

Bulk compounding-

- ▶ Drug compounding is the process of combining, mixing, or altering ingredients to create a medication that fulfill the needs of an individual patient.
- ▶ Bulk Compound means a bulk quantity of the medicine Compounded.
- ▶ Compounded drugs are not FDA-approved.

Types-

1. **Sterile Compounding-** These type of compounding is done in a clean-room environment using aseptic techniques to ensure preparations are free of microorganisms.

Examples- Injectable, implant, and ophthalmic preparations.

2. **Nonsterile compounding-** These type of compounding is done in a clean environment but without aseptic techniques required.

- ▶ Nonsterile compounding is generally used for oral and topical (skin).

Examples- capsules, solutions, suspensions, ointments, creams, and suppositories.

Reason for compounding-

- ▶ Patients who cannot take commercially prepared medicines.
- ▶ Patients requiring limited dosage strengths, such as a very small dose for infants.
- ▶ Patients requiring an allergen-free medication, such as one without colored dyes.
- ▶ Patients who absorb or excrete medications abnormally.
- ▶ Patients who need drugs that have been discontinued by pharmaceutical manufacturers because of low profitability.
- ▶ Patients facing a supply shortage of their normal drug.

Requirement of bulk compounding-

1. **Source of chemical and drugs-** Pharmacist must obtain small quantity of the appropriate chemicals or drugs from wholesalers.
2. **Equipment-** The equipment required for compounding specific dosage form should be available.
3. **Location of compounding area-** A separate compounding area should be available for compounding of sterile and nonsterile products.
 - ▶ The ideal location is away from heavy foot traffic and near a sink where there is enough space to work and store all chemicals and equipment.
4. **Staff-** sufficient staff should be available according to workload.

Compounding In Hospital

Definition

Compounding is a process of combining , mixing or altering in drug ingredients for developing a drug to fulfill the specific need of a patient .

It is done when no approved drug is appropriate for patient .

Objectives

- 1) To convert solid form to liquid .
- 2) to avoid an allergic ingredient like coloured dyes .
- 3) To provide an exact dose that is not available in market .
- 4) To mask an unpleasant taste .
- 5) Two minimize multiple dosing .

Bulk Compound

when any drug compounded in bulk (big amount) it is called bulk compounding it is required when same medication are prescribed more and more in a specific area .

Requirements for bulk compounding in hospital

1) **Manufacturing facilities** : the place where drug are being compound should be clean at high degree . it should be smooth construction specially walls and floor which are easy to clean .

2) **Raw Materials** : after deciding the drug to be compounded , its raw materials should be bought of good quality and in sufficient quantity .

3) **Equipments** : the equipments are required for specific drugs should be available .

4) **Staff** : there should be enough staff according to workload .

Control Systems In Compounding

1) **Compounding process control** : during compounding the standard process should be applied to obtain good strength , quality and purity of drug .

2) **Quality control** : it is a process to check the quality , purity or strength of a developed product .

3) **Budgetary control** : the budget of hospital should also be considered during making a program for bulk compounding .

IV Admixture Services

Definition

Combination of one or more sterile products into bottle of IV Fluid is called IV Admixture .

Preparation Of IV Admixture

1) The admixture should be prepared according to the directions of physician .

2) According to the physicians order a label should be prepared including

a) name and address of patient and location

b) name of physician .

c) name of drug with quantities.

d) date of compounding and expiry date

e) name of pharmacist who prepared Admixture .

3)The admixture should be prepared under laminar flow hood / cabinet using sterile needles and syringe .

4) After adding the drugs the solution should be mixed properly .

5) Before using the admixture solution , it should be checked carefully to satisfy that there is no incompatibility .

6) Before dispensing the final admixture preparation to use ,the pharmacist should inspect the label and calculation etc .

Incompatibility of IV Admixture

Incompatibility is an unwanted reaction that occurs between the drug to drug , fluid or containers . and unable to show required effect. like :

1) Synergism (increase in drug efficiency)

2) antagonism

3) New effects like toxic effect .

Types of Incompatibility of IV Admixture

➤ Physical Incompatibility

- chemical Incompatibility
- therapeutic Incompatibility

1) **Physical incompatibility** : when visible changes occurs after mixing two or more drugs , it is called physical incompatibility for example change in colour , formation of precipitate etc.

2) **Chemical incompatibility** : when chemical degradation occurs after mixing true or more products , it is called chemical incompatibility e. g. oxidation ,reduction ,decomposition ,complexation .

3) **therapeutic Incompatibility** : when drugs are administered and show unwanted effect like antagonism ,synergistic or toxic effect , it is called therapeutic incompatibility .

Consequences of Incompatibility of IV Admixture

Irritation , Multiple organ failure , toxicity , Embolus . etc.

Preventing Incompatibility of IV Admixture

- Preparing admixture under strict indications of Physician .
- Separating the drug dose by time and place and by rinsing the IV setup / system with a natural solution .

- by using in-line filter for infusion .
- Proper mixing of drugs added in IV fluid .
- Reducing the number of drugs in a single IV bag .
- avoiding the administration of Admixture just after the mixing .
- Discarding / should not used the admixture solution after 24 hours
- Observing the running of IV fluid to detect the physical change .
- Observing the patient to detect the therapeutic Incompatibility .

Role of Pharmacist in IV admixture Administration

- ❖ Pharmacist should provide proper supervision during preparation of IV admixture
- ❖ He should provide proper guidance for staff to avoid incompatibility .
- ❖ he should use latest research information to avoid incompatibility.
- ❖ he should use colour coding to avoid incompatibility .
- ❖ He should provide labelling on bags
- ❖ he should use alternate administration route .
- ❖ He should use in-line filter .

Total parental Nutrition (TPN)

Definition

It is a method to provide essential nutrition without using GIT . In this method nutrients are provided in the form of IV Fluid to meet the body needs .

This method is used when someone unable to take nutrients orally . or in an emergency condition .

Types of TPN

1) **Central Parental Nutrition (CPN)** : In this method fluids are delivered through a central vein ., Mainly through the superior vena cava , It is present beneath the collarbone and directly goes to the heart .

2) **peripheral Parental Nutrition (PPN)** : In this method fluids are delivered through a smaller vein .

Composition of TPN

TPN is a mixture of all the essential nutritional components , which are required for normal body functions like carbohydrates , proteins , fat and minerals .

Macronutrients provided by TPN

Proteins

200 ml bottles containing 8-9 % amino acids are available in market for IV use .

1.5 g protein /kg/day is needed for normal hepatic and renal function .

Calories (carbohydrates)

Calories are administered as 20-25% dextrose in water .

2000- 2500 calories are needed daily normally .

Fat

fatty acid deficiency may occur within 3 weeks of fat-free TPN .

milky emulsions of soyabean or safflower oils are available for lipid administration .

Micronutrients provided by TPN

Vitamins

Multivitamin Preparation which contain essential Vitamins is available in market

Minerals

Copper , zinc , selenium , and chromium are commonly added in TPN .

Indications of TPN

- 1) TPN is administered if the digestive system is not working properly .
- 2) if GIT needs a complete rest .
- 3) Abdominal surgery
- 4) Chemotherapy
- 5) Intestinal Ischemia
- 6) GIT bleeding
- 7) Extremely Premature Birth

Complication of TPN

- Bacterial Infection Through the IV Catheter .
- Blood Clots can form at catheter .
- GI atrophy (weakening of GI) after 2 weeks .
- Liver disease can be develop after long term use of TPN .
- Gallbladder problems .