Nutrition & Diet Therapy
Third Stage
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Lecture Eight : Therapeutic Nutrition

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Therapeutic Nutrition: Basic Principles

- Therapeutic nutrition is based on the modification of the nutrients or other aspects of a normal diet to meet a person's nutritional needs during an illness.
- The aim of diet therapy is to maintain health and help the patient to regain nutritional wellbeing.
- A nurse's background in anatomy, physiology, and pathophysiology will facilitate the clinical application of these principles.

Types of Diet

1. Normal Diet:

- Normal diet is modified to feed young children, elderly, and sick people.
- The modifications are based on the changed needs of the individual, due to age or sickness.
- Normal diet is planned according to the recommended daily dietary intakes, which are designed to meet the needs of all healthy persons and may not meet the needs of sick persons.

Modifications of Normal Diet

The normal diet may be modified to:

1. Provide change in consistency, e.g., soft and fluid diets.
2. Provide foods bland in flavor.
3. Modify intervals of feeding.
4. Increase or decrease energy content.
5. Increase or decrease other nutrients, e.g., protein.
6. Increase or decrease fibre.
7. include or exclude specific foods as in allergic conditions.

2. Mechanical Soft Diet:

Many people, including infants and elderly need soft diet because they have no teeth. Therefore, the only change is made in the consistency of the foods served. No restriction is placed on food selection.

The following changes in the normal diet will meet the needs of individuals without teeth:

- Rice and other cereals to be served soft-cooked.
- Soft breads are substituted for hard, crusty preparations.
- whole pulses must be cooked thoroughly.
- Eggs-boiled or scrambled.
- Meat/fish should be ground or minced finely.
- Cooked vegetables may be used.

3. Soft Diet:

It is a step between the full liquid and the normal diet. It is served to persons suffering from acute infections, gastrointestinal disturbances or persons recovering from surgery. The diet consists of simple soft foods, which are easy to chew and easy to digest. Harsh fibre, fatty or highly spiced foods are avoided. **The soft diet includes:**

- Soft cooked rice and soft bread: 6 servings or more.
- Milk, buttermilk, soft cheese, butter, soups, soft desserts: 2-3 servings
- whole pulses well-cooked: 2-3 servings
- Eggs poached, ground meat, fish and poultry: 2-3 servings
- Vegetables and fruits made up of

1. Green leafy vegetables cooked and other vegetables (tender, chopped and cooked: 2-3 servings
2. Citrus fruits or its juices or mango or banana: 2-3 servings

4. Liquid Diet or full fluid diet:

Is prepared for persons suffering from fevers, persons who have just undergone an operation or whenever a person is unable to tolerate solid foods. The adequacy of such a diet will depend on the types of liquids permitted. Full fluid diet is served to persons, who are very ill and cannot chew or swallow solid food. It includes all foods, which are liquid at 37°C. **The following foods can be included in the full fluid diet:**

- Milk--1 litre • Tea, coffee, soft drinks • Soups, broth
- Eggs--2 (in custard) • Tomato or vegetable juices--1/2 cup
- Meat/fish cooked and strained--25-50 g
- Cereal strained--1/2 cup (100 g) cooked as gruel
- Vegetables--1/4 cup cooked, strained or puree for soup
- Fruit juices--1 cup, citrus and other strained juices
- Butter • Sugar • ice cream, gelatin dessert, custard • Flavourings, salt.

5. Clear fluid diet:

- is given when a person is unable to tolerate food, due to nausea, vomiting, gas formation, diarrhea, or extreme lack of appetite. This diet is given for a day or two, until the patient is able to take a more liberal liquid diet.
- As the name indicates the diet consists of clear liquids such as tea with lemon and sugar, coffee, cereal extracts, strained fruit juices, fat-free broth, etc.
- The amount is restricted from 30 to 60 ml per hour in the beginning and gradually increased. This diet replaces the fluids lost by the body, thus preventing dehydration.
- Recent trend is to help the patient to progress from clear liquid to liquid to soft to mechanically soft to normal diet as quickly as possible. Therefore, the inadequacy of the first stage of diet may not affect the patient's health to get through this stage in a day or two.

