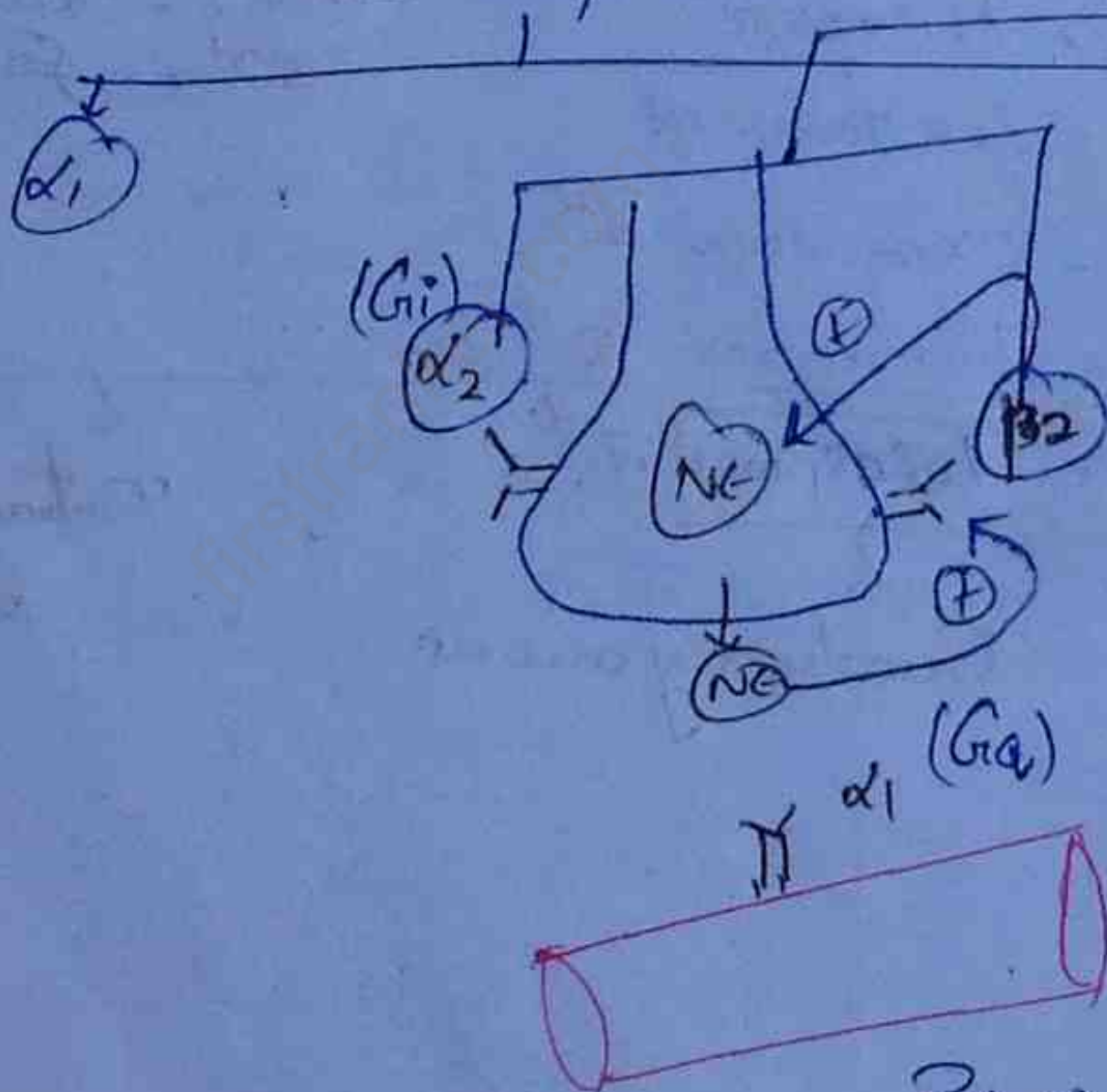
No
CNS side
effects

* Rate limiting Enzyme for NG is

RECEPTORS

[GPCRS] $\begin{matrix} \nearrow \alpha \\ \searrow \beta \end{matrix}$

[α -receptors]



Blood V

β_1 (⊕) MLCK

β_2

⊕ HEART

↑ HR

↑ C.O

↑ Conduction

2) KIDNEY

↑ Renin ⇒ ↑ B.p.

↓ Contraction

⊕ MLCP

⊖ MLCK

⊕ Ca^{2+} channel

↓

Blood Vessels

RS

Uterus

C/I in Im route

a.) Muscle Necrosis

* Droxidopa : (2014)

→ prodn of NE

→ use: Neurogenic hypotension

* ISOPRENALINE

Use :- β_1
 β_2 $\rightarrow$ B.A
 $\rightarrow$ Tocolytic

2.) NON CATECHOLAMINES: Agonist at

α Receptor Agonist

NON SELECTIVE

* PHENYLGPHRINE

DOC $\Rightarrow$ Anesthetic agent induced Hypo
Neural decongestion
Mydriatic

* Minoxidil } Hypotension
* Nephedrine }
* Metaraminol } Rx.

★ METHYL PHENIDATE

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Doc for NARCOLEPSY. $\Rightarrow$ MODAFINIL

★ AMPHETAMINES:-

USE:-

- ADHD
- Narcolepsy.

Abused :- CNS stimulant.

A - ALPSONADIL

k

T - TRAZADONE

A - ALPSONADIL [PGE₁ Analogue]

↓

Patency of D.A. (Ductus)

Floppy Kris 212721E

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[Nervous system
duct]
obstruction



• Timorol
cause of
stenosis

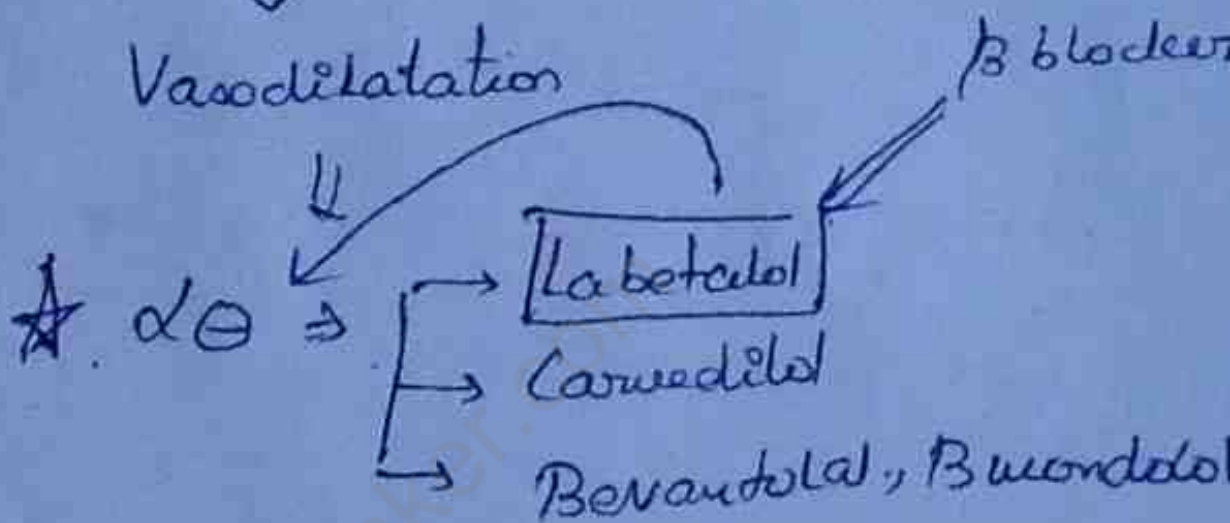
N.L.D [stenosis]

* IIIrd Generation

Non Selective $\beta\alpha$.



