DISPENSING AND HOSPITAL PHARMACY

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MIXTURES

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MIXTURES

A mixture is a liquid preparation meant for oral administration in which medicament or medicaments are dissolved , suspended or dispersed in a suitable vehicle.

ADVANATAGES

1. Easy to administer.
2. Suitable for insoluble drug.
3. Suitable for immiscible drug.
4. The bioavailability is more compare to solid dosage form.

DISADVANATAGES

1. Less soluble than solid dosage form.
2. Incompatibilities.
3. Stability.
4. Expensive.
5. Bulky to carry.

CLASSIFICATION

1. Simple mixture containing soluble substances
2. Mixture containing diffusible solids
3. Mixture containing indiffusible solids
4. Mixture containing Precipitate forming liquids
5. Mixture containing Slightly soluble liquid

DIFFUSIBLE MIXTURES

- Diffusible solids are insoluble in water.
- Uniformly dispersed in the vehicle on shaking.
- No need of suspending agent.

Example:

- Bismuth carbonate.
- Bismuth subnitrate.
- Magnesium carbonate.

METHOD OF DISPENSING

1. Powder drug in mortar add soluble drug and mix.
2. Measure 3/4th of vehicle. Make smooth cream by portion of vehicle.
3. Transfer content from mortar into a measuring apparatus.
4. Add any liquid ingredient.
5. Add more vehicle to produce final volume.
6. Fill in bottle and label. Cork it.
7. Attach label " Shake well before use" wrap bottle and dispense.

METHOD OF DISPENSING

Drug+ soluble material + Vehicle a part from 3/4th

⇩ Smooth cream

Add remaining vehicle from 3/4th

⇩ Add to measure

Add other liquid ingredient

⇩

Make up the volume with remaining vehicle

INDIFFUSIBLE MIXTURES

- Indiffusible solids are insoluble in vehicle.
- Not evenly distribute throughout the vehicle on shaking or not distribute in vehicle for sufficiently long time.
- Ex. Acetyl salicylic acid, Quinine salicylate, calomel, Phenacetin, chalk powder.
- Suspending of drug is required.

suspending agents are added in formulation.

SUSPENDING AGENTS

- **Compound Tragacanth Powder:**
  - It content 20% acacia, 15% tragacanth,
  - In the proportion of 2g/100 ml of themixture.
  - **It is used when the vehicle is other than water or chloroform**
- **Tragacanth mucilage:**
  - In the proportion of 1/4th of the volume of the mixture
  - **It is used when the vehicle is water or chloroform water.**

METHOD OF DISPENSING

Solid's + Tragacanth powder (2%)

↓

Triturate the powder with a portion from ¾ of vehicle

↓ Smooth cream is formed

Add remaining portion of vehicle from 3/4th.

↓

Examination

↓

Add other liquid ingredient + soluble ingredients Make up the

↓

volume with remaining vehicle

Solid's +Tragacanth Mucilage(1/4th)

↓

Triturate

↓ Smooth cream is formed

Add 1/2 of the vehicle.

↓

Examination

↓

Add other liquid ingredient + soluble ingredients **Make up the**

↓

volume with remaining vehicle

EXAMPLE

Rx

Ppt chalk powder ----------30 grain.

Catechu tincture ---------- 20 minim.

Cinnamon water ---------- 1 fl.oz.

- **Direction:**

  Secundis hora sumenda

- **Method of Preparation:**

  Method of dispensing using tragacanth powder

PRECIPITATE FORMING LIQUIDS

- Certain liquid preparations contain resinous matter.
- when mixed with water, the resin is precipitated
  - which may adhere to sides of bottle or
  - form a clotted precipitate.
- This will not re-diffuse upon shaking.
- To prevent this, suspending agent is used.
- Ex. resin extract, tinctures etc.

METHOD OF DISPENSING

Solid's + Tragacanth powder (2%)

⇩

Triturate the powder with a portion from ¾ of vehicle

⇩ Smooth cream is formed

Add precipitate forming liquid in the centre of cream

⇩

Add remaining portion of vehicle from 3/4th.

