Chapter 21
Basic Nutrition and Nutritional Therapy

Basic Nutrition and Nutritional Therapy
Nutrition is the total of all processes involved in the taking in and utilization of food substances for proper growth, functioning, and maintenance of health.

Role of the Caregiver in Promoting Nutrition
The PT can promote good nutrition by
- Importance of the diet and encouraging dietary compliance
- Assisting some patients with the eating process
- Taking and recording patient weight
- Recording patient intake
- Observing clinical signs of poor nutrition and reporting them
- Serving as a communication link
Old Food Pyramid

Basic Nutrition

- The six classes of essential nutrients are
  - Carbohydrates
  - Proteins
  - Fats
  - Vitamins
  - Minerals
  - Water
Essential Nutrients

- **TWO Basic Functions**
  - Provide energy
  - Build and repair tissue
    - Protein, calcium, phosphorus, iron, and fat

Carbohydrates

- **Main function of carbohydrates is to provide energy.** Breaks down into glucose. (sugar)

Carbohydrates

- If energy needs are met, carbohydrates will be stored as glycogen.
- Once glycogen stores are full, further excesses of carbohydrates will be converted to fat and stored as adipose tissue.
Fats

- Adipose tissue is the body’s storage form of fat; it helps insulate the body from temperature extremes and serves as a cushion to protect organs and other tissues.
- Fat provides satiety; it adds flavor and aroma to foods.

Saturated fatty acids
- These are generally of animal origin
- They increase blood cholesterol levels and the risk of atherosclerosis.

Unsaturated fatty acids
- They can be monounsaturated or polyunsaturated.
- They usually are from plant sources
- They are thought to have a blood cholesterol-lowering effect at moderate levels of intake.
Cholesterol

- Provides no energy.
- It is found in foods of animal origin.
- Dietary cholesterol is highest in organ meats and egg yolks.
- Intake of dietary cholesterol should average no more than 300 mg per day.

Protein

- Protein makes up the bulk of the body’s muscle tissues and organs.
- It is necessary for tissue growth and repair and wound healing.
- There are 22 amino acids, 9 essential amino acids must be obtained from the diet.
  - Generally of animal origin; found in foods such as meat, poultry, fish, milk, cheese, and eggs

Marasmus
Protein: Vegetarian Diets

- They are made up of mainly plant foods; some may include dairy products or eggs as well.
  - **Lactovegetarian** diet includes fruits, vegetables, grains, and milk and dairy products.
  - **Lacto-ovo-vegetarian** diet also includes eggs.
  - Protein needs can be met with a vegetarian diet; a wide variety of plant foods must be included.

Vitamins and Minerals

- Fat soluble
  - A, D, E, and K
  - Usually carried in the fatty portion of food
  - Can be stored by the body
- Water soluble
  - B vitamins and C
  - Not stored in the body; excesses excreted in the urine
Vitamins (continued)

- **Antioxidant vitamins**
  - Vitamins E and C
  - Possible link to reduced risks of certain cancers and heart disease
  - Function by delaying or preventing the destruction or breakdown of cell membranes in the presence of oxygen
  - Vitamin C
  - Adequate amounts are necessary for proper immune function.

Vitamin D

- Most common dietary sources include fortified milk and milk products.
- The body can also make vitamin D from exposure to sunlight.
- Promotes bone formation
- Deficiencies can lead to bone softening diseases
- Since 1930 each quart of milk has been fortified with an additional 10 mg of vitamin D and since that time rickets, a major health problem, ended.
Vitamins and Minerals

- Vitamin K
  - It plays a role in blood clotting.
  - A large fluctuation in vitamin K intake may alter the effects of anticoagulation drugs.