Vasodilatation



* $\beta_2\alpha \Rightarrow$ Bisoprolol

* C.C.B $\Rightarrow$ Carvedilol

* $\alpha\alpha\alpha \rightarrow$ NIPRAADOL

* Ca^{2+} channel opener $\rightarrow$ ~~Fenoterol~~ T

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* PROCAINAMIDE:-

⇒ I/v route

⇒ Doc for WPW Syndrome

* QUINIDINE } s/e $\alpha \ominus$ ⇒ Hypo

* DISOPYRAMIDE }

⇒ ANTICHOLINERGIC EFFECT

↓
SHORTENING OF

CLASS Ib

* LIDOCAINE:-

⇒ I/v route

⇒ Doc for Ventricular tachycardia

⇒ s/e ⇒ Neurological s/e

Atrial flutter. ✓



Acute Attack $\Rightarrow$ Toc $\Rightarrow$ Card

Doc $\Rightarrow$ Ibutil

PROPHYLAXIS $\Rightarrow$ AMIODARONE $\Rightarrow$

- SVT

- PSVT

- Long term therapy in Congen

* $\begin{cases} \rightarrow A. fib \\ \rightarrow A. flutter \end{cases}$

* $\begin{cases} \rightarrow Angina \\ \rightarrow M.I \\ \rightarrow CH Failure \end{cases}$

I) ARTERIDOLAR DILATORS

① CCB

② Hydralazine

⇒ ↑ NO release

⇒ ↓ Intracellular Ca^{2+}

⇒ Rx of HTN emergency in pregnancy

③ Minoxidil -

⇒ K^{+} channel opener

⇒ HTN & Androgenic Alopecia

S/C ⇒ • Hypotension
• Hirsutism

Pharmacokinetics :-

Very high

↓

Very low

use: Doc for an acute

↳ patch → prophylaxis

② ISOSORBIDE DINITRATE (ISDN).

↓
Denitration
↓
Le
(1st pass

Isosorbide Mononitrate

① Na - NPTiopruside

Endothelium $\rightarrow$ NO $\rightarrow$ V.D
 $\downarrow$

Thyamide toxicity!

$\downarrow$

 Rhodanase

Thyamate $\rightarrow$  Hypothy
Neurop

Use: - HTN emergency

2nd line drug:-

$\rightarrow$ Aortic dissection & BQ

I) Renin $\ominus$ TNP 15

- * ALISIRSEN
- * Renekren
- * Gnalekren

use:-

2nd line drugs in HTN.

II) ACE $\ominus$

- * Gnalepril
- * Captopril
- * Lisinopril
- * Fosinopril

Use:-

T ACE $\ominus$ / ARB

DOC = HTN { CL
DA
M

Ist line drug $\Rightarrow$ HTN

use $\rightarrow$ CHF $\Rightarrow$ $\downarrow$ M

Isolated: Nephrotic Syndrome

c/I: I) Pregnancy $\Rightarrow$ T

II) B/L RAS



NICORANDIL $\Rightarrow$

K⁺ channel O



↓ Contraction



↓ Mortality



IRABRIDINE $\Rightarrow$

Inhibiting func



↓ Ca²⁺ in



↓ in H₂O



↓ O₂ d



↓ Mort

Use:- a) CHF
b) Angina.

* ↓ preload and Afterload
↑

II.) Hydralazine + IDN

III.) ALDOSTERONE ANTAGONIST:-

Acute/chronic DeCompensated CHF

↑ve INOTROPES:-

I.) SYMPATHOMIMETICS,

a.) DOPAMINE

b.) DOBUTAMINE

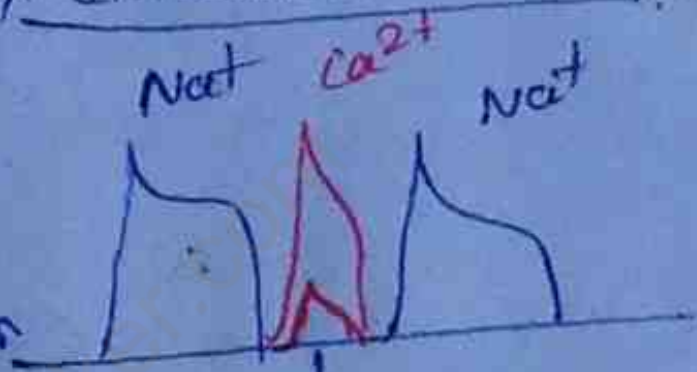
II.) DIGITALIS,

- a) ~~celtate~~

$\uparrow$ Intracellular Ca^{2+}
 $\downarrow$
 $\uparrow$ Intracellular Ca^{2+}

Released $\Rightarrow$ $\uparrow$ Contraction

$\uparrow$ Intracellular Ca^{2+}



Extrasystole $\rightarrow$ Bigeminy
Trigeminy

VT

Bidirectional
tachycardia
self-sustained
tachycardia

N-fib

Doc $\Rightarrow$

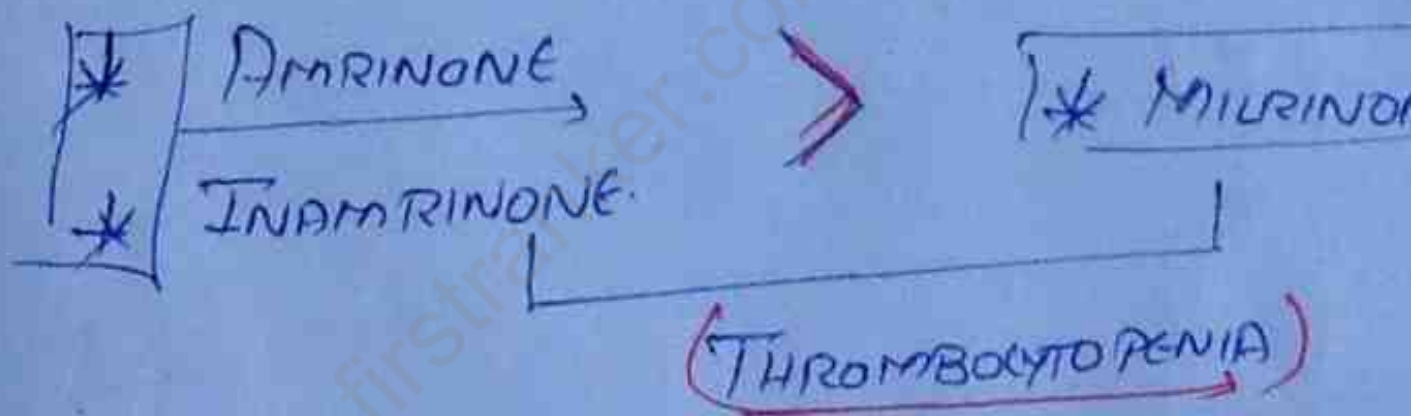
on 1st Cardioversion
Toc 3. Amiodarone
 K^+ [Doc]

I.) Name of BNP analogue

II.) Enzyme Metabolised?

III.) Route of Administration?

IV.) INODILATORS: $\rightarrow$ $\oplus$ Inotropic effect
 $\rightarrow$ Vasodilatory effect



* LEVOSIMANDAN

$\Rightarrow$ Sensitises the myocardium

S/C: * Myopathy

II.) BILE ACID BINDING RESINS:-

- * Cholestyramine
- * Colestipol
- * COLESEVELAM

MOA:- ⁽⁺⁾
B. Acid

(-) G.H.C



↓ Bile acid in liver



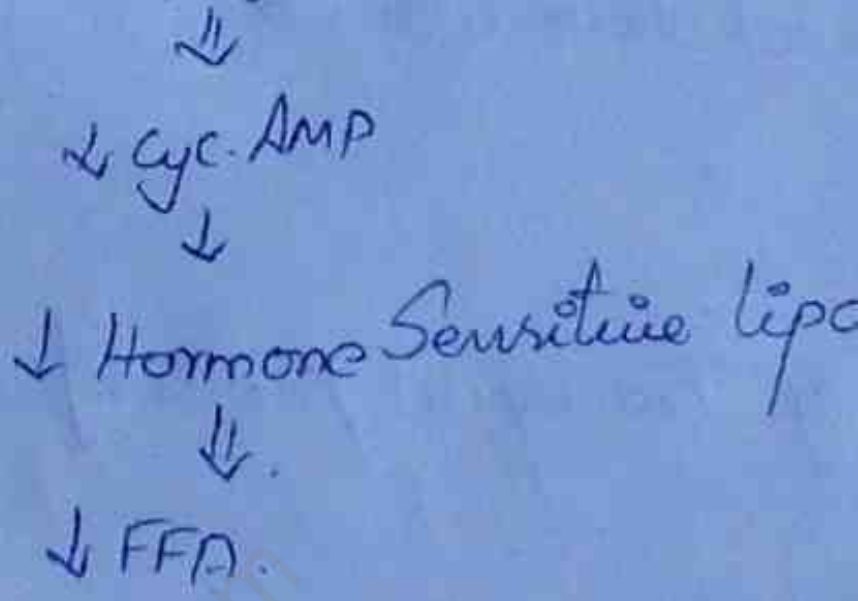
↑ Comp. BA synthesis



↓ cholesterol

MOA $\Rightarrow$

In Adipocytes



$\Rightarrow$ $\uparrow$ HDL $\Rightarrow$ Max *

white

s/c:

