Dosage Calculation:

Bioavailibility F (%) = $\frac{\text{AUC (oral)}}{\text{AUC (iv)}} \times 100$

[from plasma conc. – time curve]

Volume of distribution (V) = $\frac{\text{Dose administered iv}}{\text{plasma conc. of drug}}$

Clearance (C) = $\frac{C_u \times V_u}{C_p}$

(volume of plasma that is completely cleared off the substance by kidneys per unit time

Loading Dose = $\frac{\text{target plasma conc. [cp]} \times \text{vol. of distribution [v]}}{\text{Bioavailability (F)}}$

⇓

single or few quickly repeated doses given in the beginning to attain target plasma conc. rapidly

Maintenance Dose = $\frac{Cp \times \text{Drug clearance [C]}}{F}$

⇓

dose that is to be repeated at specified intervals after attaining steady plasma conc. so as to maintain the same by balancing elimination

In renal impairment,

Corrected dose = normal dose $\times \frac{\text{patient's creatinine clearance}}{\text{normal creatinine clearance}}$

100 ml/min ←

Patient Creatinine Clearance = $\frac{[140 - \text{age (yrs)}] \times \text{weight (kg)}}{72 \times \text{Serum creatinine}}$ Cokroft Gault's formula

Pediatric Calculations:

Young's Formula: (for children upto 12 yrs)

assumption: a 12 y/o should receive ½ of an adult dose

Child's dose = $\frac{\text{Age}}{12} \times$ Adult dose

Dillings Formula: assumption – 20 y/o should receive an adult dose

Child's dose = $\frac{\text{Age}}{20} \times$ Adult dose

Clark's formula:

Child's dose = $\frac{\text{Weight of child (pounds)}}{150} \times$ Adult dose

Child's dose = $\frac{\text{Child's BSA}}{1.73} \times$ Adult dose