PHARMACEUTICS

COMPLETE UNIT 1 NOTES

PHARMACY

- The word pharmacy is derived from a greek word 'Pharmakon' means 'drug' or 'medicine'
- Pharmacy is basically a health care profession deals with knowledge of identification of drug substances and their preparation from natural and synthetic sources.

Pharmacist

A Pharmacist is a person who is expert in drugs and medicines and specialized to prepare and dispense them.

Symbol Of Pharmacy

Bowl of Hygeia along with Rod of Ascelepius is known as symbol of pharmacy.

Father Of Pharmacy

Professor William Procter is known as 'father of Pharmacy'

Evaluation / History Of Pharmacy

Evaluation of pharmacy can be divided into 5 historical periods :

- Ancient Era
- Empiric Era
- Industrialization Era
- Patient Care Era
- Biotechnology And Genetic Engineering Era

Ancient Era

In ancient times leaves, cold water and animal extracts used in the treatment. There are no synthetic sources available in this era.

Empiric Era

In this era pharmacopoeia was introduced & became primary tool for pharmacist. Professor William Procter devoted his time and efforts to advancement of pharmacy

Industrialization Era

In this era development and manufacturing of drugs started on industry level. Rapid mass production of medicine followed.

The patient Care Era

In this era research and development of new medicine started, Pharmacist started taking more responsibilities including dispensing medicine and patient education.

History Of Pharmacy in India

The history of pharmacy in india can be divided into two phase

- Before Independence
- After Independence

Before Independence

1842 : Pharmacy education started at certified level in GOA by portuguese

1870 : Madras medical college conducted first licentiate exam for chemist and druggist.

1881 : Formal training of compounders started in Bengal.

1930 : Goverment of India appointed a committee under the chairmanship of late Col. R.N. Chopra to see pharmacy problems in India.

1931 : Committee published its report saying that there was no recognized profession of pharmacy in India.

1935 : United province pharmaceutical association was established which later converted into 'Indian Pharmaceutical Association'

1937 : Introduction of 3 year B. Pharm. course by Professor Mahadeva Lal Schroff at Banaras Hindu University.

1940 : Establishment of Indian Pharmaceutical Congress Association.

1940 : Introduction of drug act 1940.

1945 : Pharmacy bill introduced to manage the pharmacy education in India.

1946 : Publication of 'Indian Pharmacopoeia List'

After Independence

1948 : Publication of Pharmacy Act 1948.

1948 : Indian Pharmacopoeia committee constituted under the chairmanship of late Dr. B.N. Ghosh

1949 : Establishment of 'Pharmacy Council of India' (PCI).

1955 : Publication of first edition of India Pharmacopoeia.

1985 : Narcotic and Psychotropic substance act has been enacted

M.L. Schroff : Father of Pharmacy in India

Mahadeva Lal Schroff, father of pharmacy profession in India was born on 6th March 1902 at darbhanga in Bihar.
He started B.Pharm. and M.Pharm. education for the first time in India at Banaras Hindu University.

Pharmacy Cources Offered in India Today

- Diploma in Pharmacy
- Bachelor of Pharmacy
- Master of Pharmacy
- Practise Based Doctor of Pharmacy
- Master of science in Pharmacy
- Doctor of philosphy in Pharmacy

PHARMACOPOEIA

- Pharmacopoeia is derived from two greek words 'Pharmakon' means 'dru and 'Poeia' means 'to make'
- It is legal and official book of standard for drugs issued by recognized authorities appointed by 'Government of each country'.
- It contains list of pharmaceutical substances, formulae along with their description and standards.
- Pharmacopoeia is nothing but the collection of monographs.

Monographs

A monograph is a collection of detailed information on a particular drug its dosage form and methods of analysis

A monograph contains :

- Chemical Name
- Formula
- Solubility
- Identification
- pH
- Assay
- Loss on Drying
- Dose

Importance of Pharmacopoeia

- To maintain uniformity and control standards of drugs available in the market.
- Avoid adulterated drugs.
- Complete information on drugs and their dosage form.
- Reference for laboratory, industry and academic institutions.

