* Objectives

At the end of this sessions students should be able to:

* List and discuss common routes of drug administration
* Explain the absorption pattern of common routes of drug administration.
* Describe various dosage forms and their absorption pattern
* Discuss noveldrug deliv ery systems like transdermal drug delivery etc…
* PHARMACOKINETICS
* The quantitative study of drug movement in, through and out of the body(Effect of Body on Drug, fate of drug).
* Pharmacokinetic processes include
* Absorption of drug
* Distribution of drug
* Metabolism of drug
* Excretion of drug

Pharmacokinetics is significant for

* Route of drug administration
* Dose of drug
* Latency of onset
* Time of peak action
* Duration of action
* Frequency of drug administration
* Routes of drug administration

Factors governing choice of route

* Physical and chemical properties of drug
* Site of desired action
* Rate and extent of absorption of drug from different routes
* Effect of digestive juices and first pass metabolism.
* Rapidity with which the response is desired
* Condition of the patient
* PHARMACOKINETICS II  
  DRUG ABSORPTION
* Objectives
* Discuss factors affecting drug absorption
* Emphasize factors influencing bioavailability and bioequivalence
* Explain the concept of Henderson Hasselbach equation.
* DRUG ABSORPTION

Absorption is the movement of drug from its site of administration into the blood stream.

Factors affecting drug absorption:

* Aqueous solubility(transport across membrane)
* Effect of pH
* Area of absorbing surface
* Vascularity of the absorbing surface
* Route of administration

Pharmacological implications of Henderson Hasselbach’s equation:

Most drugs are weak electrolytes, that is, their ionization is pH dependant.

* Weakly acidic drugs which form salts with cations ( example: sodium phenobarbitone, sodium sulphadiazine ,potassium penicillin V) ionise more at alkaline pH.
* Weakly basic drugs which form salts with anions(example: atropine sulphate, ephedrine hydrochloride, chloroquine phosphate) ionize more at acidic ph.
* Ions being lipid insoluble do not diffuse across a biological membrane.
* Acidic drug example aspirin(pKa =3.5) are largely unionized at acidic gastric pH and are absorbed from the stomach.
* Basic drugs like atropine(pKa =10) are largely unionized and absorbed only when they reach small intestine.
* Acidic drug are ionized more in alkaline urine – do not diffuse in the kidney and are excreted faster. Accordingly, basic drugs are excreted faster if urine is acidified. This principle is used in treatment of drug overdose.
* Bioavailability
* It is a measure of the fraction of administered dose of a drug that reaches the systemic circulation in the unchanged form.
* Bioavailability of a drug injected intravenously(IV) is 100%.
* Calculated from comparing plasma level of a drug after a particular route of administration with plasma drug level achieved by IV injection.

Factors that influence bioavailability of a drug

* First pass hepatic metabolism
* Solubility of a drug
* Chemical stability
* Nature of drug formulation.

Bioavailibility variation assumes practical significance for drugs with low safety margin (digoxin) or where dosage needs precise control.