⇩

Examination

⇩

Add other liquid ingredient + soluble ingredients Make up the

⇩

volume with remaining vehicle

Solid's + Precipitate forming liquid + Tragacanth Mucilage(1/4th)

↓

Triturate

↓ Sooth cream is formed

Add 1/2 of the vehicle.

↓

Examination

↓

Add other liquid ingredient + soluble ingredients

↓

Make up the volume with remaining vehicle

MIXTURE CONTAINING SLIGHTLY SOLUBLE LIQUID

- The insoluble portion ofslightly soluble liquids is not readily diffusible.
- So a suspending agent such as tragacanth powder or tragacanth mucilage are needed to dispense such mixtures.
- Ex. Paraldehydeliquid

METHOD OF DISPENSING

Paraldehyde + tragacanth mucilage in bottle

⬇ Shake vigorously

Dissolve syrup and liquid extract of glycyrrhiza in water.

⬇ Add to

Bottle Content

⬇ Shake vigorously

Make up the volume by adding water

FORMULATION

Drug: Antibiotics , antipyretics, analgesic, etc

Vehicles: following vehicles are used.

Water: purified water

Aromatic water: Multiple use, e.g. chloroform water, Cinnamon water, etc.

Medicated vehicle: Infusions, ex. Senega infusion as expectorant.

Adjuncts: Adjuncts are generally used to improve the **Safety, efficacy and palatability.**

Chemical Stabilizers: e.g. Antioxidant: Ascorbic acid (0.1%), Sodium metabisulphite (0.1%) etc.

Preservatives: Chloroform (o.25%), Benzoic acid (0.1%) Methyl paraben, propyl paraben, etc.

Coloring Agents:

E.g. Coal tar dyes.

Flavoring Agents: The following flavoring agents are commonly used in mixtures.

Aromatic water Syrup and Glycerol.

Spirit lemon to cover the taste of alkaline citrates.

Orange syrup and compound orange spirit.

STORAGE

- Mixtures are dispensed in plain glass bottles with uniform internal diameter.
- The mixture should be dispensed and supplied to the patient for not more than 3 days to prevent deterioration.
- The bottle should be fitted with a suitable cork which ensures its easy removal and to prevent spilling of Mixture.

POWDERS

Definition

Powders are the mixture of finely divided drug or chemicals in dry form.

They are used for internally & externally.

They are available in crystalline or amorphous form.

There is a relationship between particle size of powder & dissolution, absorption & therapeutic effect of drug.

Advantages of Powders

- Powders are more stable than liquid dosageform.
- The chance of incompatibility are less as compared to liquid dosage form.
- The onset of action of powdered drug is rapid as compared to other solid dosage form e.g. tablet, capsules. Due to smaller particle size of powder, it get dissolved easily in body fluids.
- Larger quty. of powdered drugs can be administered to the patient orally by dissolving or mixing the powder in the suitable liquid.
- Small children or elderly patient can easily take the powdered drug as such or dispersed in water or any other liquid.
- Powders are more economical as compared with other dosage form because not required any special machinery or technique.
- Powders are more easy to carry than the liquid dosage form.

Disadvantages of Powders

- Drugs having bitter, nauseous & unpleasant taste cannot be dispensed in powdered form.
- Deliquescent & hygroscopic drugs cannot be dispensed in powder form.
- Drugs which get affected by atmospheric conditions are not suitable for dispensing in powder forms.
- The dispensing of powder is a time consuming.

CLASSIFICATION OF POWDERS

1. Bulk powder for internaluse.
2. Bulk powder for externaluse.
3. Simple & Compound powder for internaluse.
4. Powders enclosed in cachets &capsules.
5. Compressed powders (Tablets)

Dispensing of Powders Involving Special Problems

- **Volatile Substances:**

- Certain vegetable powder contains volatile oil.

- To prevent the loss of volatile oils, these vegetable drugs must be powdered lightly in a mortar.

- Also, menthol, camphor & essential oils takes place incorporation in powder.

- Final product pack with double wrapping.

