Preface

This manual was written for students in the Nutrition Assistant Program to serve as a guide in the study of *Clinical and Community Nutrition*, a required course in the program.

The manual is divided into two parts: *Part I – Clinical Nutrition* and *Part II – Community Nutrition*. The first part introduces the student to the basic principles of medical nutrition therapy; the second part covers basic skills in delivering nutrition services in community health settings with emphasis on nutrition education.

Each lesson includes the following: learning objectives and subject matter for discussion. The subject matter presented provides background knowledge for the nutrition assistant student to draw upon and apply in the field experience training and beyond.
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Lesson I

INTRODUCTION TO CLINICAL NUTRITION
Diet Therapy, Modified Diets, and Hospital Foodservice

OBJECTIVES:

In this lesson, the student will:

1. Describe the purpose of diet therapy.
2. Identify the information found in diet manuals.
3. Differentiate between standard and modified diets.
4. Given three hospital menu items, explain appropriate modifications needed for soft, low fat, low sodium, and calorie-controlled diets.

I. DIET THERAPY

Diet therapy, also referred to as medical nutrition therapy, strives to provide the appropriate amounts of energy, protein, carbohydrate, fat, vitamins, major minerals, trace elements and water in whatever form the client can best use. A modified diet is a nutritionally adequate diet that emphasizes a variety of foods, but adjusted to meet special needs.

A. Diet Therapy in the Hospital Setting

In health care facilities, the physician and dietitian usually select the modified diet appropriate for each patient, and the foodservice department delivers it. Diet manuals and diet orders are the primary means of communicating and implementing diet therapy in this setting.

1. Diet Manuals

A diet manual is a book that describes the foods allowed and restricted on different diets, the rationale and indications for use of the diets, and sample menus. In large hospitals, the staff of dietitians compiles and revises the diet manual, subject to approval by hospital administration, certain physicians and representatives of the nursing service. Smaller facilities may adopt the diet manual of another hospital or organization.

2. Diet Orders

In the hospital setting, the physician directs patient care, including nutritional care. Physicians prescribe a client’s diet and write the diet order into the medical record. Physicians should order diets by the names given in the diet manual and describe exact modifications, when appropriate. For example, a low sodium diet
order should specify the amount of sodium allowed, such as 1000 mg or 1 g, or 2000 mg or 2 g sodium diet.

B. Standard and Modified Diets

Standard or regular diets include all foods and provide all the nutrients in amounts appropriate for healthy people. Modified diets are used when standard diets fail to meet the specific needs of clients. Adjustments or modifications can include one or a combination of the following:

- consistency, or diet texture
- calorie value
- amounts of specific nutrients
- number of meals
- eliminate certain foods

1. Terms Used to Describe Diets

Levels of specific nutrients provided by any modified diet may be described as being any of the following:

- **Increased** Providing more of any nutrient than is usually present in the normal diet.
- **Decreased** Providing less of any nutrient than is usually present in the normal diet.
- **Restricted** Limiting the amount and/or type of one or more nutrients provided to a prescribed level.
- **High** Providing an amount of a specific nutrient that is substantially increased above the amount present in the normal diet.
- **Low** Providing an amount of a specific nutrient that is substantially decreased below the amount present in the normal diet.
- **Controlled** Implying careful regulation or adjustment of levels of one or more nutrients from day to day as needed according to biochemical changes; referring to a diet in which both the amount and type of one or more nutrients are regulated.
- **Free** Eliminating, as far as possible, all sources of a particular nutrient, food, or food component from the diet.

## Use of Modified Diets to Treat Diseases Involving Different Organ Systems

The following list gives examples of modified diets used to treat diseases involving different organ systems. These diets are described further in later lessons.

<table>
<thead>
<tr>
<th>DISORDERS</th>
<th>POSSIBLE DIET MODIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I Conditions Affecting or Involving the GI tract, Liver, and Exocrine Pancreas</strong></td>
<td></td>
</tr>
<tr>
<td>Cirrhosis</td>
<td>Increased protein OR protein restricted, sodium-restricted, fluid-restricted</td>
</tr>
<tr>
<td>Constipation</td>
<td>High-fiber, increased fluids</td>
</tr>
<tr>
<td>Difficulty swallowing (dysphagia)</td>
<td>Altered diet texture, thickened liquid, specific feeding method. Or even NPO and provide alternative nutrition feeding instead, ie: tube feeding, peripheral parenteral nutrition (PPN), and total parenteral nutrition (TPN)</td>
</tr>
<tr>
<td>Diverticulitis</td>
<td>Low-fiber</td>
</tr>
<tr>
<td>Diverticulosis</td>
<td>High-fiber</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>Regular, high-calorie, high-protein</td>
</tr>
<tr>
<td>Irritable bowel syndrome</td>
<td>High-fiber, fat-restricted</td>
</tr>
<tr>
<td>Peptic ulcer</td>
<td>Bland. Avoid spicy, sour, and other possible stimulants</td>
</tr>
<tr>
<td><strong>II Conditions Affecting the Endocrine Pancreas</strong></td>
<td></td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>Carbohydrate and Calorie controlled, low fat, and adequate amount of fiber</td>
</tr>
<tr>
<td><strong>III Conditions Affecting the Blood Vessels, Heart and Lungs</strong></td>
<td></td>
</tr>
<tr>
<td>Atherosclerosis</td>
<td>Low-fat, low-cholesterol, calorie-controlled in individual who is overweight, low-sodium,</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>Low sodium, calorie controlled, frequent small feedings &amp; fluid-restricted if indicated</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Low sodium, calorie-restricted, &amp; high potassium if only prescribed by doctor</td>
</tr>
<tr>
<td>Pulmonary disease</td>
<td>High-calorie, high-protein</td>
</tr>
<tr>
<td><strong>IV Conditions Affecting the Kidneys</strong></td>
<td></td>
</tr>
<tr>
<td>Chronic renal disease</td>
<td>Protein-restricted, low-sodium, fluid-restricted, potassium-restricted, phosphorus-restricted,</td>
</tr>
<tr>
<td>Conditions Affecting Many Organ Systems</td>
<td>(\text{Acquired immune deficiency syndrome (AIDS)})</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>(\text{Cancer})</td>
<td>(\text{High-kcalorie, high-protein})</td>
</tr>
</tbody>
</table>


II. FOOD IN THE HOSPITAL

A. Foodservice in Health Care Facilities

Providing standard and modified diets to clients in health care facilities presents unique problems. Such institutions must provide dozens of diets to hundreds, or thousands, of individuals. Familiarity with foodservice procedures can help to prevent errors and facilitate client care. An example of a health care facility is the hospital.

1. Hospital Foodservice Personnel

Administrative dietitians or foodservice managers direct all aspects of foodservice, from purchasing foods, design diet menus, to delivering meals to clients.

The clinical dietitian works directly with clients to assess their nutrition status, plan appropriate diets, and provide nutrition education. In some facilities, dietetic technicians, nutrition or dietitian assistants assist dietitians in both administrative and clinical tasks. Other dietary employees include clerks, aides, cooks, porters, and other assistants.

2. Hospital Menus

In a typical hospital setting, each client receives a menu every day and can select their meals. Clients who must follow modified diets receive menus that list only appropriate food selections. Each menu shows the day of the week, the type of diet, and the client’s name and room number. The client marks food choices on the menu and sends it back to the kitchen. The dietary department uses the menu in preparing the tray to make sure the appropriate foods are provided. The menu goes with the tray to the client’s room. The nursing or dietary personnel use the menu to check the tray before it goes to the client’s room. If a client has not marked a menu, or if a menu has been lost, the client will receive meals selected by the dietary department.
3. **Description of Common Hospital Menus**

**Regular:** People on regular diets select the foods of their choice. The regular menu may also be used for high-kcalorie, high-protein diets.

**Soft/Bland/Low Residue:** Foods for soft/bland/low-residue diets are similar to those for regular diets. Foods from the regular menu that are not appropriate are eliminated and appropriate substitutions made.

**Kcalorie-restricted and Diabetic:** Exchange values are often written next to each menu item. Both low sodium, and low fat foods are included. This menu is sometimes used for low fat, low cholesterol diets as well.

**Low Fat, Low Cholesterol (Cardiac):** Foods appropriate for both low fat and low sodium foods are included. Usually does not have Exchange values listed.

**Low Sodium:** Similar to those menus provided for low fat, low cholesterol diets, but high sodium foods are eliminated. If a person is on a low sodium, low fat and low cholesterol diet, they will be given the low fat, low cholesterol (cardiac) menus with high sodium foods crossed off. If the person is also on a low calorie diet, foods would be selected from the kcalorie restricted menu with high sodium foods crossed off.

**Renal:** Renal diets must be planned for each client, depending on the necessity for protein, potassium, sodium, phosphorus and fluid restrictions. Most items on a renal menu will be low sodium.

4. **Hospital Food Preparation**

Preparing foods tailored to each modified diet can be a difficult process. For this reason, foodservice departments use special systems designed to reduce errors. Preparing individual foods for each diet is not useful. Rather than modify every food for each different diet, most entrees such as baked chicken will be prepared two ways; one with some fat and salt, the other without fat or salt. Clients can add allowed items to their foods. For example, the person on a low-sodium diet not restricted in fat could add margarine to a serving of vegetables; the person on a low-fat diet with no sodium restriction could add salt to a serving of rice.
ACTIVITY I – MATCHING MODIFIED DIETS TO DISEASES

Directions:

From seven small groups as the instructor directs. Using the information in *Use of Modified Diets to Treat Diseases Involving Different Organ Systems*, on page 5 to page 7 of the manual, each group should work together to answer the following question: “For what disorder or disorders do we need:” (Your group works on the numbered item below that matches your group number). **Choose a recorder** to write the group’s answer.

