* Pharmacology: The study of drug and their interactions with living system.
* Clinical pharmacology: The study of drugs in humans.
* This study includes drug uses for patients as well as in healthy volunteers (during new drug development).
* Therapeutics  
  (Pharmacotherapeutics) : The use of drug to diagnose, prevent, treat disease or prevent pregnancy.

The medical use of drugs.

* Drugs: Any chemical that can affect living processes.
* Drugs:

- Natural (plants).

- Synthetics (chemical reactions).

Ideal drug:

1- Effectiveness.

2- Safety: Cannot produce harmful effect even if administered in very high doses and for Avery long time.

3- Selectivity: not produce side effects.

* Morphine - constipation.

- urinary hesitancy.

- Respiratory depression.

Drug Name:

* Chemical name: N-Acetyl-Para amino phenol
* Generic name: Acetaminophen
* Trade name: Acephen ,Aspirin Free Pain relief
* Example;

- Furosemide(Lasix).

- Cephalexin(keflex).

New drug development:

* expensive, lengthy process (6-12 years).
* from 5000 compound only one new product .
* 1-5 years ---Pre clinical testing  
  (in animals). Toxicity.
* Pharmacokinetics.
* Possible useful effects.
* Investigational new drug (IND) status
* 2-10 years---Clinical testing  
  (in humans). Phase 1 ;

- Subjects: Normal volunteers.

- Test: Metabolism and biologic effects.

500-5000 patients;  
 (3-6 months)

* Phase 2 ;  
   - Subjects: Patients.  
   -Tests: Therapeutic utility and dosage

range.

* Phase 3 ;

-Subjects: Patients.

-Tests: Safety and effectiveness

Conditional Approval of new drug application(DNA).

* 500-5000 patients;  
   (3-6 months) Phase 4 ;

- Post marketing surveillance.

(if theirs new adverse effects).

Pharmacokinetics;

* Processes determine how much of an administered dose gets to its sites of action.
* 4 processes ;

1. Drug absorption , 2. Drug distribution, 3. Drug metabolism ,4. Drug excretion



Absorption ;

* The movement of drug from its site of administration into the blood

Distribution ;

* The drug movement from the blood to the interstitial space of tissues and from there to cells.

Metabolisim:  
(Biotransfromation);-

* Enzymatically mediated alteration of drug structure.

Excretion;

* The movement of drugs and their metabolism out of the body.
* Combination of metabolisim of excretion = elimination

Pharmacokinetic processes;

* Determine the concentration of a drug at its sites of action. or ;
* Impact of the body on drugs
* Pharmacodynamics;
* The study of what drugs do to the body and how they do it.
* Determine the nature an intensity of the response.
* Or ; Impact of drugs on the body,
* Drug- receptor interaction.
* Patient’s functional state.

(examples; tolerance of morphine)

Placebo effects. (Psychological effects)

Drug-receptor interaction



Agonists;

* A molecule that activate receptors

since-neurotransmitters, hormones,

- Mimic actions of body.

* Antagonists; Produce their effects by preventing receptor activation by endogenous regulatory moleculer and drugs.