Dispensing of Powders Involving Special Problems

- **Hygroscopic & deliquescent powders:**

- Absorb the moisture from atmosphere are called hygroscopic powders.
- Absorb the moisture from atmosphere & convert into solution are called deliquescent powders.
- E.g. ammonium chloride, ammonium citrate, pepsin, phenobarbitone, sodium iodide etc.
- Such substance are usually provide in granular form in order to exposé less surface area to atmosphere & avoid convert into fine powder.
- Such powder should be double wrapped.

Dispensing of Powders Involving Special Problems

- **Efflorescent powders:**

- Some crystalline substance liberates water of crystallisation wholly or partly on exposure to humid atmosphere.
- e.g. citric acid, caffeine, ferrous sulphate etc.
- So, this problem overcome by mixing or incorporate with inert substance or using anhydrous slat.

Dispensing of Powders Involving Special Problems

- **Eutectic mixture:**

A **eutectic mixture** is defined as a **mixture** of two or more components which usually do not interact to form a new chemical compound but, which at certain ratios, inhibit the crystallization process of one another resulting in a **system** having a lower melting point than either of the components

- **Liquids:**

- In some prescription the liquid medicaments are also incorporated with powders.

- In that case, if liquid Quantiity is small, it may be triturated with equal amount of powder, then the reset of the ingredients are incorporated in small proportions with continuous stirring.

Dispensing of Powders Involving Special Problems

- **Potent drugs:**

- The substance having a max. dose of less than 60 mg & poisonous substances are called potentdrugs.
- It should be difficult to weigh on dispensing balance.
- For that, firstly potent drugs incorporated with diluents such as lactose before weigh.
- e.g. Dispense following powder in 5 powderpackets
- **Rx**,

  Codeine phosphate 10 mg

In that case, weigh 100 mg of codeine phosphate & 900 mg of lactose mixed with ascending order with help of spatula.

Out of 1 gm of triturate, weigh 100 mg of each powder contains 10 mg of codeine phosphate & pack in powder paper.

Dispensing of Powders Involving Special Problems

- **Granular powders:**

- Some solid medicaments required to administered in orally in large dose & its not possible to convert into tablet or capsule bec. a large number of them will be required to take single dose.
- And these medicaments are difficult to dispense in powder form bec. Its bitter, nauseous & unpleasant taste.
- In this case, solid medicaments mix with sweetening, flavoring & coloring agent with suitable granulating agent to moisten the powder to make coherent mass.
- Then, pass through sieve no. 10 to make granules & dry in hot air oven at 60°C & after drying pass through sieve no. 20 & pack into wide mouth containers.
- E.g. Nowadays, antibiotics like erythromycin, ampicillin etc are available in granular powder bec. They are unstable in liquid form.

- **Effervescent granules:**

  These type of medicament granules are prepared for internal use.

- In that, medicaments mixed with citric acid, tartaric acid & sodium bicarbonate with sweetening agents also present.
- When contact with water they release of carbon dioxide to mask the bitter & saline taste of drug.
- Also, carbon dioxide stimulates the flow of gastric juice & helps in the absorption of medicaments.

INCOMPATIBILITY

INDRODUCTION

- Incompatibility is defined as a change resulting and an undesirable product is formed, which may affect the safety, efficacy appearance and stability of the pharmaceutical product.
- **Incompatibilities occurs during**
  - Packaging
  - Compounding
  - Dispensing
  - Formulation
  - Storage
  - Manufacturing
  - administration of drugs

DEFINITION

- It is defined as when two or more ingredients of a prescription are mixed together , the undesired changes that may takes place in the physical, chemical or therapeutic properties of the medicament is termed as incompatibility."

Incompatibilities occur during:-

- Compounding
- Formulation
- Manufacturing
- Packaging
- Dispensing
- Storage
- Administration of drugs

- The incompatibilities may be detected by changes in the physical, chemical, and therapeutic qualities of the medicine.

TYPES OF INCOMPATIBILITIES:-

- The incompatibilities occur when the components of a medicine interact in such a way that properties of that medicine are adversely affected.

Physical incompatibilities

Chemical incompatibilities

Therapeutic incompatibilities

PHYSICAL INCOMPATIBILITIES

- When two or more than two substances are combined together, a physical change takes place and an unacceptable product is formed.
- Interaction between two or more substances which may lead to change in color, odor, taste, viscosity and morphology. It is also called as pharmaceutical incompatibility.
- **Manifestations of physical incompatibility:-**
- The following list outlines the various ways incompatibility between or among drug agents may be manifested.