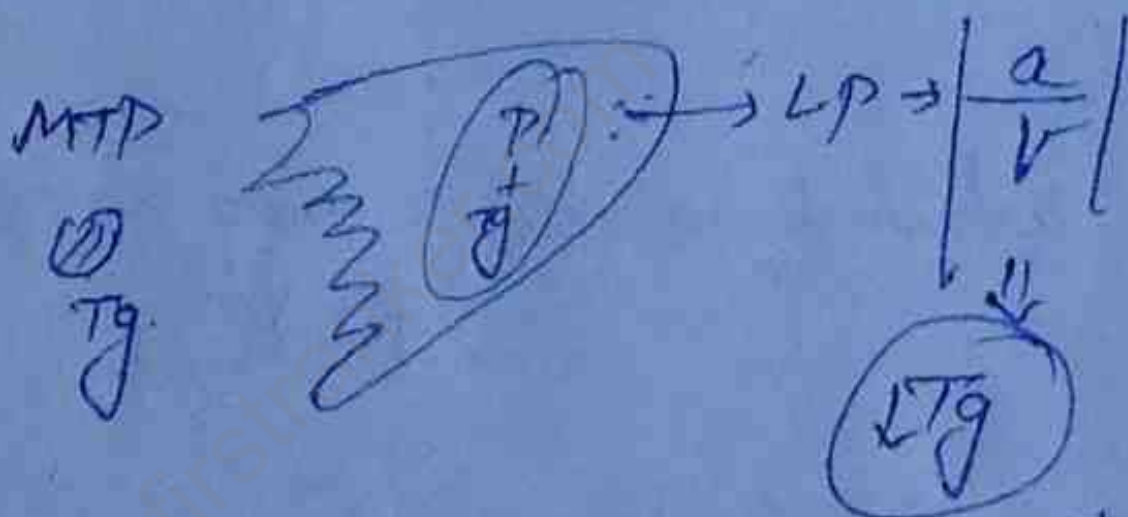
* Flushing : Doc $\Rightarrow$ Indometh

MOA $\Rightarrow$ $\ominus$ VLDL Tg Synthesis by liver.

Rx:- Familial Hypercholesterolemia

VII) LOMETAPIDISE:-

MOA $\Rightarrow$ $\ominus$ MTP [Microsomal Tg Transf.



use:- Hypertriglyceridemia.

⑤ $\uparrow K^+$ loss $\Rightarrow$ Hypokalemia

⑥ $\downarrow$ Aqueous production $\Rightarrow$ used in Glaucoma

I) Acet

II) BR

III) DOR

⑦ $\downarrow$ CSF production $\Rightarrow$ Acetazolam

* Conc
* H₂O

Hyperuric

Hypercalc
Ca²⁺ stor

Hypomagn

Hypokale

Faster

b.) Comp absorption of
uric acid

⇒

c.) ↑↑ Ca²⁺ loss in
urine

⇒

d.) ↑ Mg⁺⁺ loss in urine

⇒

e.) ↑ K⁺ loss

⇒

f.) V.D + pulm. edema

⇒

DRUGS:

I.) Furosemide

II.) Torsemide

III.) Bumetanide [most potent]

IV.) Ethacrynic acid

most
ototoxicity

st/ Oto

Fr

Ca

They ↑

c)

Con ⊖ V.A
excretion

⇒ Hyp

d)

↑ K⁺ loss

⇒ Hyp

e)

VD

⇒

1st line drug ⇒

↳ DO C = HTN & CR

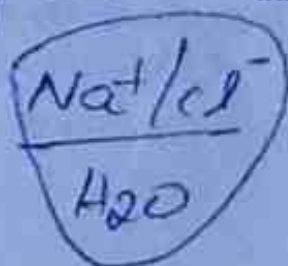
f)

↓ Insulin release ⇒ Hypergly

g)

Hyperlipidemia

SPECIFIC



* Isotonic

CONIVAPTAN
↓
TOLVAPTAN
↓
DOC ⇒ SIADH

Free H_2O

↓
[Free H_2O clearance]

→ +ve ⇒ Hypotonic
→ 0 ⇒ Isotonic
→ -ve ⇒ Hypertonic

↓
[1ed]

→ ^{DI}Lithium
→ Demeclocycline
→ Vaptans

Drugs Acting on

- I.) Block Na^+ channel
- II.) Block Ca^{2+} channel
- III.) Open Cl^- channel
- IV.) open K^+ channel

T.) Ca^{2+} channel Blockers:-

→ Na Valproate

- Most wide spectrum antiepileptic

- a) Ca^{2+}
- b) Na^+
- c) $\uparrow$
- d) $\downarrow$

Use:-

- (i) GTCS
- (ii) Myoclonic seizure
- (iii) Absence seizure

[Doc]

use:- Partial Seizure.

Doc $\left\{ \begin{array}{l} \text{Valproate} \\ \text{(or)} \\ \text{Lamotrigine} \end{array} \right.$



⇒ ETHOSUXIMIDE:
* Doc for Absence seizure in children.

II) Na⁺ channel Blockers:

* PHENYTOIN [Diphenylhydantoin] :-

USE :-

- GTCS
- Myoclonic seizure [JME]
- parkinsonism d/s.
- peripheral Neuropathic pain
-

S/E :-

Trigeminal Neuralgia *
→ Rx Of Glossopharyngeal Neuralgia.

S/G:

H → Hypонатremia → Elderly → O₂ → GS
→ Hypersensitivity → Lymphadenopathy
E → Eosinophilia → SJS → Splenomegaly
A → Agranulocytosis, Aplastic Anemia.
D → Ataxia
→ Diplopia → Therapeutic drug Monitoring
S → Seizures [Myoclonic Seizures]

↓
Lossing
Gradual upward tapering ↑↑↑↑↑

* TOPIRAMATE:

→ $\text{Na}^+ \ominus$
→ $\text{Kainate R} \ominus \Rightarrow \downarrow$ trial for Codepen

- GTCs

- MS

- Partial Seizure

- LGS

→ Bipolar disorder

→ prophylaxis of Migraine

S/G: Wt-loss $\Rightarrow \downarrow$ trial for Rx - Obesity

Weak Carbonic Anhydrase inhibitors $\Rightarrow$!

IV) ↓ Glutamate

NMDA receptor ⊖

* Felbamate

→ GTCs

S/G :- $\begin{cases} \rightarrow \text{B.M} \downarrow \\ \rightarrow \text{Hepatotoxicity} \end{cases}$

AMPA receptor

* Perampanel

* Tenampate

V) ↑ GABA

GABAPENTIN :-

- BPD Rx
- Prophylaxis of trigeminal

FIRST LINE DRUGS
for
Peripheral Neuropathy

I) GABA $\begin{cases} \rightarrow \text{Pregabalin} \\ \rightarrow \text{Gabapentin} \end{cases}$

II) TCA $\rightarrow$ Nortriptyline

III) SNRI $\rightarrow$ Duloxetine

Baclofen

use: SPASTIC PARESIS.