1. Protein restriction; increased protein
2. Sodium restriction
3. Increased Kcalories; Kcalories restriction
4. Potassium restriction; increased potassium
5. Fluid restriction; fluid replacement
6. Low fiber; high fiber
7. Low fat
8. Bland diet

You will have 10 minutes to work together. Then the class will come back together. Have your group’s recorder write the modified diet assigned to your team on the board and list the disorders that match it.
TAKE HOME ASSIGNMENT I – HOSPITAL MENUS

Directions: The following food items appear on the regular lunch menu at an ordinary hospital. For each item, decide whether or not it is OK for the modified diets listed; soft, calorie-restricted, low fat, and low sodium. If a food item is not OK, suggest a modification or substitution for it. Write your answers in the spaces provided.

20 points

<table>
<thead>
<tr>
<th>Food item</th>
<th>Soft</th>
<th>Kcal controlled</th>
<th>Low fat</th>
<th>Low sodium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Milk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coffee with Creamer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tossed salad with Italian Dressing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roast beef with gravy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple Pie</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condiments: Salt Pepper Ketchup Mayonnaise Margarine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lesson II

NUTRITION BEFORE AND AFTER SURGERY AND SPECIALIZED NUTRITION SUPPORT
Progressive surgical diets, enteral/parenteral nutrition, transitional feeding

OBJECTIVES:

In this lesson, the student will:

1. Explain the rationale for presurgery dietary modifications.
2. Outline a series of diets that progress from clear liquids to full liquids to low-fiber to regular foods and identify an appropriate clinical application for each.
3. Identify the components of a parenteral nutrition solution.
4. Discuss the transition process when total parenteral nutrition (TPN) or enteral feedings are discontinued.

I. SURGERY

The term trauma refers to any kind of injury; surgery is one type of trauma. Because most surgery is planned trauma, clients and their caretakers often have time to prepare for it.

A. Nutrition Before Surgery

All clients should enter surgery at appropriate weight and in good nutritional status, however, illness or stress before surgery, or the need to fast while having medical tests may harm nutritional status. Good nutritional status supports recovery and resistance to infection.

1. **Regular diet:** for well nourished clients who are expected to have a normal recovery. Ample calories and protein are provided.

2. **Special diet:** for malnourished clients calories and protein are boosted further by the addition of nutrition supplements and snacks with or between meals. Sometimes it is necessary to deliver pre-surgery diets by tube feedings or intravenous feedings if the client is unable to eat enough or the GI tract is not working.

3. **Immediate pre-surgery diet:** Usually no foods or fluids are allowed for at least eight hours before surgery. This helps prevent vomiting during anesthesia or recovery, and thus patient to prevent aspiration or choking. The name for this diet order is **NPO; nothing by mouth.** Liquid diets or foods low in fiber are sometimes given for
two or three days before GI tract surgery to reduce the amount of fecal material in the tract.

B. Nutrition After Surgery

Most patients will remain NPO for at least 4 hours or even longer secondary to GI tract non-functioning related to surgery and anesthesia.

The first and most important nutrition-related task after surgery is to maintain fluid and proper electrolyte balance and to prevent dehydration.

The second task is to reintroduce solid food as soon as GI tract activity resumes. People being fed by tube or vein before surgery usually continue receiving such feedings until they are able to eat normally. A well-nourished person who can tolerate table food is ready for a progressive diet.

C. Progressive Diets

After patient’s GI tract activity normalized, physicians will then order a progressive diet. A progressive diet is the series of diets that progresses from clear liquids to full liquids to low-fiber foods to regular foods.

1. Liquid diets:

   i Clear liquid diet: this diet provide fluids, electrolytes and a small amount of calories to prevent dehydration. They consist of foods that are clear and liquid at body temperature, i.e. clear gelatins, clear fruit juice (apple juice etc), clear broth, clear fruit ice, plain hard candy, honey, sugar substitutes, and frozen pops.

   ii Full liquid diets: include both clear and opaque liquid foods. Full liquid diets supply some protein from milk and milk products, eggs and egg products that are missing on clear liquid diets. Both clear and full liquid diets are deficient in calories and most nutrients and should not be used for more than a day or two if possible. Should patient required clear liquid or full liquid diet on a long-term basis; additional nutritional feedings should be considered. Foods allowed in this category include: milk and milk beverages, smooth custard and puddings, sherbet, strained and cream soup, vegetable and fruit juices, ground seasoning and smooth condiments, and foods that are included in clear liquid diet.

2. Solid foods: Clients may better tolerate the shift from liquids to regular foods if they begin solid foods that are low in fiber or even lactose free (free of dairy products). Low fiber foods are easier to chew, swallow, digest and absorb. A low fiber diet is the same as a soft diet. If the low fiber diet is well tolerated, clients then can advance to the regular or
standard diet that includes all foods and nutrients within prescribed diet’s limitation.

II. SPECIALIZED NUTRITION SUPPORT

At times a person cannot tolerate foods other than clear liquids; in such cases enteral (tube) or parenteral (intravenous) nutrition may be necessary.

A. Enteral Nutrition:
Feedings by tube or mouth are enteral. If a client’s appetite is satisfactory and he is physically able to eat, enteral formulas or nutrition supplements can be used as extra nourishment with or between meals if necessary. Tube feeding is only appropriate if a patient has a functioning GI tract, and is for any medical reason that he/she is unable to consume enough nutrition by mouth only. Feeding tube could be inserted into the stomach, duodenal, even all the way to the jejunal area.

B. Parenteral Nutrition:
Feedings into a vein are parenteral, meaning around or bypassing the intestine. Only when people cannot meet their nutrient requirements using the enteral route should they receive parenteral or intravenous (IV) nutrition.

A variety of nutrient solutions can be administered by vein. These IV solutions contain any or all of the essential nutrients: water, amino acids, carbohydrate, fat, vitamins and minerals.

1. amino acids - standard IV amino acid solutions contain both essential and nonessential amino acids to meet the body’s need for protein.

2. carbohydrate - standard IV solutions provide carbohydrate as dextrose, a form, of glucose that dissolves in water.

3. fat - intravenous fats are provided either daily or periodically usually once or twice a week. IV fat emulsions are a source of essential fatty acids and a concentrated source of calories.

4. micronutrients - vitamins, minerals (electrolytes) and trace elements may be used in IV solutions.

C. Transitional Nutrition
Once the problem causing the need for IV nutrition ends the client can slowly change to an enteral diet while the amount of IV feeding is reduced. This process of refeeding must include careful monitoring of patient’s tolerance to new nutritional regimen to allow the GI tract time to return to normal. Signs of intolerance could include stomach discomfort, diarrhea, and/or nausea/vomiting.
The switch from IV feeding to an enteral route can be done in different ways. A tube feeding may be given first and the volume of IV solution is reduced as the volume of tube feeding is increased. Or a progressive diet, beginning with liquid diet given in small amounts periodically may be started and the IV solution reduced accordingly.

The volume of IV solution is reduced as the volume of enteral feeding, either by tube or from foods, increases. IV feedings usually end when enteral feedings meet 60% or more of a client’s calorie needs.
ACTIVITY II  PROGRESSIVE DIETS

Directions:

1. Write each food from the following list under the progressive diet heading it most closely matches. (Some foods may fit into more than one diet).  12 points

<table>
<thead>
<tr>
<th>Sugar</th>
<th>Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custard</td>
<td>Soups, strained vegetables, meat or cream</td>
</tr>
<tr>
<td>Egg, soft-cooked or scrambled</td>
<td>Plain ice cream</td>
</tr>
<tr>
<td>Gelatin</td>
<td>Saltine crackers</td>
</tr>
<tr>
<td>Beef broth</td>
<td>Margarine</td>
</tr>
<tr>
<td>Popsicle</td>
<td>Banana</td>
</tr>
<tr>
<td>Orange juice</td>
<td>Cranberry juice</td>
</tr>
<tr>
<td>Salt</td>
<td>Pepper</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clear Liquid</th>
<th>Full Liquid</th>
<th>Low Fiber</th>
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<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

2. Discuss ways to help clients make the transition from tube feedings to an oral diet.  3 points
**TAKE HOME ASSIGNMENT II**

**CALORIE COUNT**

**Directions:** Take a hospital menu from the instructor. You have been asked to determine the nutritional adequacy of Mr. Poor Eater’s food intake. The hospital nurses have observed Mr. Eater at mealtimes, recorded on the menu the proportion eaten of foods served and saved these menus for you. Refer the “Exchange Lists” and calculate Mr. Eater’s calories, carbohydrate, protein, fat, and fluid intakes. Use this worksheet to record your data. (Assume all starch, cooked cereals, vegetables, and juice portions are ½ cup; dry cereals are ¾ cup; milk, coffee, and tea are 8 fluid ounces; salads, 1 cup; and salad dressing, 2 T.)

20 points

<table>
<thead>
<tr>
<th>Food items</th>
<th>Kcalories</th>
<th>CHO (gram)</th>
<th>Protein (gram)</th>
<th>Fat (gram)</th>
<th>Fluid (ounces)</th>
</tr>
</thead>
</table>
LESSON III

MODIFICATIONS IN CONSISTENCY AND TEXTURE
Dysphagia Diets, High/Low Fiber Diets, Ulcer Diet/Drug Treatment

OBJECTIVES:

In this lesson, the student will:

1. Describe the diet therapy required for clients with chewing problems.
2. Given a regular (standard) hospital menu, summarize the changes needed to modify it for both low fiber and high fiber diets.
3. Match foods from a list with their correct consistency; semi-solid, spoon-thick liquids, medium-thick liquids, thin liquids, sticky or bulky foods.
4. Name two food consistencies that are usually most appropriate for clients with dysphagia.
5. Outline nutritional and pharmacological interventions needed for management of peptic ulcers.