PHYSICAL INCOMPATIBILITIES

A. **Insolubility:-**insolubility of prescribed agents in vehicle

B. **Immiscibility:-**Immiscibility of two or more liquids

C. **Precipitation:-**It occurs due to solvent is insoluble when it is added to solution

D. **Liquefaction:-**Liquefaction of solids mixed in a dry state (called eutexia)

PHYSICAL INCOMPATIBILITIES

- **A. Insolubility:-**insolubility of prescribed agents in vehicle:

- It means the inability of material to dissolve in a particular solvent system. The majority of incompatibilities is due to insolubility of the inorganic as well as organic compounds in particular solvents.
- The following factors affect the solubility of prescribed agent in vehicle and may render it less soluble.
  - Change in pH
  - Chemical reaction
  - Surfactant
  - Complex formation

PHYSICAL INCOMPATIBILITIES

- Any change in previous factors may lead to precipitation of drugs and change in their properties.
- Substances like chalk, acetyl salicylic acid, succinyl sulphathiazole, zinc oxide, and calamine are the common examples of in diffusible solids.
- Some tinctures containing resins or chlorophyll may provide precipitation when added to the aqueous system.

PHYSICAL INCOMPATIBILITIES

E.g.:-Mixture of prepared chalk

Rx

Chalk powder –2g
Tincture catechu – 2ml
Cinnamon water – 2ml

The corrected prescription is

Mixture of prepared chalk

Rx

Chalk powder –2g
Tragacanth – 0.4g
Tincture catechu – 2ml
Cinnamon water up to 30ml

- Causes: - Chalk powder is not soluble in water.It gets precipitated when added to aqueous medium.These precipitates are found indiffusible in nature which results in physical incompatibility.
- Remedy: - Use of suspending agents is necessary to suspend the precipitated chalk particles.
- Generally 2% W/V of compound tragacanth powder is recommended as suspending agent.

PHYSICAL INCOMPATIBILITIES

B. **Immiscibility:-**Immiscibility of two or more liquids

- When two such ingredients are combined resulting in a non-homogenous product, such ingredients are called immiscible to each other and the phenomenon is called immiscibility.
- This manifestation appears clearly in emulsions, creams, lotions, some types of ointments.
- Separation in two phases is noticed in this pharmaceutical dosage form.
- Storage must be in room temperature to prevent separation

PHYSICAL INCOMPATIBILITIES

B. **Immiscibility:-**Immiscibility of two or more liquids

- The following factors lead to immiscibility
- Incomplete mixing
- **Addition of surfactant with**
- Unsuitable concentration
- False time of addition
- Unsuitable for the type of emulsion
- **Presence of micro – organisms**
- Some bacteria grow on constituents of mixture. E.g.:- Gelatin Arabic gum

PHYSICAL INCOMPATIBILITIES

B. **Immiscibility:-**Immiscibility of two or more liquids

- Others produce enzymes which oxidize the surfactant.
- Temperature
- Oils and water are immiscible with each other which shows physical incompatibility

E.g.:- Castor oil emulsion

Rx

Castor oil – 15ml

Water – 60ml

PHYSICAL INCOMPATIBILITIES

B. **Immiscibility:-**Immiscibility of two or more liquids

- Causes: -In this prescription castor oil is immiscible with water due to high interfacial tensions, which is a sign of incompatibility.
- Remedy:-To overcome this type of incompatibility emulsification is necessary with the help of an emulsifying agent.
- The corrected prescription is

Ex: Castor oil emulsion

Rx

Castor oil – 15ml

Acacia – 2% W/V

Water– upto 60ml

PHYSICAL INCOMPATIBILITIES

C. **Precipitation:-**It occurs due to solvent is insoluble when it is added to solution.

- **PRECIPITATION:** Solubilized substances may precipitate from it solution if a non-solvent for the substances is added to the solution.
- E.g.:- Resins are insoluble in water
- Alcoholic solution of resins + water =precipitated resins.
- Aqueous dispersions of hydrophilic colloids (polysaccharide mucilage + high concentration of alcohol or salts) =precipitated colloids.