Pharmacopoeia of Different Countries

- Indian Pharmacopoeia
- British Pharmacopoeia
- United States Pharmacopoeia
- European Pharmacopoeia
- French Pharmacopoeia

Indian Pharmacopoeia

- Indian pharmacopoeia is official book of standard for drugs to define identity, purity and strength for the drugs imported, manufactured, stocked and distributed in India.
- Indian Pharmacopoeia is published by 'IPC'
- It's head office is in Ghaziabad (UP)
- Indian Pharmacopoeia is published by 'NISCAIR'

Indian Pharmacopoeia Commission

Indian Pharmacopoeia Commission is an autonomous institution of the ministry of health and family welfare which sets standard for all the drugs that are manufactured, consumed and sold in India.

NISCAIR

It is known as The National Institute of Science Communication and Information Resources, located at New Delhi, India.

History Of Indian Pharmacopoeia

- In pre-independence days, British pharmacopoeia was used in India.
- In 1946 Government of India issued 'The Indian Pharmacopoeial List' Committee under chairmanship of late 'Col. R.N. Chopra' along with other nine members prepared 'The Indian Pharmacopoeial List'
- It was prepared by Dept. of Health, Government of India, Delhi in 1946
- In 1948 Government of India appointed an Indian Pharmacopoeia Committee to prepare 'Pharmacopoeia Of India'
- Indian Pharmacopoeia committee under chairmanship of Dr. B.N. Ghosh published first edition of IP in 1955

List Of Indian Pharmacopoeia

EDITIONS	YEAR	ADDENDUM / SUPPLEMENT	VOLUMES	MONOGRAPHS
1st Edition	1955	Supplement 1960	2	986
2nd Edition	1966	Supplement 1975	3	890
3rd Edition	1985	Addendum 1989 Addendum 1991	2	261
4th Edition	1996	Addendum 2000 Supplement 2000 Addendum 2002 Addendum 2008	3	1149 208 19
5th Edition	2007	Addendum 2008	3	271
6th Edition	2010	Addendum 2012	3	52
7th Edition	2014	Addendum 2015 Addendum 2016	4	577
8th Edition	2018	Addendum 2019	4	220

British Pharmacopoeia

- The British Pharmacopoeia is the national pharmacopoeia of the United kingdom.
- The British Pharmacopoeia is an important component in the control of medicines, alongwith British National formulary, it defines UK's pharmaceutical standard.

Editions of British Pharmacopoeia

EDITIONS	YEAR
First Edition	1864
Second Edition	1867
Third Edition	1885
Fourth Edition	1898
Fifth Edition	1914
Sixth Edition	1932
Seventh Edition	1948
Eigth Edition	1953
Ninth Edition	1958
Tenth Edition	1963
Eleventh Edition	1968
Twelfth Edition	1973
Thirteenth Edition	1980
Fourteenth Edition	1988

DOSAGE FORM

Dosage form are pharmaceutical drug product in the form in which they are marketed for use.
It generally regard as medicine.

Dosage Form (Medicines) = API + Excipients

Active Pharmaceutical Ingredient / Drug

API or Drug is the main part of a medicine that actually produces effect. It is chemical compound used in diagnosis, treatment and prevention of disease.