I. CHEWING AND SWALLOWING PROBLEMS

A. Chewing Problem

Many health conditions can temporarily or permanently interfere with chewing, from injuries, surgery or infections of the mouth to missing teeth, poorly-fitting dentures, or strokes. Modifications in the diet may be necessary to prevent deterioration of nutritional status.

1. Nutritionally Complete Formulas

Nutritionally complete formulas, (covered in lesson 2), may take the place of solid foods if a person with chewing difficulties can only tolerate liquids. A person who cannot drink enough liquids to meet nutrient needs should be fed by tube (also covered in lesson 2).

2. Mechanical Soft Diet

A mechanical soft diet is a regular diet modified to eliminate all foods that a person cannot easily chew. It is also called a dental soft diet. All foods and seasonings are allowed but are prepared in liquid, chopped, tender-cooked form. Overall, foods included are those that can be chewed even without dentition.

If medically appropriate, drinking plenty of fluids along with meals, and other fluid like gravy may help ease chewing.
3. Pureed Foods

If chopped, soft / mechanical soft foods are not tolerated, pureed foods may be necessary. Pureed foods are blenderized and smooth like baby food or mashed potato, which should be thick, not watery or too thin.

B. Swallowing Problems

Problems in swallowing are called dysphagia (dis - FAY - gee - ah). Causes for dysphagia include: ordinary aging (very advanced age and is to fatigue to eat), nervous system diseases, injuries, post -surgery, developmental disabilities, or strokes. A person with dysphagia may be unable to begin swallowing, to chew foods and mix them with saliva or to move foods to the back of the throat and into the esophagus. Some forms of dysphagia involve abnormal functioning of the esophagus.

Sometimes dysphagia is not easy to see. As food catches in the throat more often it may be considered normal and go unnoticed. The person may gradually stop eating and develop nutrient deficiencies.

Dysphagia can be dangerous. Foods that move into the throat may enter the wind pipe or trachea and choked. If the person go asymptomatic, food may even enter the lungs (aspiration), carrying bacteria with them and causing pneumonia, aspiration pneumonia.

II. DIETS FOR DYSPHAGIA

There are many challenges in defining a standardized dysphagia diet, and thus, diets for patient with dysphagia must be adjusted per each patient’s tolerance.

A. Purpose of the Diet

The purposes of dietary management of dysphagia are:
• to safely optimize nutritional and hydration status
• to provide nutrition in a form that fits the specific needs of the client, and
• to avoid aspiration

B. Needs for Individualization

Each individual may have different types of problems with the swallowing process. This requires individualized dietary intervention.

In dietary management of dysphagia, thought must be given to the consistency of foods, and liquids. At time, a client with dysphagia can handle only semisolid foods or thickened liquids that flow slowly enough to allow time to coordinate swallowing movements. Smooth solids such as puddings and smooth yogurts can be good choices; commercial thickeners, tapioca or baby cereal can also be used to thicken liquids.
C. Modified Food Consistency

The appropriate consistency of foods for each client with swallowing difficulties will be determined by their doctor. At time, doctor may even order a swallowing evaluation, done by speech pathologist, to determine the most appropriate diet texture, liquid consistency, and even feeding precaution for the patient.

Food consistency and liquid consistency must be evaluated separately and modified based on client’s tolerance.

Liquids can be categorized into thin, nectar thick, honey thick and spoon thick (pudding thick).

And diet texture can varies from pureed, ground/minced, soft/easy to chew, and modified general diet.

### DEFINITION AND EXAMPLES OF FOOD AND LIQUID CONSISTENCIES

<table>
<thead>
<tr>
<th>FOOD CONSISTENCIES</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pureed</td>
<td>Texture is semiliquid, thick, and homogeneous, and should be “spoon thick” consistency with no coarse texture like nuts, raw fruits and vegetables. Examples: Cream of wheat, smooth cereals, gelatin, pureed bread / pasta/ rice/congee, pureed scrambled eggs, milk and milk beverages, ice cream, smooth custard and pudding, pureed fruits and vegetables (without seeds or skins) and it’s juices, gravy, margarine, butter and other fats, pureed meat and legumes, pureed soup, honey, sugar, syrup, fruit jellies of allowed foods</td>
</tr>
<tr>
<td>Ground/Minced</td>
<td>Texture of this diet is no coarse texture with ground up food. Examples: smooth cooked cereals, pancakes with syrup, slurried bread, soft/bite size pasta or rice, soft poached/scrambled egg, mashed / minced fruits / vegetables without skin or seeds, cottage cheese and soft / grated cheese, ground meat or soft casseroles, macaroni and cheese, soups with allowed ingredients, and pureed food as mentioned above</td>
</tr>
<tr>
<td>Soft / easy to chew</td>
<td>Textures should be soft with no tough skins, no nuts or dry, stingy crispy, or raw foods are allowed, with hard to chew food minced or cut to small pieces (1 cm or less). Examples: soft breads, cookies without nuts or seeds, graham crackers, toast without crust, soft cereal, egg salad, ricotta and cream cheese, soft fresh or canned fruits without skin or seeds, well-cooked or canned vegetables / potatoes without skin or seeds, chopped spinach and lettuce, moist and tender meats, well cooked soups with small pieces, all soft desserts, plus ground/minced food as mentioned above</td>
</tr>
<tr>
<td>Modified general</td>
<td>This diet texture allowed food that is not grind or chopped, but still no nuts or crisp, deep-fried food. This diet should avoid crunchy or chewy food like hard bagles or English muffins, hard breadsticks, melba toast, hard marshmallow or caramel, chips and popcorn; all fruits and vegetables without coarse skin, tender meat</td>
</tr>
</tbody>
</table>

### LIQUID CONSISTENCIES
<table>
<thead>
<tr>
<th>Thin</th>
<th>Any liquids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nectar thick</td>
<td>Fluids that can be sipped from a cup or through a straw and will slowly fall off a spoon that is tipped. Examples: buttermilk, cold tomato juice, eggnog</td>
</tr>
<tr>
<td>Honey thick</td>
<td>Fluids that can be eaten with a spoon but do not hold their shape on a spoon. They may be sipped from a cup but are too thick to be taken through a straw. Examples: thick yogurt, tomato sauce, honey</td>
</tr>
<tr>
<td>Pudding thick (Spoon thick)</td>
<td>Very thick liquid that must be eaten with a spoon. They hold their own shape on a spoon and are too thick to be sipped from a cup. Examples: thickened applesauce and thick milk pudding</td>
</tr>
</tbody>
</table>


III. MODIFIED FIBER DIETS

A. Fiber Content in Foods

1. Definition

Fiber is that portion of plant foods that are not broken down by digestive enzymes. Because it is indigestible, fiber adds bulk to the stool and makes it easier to pass. Fiber is found in fruits, beans, vegetables and whole grain breads and cereals.

2. Types

Fibers in foods are described by whether or not they dissolve in water. This influences the health effects of fibers.

a. Insoluble fiber

Insoluble fibers are the tough, fibrous structures of fruits, vegetables and grains; indigestible food particles that do not dissolve in water. Examples include: fruits, vegetables, cereals, whole-wheat products, and wheat bran.

b. Soluble fiber

Soluble fibers are indigestible food particles that dissolve in water and form a gel or gum. Examples include: fruits, vegetables, barley, legumes, oats and oat bran.

c. Summary

Vegetables, wheat and most grains are good sources of insoluble fiber, whereas fruit, oats, barley and legumes such as dried beans, split peas, and lentils provide more soluble
fiber. Oat bran and legumes are especially good source of soluble fiber.

3. **Health Effects of Fiber**

   a. **Constipation, hemorrhoids**
   Insoluble fiber such as wheat bran may relieve

   b. **Diverticulosis**
   Fibers stimulate the muscles of the digestive tract so that they retain their health and tone. This prevents the muscles from becoming weak and the lining of the digestive tract from bulging out in places, as occurs in diverticulosis.

   c. **Heart disease**
   Soluble fibers bind cholesterol compounds and carry them out of the body with the feces, thus lowering the body’s cholesterol concentration and possibly the risk of heart disease.

   d. **Diabetes**
   Some fibers delay the passage of nutrients from the stomach to the small intestine. This delay slows glucose absorption, thus causing a moderate rise in blood glucose.

B. **Indications for Modified Fiber Diets**

1. **Low fiber or fiber-restricted** *(also called soft)*

   Low fiber diets decrease the bulk of the stool and slow its movement through the intestines. Low fiber diets are indicated if there is narrowing, obstruction, or inflammation in the intestine. A low fiber diet may be useful for a short period in the transition from a completely liquid to a normal diet after surgery, trauma or other illnesses.

   A low fiber diet is achieved by using mostly canned or cooked fruits and vegetables or certain raw fruits and vegetables low in fiber content, and refined grain products.

2. **High fiber**

   High fiber diets increase the bulk of the stool and speed up its movement through the intestines. A high fiber diet may benefit health by decreasing risk of colon cancer, decreasing blood cholesterol levels, decreasing glucose absorption rate and relieving constipation. A high fiber diet, then is indicated for diverticulosis, diabetes, high blood cholesterol as well as constipation.
A high fiber diet is achieved by increasing the intake of whole grain breads and cereals and of fruits and vegetables that are high in fiber content.

Fiber should be added to the diet gradually to allow the GI tract to adapt. Clients should be reminded to drink lots of fluids, at least 8 - 12 cups daily.