- Folate (folic acid)
  - Before and during pregnancy, it plays a role in reducing the risk of neural tube defects in the infant. 2500-3000 infants/yr
  - Anemia

Spina bifada

Vitamin B₁₂

- It is primarily found in foods of animal origin. Strict vegans need to take B-12 supplement
- It requires a special intrinsic factor produced in the stomach for absorption.
- Pernicious anemia may result with inadequate amounts of intrinsic factor because B₁₂ is not absorbed.
- Maintains myelin sheath, insulting covering of nerve
Minerals

- Major minerals are those needed in amounts greater than 100 mg per day: calcium, phosphorus, magnesium, sulfur, sodium, potassium, and chloride.
- Trace minerals are needed in much smaller amounts: iron, zinc, iodine, selenium, copper, fluoride, chromium, and molybdenum.

Minerals

- Calcium
  - Protective effect against osteoporosis and hypertension
- Sodium
  - Functions as an electrolyte
  - Salt is a major dietary source
- Potassium
  - An electrolyte; may have a protective effect against hypertension
  - 2000 mg per day
- Iron
  - Part of hemoglobin, which is part of the red blood cell and carries oxygen to the cells

WATER
How long can you live without water

- 3 to 4 days regardless of your size
- If you have food and not water you can survive for weeks

Water

- Nutrient most vital to life
- Makes up approximately 60% of adult body weight and 80% of infant weight
- Provides form and structure to body tissues
- Transports nutrients and other substances
- Lubricates and protects moving parts of the body
- Lubricates food and aids in digestion
- Regulates body temperature

Life Cycle Nutrition

- Adulthood Nutritional concerns of adults in long-term care facilities
  - Malnutrition is a common problem among nursing home residents and profoundly influences physical health and quality of life.
  - Residents should be offered familiar foods that taste good.
  - Fluids should be offered to residents at all meals and between meals.
  - Nurses must understand the value of mealtime as a pleasant, social experience.
Life Cycle Nutrition

○ Nutrient-Drug Interactions
  ● Drugs may alter food intake by either increasing or decreasing appetite or the ability to eat.
  ● They may also affect the absorption, metabolism, and excretion of certain nutrients.
  ● Food intake and vitamin/mineral supplementation may affect the absorption, distribution, metabolism, and action of some medications.

Therapeutic Diets

○ Liquid diets
  ● Clear liquid diet: easily digested and absorbed.
    - bouillon, broth
  ● Full liquid diet is more nutritionally complete than a clear liquid diet but is still lacking in some nutrients: strained cereals and soups, ice cream, puddings, milk/milkshakes, and fruit juices

○ Soft and low-residue diets
  ● Soft diet: low in fiber; pureed
  ● Low-residue diet is similar to the soft diet but also includes restrictions on milk, because it leaves more residue in the colon.
  ● Mechanical soft diet eliminates foods that are difficult to chew or swallow.

○ High-Fiber Diets
  ● Doubles the intake of dietary fiber.
  ● Used for the treatment of some GI disorders.

○ High-kilocalorie and high-protein diets
  ● During times of physiological stress, the body’s energy and protein needs are increased.
  ● Diet should provide increased amounts of kilocalories and protein in small volumes.
  ● Nutritional support in the form of tube feedings or IV feedings may be considered.
Medical Nutrition Therapy and Therapeutic Diets

- **Carbohydrate-Modified Diets**
  - **Lactose Intolerance**
    - Intolerance occurs as a result of a lack of the digestive enzyme lactase.
    - The GI tract is unable to break down lactose.
    - Symptoms occur after the ingestion of milk products and include nausea, cramps, bloating, flatulence, and diarrhea.
    - Diet for lactose intolerance excludes milk and milk products; foods with milk added may need to be avoided as well.

Parenteral Nutrition Support

- **Intravenous feedings**
  - May be administered through peripheral veins
- **Total parenteral nutrition (TPN)**
  - Administration of hypertonic solution into a large central vein
  - Composed of glucose, amino acids, vitamins, minerals, and electrolytes; fats also given as a supplement to the main formula
  - Indicated for the patient with a nonfunctioning or dysfunctional GI tract

Time for lunch