Plasma Half life

First order kinetics

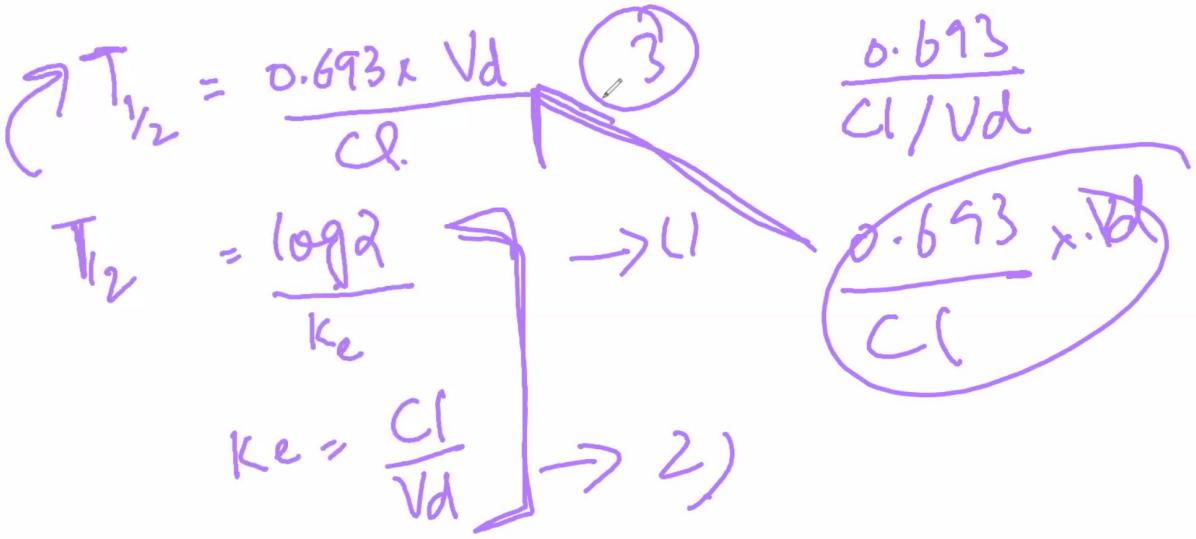
→ 90% follow rule. $T_{1/2}$ = Constant

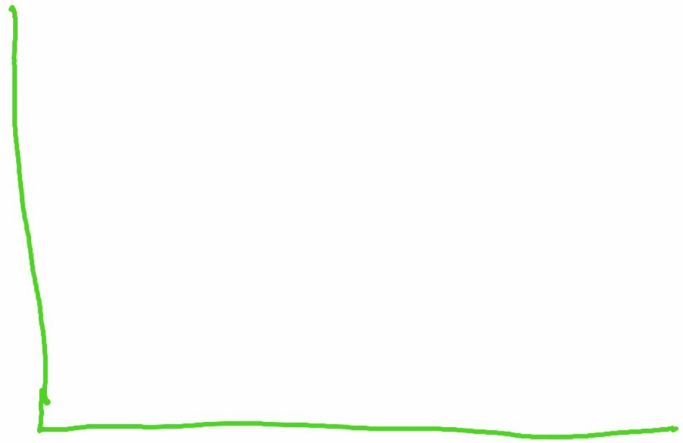
30 hr — 12 hrs. — 4 hrs $T_{1/2}$ = Variable.