IV. ULCERS

The word ulcer used alone generally refers to a peptic ulcer, an erosion of the top layer of cells from the lining of the stomach (gastric ulcer), or duodenum (duodenal ulcer). This erosion leaves the underlying layers of cells exposed to gastric juices. When the gastric juices reach the capillaries the ulcer bleeds, and when they reach the nerves, they cause pain.

A. Causes

Three major causes of ulcers have been identified: bacterial infection, the use of certain anti-inflammatory drugs and disorders that cause greater release of gastric acid. The bacterial infection often linked with ulcers is caused by Helicobacter pylori. The drugs linked with ulcers are nonsteroidal anti-inflammatory agents such as ibuprofen and naproxen.

B. Drug Treatment

The specific type of drug prescribed depends on the cause of the ulcer. Antibiotics are used to treat bacterial infections. Other drugs may be used to neutralize acid, reduce the release of, and or protect the GI tract lining from erosion by acid.

C. Diet Therapy

Current medical therapy is based heavily on drug, not nutritional, treatment. However, during acute stages, client may require liquid diet or even NPO. If client is allowed to eat, current diet therapy practice is as follow:

- Eliminate any food that routinely causes indigestion or pain, such as food that is spicy and sour
- Avoid caffeine-containing beverages and all coffee and tea, even decaffeinated
- Avoid alcohol
- Eat a well balanced diet with adequate nutrients to permit healing
- Late dinners close to bedtime should be avoided because they may increase nighttime or nocturnal release of gastric acid
- Avoid empty stomach for prolonged period of time.
ACTIVITY III – A  MATCHING FOODS TO CONSISTENCIES

Directions:

Locate the signs posted around the room for each of the following food consistencies: Pureed, nectar thick liquid, honey thick liquid, thin liquid, and sticky or bulky foods.

Each group takes an index card with patient’s prescribed diet texture, and liquid consistency. Choose a recorder to write all the foods that your group considers is appropriate for the diet described on the index card.

ACTIVITY III – B  MENU MODIFICATION

Directions:

Take 2 copies of a regular menu from the instructor. Modify one copy of the regular menu for a high fiber diet. 5 points

Modify the other copy of the regular menu for a low fiber diet. 5 points
OBJECTIVES:

In this lesson, the student will:

1. Describe the appropriate diet therapy for hepatitis.
2. Apply principles of diet therapy for hepatitis by listing three foods that may be added to a standard hospital menu to boost calorie and protein values.
3. Discuss necessary diet modifications for cirrhosis.
4. Plan a protein and sodium restricted daily menu.

Metabolism is the process by which energy is made available from food. The liver is the body’s main organ of metabolism. It receives nutrients and metabolizes, packages, stores or ships them out for use by other organs. Liver disorders greatly affect both nutrition and general health status.

Many health conditions can lead to liver disease: alcohol abuse, poisoning, infections, tumors, heart disease and others.

I. HEPATITIS

A. Definition, Symptoms, Health Effects

1. Definition

Hepatitis is an inflammation of the liver caused by a virus, alcohol, drug, obstruction or other toxin. Hepatitis can progress to cirrhosis, scarring of liver.

2. Symptoms

Early hepatitis symptoms may include fatigue, joint and muscle pain, loss of appetite, nausea, vomiting, diarrhea or constipation, and mild fever.

As hepatitis worsens, yellow bile pigments from the diseased liver may spill into the blood causing jaundice, or yellowing of the skin, and dark urine. In later stages, the liver enlarges and becomes tender. In severe cases, hepatitis can lead to liver failure and coma.
3. Health Effects

The cause for hepatitis, the amount of liver damage, and the person’s response to treatment all determine how seriously the disease will affect health. Some mild cases may go unnoticed but some may be so severe as to be fatal. Some cases may become chronic with occasional flare-ups.

Because persons with hepatitis may have loss of appetite, nausea, vomiting and fever they can easily become malnourished. Those people with alcohol-related hepatitis have an especially high risk of nutrient deficiencies.

B. Diet Therapy

Liver cells need nutrients to help them recover from hepatitis. Avoiding alcohol is critical. The person with hepatitis who is in good nutrition status receives a regular, well-balanced diet. The malnourished person with hepatitis receives a high-calorie, high-protein (70-100 gram), moderate fat diet to restore good nutritional status. Liquid oral supplements or small frequent meals may help persons with appetite loss. If the patient is severely malnourished, or there is nonstop vomiting, enteral (tube) or parenteral (IV) nutrition may be used to meet the patient's nutritional needs.

II. CIRRHOSIS

A. Description

Cirrhosis is the result of liver damage. Causes of damage could include alcoholism, obstruction of the bile duct, and viral infection. Out of all causes, alcohol abuse is the most common cause of cirrhosis in the U.S. The damaged liver cells die, and scar tissue fills the liver. The scar tissues then impair the normal flow of blood within liver, bile, and other liver metabolites.

B. Health Effects

The hardened scar tissue within the liver is tough. This tough scar tissue can lead to blood flow through the liver is obstructed, causing back pressure and leading to problems such as portal hypertension, and esophageal varices.

1. Portal Hypertension

The portal vein carries nutrients from the GI tract to the liver. The hepatic vein returns blood from the liver to the heart. The hepatic artery delivers oxygen-rich blood from the heart back to the liver. Tough scar tissue in the liver may cause blood to back up into the portal vein and cause blood pressure there to rise quickly.
2. **Ascites**

Rising pressure in the portal vein forces fluid, which containing large amount of protein and electrolytes, out of the liver’s blood vessels into the abdominal cavity where it can build up and cause the abdomen to swell. Ascites can affect the kidneys and lead to a problem with retaining sodium and water.

3. **High Blood Ammonia Levels**

Blood ammonia comes mainly from the GI tract: some bacteria in the intestine make ammonia and protein coming either from food or GI bleeding, makes some ammonia as it breaks down. High blood ammonia is a health hazard because it affects the nervous system and may lead to coma.

A high blood ammonia level is one of the signs and symptoms for a severe liver dysfunction, which results in intolerance of protein and hepatic encephalopathy. Other signs and symptoms of hepatic encephalopathy also include confusion, tremor, and eventually coma and death.

C. **Diet Therapy**

1. **Energy**

Weight loss occurs in most patients with severe liver disease. Energy needs can vary depending on the disease state, they could range from 25-30 Kcal/kg body weight to as high as 45 to 50 KCal/kg body weight. Other factors should also be considered to decide if more calories are required for the patient to meet his/her energy needs.

2. **Protein**

Diet therapy for cirrhosis can be confusing. The diet must provide enough protein to help the liver to heal and prevent infections, but not enough to raise ammonia levels in the blood and cause coma. Diet treatment, then, must give proper calories and restrict protein only if the patient has signs and symptoms of encephalopathy – an abnormal condition of the function of tissues in the brain.

People who have liver disease but do not have encephalopathy require at least 0.8 grams per kilogram body weight per day, but may require up to 1.2 to 1.5 gram protein per kg body weight per day. If a person shows signs of possible coma, protein must be restricted to 0.5 grams or less per kg body weight per day. Then the protein needs will be increase as the patient’s condition improve with the eventual goal of 1-gram protein per kg body weight per day. Vegetable protein appears to be better tolerated than meat protein by some patients with chronic hepatic encephalopathy.
3. **Carbohydrate**

Since liver is involved with the making and storage of glucose, careful monitoring of patient's blood glucose and carbohydrate intake is needed.

4. **Fat**

Fat intake should not be restricted unless patient experience steatorrhea – fat in feces. Otherwise, fat can helps make foods taste better and is high in calories, and therefore, it is an important part of the diet for cirrhosis.

5. **Fluids and Sodium**

When doctors prescribe water pills or drugs that increase release of water through the kidneys, referred to as *diuretics*, for ascites, fluid and sodium intakes are also restricted accordingly to control fluid retention and ascites.

6. **Alcohol**

Clients with cirrhosis must completely avoid alcohol to protect the liver from further injury.
**LESSON IV – TAKE HOME ASSIGNMENT**

**MENU PLANNING**

**Directions:**
Plan a one-day meal plan for a 60-gram protein, 2-gram sodium diet. Remember to include all necessary condiments and cooking method. **20 points**

<table>
<thead>
<tr>
<th>MEAL /SNACK</th>
<th>FOOD ITEM</th>
<th>Amt of Protein</th>
<th>Amt of sodium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**TOTAL**
LESSON V

NUTRITION AND DIABETES
Meal Planning Principles, Medications, Self-Care Guidelines

OBJECTIVES:

In this lesson, the student will:

1. Explain what diabetes is and differentiate between Type 1 and Type 2.
2. Discuss the purpose of medications for diabetes control.
3. Interpret a typical daily insulin regimen, stating the approximate duration and peak action times for each injection.
4. Describe the desired balance between activity, medication and diet for clients with diabetes.
5. Explain the role of blood glucose monitoring in diabetes control and list target blood glucose levels before meals and at bedtime.

I. OVERVIEW OF DIABETES

Approximately 10 million people in the United States have diabetes, and it is estimated that another 5.5 million do not know they have it. The chronic high blood sugar levels of diabetes can cause long-term damage in various organs, especially the kidney, nerves, heart and blood vessels. (Source: Clinical Practice Guidelines for Management of Diabetes, Kaiser-Permanente, 2003).

A. Definition

Diabetes is a disorder of metabolism caused by lack of, insufficient amount of, or defective insulin. Insulin is a hormone, (body chemical), that, among other things, carries glucose from the bloodstream to the body’s cells. If insulin is missing or not working properly, it results in a high level of glucose in the bloodstream. Glucose is trapped in the bloodstream and locked out of the body’s cells. Diabetes is diagnosed by blood sampling.