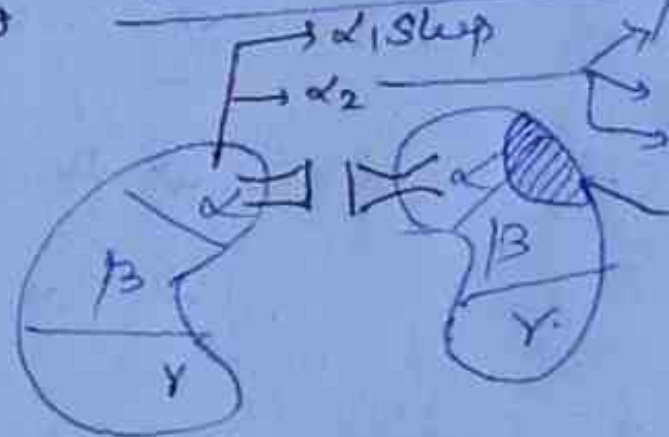
Reuptake



Anxiolytic Sleep

I) GABA_A Agonists →

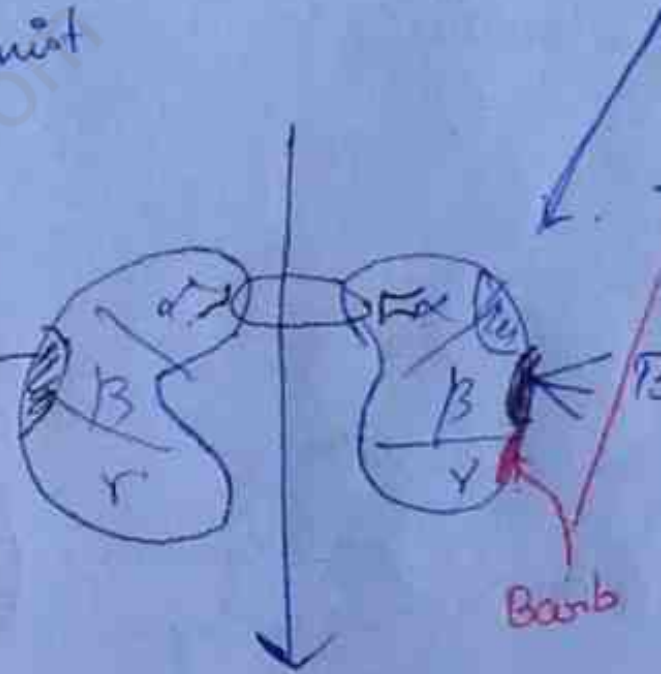
Cl⁻ ion channel Rec



Inverse Agonist

β -Carboline (I.A)

FLUMAZENIL Antagonist



Cl⁻ ion Conductance

* Preanesthetic Medications

I/v { → Lorazepam
 → Midazolam

* Muscle Relaxants

→ Diazepam

* Abused

→ Flunitrazepam. ⇒ "Roofies"

⇒ 1

Date rape [Tasteless]

* Alcohol toxicity : Doc.

{ → Midazolam
 → Oxazepam.

Alcohol withdrawal

→ Diazepam

→ BZD
→ Clonidine

Pharmacokinetics :-

METABOLISM

① → P.I = CYP3A4
→ P.II = Glucuronidation

↓

Longest acting

Min dependence
&
Withdrawal
Symptoms.

* Diazepam
* Clonazepam
* Chlordiazepoxide

② → P.I = CYP3A4
→ P.II = Fast
glucuronidation

↓

Shortest acting

Max. dependence
&
Withdrawal
Symptoms.

* Midazolam
* Triazolam

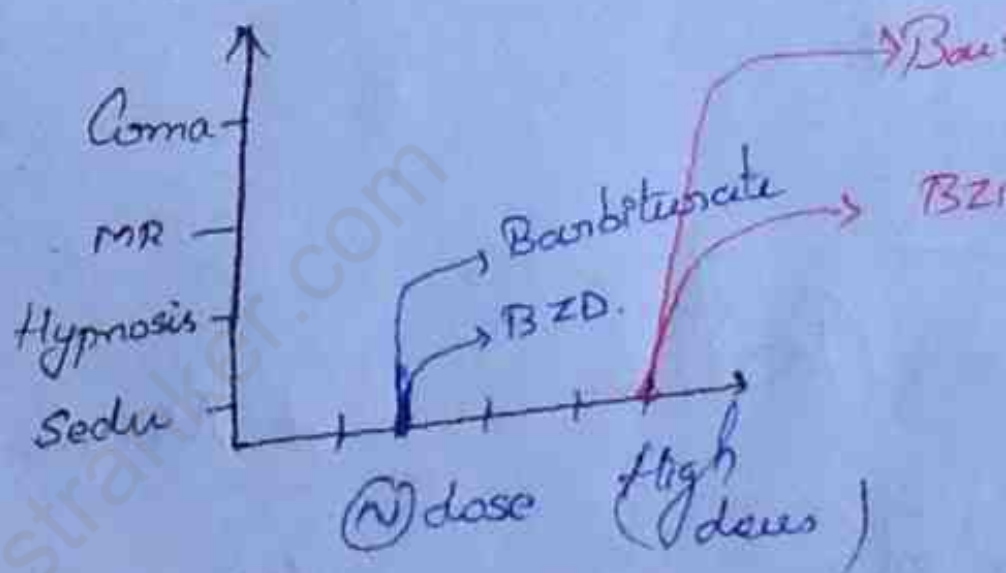
MOA:-

(i) GABA_A ⊕

(ii) ↓ Glutamate

(iii) At High doses ⇒ GABA mimetic

Highly unsafe at High dose



Pharmacokinetics

Duration of Action

Short acting

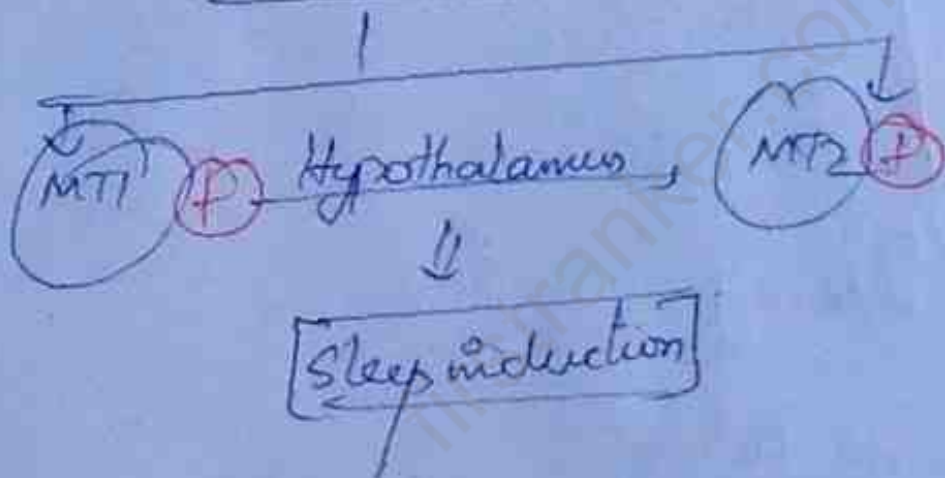
- Butobarbital
- Secobarbital
- Pentobarbital

② Melatonin ⊕

Darkness

↓
Pineal gland

↓
Melatonin



⇒ Less chance of dependence as compared to BZD.