Specialized Nutrition : 1- Enteral Nutrition (Tube Feedings)

- Enteral (tube) feedings are used only for patients who have enough functioning of the GI tract to digest and absorb their food.
- They are also used when the patient cannot eat enough regular food to promote healing, even though the GI tract is functional.
- Frequently, an oral supplement has been added to the diet before tube feedings are considered, but it has been insufficient. After careful assessment of nutritional status, tube feedings are added as an additional supplement.

Figure1: Use of Oral Supplements Patients can drink nutrient-dense formulas when they are unable to consume enough food from a regular diet.

The following medical conditions or treatments may indicate the need for tube feedings:

- Severe swallowing disorders
- Impaired motility in the upper GI tract
- GI obstructions and fistulas that can be bypassed with a feeding tube
- Certain types of intestinal surgeries
- Little or no appetite for extended periods, especially if the patient is malnourished
- Extremely high nutrient requirements
- Mechanical ventilation
- Mental incapacitation due to confusion, neurological disorders, or coma

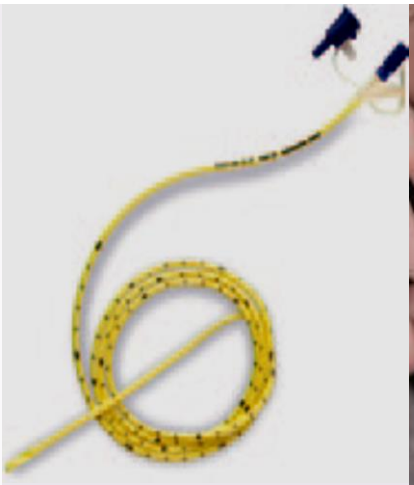
Tube Feeding Routes

- The feeding route chosen depends on the patient's medical condition, the expected duration of tube feeding, and the potential complications of a particular route.
- When a patient is expected to be tube fed for less than four weeks, the feeding tube is generally routed into the GI tract via the nose (nasogastric or nasoenteric routes).
- The patient is frequently awake during transnasal (through-the-nose) placement of a feeding tube.
- While the patient is in a slightly upright position with head tilted, the tube is inserted into a nostril and passed into the stomach (nasogastric route), duodenum (nasoduodenal route), or jejunum (nasojejunal route).
- The final position of the feeding tube tip is verified by abdominal X-ray or other means.

Tube Feeding Routes

- In infants, orogastric placement, in which the feeding tube is passed into the stomach via the mouth, is sometimes preferred over transnasal routes; this placement allows the infant to breathe more normally during feedings.
- When a patient will be tube fed for longer than four weeks, or if the nasoenteric route is inaccessible due to an obstruction or other medical reasons, a direct route to the stomach or intestine may be created by passing the tube through an enterostomy, an opening in the abdominal wall that leads to the stomach (gastrostomy) or jejunum (jejunostomy). An enterostomy can be made by either surgical incision or needle puncture.

A transnasal feeding tube accesses the GI tract via the nose. The patient in this photo is being fed through a nasogastric tube; he is also attached to a respirator to help him breathe.



The feeding tube shown here has centimeter marks to help with insertion and to check migration. The Y-port at the upper end of the tube allows the administration of water or medications during feedings.

In a gastrostomy, the feeding tube accesses the GI tract through the abdominal wall.

TABLE 16-1 Comparison of Tube Feeding Routes[a]

