

1. An antibiotic was given by intravascular bolus injection at a dose of 500 mg. the apparent volume of distribution was 21L and the elimination half life was 6 hours. Urine was collected for 48 hours and 400 mg of the unchanged drug was recovered.

A) What is the fraction of the dose excreted unchanged in the urine

B) Calculate: k_e , Clr, TBCl and Clm of the drug

2. After 5 hours of IV bolus administration of 300 mg of a drug, where its distribution follows one compartment open model, 3 $\mu\text{g/ml}$ of plasma concentration was obtained, if the $V_d=12\text{ L}$ and the $\text{Clr} = 3\text{ L/h}$.

Calculate the maximum amount of drug excreted by urine

3. A disease such as viral hepatitis can affect the elimination of some drugs. An IV bolus administration of 30 mg of indocyanine green (ICG) was given to 60 kg subject during and after the recovery of viral hepatitis produced the following data:

During hepatitis (mg/L)	After hepatitis (mg/L)	Time (hours)
7.2	5.1	2.5
5.7	2.5	5.0
4.3	1.3	7.5
3.3	0.74	10.0
2.6	0.39	12.5
2.1	0.19	15

Calculate the following parameters after and during the recovery of acute viral hepatitis: $t_{1/2}$, K_e , V_d and the TBCI

4. If we consider two medicaments A and B and their pharmacokinetic parameters are reflected in the following table

Pharmacokinetic parameters	Drug (A)	Drug (B)
Ke	0.055 h ⁻¹	0.070 h ⁻¹
Protein binding	76%	20%
Xu [∞]	100 mg	400mg
Cp (3h)	10.59 μg/ml	4.08 μg/ml
X ₀	500mg	500mg
GFR	130 ml/min	130 ml/min

Indicate which mechanism is predominant in the renal excretion for each medicament?

5. From the following table, the following parameters were taken:

Pharmacokinetic parameters	Drug A	Drug B
P. plasma binding	70%	40%
Cl _r L/h	15	4.1
TBCl L/h	19.2	4.8

- a) Indicate how much % of the drug will be eliminated by extra renal via for each drug
- b) In which drug the tubular secretion is predominant mechanism if the GFR is 130 ml/min
- c) Calculate the k_m for both drugs if the $V_d = 15$ L

6. The c_p at time zero was obtained after iv bolus administration of the one dose of medicament which distributes to one compartmental open model is $22\mu\text{g/ml}$. the excretion results of the medicament were:

Interval of time (hours)	$\Delta X_u/\Delta t$
0-1	40.2
1-2	37.5
2-3	34.9
3-6	30.5
6-12	22.5

1. Calculate CLT if the dose is 750 mg
2. Calculate the CL_r by two different methods
3. If the $k_m = 0.0128 \text{ h}^{-1}$, Calculate (CL_m) and indicate if exist any other via of elimination
4. How much percent if medicament can be eliminated in each process