Ramelte

↳ Low

↳ High

↳ BZD

↳ 1/2

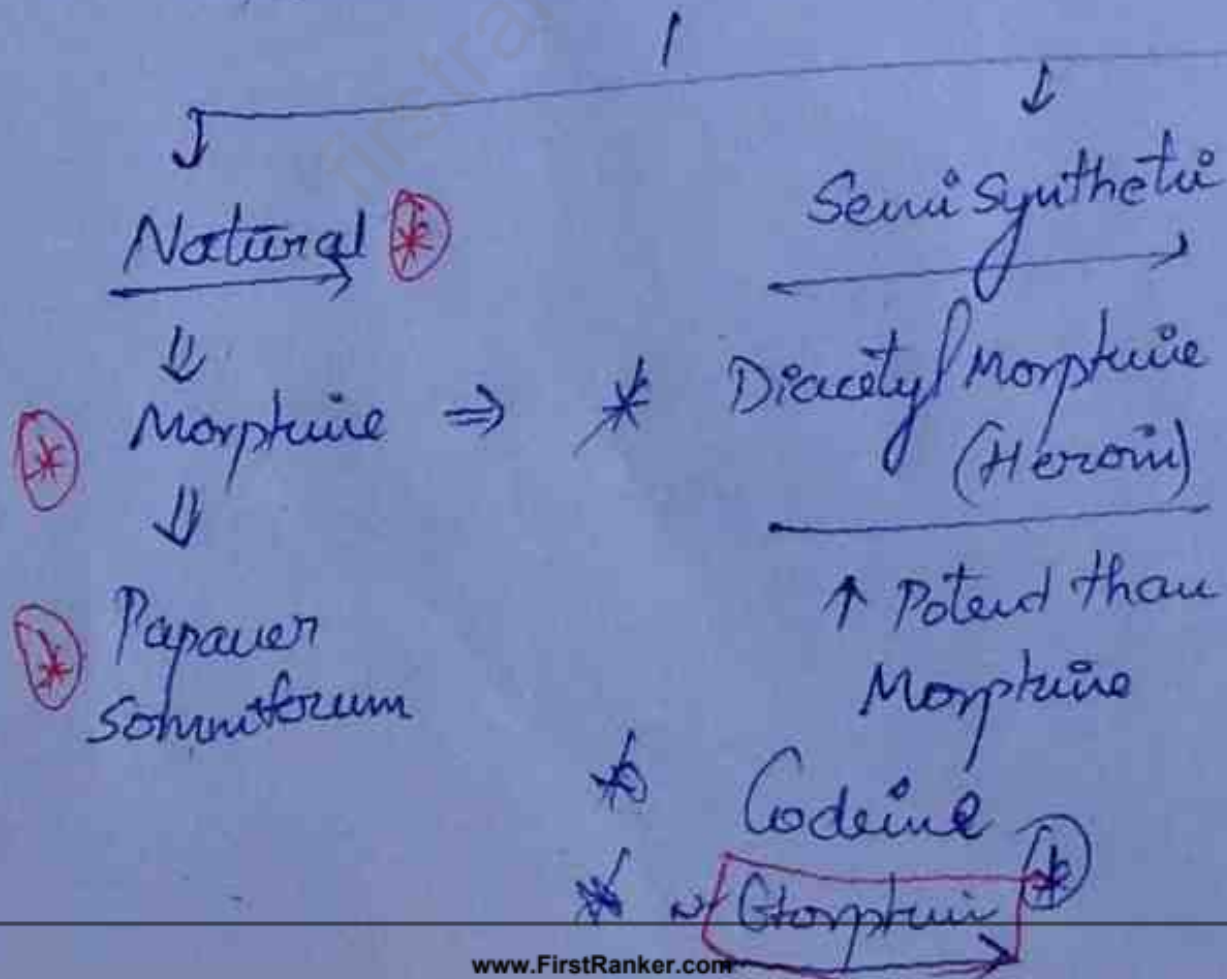
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II) ENDOGENOUS OPIOIDS

* ENKEPHALIN	⇒	δ (most potent)	D
* ENDORPHIN	⇒	μ	M
* DYNORPHIN	⇒	κ	K
* NOCICEPTION	⇒		

III) EXOGENOUS OPIOIDS

A) Based on Source



↓ Cancer patients (MM)

↓ MI

* Pulmonary edema

* Antitussive effect

C/I :- Head injury

[↑ ICT]

* PETHIDINE (Meprobazine)

• Analgesic (Magonine)

• post anesthetic shills

[Tramadol]

Pharmacokinetics :-

Pethidine

↓ MAO

Pethidine acid

↓ ⊕

Kidney

Two C/I :

a) No MAO

b) Renal failure

[Rapid]

* Loperamide:-

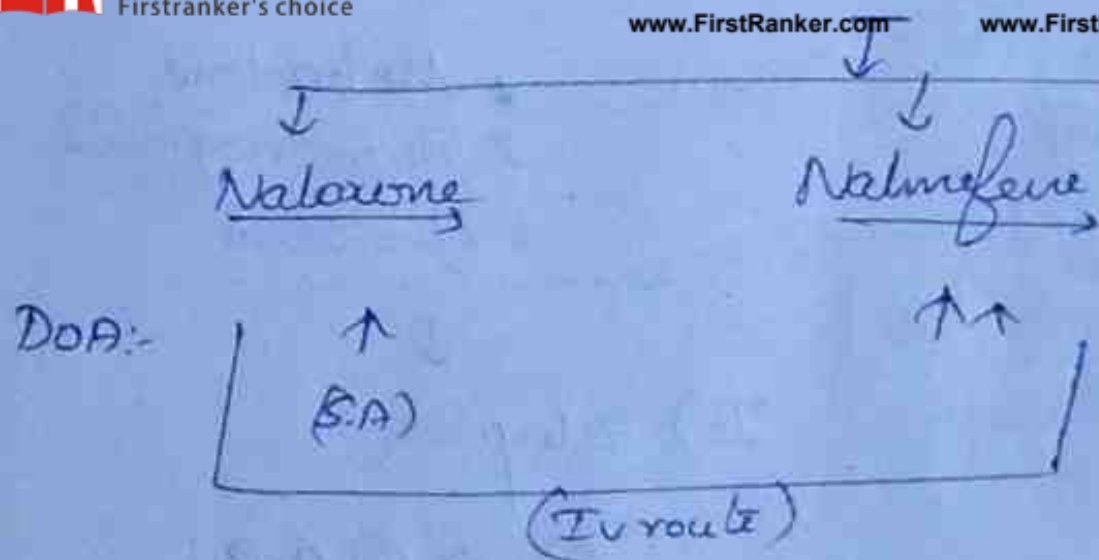
[Use:] Doc $\Rightarrow$ IBS & diarrhea

[C/I:] :- Infectious diarrhea

* Tramadol:-

* $\ominus$ reuptake of NE and Dopamine

* Use:- (i) Analgesic for mild to moderate pain.
(ii) Post-anesthetic shills



Use:- Rx of opioid toxicity (Naloxone)

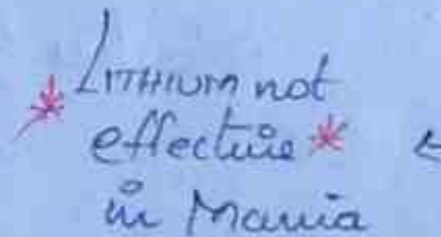
S/E: Naloxone

↑ Catecholamines;

→ HTN
→ pulm. Edema
→ Arrhythmia.

Naloxone do not cause
seizure but used in
Rx of seizures.

T - Increased temperature
A - Hyperventilation
D - Diarrhea
R - Rhinorrhea
IA - Anxiety
W - M = Myalgia
L - Lacrimation



Ex: unipolar depression

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- * Pregnancy not safe
due to Ebstein anomaly
- * Leucytosis

Precautions :-

- * $LP \equiv Na$ are similar [diuretics]
 $\downarrow$ $\downarrow$
 Retention $\rightarrow$ Na^+ loss

[Toxicity] $\rightarrow$ Diuretics $\&$ in Lithium toxicity

II) OTHER DRUGS Used in Bipolar disorder:

- V $\rightarrow$ Valproate
- O $\rightarrow$ Oxcarbazepine (CBZ)
- L $\rightarrow$ Lamotrigine
- T $\rightarrow$ Topiramate
- A $\rightarrow$ Atypical Ap
- G $\rightarrow$ Gabapentin
- E $\rightarrow$

* Nortriptyline $\Rightarrow$ used in peripheral neuropathy

* Doxepin $\Rightarrow$ Antihistamine
TCIA

* Amoxapine

$D_2 \ominus \Rightarrow$ Psychosis progression.
 $\rightarrow$ Loxapine Atypical

S/C:- Binds to many receptors (other receptors)

$\left[\begin{array}{l} H_1 \ominus \\ H_1 \ominus \\ 5HT \ominus \end{array} \right] \Rightarrow$ Sedation
 $\Rightarrow$ (Anorexia effect) $\Rightarrow$ OBG ST
 $\rightarrow \alpha_1 \ominus \Rightarrow$ Gaculation abnormalities

I) $\Rightarrow$ Doc $\Rightarrow$ perimenopausal hot flashes

II) $\Rightarrow$ Doc for depression

DRUGS:

* FLUOXETINE (50 hrs)



Nordfluoxetine (200 hrs)
(Active metabolites)

$\Rightarrow$ Longest acting (no withdrawal)

* FLUOXAMINE = shortest-acting



Doc $\rightarrow$ OOC in children

Doc $\rightarrow$ Depression in older

* Doc for depression in children
OOD

S/C Thrombocytopenia

use: ED

Q. Tetracyclic A.D

→ MIRTAZAPINE
→ MAPROTILINE

Anticholinergic effect



Sedation

use:- [Depression & Insomnia]

- b.) Tourette syndrome
- c.) ADHD
- d.) Mania
- e.) Migraine
- f.) Antiemetics } $D_2 \ominus$
- g.) Prokinetics }
- h.) Antipsychotics } $H_1 \ominus$

CTI in closed angle glaucoma :-

*SO CLOZAPINE

FLUPHENAZINE (Anticholinergic
Effect
Very less)

EPS:

- Acute dystonia
- Akathisia → [TCA
SPRIS.