Zero order kinetics

- Aspirin
- Alcohol (ethanol)
- Phenytoin

(Anticeizure)

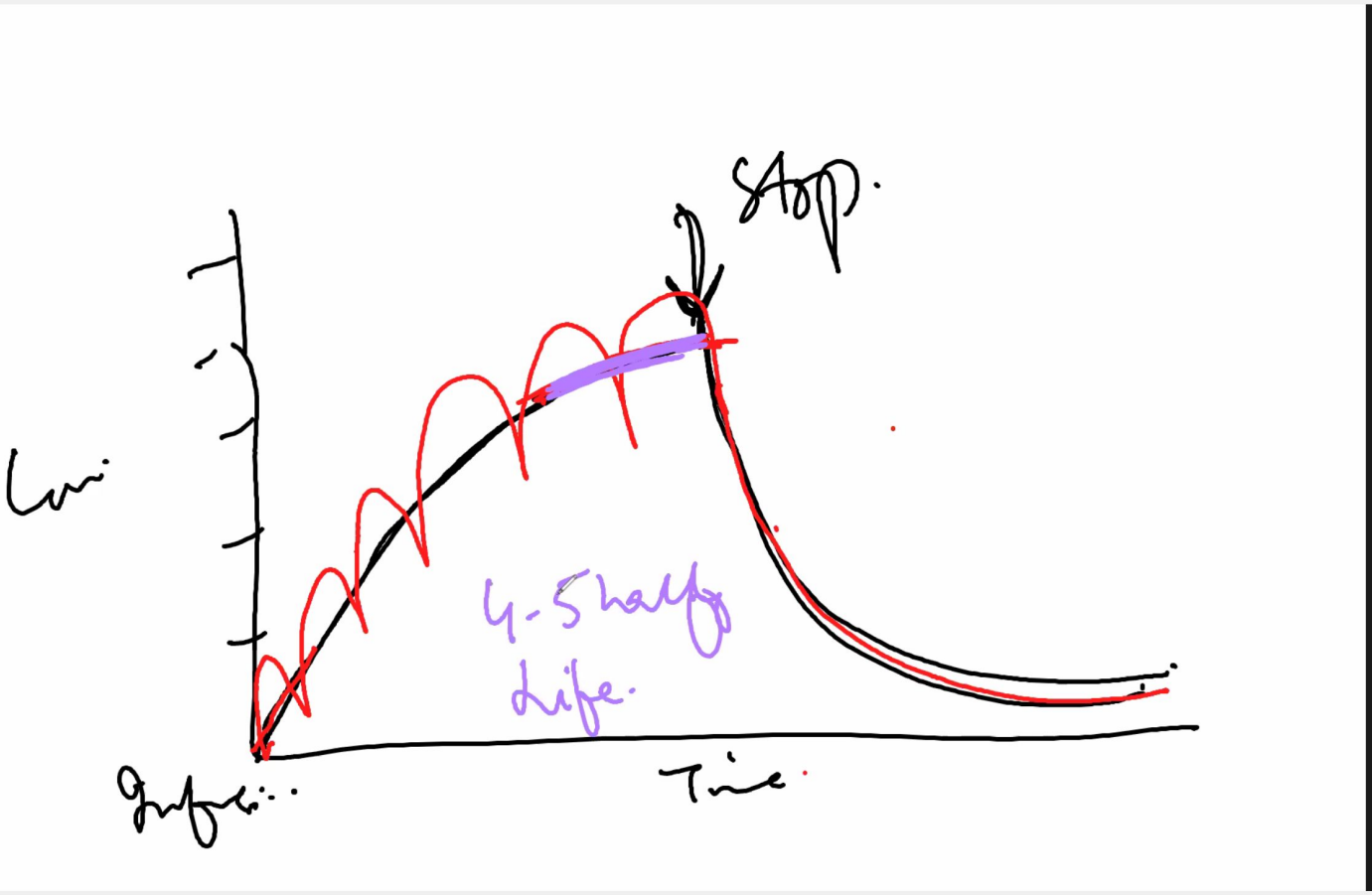

$T_{1/2} = \frac{0.693 \times Vd}{Cl}$
3
$\frac{0.693}{Cl/Vd}$
$T_{1/2} = \frac{\log 2}{k_e}$
→ 1)
$\frac{0.693 \times Vd}{Cl}$
$k_e = \frac{Cl}{Vd}$
→ 2)