B. Types

1. Type 1

Type 1 diabetes happens when a person’s body makes no insulin at all, and is required for insulin injection for rest of patient’s life. This usually comes on before age 30 (often under age 20, especially during periods of rapid growth) and are usually of normal weight or have a history of recent unintentional weight loss. Type I diabetes occurs in ~10% of all cases of diabetes.
2. **Type 2**

Type 2 diabetes happens when a person’s body does not produce enough or the right kind of insulin, or insulin resistance in which insulin does not function adequately. This type usually occurs after age 40 and most often to people who are overweight or obese. Type 2 occurs in ~90% of all cases of diabetes.

3. **Gestational or Pregnancy Diabetes**

Gestational diabetes (GDM) develops during pregnancy and usually disappears afterwards; however, women who have had gestational diabetes have a greater chance of developing Type 2 diabetes later in life. Note: GDM is covered in *Life Span Nutrition and Assessment*, taken concurrently with this course.

C. **Signs and Symptoms**

Some of the early signs and symptoms of the disease can include excessive thirst and hunger, and frequent urination. People may also have blurry vision, fatigue, and have unexplained weight loss. Urinary tract or bladder infections may also occur. Persons with Type 1 diabetes are prone to making ketones for energy if blood sugar is high. Ketones in the bloodstream can lead to a serious condition called diabetic ketoacidosis, requiring urgent medical care.

II. **MEDICATIONS**

A. **Oral Hypoglycemic Agents**

Often, people with Type 2 diabetes can control blood sugar levels with healthy eating, exercise and weight loss. Others may need oral medications as part of their treatment. Medications usually function as either:

- Stimulates secretion of insulin by pancreas
- help the body’s cells to use insulin better (decrease insulin resistance)
- keep the liver from releasing too much stored glucose into the bloodstream, or
- delay the absorption of carbohydrates from the GI tract

B. **Insulin**

As persons with Type 1 diabetes cannot produce insulin on their own and thus require insulin injection. However, persons with Type 2 may also need insulin if oral agents fail to achieve good blood glucose control.
Insulin is available in different types, and they include short-acting, intermediate-acting and long-acting. They function differently with different onset of action, different peak timing, and duration of action.

<table>
<thead>
<tr>
<th>Insulin Preparation</th>
<th>Onset of Action (hr)</th>
<th>Peak Action (hr)</th>
<th>Duration of Action (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid-acting (Lispro)</td>
<td>0.25 – 0.5</td>
<td>0.75 – 2.5</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Short-acting (regular)</td>
<td>0.5 – 1</td>
<td>2.5 – 4</td>
<td>6 – 8</td>
</tr>
<tr>
<td>Intermediate-acting (NPH or Lente)</td>
<td>1.5</td>
<td>4 – 12</td>
<td>18 – 24</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>7 - 15</td>
<td>22 - 24</td>
</tr>
<tr>
<td>Long -acting (ultralente or Glargine - analogue)</td>
<td>4</td>
<td>8 – 24</td>
<td>24 – 28</td>
</tr>
<tr>
<td></td>
<td>1 - 2</td>
<td>flat / smooth</td>
<td>24</td>
</tr>
<tr>
<td>Premixed - regular/NPH 10 / 90 to 50 / 50</td>
<td>0.5</td>
<td>2 – 12</td>
<td>18 - 24</td>
</tr>
</tbody>
</table>


II. MEAL PLANNING

A. Goals

According to the American Diabetes Association’s recommendations, the goals for meal planning are the same for both Type 1 and Type 2 diabetes:

- the best blood glucose control possible
- blood fats (cholesterol, triglycerides) in normal ranges
- the proper amount of calories to maintain, gain or lose weight
- all of the necessary nutrients


B. Guidelines

1. Controlling Total Carbohydrate

Carbohydrate is the nutrient that has the biggest impact on blood glucose because for all kinds of carbohydrate, they will eventually be digested and being break down into their simple sugar form. Carbohydrate-containing foods act not just as an energy source but also as blood glucose regulators, together with insulin (either natural or injected), and exercise.
A challenge to diabetes meal planning is to learn which food contains carbohydrate, and adequate portion size with different kind of food. Carbohydrate is divided to 3 subgroups – polysaccarides (starch, glycogen, dietary fiber), disaccarides (sucrose, lactose, maltose), and monosaccharides (glucose, fructose, and galactose). The following list is foods that contain carbohydrate:

- breads, crackers and cereals
- pasta, rice, potatoes, and other grains product
- vegetables
- milk and yogurt
- fruits and juice
- beans and peas
- table sugar, honey, syrup and molasses

Total carbohydrate is the focus of diabetes meal planning guidelines, rather than source. Sucrose/simple sugars can be included as part of the total carbohydrate.

2. **Timing**

Foods should be spaced out over the day (i.e. 6 small frequent meals). Carbohydrate foods should be included in each meal and snacks. Even spacing of food portion can help with appetite as well as blood glucose control. For persons taking insulin, the timing of meals and snacks should match insulin peak activity.

For persons with both Type 1 and Type 2 diabetes, recommended meal timing is no more than 4 - 5 hours during waking hours, beginning soon after getting up. Consistent timing of meals and snacks from day to day can help improve blood glucose control.

3. **Portion Control**

Carbohydrate raises blood glucose levels proportionally. Besides knowing which foods have carbohydrate, persons with diabetes should also paying attention to adequate portion sizes to achieve optimal blood glucose control.

4. **Fat**

Persons with diabetes have two times the chance of developing heart disease than those without diabetes. Person with diabetes should be aware of amount of total fat, saturated fat (fat that is solid at room temperature), and cholesterol consumed. In addition, given fat contain dense energy (9KCal/gm), people who are overweight or obese should ingest only modest amount of fat to prevent further weight gain, or even attempt slow but steady weight loss.
Other meal planning tips to eat less fat include:

- choose fish and skinless poultry more often
- select lean cuts of beef, veal, pork or wild game
- trim all visible fat from meat
- bake, roast, broil, grill or boil instead of frying or adding fat
- Avoid excessive oil during cooking process

C. Exchange Lists for Meal Planning

Registered dietitians assess an individual’s diet history and preferences to select the proper diet strategy and design a realistic diet plan. A common tool used for diabetes meal planning are the Exchange Lists.

In the Exchange Lists, foods are grouped by the grams of protein, carbohydrate, fat and calories per serving. Foods with similar nutrient makeup are in the same list, therefore, foods from the same list should have the same effect on glucose, blood fats and body weight when eaten in the amounts given.

Exchange Lists can be a useful tool for a meal plan that prescribes an exact amount of carbohydrate, fat, protein and calories. A meal plan with specific numbers of servings or exchanges per food list can be the basis for menu planning.

| TABLE V – 2 |

<table>
<thead>
<tr>
<th>EXCHANGE LIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange group</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>CARBOHYDRATE</td>
</tr>
<tr>
<td>Starch</td>
</tr>
<tr>
<td>Fruit</td>
</tr>
<tr>
<td>Milk</td>
</tr>
<tr>
<td>Fat free</td>
</tr>
<tr>
<td>Reduced fat</td>
</tr>
<tr>
<td>Whole</td>
</tr>
<tr>
<td>Other carbohydrate</td>
</tr>
<tr>
<td>Vegetables</td>
</tr>
<tr>
<td>MEAT AND MEAT SUBSTITUTES GROUP</td>
</tr>
<tr>
<td>Very Lean</td>
</tr>
<tr>
<td>Lean</td>
</tr>
<tr>
<td>Medium fat</td>
</tr>
<tr>
<td>High fat</td>
</tr>
<tr>
<td>FAT GROUP</td>
</tr>
</tbody>
</table>
**TABLE V – 3**

**MEAL PLANNING WITH KCAL AND SERVING SIZE**

<table>
<thead>
<tr>
<th>FOOD GROUP</th>
<th>1200</th>
<th>1400</th>
<th>1600</th>
<th>1800</th>
<th>2200</th>
<th>2800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains, beans and starchy vegetables</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Vegetables</td>
<td>1.5</td>
<td>1.5</td>
<td>2</td>
<td>2.5</td>
<td>3</td>
<td>3.5</td>
</tr>
<tr>
<td>Fruits</td>
<td>1</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>Milk</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Meat and Others</td>
<td>3 oz</td>
<td>4 oz</td>
<td>5 oz</td>
<td>5 oz</td>
<td>6 oz</td>
<td>7 oz</td>
</tr>
<tr>
<td>Fat</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>11</td>
<td>14</td>
</tr>
</tbody>
</table>

SOURCE: [http://www.mypyramid.gov](http://www.mypyramid.gov)

**IV. SELF-CARE GUIDELINES**

**A. Blood Glucose Monitoring**

Successful control of blood glucose is now possible thanks to improved and widely available technology for testing blood glucose at home. Persons with both Type 1 and Type 2 diabetes are advised to do home glucose testing. When and how often a person tests their blood glucose is a decision between them and their doctor and is based on individual needs and the goals of their treatment plan.

Results of a client’s home blood glucose tests can be used to guide decisions about diet, activity and medication. Machines called meters provide accurate results. NOTE: *hyperglycemia* is defined as blood glucose numbers above 180; *hypoglycemia* are numbers below 70.

**1. Target Blood Glucose Values**

Each person with diabetes will have different goals for these numbers depending upon their age and any other health problems they may have. Table V-2, *Know the Numbers*, provides specific target numbers of values that the American Diabetes Association recommends.