Excipients

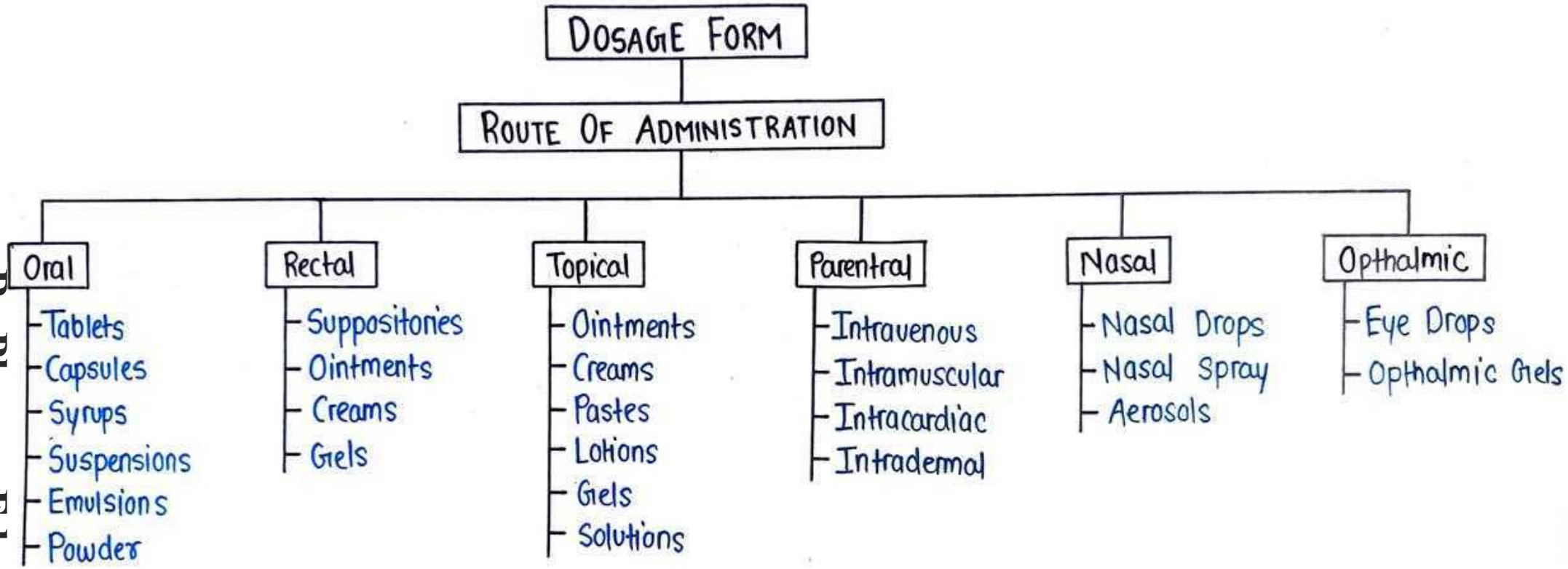
Excipients are the inert pharmaceutical ingredients that are used in drug formulation. It doesn't increase or decrease the therapeutic action of active pharmaceutical ingredient (API).
Examples: Preservatives, Flavouring Agents, Sweetening Agents etc.