• Parkinsonism +

Rx for (Doe)
Drug induced
Parkinsonism

• Hyperprolactinemia

• Oculogyric Crisis

• Perioral tremor [Rabbit Syndrome] ↓

→ Tardive dyskinesia

↓
D₂ receptor Supersensitivity

→ No M.S. ⇒ Rx: Dantrolene (Doe)

↓
Followed by

D₂ ⊕ = [most specific]

→ Drug induced psychosis.
[Levodopa; Dopamine]

S/e: • Obesity → 2nd M/C

ADPG 14

→ Myocarditis

→ Seizures

→ Agranulocytosis

Li + CBZ

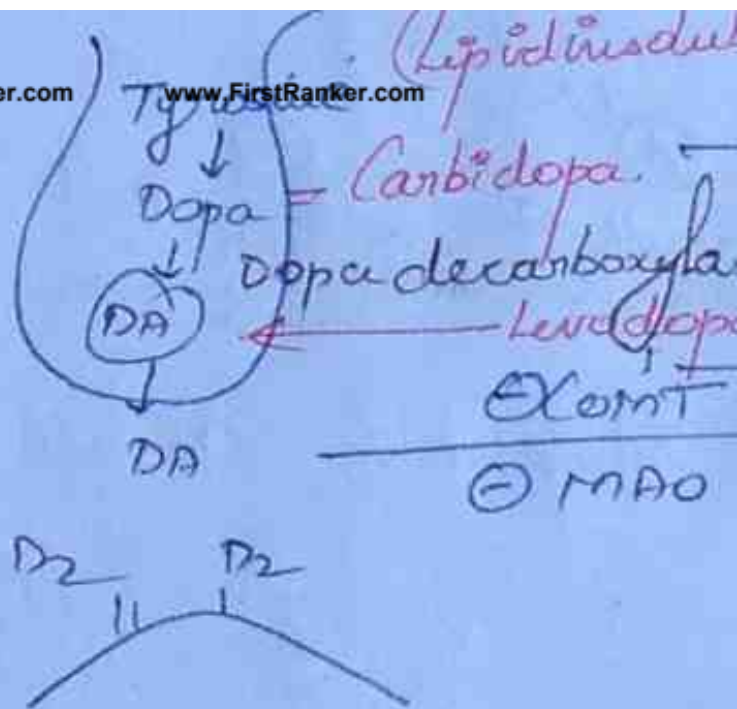
TDM cannot be

* Quetiapine: • Cataract

• QT prolongation

* Ziprasidone ⇒ Max QT prolongation
Min wt gain

* Aripiprazole ⇒ Doesn't ⊖ D₂ rec
Atypical Ap of choice

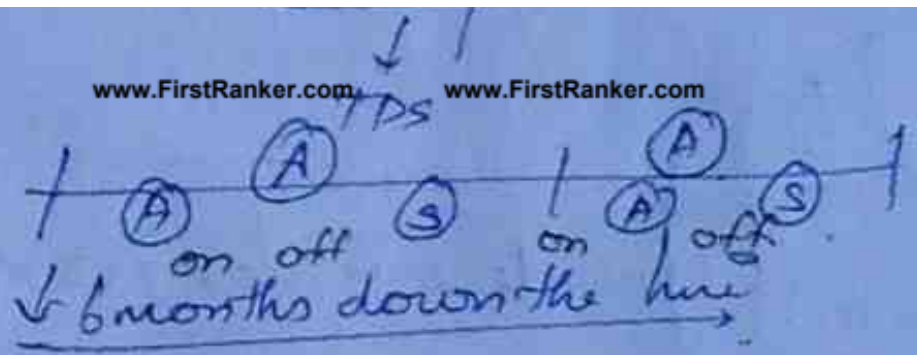


* (Levodopa + Carbidopa) to inhibit Dopa de

* Carbidopa + Levodopa + COMT

* Which class of drugs can ↑ Levodopa
↓
COMT

* B₆ Contraindicated



Doc: MAO-Inhibitors for On-off ph

II.) MAO $\ominus$ $\rightarrow$
 $\rightarrow$ Rasagiline $\rightarrow$ $\uparrow$ Potent
 $\rightarrow$ Selegiline

Use: Doc for on-off phenomenon

Young onset P.D

S/E → Acute edema
→ Lúndu reticulosis.

Lúndu

II) BACITRACIN:-

MOA:- ⊖ Transport of cell wall unit
→ Toxic on systemic adminis

Topical antibiotic

III) CYCLOSERINE:-

- Analogue of d-alanine
- It inhibits Glycine.
- It is used as a second line T.R.

S/E → Neuropsychiatric

Gram +ve

* Penicillin G

↳ Large Gram -ve cocci.

* - Route :- → Parenteral (Preferred route)
Oral → Can be given ⇒ Poor

USE:-

Doc: a) Streptococcus

b) Syphilis → All stages ⇒ Doc ⇒
↳ CNS stage ⇒ Doc ⇒

c) Actinomycosis

d) Leptospirosis

e) Gas gangrene

f) Yaws

g) Anthrax

② Poor Oral Absorption:

- Broken down by HCl

↓
Amin

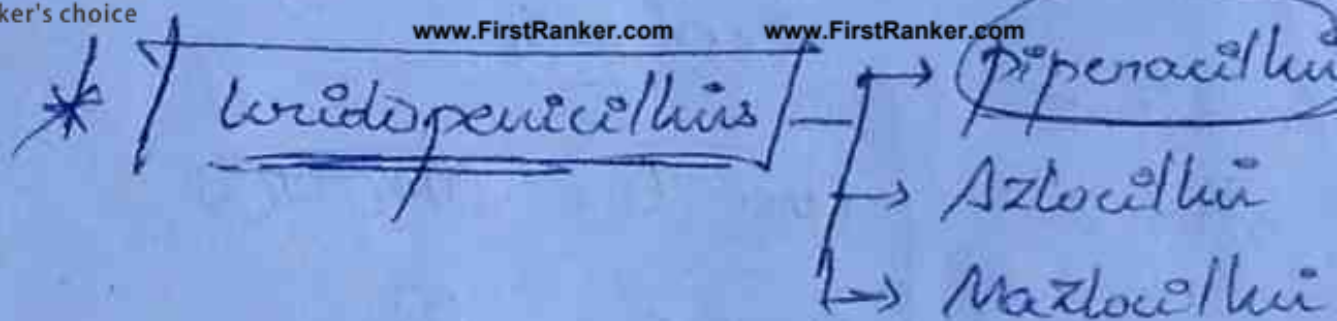
⇓

Oral penicillins

→ Penicillin - V

→ OXACILLIN.

→ CLOXACILLIN/DICLOXACILL



Others :-

80% ~~x~~

Doc is CARBEPENAMASE

[Ampicillin + Substanz!]

iv.) IV th gen



IRSA / VRE

* Doc: - Daptomycin

* A patient of IRSA & sensitivity
DOC is. [Empirical drug of choice]



[DAPTOMYCIN] ⇒ [Emp]

Others:-

- (i) Linezolid
- (ii) Streptogramins
- (iii) Tigecycline

GONORRHEA

[Resistant Gonorrhea]

- E. coli
- Klebsiella
- Providencia
- H. influenza

Xam → Cefixime

Pseudomonas

(2)

* Doc: Ceftriaxone

* Toc: Ceftriaxone + Gentamicin

* MDR: Colistin

Drugs:-

* IMIPENAM

* short acting drug.