**TABLE V - 2**

<table>
<thead>
<tr>
<th>GLUCOSE CONTROL IN DIABETES</th>
<th>Goal</th>
<th>Non-Diabetic</th>
<th>Acceptable</th>
<th>Time to Make Changes If</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Meals</td>
<td>less than 100</td>
<td>80 - 120</td>
<td>Under 80 or over 140</td>
<td></td>
</tr>
<tr>
<td>2-hour after meals</td>
<td>180</td>
<td></td>
<td>&gt;180</td>
<td></td>
</tr>
<tr>
<td>At Bedtime</td>
<td>less than 110</td>
<td>100 - 140</td>
<td>Less than 100 or over 160</td>
<td></td>
</tr>
<tr>
<td>HbA1c</td>
<td>&lt;7</td>
<td></td>
<td>&gt;8</td>
<td></td>
</tr>
</tbody>
</table>


B. Exercise

Exercise is good for the majority of persons with diabetes as it promotes heart health by improve circulation and blood pressure, improving HDL/LDL ratio, and overall well-being. Routine exercise also helps decrease body fat and increase muscle mass, and thus, improve patient’s sensitivity to insulin. Thirdly, exercise could help with weight loss, a goal for many persons with Type 2 diabetes. Last but not least, exercise can also be useful in lowering blood glucose levels if the patient is able to monitor their blood glucose before, during and after exercise.

Any nonstop activity that makes a client’s heart and lungs work harder than they normally do is called aerobic activity. Brisk walking, swimming and bicycle riding are aerobic exercises.

As with anyone, persons with diabetes should check with their doctor before starting an exercise program. The exercise goal for clients is 30 minutes of activity most days of the week. Allow time to stretch, warm up before, and cool down after exercise.

Persons taking insulin are advised to avoid exercising during the time their insulin peaks. The best timing for exercise for insulin-users is 1 - 2 hours after a meal. Insulin users should test blood glucose before exercise to determine whether they need to take a carbohydrate-containing snack before starting. They should also carry some form of sugar with them while exercising. Pre-exercise snacks are seldom necessary for persons with Type 2 diabetes though they are advised to test blood glucose before starting and to carry some form of sugar with them.
ACTIVITY V

INFORMATION SEARCH

Directions:
Answer the following questions using the information you learned from class, this student manual, and your textbook. 15 points

1. What is diabetes?

2. How is type 2 diabetes different from type 1?

3. What are 2 common early symptoms of diabetes?

4. List 2 mechanisms how a diabetes medication controls blood sugar.

5. How soon after in is injected dose NPH insulin (intermediate –acting) start to work? When does it peak? How long does it stay in the system?

6. Name 2 goals of diet therapy for diabetes.

7. What is a good blood sugar reading for a diabetic before meals?

8. List the food groups that contain carbohydrate. What is carbohydrate's effect on blood sugar?

9. List 3 ways in which a person can lower their dietary fat intake.

10. Why is portion control important to clients with diabetes?
LESSON V – TAKE HOME ASSIGNMENT
Case study: truck driver with type 2 diabetes

Directions: Mr. E, a truck driver, was 52 years old when he was first diagnosed with type 2 diabetes. He visited his physician after experiencing excessive thirst and urination, and excessive appetite. Mr. E, who height 5 feet 11 inches and weight 200 pounds, had 30-pound weight gain over the past 2 years. His fasting blood glucose is 235 mg/100 ml. Please plan a one day menu for Mr. E, using 1800 KCal as the appropriate calorie level.  

<table>
<thead>
<tr>
<th>MEAL</th>
<th>FOOD, INCLUDING AMOUNT</th>
<th>FOOD GROUP and # of SERVING</th>
</tr>
</thead>
</table>
Lesson VI

NUTRITION AND DISORDERS OF BLOOD VESSELS, HEART AND LUNGS

Diet Principles for Management of Coronary Artery Disease, Hypertension, Congestive Heart Failure and Chronic Obstructive Pulmonary Disease

OBJECTIVES:

In this lesson, the student will:

1. Identify risk factors for coronary heart disease.
2. Compare and contrast the characteristics, food sources and suitability for improving blood lipids of the three types of dietary fats.
3. Describe diet therapy for hypertension.
4. Discuss the nutritional problems and appropriate intervention for a client with congestive heart failure.
5. Discuss the nutritional problems and appropriate intervention for a client with chronic obstructive pulmonary disease.

I. ATHEROSCLEROSIS AND CORONARY HEART DISEASE

Cardiovascular disease (CVD), which is the general term for all diseases of the heart and blood vessels, is the leading single cause of death in the world today. The three major risk factors for CVD are cigarette smoking, high blood pressure and high cholesterol.

Atherosclerosis and hypertension most often lead to CVD; heart attack, stroke and congestive heart failure may result if these disorders are ignored.

A. How Atherosclerosis Develops

The main form of CVD is atherosclerosis, arterial blockage caused by plaques. Atherosclerosis usually begins with damage to the smooth inner lining of arteries, followed by collection of soft fatty streaks that gradually get larger and become hardened with minerals, forming plaques.

When atherosclerosis damages the arteries that feed the heart (coronary arteries), the heart muscle may suffer from limited flow of oxygen and blood. If ignored, this process can lead to heart attack or stroke if arteries to the brain are blocked.

B. Risk Factors for Coronary Heart Disease (CHD)

Factors or traits that are linked with an increased chance of getting a disease are called risk factors. The major risk factors for CHD are:
• High LDL cholesterol
• Low HDL cholesterol
• Age (over 45 for men; over 55 for women)
• Low HDL cholesterol
• Hypertension
• Smoking
• Diabetes Mellitus
• Family history of heart attack or stroke before age 55 in a male parent/sibling or age 65 in a female parent/sibling.
Other factors that may strongly affect the risk factors above are obesity and lack of exercise.

C. Diet Therapy to Normalize Blood Lipids

Both medical and diet therapy aim to reduce LDL cholesterol because LDL is the kind of cholesterol linked to atherosclerosis.

1. **Weight Reduction**

   When overweight people lose weight, their heart disease risk factors improve. This is especially important for persons who carry their body fat around their abdomen, or apple-shaped. Weight loss can also help improve hypertension and diabetes, 2 other major CHD risk factors.

2. **Reduce Fat, Especially Saturated Fat**

   The National Cholesterol Education Program, developed by an expert panel at the National Heart, Lung and Blood Institute, recommends a 2-step plan for diet therapy to lower LDL cholesterol; Step 1 is slightly less restricted than Step 2. Most person will be prescribed with Step 1 diet as an initial treatment plan, but if blood cholesterol does not improve in 3 months, the patient may instructed to move on to the Step 2 diet.

   Studies show strong evidence that saturated fats raise blood cholesterol. Saturated fats occur naturally in high fat meats and dairy products, including cheese, butter and eggs, as well as tropical oils like coconut and palm kernel. Unsaturated fat may become saturated through processing; examples are shortening and stick margarine. Saturated fats are usually solid when at room temperature.

   Acceptable types of fats include poly and monounsaturated because they do not raise blood cholesterol. Unsaturated fats are usually liquid at room temperature.

   Even acceptable fats and oils should be used in moderation. Too much total fat can cause weight gain and poses other health risks.
3. **Restrict Dietary Cholesterol**

Dietary cholesterol is less likely to raise blood cholesterol than is total dietary fat, especially saturated fat. The typical American diet includes more than 400 mg cholesterol daily; the Step 1 diet restrict cholesterol to less than 300 mg, and Step 2 diet further restrict patient’s cholesterol intake to less than 200 mg.

Cholesterol is found only in animal foods. Because most saturated fats also come from animal foods, dietary changes to lower saturated fat in the diet will also help lower dietary cholesterol. Because cholesterol cannot be cooked or trimmed away, portion sizes, even of lean meat, should be limited to 4 - 6 ounces daily. A person should be urged to try occasional meatless meals with beans, nuts or tofu as protein sources.

4. **Putting It All Together**

Eating less fat and cholesterol includes:
- Choose lowfat milk or yogurt
- Choose sweets less often because they are usually high in fat
- Eat fish and skinless poultry more often
- Select lean meat and trim all visible fat before cooking
- Bake, roast, broil, grill or boil instead of frying or adding fat.
- Build meals around lower fat foods from MyPyramid.

### STEP 1 & 2 DIET FOR HIGH BLOOD CHOLESTEROL

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Step 1</th>
<th>Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>&lt;30% of total KCal</td>
<td>&lt;30% of total KCal</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>8-10% of total Kcal</td>
<td>&lt;7% of total Kcal</td>
</tr>
<tr>
<td>Polyunsaturated fat</td>
<td>up to 10% of total KCal</td>
<td>up to 10% of total KCal</td>
</tr>
<tr>
<td>Monounsaturated fat</td>
<td>up to 15% of total KCal</td>
<td>up to 15% of total KCal</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>55% or more of total KCal</td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>Approx 15% of total KCal</td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td>&lt;300 mg/dl</td>
<td></td>
</tr>
<tr>
<td>Total Calories</td>
<td>To achieve and maintain desirable body weight</td>
<td></td>
</tr>
</tbody>
</table>

SOURCE: National Cholesterol Education Program (ATP 11)

II. **HYPERTENSION (HTN)**

Hypertension affects an estimated 50 million people in the United States and is considered a major risk factor of CVD.

A. **How Hypertension Develops**

The heart’s pumping action creates pressure to push blood throughout the circulatory system. Narrowed blood vessels or a larger volume of blood in the circulatory system raises blood pressure. High blood pressure can enlarge and weaken the heart, may damage the kidneys or lead to stroke.
1. Risk Factors for Hypertension

Major risk factors for hypertension include:
- Age (older than 60)
- Family history of cardiovascular disease
- Smoking
- High lipid
- Race (2 times as common in African Americans, may develop earlier and become more severe).
- Men, and postmenopausal women

Other possible contributing factor could include but not limited to renal disease, and previous stroke.