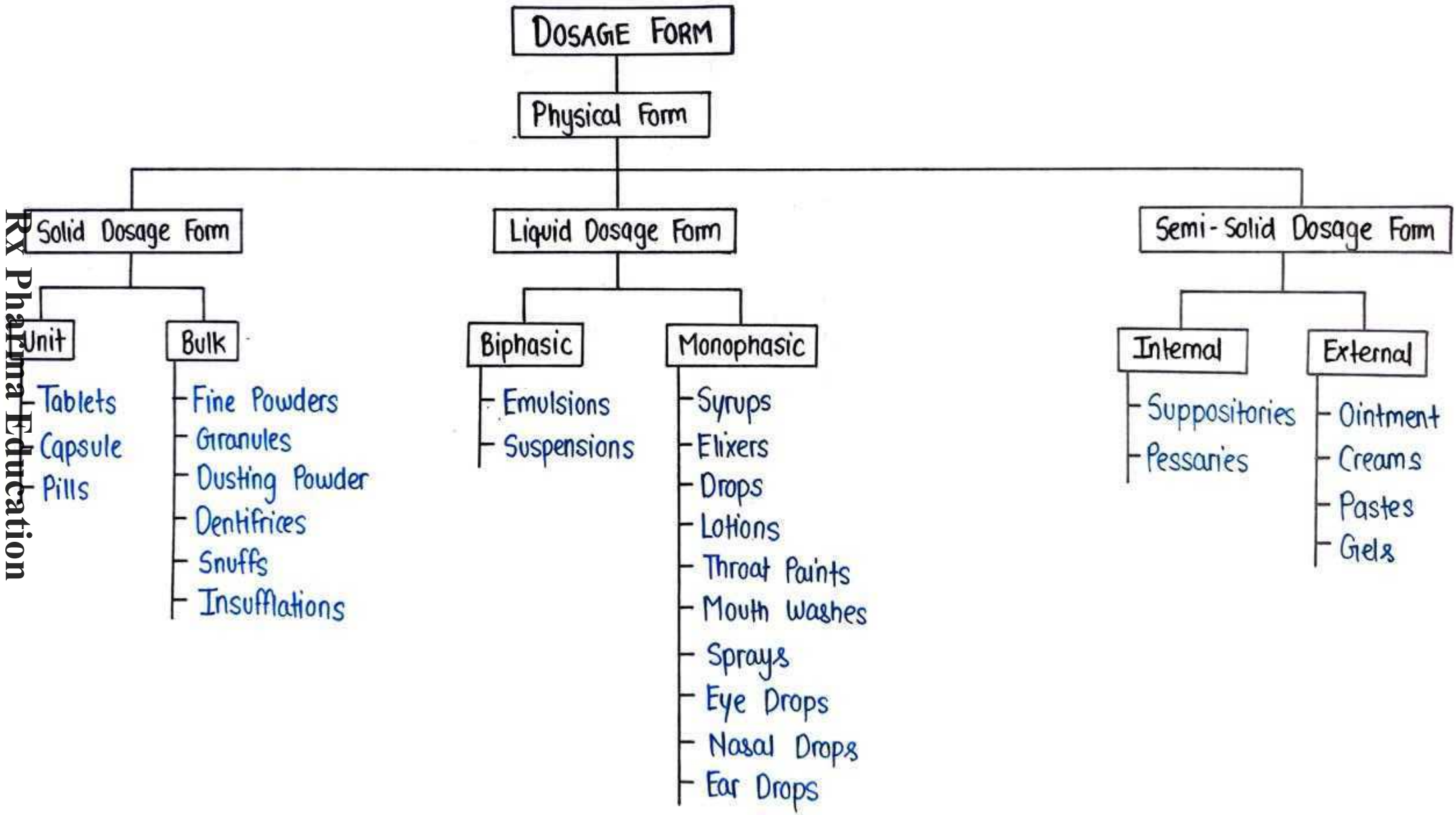
Need of Dosage Form

- To provide accurate dose
- Protection from atmosphere
- Masking taste and colour
- To provide liquid dosage form
- For insertion of drug into body's orifices.

Classification of Dosage Form

Dosage form are generally classified into/on the basis of two categories
- Based on Route of Administration
- Based on Physical Form.