Insertion Method or Feeding Site	Advantages	Disadvantages
Transnasal	Does not require surgery or incisions for placement; tubes can be placed by a nurse or trained dietitian.	Easy to remove by disoriented patients; long-term use may irritate the nasal passages, throat, and esophagus.
▪ Nasogastric	Easiest to insert and confirm placement; least expensive method; feedings can often be given intermittently and without an infusion pump.	Highest risk of aspiration in compromised patients;[b] risk of tube migration to the small intestine.
▪ Nasoduodenal and nasojejunal	Lower risk of aspiration in compromised patients;[b] allows for earlier tube feedings than gastric feedings during acute stress; may allow enteral feedings even when obstructions, fistulas, or other medical conditions prevent gastric feedings.	More difficult to insert and confirm placement; risk of tube migration to the stomach; feedings require an infusion pump for administration.
Tube enterostomies	Allow the lower esophageal sphincter to remain closed, reducing the risk of aspiration;[b] more comfortable than transnasal insertion for long-term use; site is not visible under clothing.	Tubes must be placed by a physician or surgeon; general anesthesia may be required for surgically placed tubes; risk of complications from the insertion procedure; risk of infection at the insertion site.
▪ Gastrostomy	Feedings can often be given intermittently and without a pump; easier insertion procedure than a jejunostomy.	Moderate risk of aspiration in high-risk patients;[b] feedings often withheld for 12 to 24 hours before and 48 to 72 hours after the insertion procedure.
▪ Jejunostomy	Lowest risk of aspiration;[b] allows for earlier tube feedings than gastrostomy during critical illness; may allow enteral feedings even when obstructions, fistulas, or medical conditions prevent gastric feedings.	Most difficult insertion procedure; most costly method; feedings require an infusion pump for administration.

Formulas may be delivered using an open feeding system or a closed feeding system

In an open feeding system, the formula is transferred from its original packaging to a feeding container.

In a closed feeding system, the formula is prepackaged in a container that can be attached directly to a feeding tube, such as the bottle shown on the left. The formula in the can at right can be used in an open feeding system.

FIGURE 16-7 Comparison of Open and Closed Feeding Systems

open feeding system: a formula delivery system that requires the transfer of the formula from its original packaging to a feeding container.

closed feeding system: a formula delivery system in which the sterile formula comes prepackaged in a container that can be attached directly to the feeding tube for administration.

intermittent feedings: delivery of about 250 to 400 milliliters of formula over 30 to 45 minutes.

continuous feedings: slow delivery of formula at a constant rate over an 8- to 24-hour period.

2- Parenteral Nutrition

- When a patient is severely depleted nutritionally or if the GI tract cannot be used, parenteral feeding should be used. Such routes cannot be used when intestinal function is inadequate, however, the ability to meet nutrient needs intravenously is a lifesaving option for critically ill persons. The procedure is costly and is associated with a number of potentially dangerous complications.
- Parenteral Feedings via Peripheral Vein: Nutrient fluids entering a peripheral vein can be saline with 5%–10% dextrose, amino acids, electrolytes, vitamins, and medications. Intravenous fluids may be either isotonic, hypotonic, or hypertonic. Hypotonic solutions draw fluid from the blood vessels into the interstitial spaces and cells. Hypertonic solutions create the opposite effect; they draw fluids out of interstitial spaces into the blood. This type of feeding is safer than feeding by a central vein, but it fails to provide adequate calories and other nutrients for repair and replacement of losses.

2- Parenteral Nutrition

- Parenteral Feeding via Central Vein (Total Parenteral Nutrition [TPN]): parenteral feeding via a catheter inserted into a central vein (usually the subclavian to the superior vena cava) can provide adequate nutrition.
- The solution for TPN is a sterile mixture of glucose, amino acids, and micronutrients. The intralipids are not given in this solution and may be administered via a peripheral vein. The amounts of micronutrients added are based on the individual's blood chemistry. Multivitamin preparations can be added to the TPN solutions, except for B12, K, or folic acid, which are given separately.
- TPN has many advantages: It can be used for long periods of time to meet the individual body's total nutritional needs. The solutions can be adjusted according to individual needs by increasing or decreasing any or all of the nutrients.
- TPN also has many disadvantages. The solutions are very expensive, and they support rapid growth of bacteria and fungi. The rate of infusion must be adhered to rigidly, around the clock. Dressing changes are done using sterile technique

The following conditions may require use of parenteral nutrition:

- Intractable vomiting or diarrhea
- Severe GI bleeding
- Intestinal obstructions or fistulas
- Paralytic ileus (intestinal paralysis)
- Short bowel syndrome (a substantial portion of the small intestine has been removed)
- Bone marrow transplants
- Severe malnutrition and intolerance to enteral nutrition

FIGURE 16-9 Peripheral Parenteral Nutrition
The peripheral veins can provide access to the blood for delivery of parenteral solutions.