PHYSICAL INCOMPATIBILITIES

C. **Precipitation:-**It occurs due to solvent is insoluble when it is added to solution.

- a) High concentration of electrolytes causes cracking of soap emulsion by salting out the emulsifying agents.
- Vehicles (one or more organic liquids) use to dissolve medicaments of low solubility; water soluble adjuvant practically inorganic salts may be precipitated in such vehicles.
- When tinctures containing resinous matter are added in water, resin agglomerates forms indiffusible precipitates.
- This can be prevented by slowly adding the undiluted tincture with vigorous shake. Suspension or by adding

PHYSICAL INCOMPATIBILITIES

C. **Precipitation:-**It occurs due to solvent is insoluble when it is added to solution.

E.g.:- Lotion of compound tincture of benzoin

Rx

Tincture benzoin compound – 5g

Glycerin – 10ml

Rose water upto 100ml

- Causes: - Tincture benzoin compound contain resins.This change in solvent system results in an unavoidable precipitate.
- Remedy: - Addition of tincture with rapid stirring yields a fine colloidal dispersion. So there is no need of any suspending

PHYSICAL INCOMPATIBILITIES

D. **Liquefaction:-**Liquefaction of solids mixed in a dry state (called eutexia) :

- When certain low melting point solids are mixed together, a liquid or soft mass know as eutectic mixture is produced.
- This occurs due to the lowering of the melting point of the mixture to below room temperature and liberation of hydrates.
- If such conditions take place, compounding such powders becomes difficult since the ultimate mixture turns to liquid.
- The medicaments showing this type of behavior are camphor, menthol, phenol, thymol, chloral hydrate,

D.Liquefaction:-Liquefaction of solids mixed in a dry state (called eutexia) :

- Causes: - This mixture is a physical incompatibility because both the ingredients in the prescription are liquefiable of mixed together.
- Remedy:-These substances can be dispensed by any one of the following method.
- Triturate together to form liquid and mixed with an absorbent (light kaolin, magnesium carbonate) to produce the following powder.
- The individual medicaments is powdered separately and mixed with an adsorbent and then combined together tightly and filled in a suitable container.

E.g.:-Insufflations

Rx

Menthol – 5g
Camphor – 5g
Water – 60ml

Hence the corrected prescription is

Rx

Menthol – 5g
Camphor – 5g
Light kaolin– 0.2g

CHEMICAL INCOMPATIBILITIES

Reaction between two or more substances which lead to change in chemical properties of pharmaceutical dosage form. As a result of this a toxic or inactive or product may be formed

- **Occurrence:-**
- Chemical incompatibilities occur, due to the chemical properties of drugs and additive like,
- PH change
- Oxidation-reduction reactions
- Acid-base hydrolysis
- Double decomposition

These reactions may be noticed by

- ❑ Precipitation
- ❑ Effervescence
- ❑ Decomposition
- ❑ Color change
- ❑ Explosion

CHEMICAL INCOMPATIBILITIES : TYPES

- **Based on chemical interactions**
- Tolerated incompatibility: - In this type incompatibility, the chemical interactions can be minimized by changing the order of mixing, the solutions in dilute forms, but no alteration is made in formulation
- Adjusted incompatibilities: - In adjusted incompatibility the chemical interaction can be prevented by addition or substitution of one of the reacting ingredients of a prescription with another of equal therapeutic value .
- E.g.: substitution of caffeine citrate with caffeine in sodium salicylate and caffeine citrate mixture

CHEMICAL INCOMPATIBILITIES : TYPES

- **Based on nature of chemical reaction**
- **Immediate incompatibilities: -** If the chemical reaction takes place, immediately after combining the prescription ingredients, they are called immediate incompatibilities. Hence, they should be dispensed only after correction.
- **Delayed incompatibility:** - When the chemical reaction proceeds at a very slow rate and no appreciable visible change occurs which may develop on keeping the product for along time are called delayed incompatibility.