B. Diet Therapy for Hypertension

Many diet-related factors are thought to affect blood pressure.

1. Weight Control

Excess body fat, especially abdominal fat, can bring on high blood pressure. Weight loss is one of the most effective nondrug treatments for hypertension. A moderate weight loss of just 10 pounds may lower blood pressure.

2. Sodium/Salt Restriction

A high salt diet may raise blood pressure. As many as one third of all persons may be salt-sensitive and this proportion increases as we age. All Americans have been advised to use salt in moderation. Since most salt in our diets comes from processed and packaged foods a diet that includes more fresh foods will automatically be moderate in salt. Spices, herbs, and extracts may be used in place of salt to flavor foods.

3. Limit Fat

The effects of dietary fat on hypertension are not clear, but we know a high fat diet can increase one’s risk factor for other heart disease, and thus, it is recommended a person with hypertension should also watch their fat intake carefully. In addition, limit fat intake may also aid with weight control.

4. Limit Alcohol

Alcohol is clearly linked to hypertension, and may be linked to the risk of stroke even if blood pressure is normal. Alcohol should be used in moderation if at all. Moderation means no more then 1 drink daily for women; 2 for men. Count the following as 1 drink:

- 4 - 5 ounces wine
• 10 oz. wine cooler
• 12 oz. beer
• 1 1/4 oz. distilled liquor (80 proof)

5. The Dietary Approaches to Stop Hypertension (DASH) Diet

Results of the Dietary Approaches to Stop Hypertension, (DASH) trial show that a diet emphasizes whole grain, fruits, vegetables, and low-fat dairy products combined with a reduced total fat and saturated fat, cholesterol, sweets and salt intake can lower blood pressure to a significant degree.

III. CONGESTIVE HEART FAILURE (CHF)

A. Description

Chronic, or congestive heart failure (CHF) is a form of heart disease in which the heart does not function normally, and cannot pump enough blood to meet the body's requirement for oxygen and other function. CHF may result from CHD, hypertension or kidney disease. The person becomes congested with excess fluids, sometimes in the lungs, a condition sometimes referred to as pulmonary edema. Pulmonary edema can lead to pneumonia or other respiratory infections.

B. Nutritional Problems

Persons with CHF are at risk for malnutrition, especially if their condition causes them to lose their appetite or be too exhausted to eat. In addition, the energy requirement for person with CHF is higher because of the higher resting metabolic rate. Malnutrition may go unnoticed if the client's edema masks underweight, or if the client is overweight.

C. Dietary Interventions

Diet therapy includes actions to reduce the work required of the heart, to relieve edema and to correct nutrition problems.

1. Sodium and Fluid Restriction

Sodium is the primary focus on diet therapy for CHF patient. A sodium and fluid-restricted diet may help reduce the work of the heart by relieving edema; especially the patient is on diuretic therapy. The degree of sodium and fluid restriction depends on how severe the CHF is. Generally, a person with a moderate case of CHF is limited to 3 grams sodium daily, on severe cases, it can be as low as 500 mg per day if necessary. Fluid restriction of 1 to 2 liters daily is indicated for some individuals.
2. **Adequate Caloric Intake**

The person with CHF has higher energy needs because the heart and lungs must work harder to deliver adequate oxygen and nutrients to the tissues. Additional calorie is needed if infection is present.

3. **Small, Frequent Meals**

Although the person with CHF usually has higher energy needs and may be malnourished, overfeeding may add stress to the heart. Small, frequent feedings help to ease the task of eating and reduce the stress on the heart.

### IV. CHRONIC OBSTRUCTIVE PULMONARY DISEASE

The lung works together with the heart, to deliver oxygen throughout the body, and to remove some of the waste products from metabolism. Lung disorders, therefore, can affect nutritional status.

#### A. Definition

Chronic obstructive pulmonary disease (COPD) is a progressive but irreversible condition that cause blockage of the lung’s air passages. The disease decreases the lung’s capability to exchange gases between the air and the body. The two major types of COPD are emphysema and chronic bronchitis.

#### B. Nutritional Consequences

During breathing, oxygen from the air is usually exchanged for carbon dioxide from the blood. COPD interferes with this exchange. Breathing is more difficult.

People with COPD frequently get respiratory infections and may lose weight and become malnourished. Weight loss can occur for many reasons:

- appetite loss
- difficulty breathing raises energy expenditure
- steroid drug therapy raises nutrient requirements
- persons on mechanical ventilators cannot eat
- repeat infections raise nutrient needs and cause deficiencies

#### C. Dietary Interventions

The goal of dietary treatment for COPD is to restore and maintain nutrient stores. Overfeeding must be avoided because it burdens the respiratory system. Small, frequent feedings should be offered. Persons with COPD should be gradually advanced to a high calorie, high protein diet as per person’s tolerance. Some may even require enteral (tube), or parenteral (IV), feedings if oral intake is unable to meet one’s needs.
ACTIVITY VI  LEARNING TOURNAMENT

Directions:

1. The instructor will divide the class into teams.

2. In round one of the tournament, the instructor will give each student a list of multiple-choice questions. Each student must answer the questions individually.

3. The instructor will then provide the answers and you will score your own answers. Pool your scores with other team member and obtain a team score.

4. Your team will then review the learning material again for the second round of the tournament.

5. In round two, repeat step 2 and 3. Then present your team's total score from round one and round two.
TAKE HOME ASSIGNMENT VI – CASE STUDY

Mr. J is a 48-year old male, height 5’10”, weight 250 pounds, smoke about 2 pack of cigarettes a day, and drink beer on Friday and Sunday night. On his regular physical check up 4 months ago, his blood pressure was 160/100, cholesterol 283, LDL 190, and HDL 30. He was instructed to go on a low cholesterol diet. Today, he went back for a follow up only to find his blood pressure is still at 159/104, and other lab as follow: cholesterol 274, LDL 205, and HDL 25.

1. List all of the Mr. J’s risk factor for cardiovascular disease, and list which risk factor Mr. J has control over, and which doesn’t.

2. Suggest and described which diet should Mr. J on in addition to 2 gram sodium diet with no fluid restriction is needed.

3. List major point of areas that you will need to explain to Mr. J in order for him to follow the above diet.
Lesson VII
NUTRITION AND RENAL DISEASE
Diet Principles for Management of Chronic Renal Failure

OBJECTIVES:

In this lesson, the student will:
1. Name three normal kidney functions.
2. Describe the long-term nutritional problems associated with chronic renal failure.
3. Discuss appropriate diet interventions for clients with chronic renal failure.

I. NORMAL KIDNEY FUNCTION

The kidneys’ main function is to produce and eliminate urine, reabsorption of certain essential nutrients, filtering blood by removing waste from blood, and maintaining body chemistry. There are many nutritional challenges to caring for clients with kidney or renal disease.

A. Filtration

The kidneys filter out waste products and excrete them in the urine. Through this filtering process the kidneys help maintain normal fluid balance and body chemistry.

B. Blood Pressure

Kidneys help control blood pressure. They make a substance, renin, that triggers the release of the hormone aldosterone. Aldosterone prompts the kidneys to save sodium and water, causing blood pressure to rise.

C. Red Blood Cell Production

The kidneys also produce the hormone, erythropoietin, which causes the bone marrow to produce red blood cells.

D. Calcium and Bone Metabolism

The kidneys change Vitamin D to its active form. Activated Vitamin D supports calcium absorption, calcium and phosphorus metabolism and bone maintenance.
II. CHRONIC RENAL FAILURE

A. Definition

The term “renal” refers to the kidneys. In chronic renal failure (CRF), gradual but irreversible nephron (a structural and functional unit of the kidney) damage developed over months to years.

B. Consequences of Chronic Renal Failure

1. Buildup of Waste Products and Fluids

As kidney function declines, the contents of blood and urine change, and therefore, waste products and electrolytes may build up to toxic levels in the bloodstream (uremia). The body may begin to swell as it is unable to rid itself of excess fluid. The person with uremia may have symptoms that affect their entire body, like fatigue, weakness, muscle cramps, drowsiness, and loss of appetite.

2. Chronic Complications

CRF can be followed by hypertension, congestive heart failure and atherosclerosis. High blood levels of potassium can cause a serious, irregular heartbeat. Bone disease and anemia are also linked to CRF.

3. Growth Failure and Wasting Syndrome

For a number of reasons, both children and adults with renal disease may have poor growth and wasting of muscle mass. Diet is important to help correct these problems.

III. DIETARY TREATMENT IN CHRONIC RENAL FAILURE

A. Objectives

- reach or maintain good nutritional status
- delay further renal damage
- prevent buildup of toxic waste products
- prevent complications like growth failure, muscle wasting, bone disease, hypertension, congestive heart failure and fluid retention.
- to support the client’s well-being

B. Description

Renal diets vary a lot from person to person. Usually they may be prescribed with diet that restricts protein, and carefully control sodium, potassium, fluids, and phosphorus. Because renal diets can control many nutrients, and therefore, food choices may be limited.
C. **Energy**

Kcalories (KCal) must be adequate to achieve or maintain desirable weight. Adults need 35Kcal per kilogram body weight per day for people younger than 60 years old, and 30-35 KCal per kg body weight per day for people that are older than 60 years.

Kcalorie source should be accordance to diet restriction, i.e. low in protein, sodium and potassium and may include sugars, sweet drinks and unsaturated fats, like margarine and oils if indicated.

D. **Protein**

Clients with chronic renal failure need enough, but not too much protein, to prevent malnutrition but avoid uremia, (buildup of toxic waste products from protein metabolism). Renal diets often provide 0.6 g pro/kg body weight.