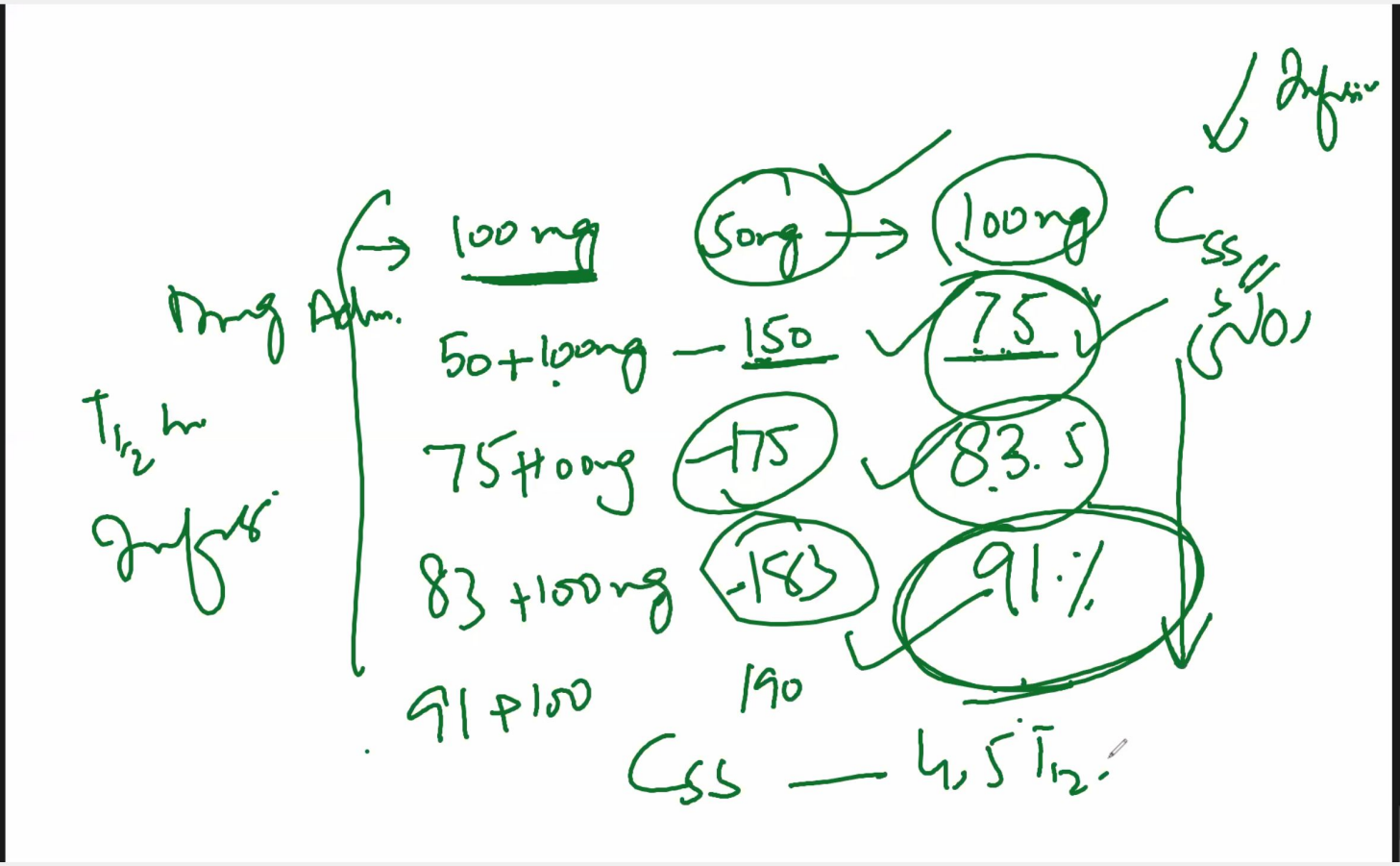


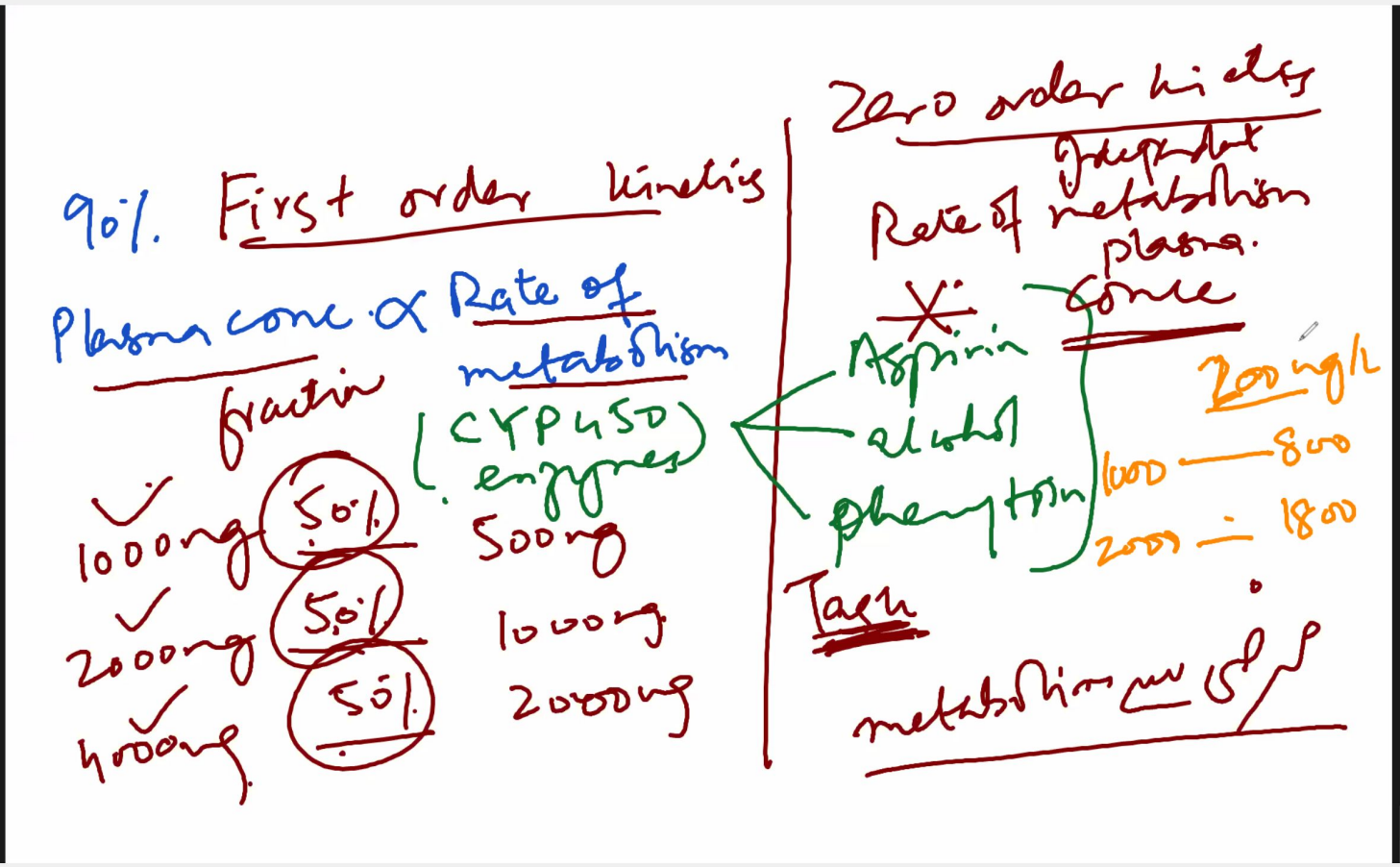
		Remaining in plasma
100mg	1hr	50mg
50mg	1hr	25
25	1hr	12.5
12.5	1hr	6.3
6.3	1hr	3.2