↓

Rapidly metabolised by Renal

* Combine with Cilastatin

* ERTAPENAM:-

* Longest acting

* MEROPENAM

* DORIPENAM



$\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ Eigenvalue
Eigenvector

$\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ Eigenvalue
Eigenvector

1. 1st part solved

2. 2nd part solved
3. 3rd part solved
4. 4th part solved
5. 5th part solved
6. 6th part solved
7. 7th part solved
8. 8th part solved
9. 9th part solved
10. 10th part solved

* Doxycycline

use: Doc

INDICATIONS

My → Mycoplasma

R → Rickettsia

B → Brucella
B → Brucella

C → Chlamydia
C → Chlamydia

Doc → Pleuroderis
Doc → Pericarditis

use: * Chloroquine resistant malaria

* MRSA

- ⇒ Bone growth abnormality
- ⇒ photokeratitis
- ⇒ Vertigo [max neurocytine]

children

→ Enterococcus

* Streptomycin:-

→ plague
→ Tularemia

→ Pseudomonas.

→ 2nd line T.B drug.

- * Amikacin
- * Capromycin
- * Kanamycin
- * Tobramycin

2nd line TB.

[Inhalational pseudomonas]

* Cholestyramine
* Hypertrophic pyloric stenosis
* Motilin receptors $\Rightarrow$ $\rightarrow$ (stomach)
 $\rightarrow$ us

Prokinetic / $\leftarrow$ Motilin Receptor $\rightarrow$ Low

* Clarithromycin
* Azithromycin } 1st line drugs + (MAC) in

- Longest acting macrolide
 $\rightarrow$ DOC $\rightarrow$ Legionella
 $\rightarrow$ Chlamydia

DOC = Pregnancy $\rightarrow$ Chlamydia
 $\rightarrow$ Cholera
 $\rightarrow$ Mycoplasma

→ ^{www.FirstRanker.com} Supradiephragmatic (Pseudo)
→ ^{www.FirstRanker.com} Intradiephragmatic (Bacter)

S/E:- Pseudomembranous Gnt

④ Fidoxamicin :-

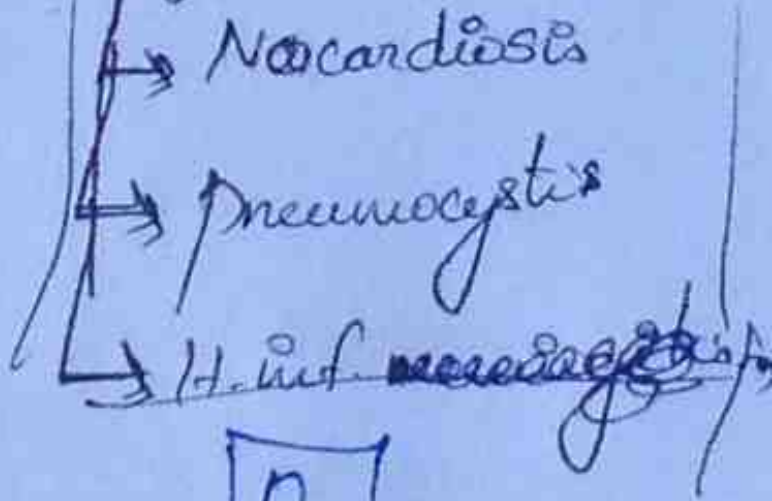
MOA:- RNA polymerase ②

Oral:- Pseudomonas enterocolit

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C/T:

Doc for Rx of cystitis



* Sulfazoxazole Qu

most H₂O Soluble.

* Sulfadiazine pyrimethamine?

S/C:

* Rash

* Crystalluria

* Bone Marrow Suppression

* ↑ PP Binding

→ Toxicity
→ kernicterus

* Methemoglobinemia

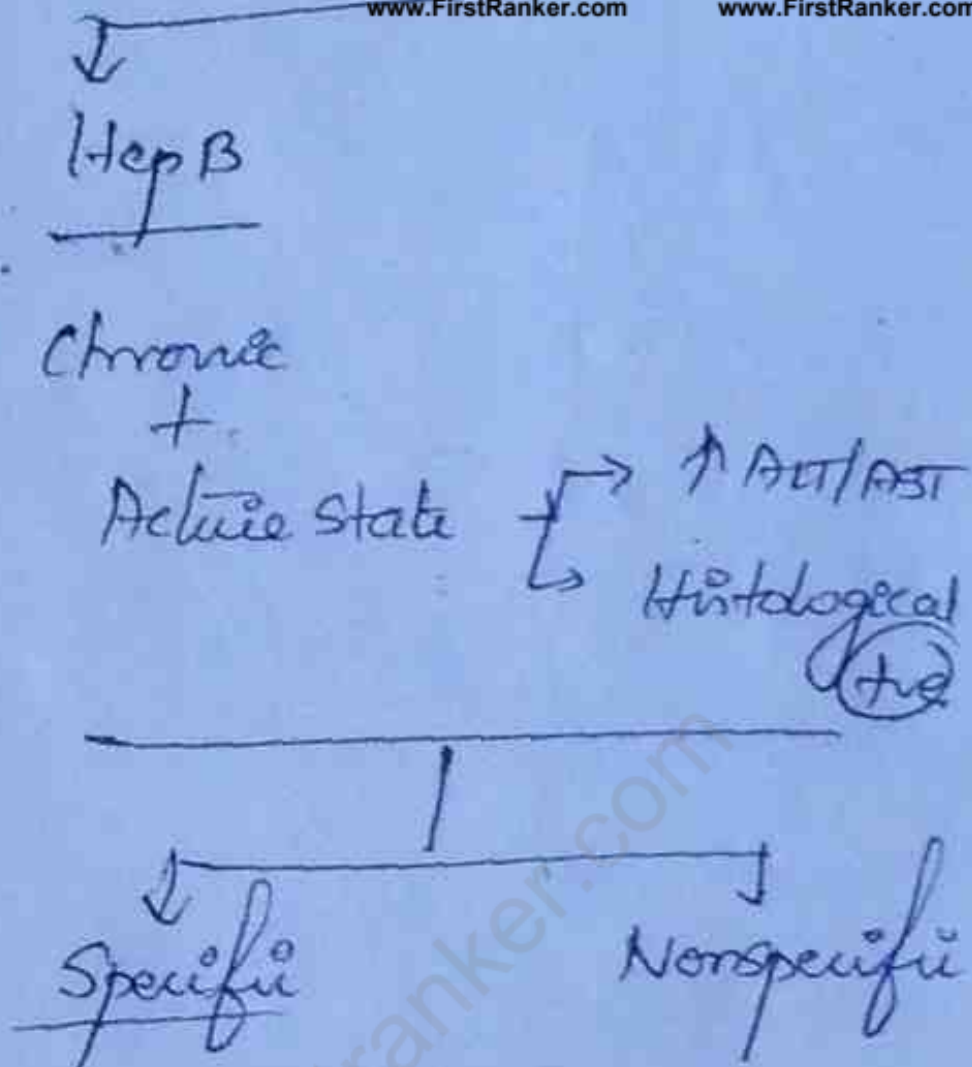
* Allp.

Ques: Doc $\begin{cases} \rightarrow \text{HSV} \\ \rightarrow \text{VZV} \end{cases}$

Resistance

Doc $\Rightarrow$ Foscarnet

- $\rightarrow$ Fomocine
- $\rightarrow$ Aciclovir



* ENTECAVIR

Most effective

Doc → Hep B. ✓

* ADEFOVIR

→ poor oral absorption

→ prodrug

→ Adefovir dipivoxil

MOA $\Rightarrow$ RNA polymerase $\ominus$

Use $\Rightarrow$ Hep C & Rubella virus

Zidovudine Perinatal prevention

[ive

post exposure

Toc = Zid + L

S/C:

* Bone Marrow ↓

* Myopathy

* Insomnia

* Hepatotoxicity [only

MOR ⇒ R.T Mutation

use - 2nd line

1) INTEGRASE INHIBITORS:

→ Raltegravir. 
→ Solitegravir

use: Add on drugs (HIV)

(Keep

S/C $\Rightarrow$ Nephrotoxic drug!