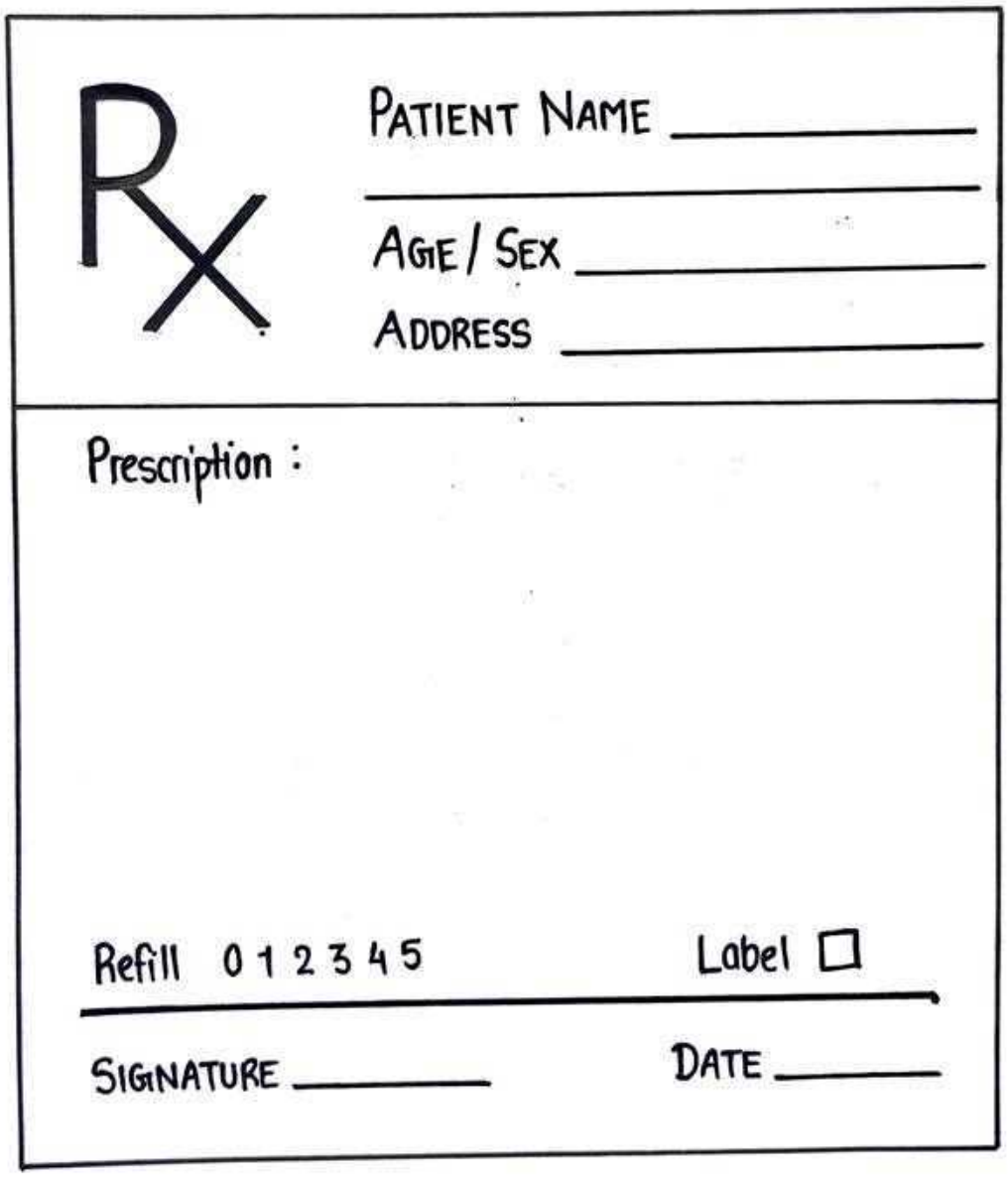




PRESCRIPTION

A Prescription is a written order from a registered medical practitioner to pharmacist in order to compound and dispense specific medicament for patient.

Prescription is generally written in English language but latin words and abbreviations are frequently used to save time.



Parts Of Presciption

- Date
- Name, Age, Sex and Address of the patient
- Supescription
- Insciption
- Subscription
- Signatura / Transcription
- Renewal Instructions
- Signature, address and registration number of prescriber.

Date :

It is very important part of a prescription as it helps a pharmacist to find out the date of prescribing and date of prescription.
In case of narcotic and habit forming drug, the date prevents the misuse of drug by the patient.

Name, Age, Sex and Address of the patient :

Name and address of the patient helps in the identification of patient while age and sex helps to decide the dose for that particular patient

Superscription :

It is represented by 'Rx' symbol. It is a Latin word which means 'You Take'
In olden days, the symbol was considered to be originated from the sign of Jupiter, the god of healing. It is used to pray to God for the quick recovery of the patient.

Inscription :

It is the main part of the prescription containing name and quantities of prescribed medicament.
The name of each ingredient is written on a separate line along with its quantity.

Subscription :

In this part prescriber gives direction to the pharmacist regarding to dosage form and number of dosage to be dispensed.

Signatura :

In this part prescriber gives direction to the patient regarding the administration of drugs.
It contains :

- Quantity / Amount to be taken
- Frequency / Timing of administration
- Special Instruction such as dilutions

Renewal Instructions :

In this part prescriber indicates whether the prescription may be renewed or not and if so then how many times.
It is very important specially in the prescription containing narcotic and habit forming drug to avoid its misuse.

Signature, Address and Registeration No. of Prescriber :

It is very important and much needed part of prescription to verify that the prescription is official and issued by the doctor.
It becomes very important particularly in narcotic and habit forming drugs to prevent its misuse.

Handling of Prescription

Following procedure should be followed by the pharmacist while handling the prescription for compounding and dispensing

- Receiving
- Reading & Checking
- Collecting & Weighing the material
- Compounding, labelling & Packaging

Receiving :

The prescription should be received by the pharmacist from patient himself while receiving a prescription a pharmacist should not change his facial expression as it can give negative impression to the patient

Reading And Checking :

After receiving prescription, pharmacist must have to check whether it is written in proper format or not

A prescription should always screened behind the comer.

