

Chapter-5

Compounding in Hospitals

Compounding in Hospitals: Bulk compounding, IV admixture services and incompatibilities, Total parenteral nutrition

Compounding in Hospitals:

- Compounding in hospitals refers to the process of preparing and mixing medications in a controlled environment, such as a pharmacy.
- This can include creating new formulations of medications, adjusting the strength of medications, or combining multiple medications into a single dose.
- Pharmaceutical/hospital compounding require because of the-
 - Limited number of dosage forms.
 - Limited number of drug strengths.
 - Shortages of stability of the drug products and combination.
 - New therapeutic approaches.
 - Due to changes in environmental/patient's conditions.
- Compounding is typically done under the supervision of a licensed pharmacist and must adhere to strict guidelines to ensure the safety and effectiveness of the compounded medications.
- The goal of compounding is to provide personalized and unique medication options for patients that cannot be obtained through commercially available products.
- Due to the compounding, we make the suitable doses and formulation according to the patient/disease conditions.
- Now a days, compounding is very easy because many combinations drugs are already present in the market.

Ideal requirement for the compounding

For compounding the medicine first of all aseptic area, room temperature and necessary equipment's like-

- Compounding platform.
- Lab coat and gloves.
- Sterile equipment's like mortar and pestle.
- Sterile container and closers.
- Packing material etc.

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Bulk compounding:

- Involves the preparation of large quantities of a medication for use in the hospital.
- This can include creating new formulations of medications, adjusting the strength of medications, or combining multiple medications into a single dose.
- This is usually done in a controlled environment such as a hospital pharmacy, under the supervision of a licensed pharmacist.
- The goal is to provide a consistent and cost-effective supply of medications for patients.
- **Examples of bulk compounding** include creating a batch of an ointment for wound care or preparing a large quantity of an IV solution for a specific unit of the hospital.

IV admixture services:

- Involves the preparation of medications for intravenous administration.
- This includes mixing different medications into a single solution, which is known as an IV admixture.
- IV admixtures are typically prepared by a pharmacist and administered by a nurse or other healthcare professional.
- The goal of IV admixture services is to provide patients with a convenient and efficient way to receive multiple medications at once.
- Examples of IV admixture services include preparing a solution of antibiotics and pain medication for post-surgery patients or a solution of anticoagulant and electrolytes for critical care patients.

IV fluids commonly used for IV admixtures

Injection	Concentration	pH	Therapeutic use
Dextrose	2.5%-50%	3.5-6.5	Nu trient replenisher
Dextrose/Na Cl	5%-20%	3.5-6.5	Nu trient replenisher
Lactated Ringer's solution	0.5%	6-7.5	Systemic alkalizer/electrolyte replenisher
Sodium chloride	0.45%, 0.9%, 2%, 5%	4.5-7	Nutrient replenisher

IV fluids are commonly used for number of clinical conditions

- Correction of disturbances in electrolyte balance
- Correction of disturbances in body fluids
- Provides basic nutrition
- As a vehicle for other drug substances
- Provide total parenteral nutrition

Incompatibilities:

- Refers to situations where certain medications cannot be mixed together due to chemical reactions that could potentially harm the patient.
- Medications can be incompatible due to chemical reactions such as precipitation, oxidation, or neutralization.
- It is important to identify and avoid these incompatibilities to ensure the safety and effectiveness of the medication.
- Examples of incompatibilities include mixing an aminoglycoside antibiotic with a beta-lactam antibiotic, as it may cause inactivation of the aminoglycoside or mixing a calcium-containing solution with a phosphate-containing solution which could lead to the formation of an insoluble salt.

Total parenteral nutrition (TPN):

- A method of providing nutrients to a patient through intravenous means, rather than through the gastrointestinal tract.
- It is typically administered under the supervision of a healthcare professional and requires careful monitoring to ensure that the patient is receiving the appropriate balance of nutrients.
- Examples of patients who may receive TPN include critically ill patients, burn victims, or patients recovering from surgery.

Total parenteral nutrition (TPN) is a method of delivering nutrients directly into the bloodstream via a vein. It is used when a patient is unable to consume food or absorb nutrients through the gastrointestinal tract due to a medical condition or surgical procedure. TPN solutions are typically made up of a combination of glucose, amino acids, lipids, vitamins, and minerals.

Indications for TPN include:

- Short bowel syndrome
- Malabsorption

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- Severe injuries or burns
- Cancer
- Trauma
- Intestinal surgery
- Inflammatory bowel disease

TPN is usually administered through a central venous catheter, which is inserted into a vein in the neck, chest, or arm. The catheter is then threaded through the vein to the superior vena cava, which is the large vein that carries blood back to the heart. This allows the TPN solution to bypass the gastrointestinal tract and go directly into the bloodstream.

Risks and complications of TPN include:

- Blood clots
- Infection
- Inflammation of the vein
- Liver dysfunction
- Metabolic imbalances
- Blood sugar fluctuations
- Weight gain

TPN is typically administered under the supervision of a healthcare provider, such as a dietitian or nurse. Blood tests are regularly done to monitor electrolyte, glucose, and lipid levels, to ensure that the patient is receiving the appropriate balance of nutrients.

Overall TPN is a complex procedure that requires close monitoring, and should only be administered under the supervision of trained healthcare professionals. It can be life-saving for patients with certain medical conditions, but also carries significant risks and complications.