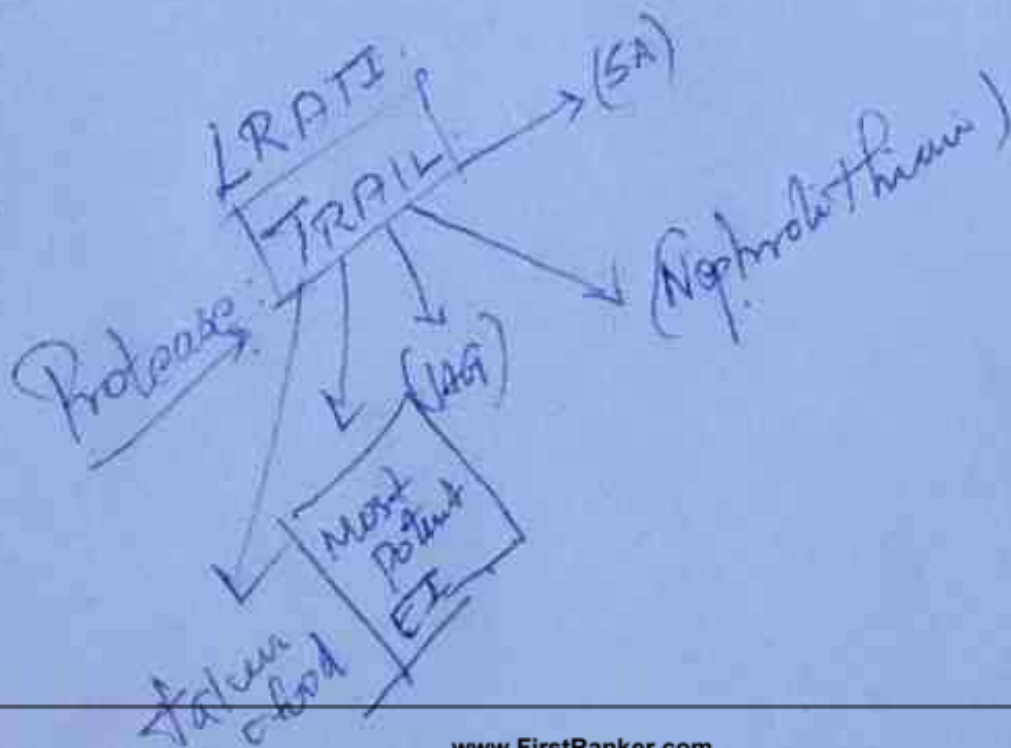
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Prevent

- ① preload $\pm$ 1-2 Na
- ② Amphotericin B $\pm$ Ig

- Hypokalemia (KCl)
- Hypomagnesemia
- Anemia



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Doc $\Rightarrow$ Steroid synth

4

20/4

China Conazole

$\Rightarrow$ onychomycosis

Isura Cona Zoni unj

→ Aspengell

мисоту

use $\rightarrow$ Doc + Bernoulli byte



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* D. Saccaudus

IVERMECTIN $\Rightarrow$ * stimulating glutamate @

$\Downarrow$
Only on Nematode

* Albendazole resistant &

Rx $\Rightarrow$ Ivermectin

* Induce Flaccid paralysis

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Visceral, [kala azar]

Dox = $\frac{1}{2}$ AMB.

- I.) * MILTEFOSINE $\Rightarrow$ ORAL (AIIMS)
- II.) * Sodium Stibogluconate
- III.) * Paromomycin
- IV.) * Pentamidine
- V.) * Sitamaquine.

Pyruvate ferrodoxin Oxid

V) MALARIA:-

Hypnozoites

Oral vivax

[Relapses]

①

Gametocytes

↓
Infective form
mosquito
transmission

* Primaquine

→ Radical cure

→ Terminal

Prophylaxis

- Absolutely C/I in pregnancy

→ Quinine/chloroquine

→ Primaquine
→ Artemisinin
group

- Chloroquine resistant Malaria

Doc: - Oral Artesunate 200

Regimens:-

- I.) Oral Artesunate + Mefloquine
- II.) Oral Artesunate + Sulfadoxine
- III.) Artemether + Lumefantrine
- IV.) Quinine + (Tetra/Doxy/Chl)

I) BEDAQVILINE

MOA: ⊖ Mycobacterial ATP Synthase

MDR TB

II) DERAMANID

↓ trial ⇒ MDR TB

DIABETES MELLITUS:-

I) CHOLESTYRAMINE

II) SGLT 2 Inhibitors : [Canagliflozin, Dapag

m/c s/e ⇒ V

III) Dual PPAR agonist

Agonist @ γ and α

↓ Glucose

* Pioglitazone }
* Saroglitazone } Carimazumab

* Father of EBM → David Sackett

* Procedure:

i) Formulate a Question?

What is Doc for Rx of HT?

ii) Search literature → Meta
RCT

iii) Apply Statistics.

↳ Statistical tools

iv) Ans:- ACEG / ARB. Inc.

Grades of Evidences;

* Grade I :- meta analysis

* Grade II :- RCT.

* Grade III :- Open label trial (Poor)
Observational studies
↳ pilot study [small study]

* Grade IV :-

* Drug designing steps

* Phase 0, [microdosing]

⇒ 100 micrograms $\frac{1}{100}$ of Normal dose

⇒ Drug taken at doses

Bound to $100 \mu\text{g} / \frac{1}{100}$ of N.D.
Radioligand.

↓
Healthy volunteers

↓
[α , β , γ rays]

↓
Sampling

Pharmacokinetics

Pharmacodynamics

(v) Tropium

28.) * Atropa Belladonna [violet color]

29.) * Calabar beans

⇒ physostigmine extracted from bean

30.)

β -blockers

$\frac{\text{Bioavailability}}{100\%}$

30%

* Nadolol (LA)

* Esmolol (SA)

- (i) Epinephrine $\Rightarrow \uparrow \uparrow$ HR
(ii) NE $\Rightarrow \uparrow$ HR

34.) NEBIVOLOL $\Rightarrow$ Vasodilatation [NO]
IIIrd generation β blocker

35.) STRESS incontinence $\rightarrow$ Duloxetine

(Side effects will be more
Non selective)

- * Flavonate
- * Fesoterodine
- * oxybutynin
- * Tolterodine
- * Trospium

Stimulation of α_1 .

↓

↑ NE

↓

SNRI

↓

Duloxetine

Toxicity

No

(i)

(ii)

(iii)

(iv)

(v)

Digitally!

1st $\Rightarrow$ Vasculators:

CHRONIC CHF



Gradual $\downarrow$ in Cardiac output



$\downarrow$ in oxygen supply.



Baroreceptors stimulation

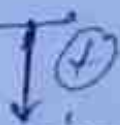


$\uparrow$ Endogenous Catecholamine



$\oplus$ Heart rate

DeCompensated



Compensated

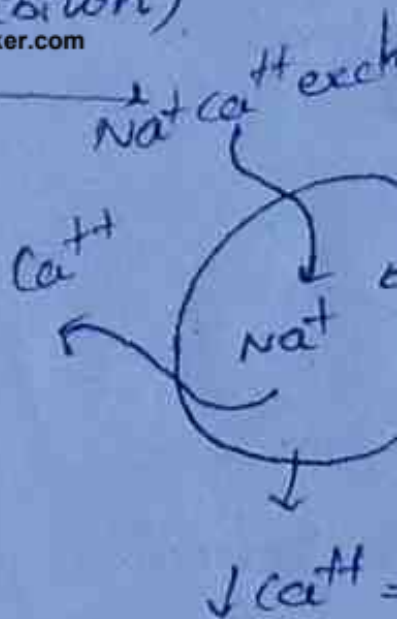


Acute

Doc $\Rightarrow$ β -block

* Ranolazine (Na⁺ channel inhibition)

→ Na⁺ Ca⁺⁺ exchanger:



* NICORANDIL → Open K⁺ channel

⇓
↑ Hyperpolarisation

↓
↓ O₂ demand

↓
↓ Mortality

BZD $\rightarrow$ Shortacting $\swarrow$

- * Lorazepam
- * Oxazepam

51) Levetiracetam:-

Inhibitor of SV2A protein

$\Downarrow$

[Synaptic Vesicular protein]

52) Lamotrigine:-

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