CHEMICAL INCOMPATIBILITIES : TYPES

- **Based on the prescriber**
- **Intentional:-** When the prescriber knowingly prescribes the incompatible drugs.
- **Unintentional :-** When the prescriber prescribes the drugs without knowing that there is incompatibility between the prescribed drugs.
- Generally reaction between strong solution proceed at a faster rate and the precipitates are formed are thick and do not diffuse readily.
- Reaction between the dilute solutions proceeds at a slow rate and the precipitates formed are light and diffuse readily in the solution.
- Hence the reacting substances should be diluted as much as possible before mixing.

CHEMICAL INCOMPATIBILITIES : TYPES

- **Precipitate yielding interactions**
- The precipitates so formed may be diffusible or indiffusible. The method A or B is followed in dispensing the prescription yielding diffusible and indiffusible precipitates respectively.
- The preparation should contain a thickening agent if the precipitate is non-diffusible.
- **Method A:**
- This method is suitable for diffusible precipitates following steps are carried out.
- Divide the vehicle into two portions.
- Dissolve the reactants in separate portions and mix the two portions by slowly by adding one into other with

CHEMICAL INCOMPATIBILITIES : TYPES

- **Method B:**
- This method is suitable for indiffusible precipitates following steps involved:
- Divide the vehicle into two portions.
- Dissolve the one of the reacting substance in one portion.
- Place second portion of vehicle in mortar and incorporate suitable amount of compound.
- Tragacanth powder (2g/100ml of preparation) with constant trituration until a smooth mucilage is produced.
- Add and dissolve the other reacting substance to the mucilage.
- Add the solution of first reactant to the mucilage slowly with constant stirring.
- A secondary label —**SHAKE THE BOTTLE BEFORE USE|| should be fixed on the container whenever method A or method B is followed in dispensing the prescription.**

CHEMICAL INCOMPATIBILITIES : TYPES

Alkaloid incompatibility:-

1. Alkaloidal salts with alkaloid substances
2. Alkaloidal salts with soluble iodides
3. Alkaloidal salts with tannins
4. Alkaloid salts with salicylates
5. Alkaloid with soluble iodides and bromides.

Soluble salicylates incompatibility:-

1.Soluble salicylates with ferric salts

2.Soluble salicylates with alkali bicarbonates

3.Soluble salicylates and benzoates with acids.

Soluble iodides incompatibility:-

1.Oxidation of iodides with potassium chlorate

2.Oxidation of iodides with quinine sulphate.

CHEMICAL INCOMPATIBILITIES : TYPES

- **Chemical incompatibility causing evolution of carbon dioxide gas:-**

1.Sodium bicarbonate with soluble calcium or magnesium salts

2.Bismuthsubnitrate and sodium bicarbonate

3.Borax with sodium bicarbonate and glycerin.

- **Miscellaneous incompatibilities:-**

1.Soluble barbiturates with ammonium bromide

2.Potassium chlorate with oxdisible substances

3. Incompatibility of emulsifying agent

4. Color stability of dyes

5. Incompatibilities of liquorices liquid extract

CHEMICAL INCOMPATIBILITIES : TYPES

Eg-1: strychnine hydrochloride mixture

Rx

Strychnine hydrochloride solution -6ml

Aromatic spirit of ammonia -4ml

Water up to - 120ml

- **Causes:-**
- The quantity of strychnine hydrochloride is more than its solubility in water (1:7000).
- The aromatic spirit of ammonia contains negligible mount alcohol.
- **Remedy: - Strychnine hydrochloride gets precipitated yielding diffusible precipitate, hence**

CHEMICAL INCOMPATIBILITIES : TYPES

- **E.g-2.:Quinine hydrochloride mixture**

Rx

Quinine hydrochloride -0.12ml

Sodium salicylate -4g

Water -100ml

- **Causes: -** When quinine hydrochloride combined with the sodium salicylates it forms quinine salicylates which is an indiffusible precipitate.
- **Remedy: - Hence follow method B for precipitate yielding interactions.**

THERAPEUTIC INCOMPATIBILITY

- It is the modification of the therapeutic effect of one drug by the prior concomitant administration of another. It may be as a result of prescribing certain drugs to a patient with the intention to produce a specific degree of pharmacological action, but have restore or intensity of the action produced is different room that intended by the prescriber.