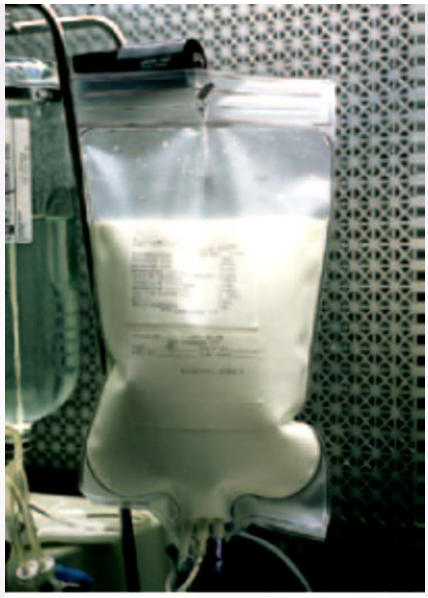


FIGURE 16-12 A lipid emulsion gives the parenteral solution a milky white color.

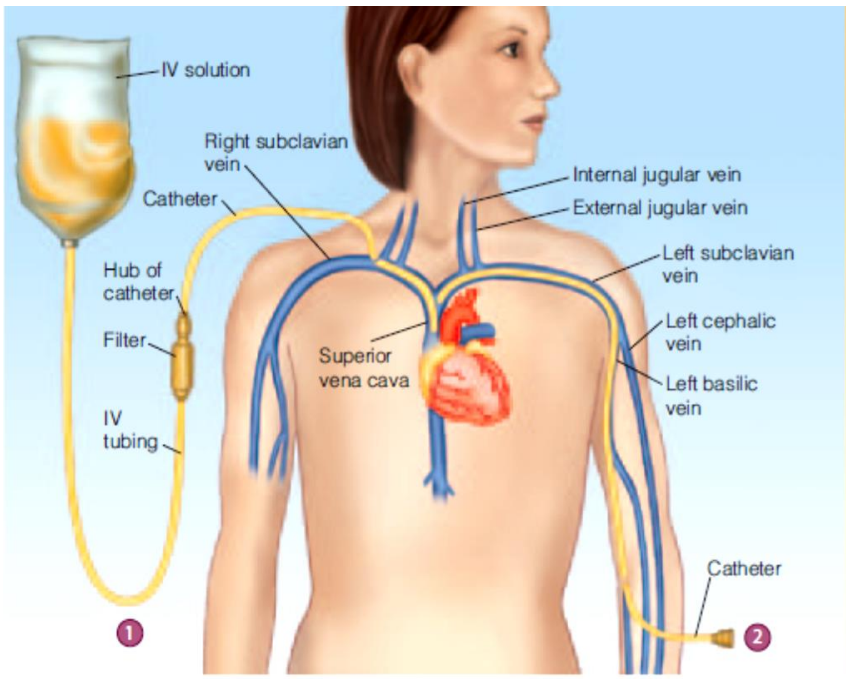
peripheral veins: the small-diameter veins that carry blood from the limbs.

central veins: the large-diameter veins located close to the heart.

peripheral parenteral nutrition (PPN): the infusion of nutrient solutions into peripheral veins, usually a vein in the arm or back of the hand.

total parenteral nutrition (TPN): the infusion of nutrient solutions into a central vein.

catheter: a thin tube placed within a narrow lumen (such as a blood vessel) or body cavity; can be used to infuse or withdraw fluids or keep a passage open.



1 Traditionally, central catheters enter the circulation at the right subclavian vein and are threaded into the superior vena cava with the tip of the catheter lying close to the heart. Sometimes catheters are threaded into the superior vena cava from the left subclavian vein, the internal jugular vein, or the external jugular vein.

2 Peripherally inserted central catheters usually enter the circulation at the basilic or cephalic vein and are guided up toward the heart so that the catheter tip rests in the superior vena cava.

FIGURE 16-10 Accessing Central Veins for Total Parenteral Nutrition