In case of any doubt pharmacist should immediately consult the other pharmacist or doctor.

Collecting and Weighing the materials :

Before compounding the prescription all the materials required for it should be collected on left hand side of the balance.

After weighing all the materials it should be sifted on right hand side of the balance

while compounding label of every stock bottle it should be read at least 3 times to avoid any mistake.

Compounding, Labelling and Packaging:

Only 1 prescription should be compounded at 1 time. All the materials required should be suitably cleaned & dried.

After that the compounded medicament should be suitably labelled and filled / packed in appropriate containers depending on its quantity and use.

Posology

- Posology is derived from two greek words 'Posos' means 'how much' and 'logos' means science.
- Posology is a branch of medical science that deals with dose or quantity of drugs which can be administered by the patient to get desired pharmacological action.
- The dose of a drug cannot be fixed very easily as it depends on various factors i.e., age, sex, administration etc.

Factors Affecting Posology

- Age
- Sex
- Body Weight
- Route of Administration
- Time of Administration
- Environmental Factors
- Presence of disease
- Accumulation
- Additive Effect
- Tachyphylaxis
- Synergism
- Antagonism
- Tolerance
- Metabolic Disturbances
- Emotional Factors

Age

The pharmaceutical effect of many drugs changes with age.
Newborn babies are generally more sensitive towards some drugs because of their immature state of liver functions through which drugs are eliminated from body.
Also, some elder patients are more sensitive to some drugs like 'hypnotics' which may produce confusion state between them.

Sex

Sometimes effect of drug is not same in woman as in men.
Special care should be taken while giving the drugs in state of menstruation, pregnancy and lactation.
Alcohol and narcotic drugs (morphine and barbiturates etc) must be avoided during pregnancy because it can have a harmful effect on babies.

Body Weight

The average dose that is decided for a drug is for body weight between 50-100 kg.
However this dose is not applied in case of obese patients, children and very weak (malnourished patients).
It should be calculated according to the body weight.

Route Of Administration

Intravenous doses are always smaller than oral and topical doses because they are directly administered in blood.

Time of Administration

Presence of food in the stomach always delays the absorbtion of drug in compare to empty stomach.
But it should be noticed that effectiveness of a drug is not depend upon taking before or after the meal.
Iron, arsenic containing drugs preferred after the meal while antacid like drugs given before the meal.

Environmental Factors

Condition of environment also affect the dose of drugs.
Sedative and hypnotics drugs like Barbiturates required in high amount at day time while in less amount at night.

Presence of Disease

Presence of disease also affect the pharmaceutical effect of a drug such as streptomycin produce toxic effect on liver patients because their kidney function is not working properly and streptomycin is those types of drugs that excreted through kidney.

Accumulation

Drugs which are slowly excreted may accumulate in the body and produce toxic effects if repeatedly administered for a long time.
e.g. digitalis, emetine, heavy metals.

Additive Effect

When two or more drugs administered together and their total pharmacolog action is equivalent to sum of their indivisual pharmacological action then this phenomenon is called additive effect.

example : Combination of ephedrine and aminophyllin in the treatment of bronchial asthama.

Synergism

When two or more drugs administered together and their total pharma-cological action is increased then this phenomenon is called synergism.

example : procaine and ademaline combination increased the duration of action of procaine.

Antagonism

When action of one drug is opposed by other drug, then this phenomenon is called antagonism. Antagonistic response used in the treatment of poisoning.

Example : Milk of magnesia is given in acid poisoning

Tolerance

When an unusually large dose of a drug is required to produce an effect that ordinarily produced by the normal dose then this phenomenon is called 'Tolerance'

Examples : Sømokers can tolerate 'Nicotin'
Alcoholic can tolerate large amount of 'Alcohol'

Metabolic Disturbances

Changes in water electrolyte balance, acid- base balance, body temperature and other physiological factor may affect the action of drug

Emotional Factor

Personality and behaviour of physician may also influence the effect of drug especially in the case of psychomatic drugs / disorders. Females are generally more emotional than male and required less dose of certain drugs.