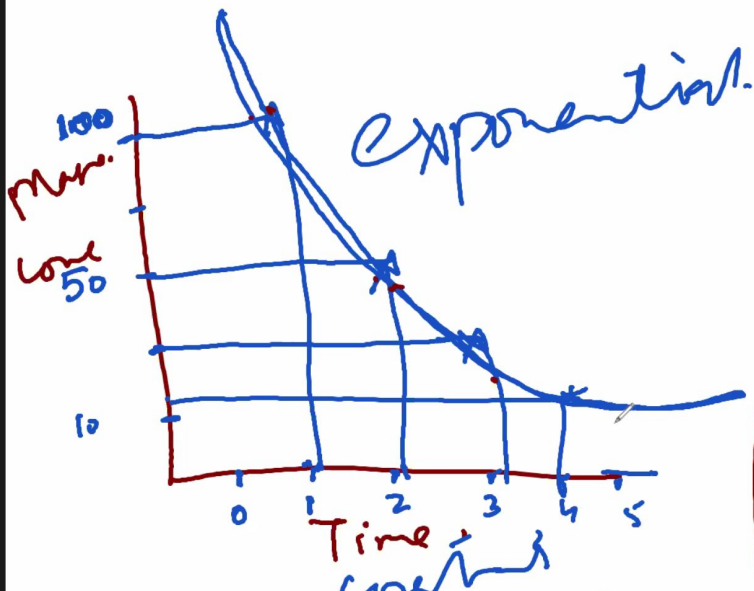
Negligible.

4-5 90% eliminate.


Stop.
4-5 half life.
Time


100 mg
50mg → 100mg
50+100mg — 150
75
75+100mg
175
83.5
83+100mg
183
91%
91+100
190
Css — 4.5 T1/2

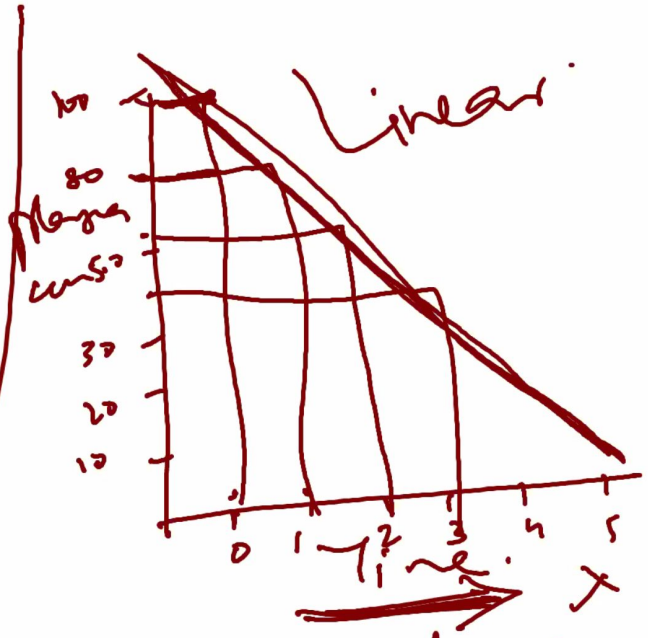

90%. First order kinetics
Plasma conc. ∝ Rate of metabolism
fraction
(CYP450 enzymes)
1000mg
50%
500mg
2000mg
50%
1000mg
4000mg
50%
2000mg
Zero order kinetics
Rate of metabolism
Independent
plasma conc
Aspirin
alcohol
phenytoin
200 mg/L
1000 — 800
2000 — 1800
Tash
metabolism



exponential.

constant

1st order kinetics



Linear.

zero order.

Importance of Plasma Half Life

- 1. Indicates how quickly a drug is removed from the plasma
- 2. Indicates duration of action of a drug
- 3. It determines the frequency of dosing for a drug i.e. a drug that a short half life will have to be given more frequently than that drug that has a longer half lives
- 4. Knowledge of t1/2 of different drugs helps us to choose between different drugs of a same group according to the requirement of duration of action. For example different Benzodiazepines have different half lives and we can chose according to requirement of duration of sedation