THERAPEUTIC INCOMPATIBILITY

- **MECHANISM:**

  It is divided into two groups. They are

- **Pharmacokinetic:** absorption, distribution, metabolism and excretion.
- **Pharmacodynamics:** These are related to the pharmacological activity of the interacting drugs.

E.g., Synergism, antagonism, altered cellular transport, effect on the receptor site.

- Therapeutic incompatibilities occurs due to following reasons

a. Error in dosage

b. Wrong dose or dosage form

c. Contra-indicated drugs

d. Synergistic and antagonistic drugs

e. Drug interactions

THERAPEUTIC INCOMPATIBILITY

- **ERROR IN DOSAGE**
- Many therapeutic incompatibilities result from errors in writing or interpreting the prescription order.
- The most serious type of the dosage error in the dispensing is overdose of a medication26.

E.g., Atropine sulphate capsules

Rx

Atropine sulphate - 0.005g

Phenobarbitone - 0.015g

Aspirin - 0.300g

- Causes:- In this prescription, the quantity of the atropine sulphate in each capsule is more than its recommended dose.
- Remedy:- The prescription is referred back to the prescriber to correct the overdose of the atropine sulphate.
- The recommended dose of atropine for a single capsule is 0.25 to 2mg.

THERAPEUTIC INCOMPATIBILITY

WRONG DOSE OR DOSAGE FORM

- There are certain drugs which have quite similar names and there is always a danger of dispensing the wrong drug.

  E.g., Prednisone and Prednisolone

  Digoxin and Digitoxin

- Some times many drugs are available in the different dosage forms and hence, if the dosage form is not clearly mentioned on the prescription, it becomes necessary to seek clarification from the prescriber.
- The responsibility of the pharmacist becomes to check the prescription intensively and if he finds these types of errors he should immediately consult the prescriber for the clarification.

THERAPEUTIC INCOMPATIBILITY

PRESCRIBING CONTRA-INDICATED DRUGS

- There are certain drugs which may be contra- indicated in a particular disease or a particular patient who is allergic to it.
- Corticosteroids are contra-indicated in the patients having peptic ulcers
- The penicillin and sulphur drugs are contra- indicated in the patients who are allergic.
- Vasoconstrictors are contra-indicated in hypertensive patients.
- Barbiturates and morphine should not be given to the asthmatic patients.

THERAPEUTIC INCOMPATIBILITY

E.g., Sulphadiazine capsules

- **Causes:-**Ammonium chloride is a urinary acidifier. It causes the deposition of the Sulphonamide crystals in the kidney.
- **Remedy: -** Before prescribing such substances a doctor must be careful.
- If he does not, a Pharmacist shows his caliber to point out such type of the doctor's error.
- Such must Immediately be referred back to the concerned doctor and get corrected.

PRESCRIBING SYNERGISTIC OR ANTAGONISTIC DRUGS

- When two drugs are prescribed together, they tend to increase the activity of each other which is known as SYNERGISM.
- When two drugs are prescribed together, they tend to decrease the activity of each other which is known as ANTAGONISM.

E.g.,

- A combination of aspirin and paracetamol increases the analgesic activity.
- A combination of penicillin and streptomycin increases the antibacterial activity.
- Amphetamines show its antagonists effect with the barbiturates.
- E.g., Amphetamine sulphate syrup
- Causes:-In this prescription, there is a combination of two sympathomimetic drugs There by causing additive effect.
- Remedy:- The prescription is referred back to the prescriber for necessary corrections.

DRUG INTERACTIONS

- The effect of one drug is altered by the prior or simultaneous administration of another drug. The drug interaction can usually be corrected by the proper adjustment of dosage if the suspected interaction is detected.
- E.g., Tetracycline capsule - 250mg capsules
- **Direction:** Take one capsule every 6 hours with milk.
- **Causes:-**Tetracycline is inactivated by calcium present in milk.
- So, it should not be taken with milk.
- **Remedy:** In this prescription, the therapeutic incompatibility is unintentional.
- So, the prescription is referred back to the prescriber to change the direction

THANK YOU

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