

1. Dosage Calculations

- Dose Required (mg) = Dose per kg × Patient's Weight (kg)
- Total Daily Dose = Dose per administration × Number of doses per day
- Infusion Rate (mL/hour) = Total Volume (mL) ÷ Time (hours)
- Drug Concentration (mg/mL) = Total Drug (mg) ÷ Total Volume (mL)

2. Dilution and Concentration

- $C_1 V_1 = C_2 V_2$ (Dilution formula)
- Weight/Volume Percentage (w/v%) = (Mass of solute (g) ÷ Volume of solution (mL)) × 100
- Volume of stock solution required = (Desired Concentration × Final Volume) ÷ Stock Solution Concentration

3. Molecular Weight and Millimoles

- Millimoles (mmol) = Mass (mg) ÷ Molecular Weight (mg/mmol)
- Molarity (M) = Number of moles ÷ Volume (L)
- Concentration (mg/mL) = (Weight of solute (mg) ÷ Volume of solution (mL))

4. Bioavailability & Pharmacokinetics

- Bioavailability (%) = (AUC oral ÷ AUC IV) × (Dose IV ÷ Dose Oral) × 100
- Half-life ($t_{1/2}$) = (0.693 × Volume of Distribution) ÷ Clearance
- Steady-State Concentration (C_{ss}) = (Dosing Rate ÷ Clearance)
- Loading Dose = (Target Concentration × Volume of Distribution)
- Maintenance Dose = (Clearance × Target Concentration) ÷ Bioavailability
- Absolute Bioavailability = (AUC (Oral) × IV Dose) ÷ (AUC (IV) × Oral Dose)

5. Infusion and IV Rate

- IV Flow Rate (mL/hr) = (Volume to be infused (mL) ÷ Time (hr))
- Dose per minute = (Drug concentration × Infusion rate)
- Rate of Drug Elimination = (Clearance × Plasma Concentration)

6. Electrolyte Calculations

- Sodium Concentration (mmol/L) = (Amount of NaCl (g) × 1000 ÷ Molecular Weight of NaCl) ÷ Volume (L)
- Strength (%) = (Weight of solute (g) ÷ Volume of solution (mL)) × 100

7. Pharmacokinetic Principles

- Volume of Distribution (Vd) = Dose ÷ Plasma Concentration
- Clearance (CL) = (Rate of Elimination ÷ Plasma Concentration)
- Rate of Elimination = Clearance × Plasma Drug Concentration
- Loading Dose = (Target Concentration × Volume of Distribution) ÷ Bioavailability