Since clients are on a protein restriction diet, most of the protein in the diet should come from high quality sources, i.e. meat, poultry and seafood.

E. **Phosphorus**

Renal osteodystrophy is a bone disorder resulting from calcium and phosphorus imbalances in renal disease. It may be avoided through diet control. Persons with renal disease must limit high phosphorus foods like milk and milk products, cheese, poultry, nuts and legumes including tofu. Drugs that bind phosphates in the digestive tract are often prescribed to take shortly before or with meals.

F. **Sodium**

Needs for sodium restriction greatly depends on client’s blood pressure, cardiac status, hydration status, and renal function. As kidney function worsens, more sodium restriction may be indicated. A typical renal diet may contains 1 to 4 grams of sodium daily.

G. **Potassium**

Some client with CRF may still able to tolerate normal intakes of potassium. However, if high potassium develops it can be serious, for it could lead to irregular heat beat. For this reason, renal diets are often moderately restricted to 1 - 3 grams potassium per day depends on patients’ severity of the disease. This means to avoid all food that is high potassium and avoiding low sodium products made with salt substitutes that contain potassium.

The richest sources of potassium are fresh fruits, vegetables and legumes, while all living cells from plants and animals contain potassium. Potassium tends to decrease as foods are processed.
H. Fluids

Individual fluid needs vary. If sodium and fluid are being retained, daily fluid intake may need to be restricted. A typical renal diet provides from 500 - 3000 ml or about 1/2 to 3 liters of fluids daily. All beverages and food, that are liquid at room temperature, like Jello and gravy, must be counted as part of the fluid allowance.

I. Putting It All Together

Because renal diets restrict so many nutrients, planning them is a job for a specialist. Other nutrition specialists can be helpful in supporting the diet order and assisting the client on the diet to find foods they will accept and enjoy.
ACTIVITY IV
MENU PLANNING UTILIZING THE COMPUTER PROGRAM

Directions:
Using the computer program, ESHA Food Processor SQL, plan a 1 meal (dinner) for a patient who is on a renal diet with 40 gm protein, 2 gm potassium, 2 gm sodium restriction, with 1600 Kcal energy needs.
Use about one third of the restriction for that particular meal.
Directions:
1. Write each food from the following list under the nutrient heading it most closely matches. (Some foods may fit into more than one category)  

<table>
<thead>
<tr>
<th>jelly</th>
<th>banana</th>
<th>soft drink</th>
</tr>
</thead>
<tbody>
<tr>
<td>gelatin</td>
<td>margarine</td>
<td>milk</td>
</tr>
<tr>
<td>Popsicle</td>
<td>cottage cheese</td>
<td>chicken</td>
</tr>
<tr>
<td>Canned green beans</td>
<td>peanut butter</td>
<td>bottled salad dressing</td>
</tr>
<tr>
<td>Dried beans</td>
<td>potato</td>
<td>fresh peach</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy</th>
<th>Protein</th>
<th>Sodium</th>
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<tr>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Potassium</th>
<th>Fluids</th>
<th>Phosphorus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</table>

2. For each nutrient heading listed above, state one reason why it is either increased or restricted on a renal diet.  

6 points
Lesson VIII

NUTRITION AND CANCER/ HIV AND AIDS
Nutritional Problems and Dietary Interventions for Cancer, HIV and AIDS

OBJECTIVES:

In this lesson, the student will:

1. Describe the nutritional consequences of cancer and cancer treatments.
2. List 2 goals of nutrition support for clients with cancer.
3. Discuss dietary interventions to help clients with cancer handle food-related problems.
4. Describe the nutritional consequences of HIV/AIDS.
5. List 2 goals of nutrition support for clients with HIV/AIDS.
6. Discuss dietary interventions to help clients with HIV/AIDS handle food-related problems.

I. CANCER AND HIV/AIDS

A. General Descriptions

1. Cancer

Cancer is a disease in which abnormal cells multiply out of control and disturb the normal functioning of the body’s cells or organs. Cancer is not a single disorder; instead, there are many different cancers. They have different features, occur in different organs, behave differently and need different treatments. Tumors that grow uncontrollably rob nutrients from the diet or the body’s stores. This has an impact on the client with cancer’s nutrition.

2. HIV/AIDS

Infection by the human immunodeficiency virus (HIV), eventually causes acquired immune deficiency syndrome (AIDS). Like cancer, AIDS has an impact on the client’s nutrition. AIDS, however, is unlike cancer in 2 ways; AIDS is incurable and HIV infection is largely preventable.

HIV infection attacks the immune system and leaves its victims helpless against infections from causes that most people are protected from, also known as opportunistic infections.
B. Cancer Treatment

Nutrition plays a supporting role in cancer treatment. Nutritional side effects of cancer treatment can be of serious concern. Primary treatments include:

- radiation therapy - the use of radiation to stop or destroy cancer cells. Radiation also damages normal body cells, including blood cells and the GI tract.
- chemotherapy - the use of drugs to stop or destroy cancer cells.
- surgery - may be necessary to remove a tumor. The effect of surgery depends on the size and location of the tumor.

II. NUTRITIONAL CONSEQUENCES OF CANCER AND HIV/AIDS

A. Effects on Metabolism

In people with cancer, changes in metabolism either raise kcalorie needs or cause the body to waste kcalories when burning food for energy. Both metabolic changes result in an increased need for kcalories.

In people with HIV/AIDS, there are also changes in metabolism resulting in an increased need for kcalories. Repeated infections and the presence of Kaposi’s Sarcoma, a type of cancer, are two contributing factors.

B. Inadequate Nutrient Intake

Persons with HIV/AIDS have appetite loss and inadequate nutrient intake for reasons similar to those of people with cancer.

1. Early Satiety
   Early satiety is common to cancer. A person with cancer often feels full quickly when eating. They are unable to finish normal portions.

2. Fatigue
   Fatigue is common to both cancer and HIV/AIDS. Tiredness or exhaustion make buying, preparing, serving and cleaning up after meals difficult. This often worsens as the day goes on.

3. Psychological Stress
   Psychological stress is common to both cancer and HIV/AIDS. Depression over diagnosis or feeling anxious or overwhelmed interferes with food intake.

4. Food Aversions
   Common to both cancer and HIV/AIDS. Due to either the disease or its treatment, clients may develop a strong dislike for certain foods, especially red meat.
5. **Oral and Respiratory Infections**

People with AIDS often develop an oral *Candida* infection, sometimes called thrush. The taste of foods can be affected and there can be dry mouth and pain when swallowing. Oral infections caused by the herpes virus, which is common in people with AIDS, can cause mouth sores and chewing/swallowing problems.

Respiratory infections like TB and pneumonia can limit food intake. Oxygen masks, if needed, make eating difficult.

C. **Treatment Side Effects**

1. **Cancer**

Cancer therapy can lead to anorexia by causing the following side effects:

- nausea
- vomiting
- altered taste perceptions
- mouth blindness
- dry mouth
- inflamed esophagus
- mouth sores

2. **HIV/AIDS**

Drugs used to treat the various problems caused by HIV infections suppress appetite and reduce food intake. As with cancer treatment, certain drugs used to treat infections or Kaposi’s Sarcoma may cause nausea/vomiting and food aversions.

D. **NUTRIENT LOSSES**

1. **Cancer**

Cancer can lead to nutrient losses by:

- inadequate digestion - depending on tumor location/size
- malabsorption - may be caused by tumor or treatment
- vomiting - may be caused by tumor or treatment
- diarrhea - largely caused by treatment, especially damage to the lower GI tract from radiation therapy, a condition called radiation enteritis

2. **HIV/AIDS**

From 50 to 90% of people with AIDS experience chronic diarrhea and malabsorption. GI tract infections can cause diarrhea and malabsorption in people with HIV infections. Many of the agents
that cause these infections come from infected foods. People with advanced HIV infections are at high risk for food-borne illnesses.

HIV infection alone may cause malabsorption. Certain *antimicrobial* drugs used in HIV/AIDS or chemotherapy may also cause diarrhea and malabsorption.

III. **DIETARY INTERVENTIONS FOR CANCER AND HIV/AIDS**

**A. Goals**

1. **Cancer**

Cancer nutrition cannot cure cancer but plays a supportive role. Dietary interventions can prevent or reverse poor nutrition status so that a person with cancer:
   - feels better and functions better
   - resists infections better
   - may tolerate cancer therapies better
   - enjoy a better quality of life

2. **HIV/AIDS**

As with cancer, nutrition cannot cure HIV. Dietary interventions, especially early after HIV diagnosis may:
   - slow the infection’s progress
   - improve quality of life
   - improve responses to drug therapy
   - shorten length of hospital stays
   - promote physical independence

**B. Problem-Oriented Interventions**

1. **Improve Food Intake**

Suggestions for helping clients improve food intake focus on including favorite foods, filling up on nutrient-dense foods first at mealtime, establishing a comfortable atmosphere for eating, spreading daily food intake over small, frequent meals, and keeping high calorie convenient snacks handy.

2. **Fight the Feeling that Foods Taste Bitter or Metallic**

Persons with HIV/AIDS or cancer often say that red meats, (beef, pork, lamb, and veal), taste metallic. They may complain of a bitter taste in their mouth. Suggestions for dealing with these problems focus on trying new seasonings, preparation methods, serving temperatures, or replacing red meats with fish, poultry, eggs or
dairy products. Good dental care can help rule out the chance that dental problems are causing bad taste.

3. **Control Nausea/Vomiting**

Techniques for dealing with nausea and vomiting focus on avoiding foods that have strong odors, are rich, or spicy. Small, frequent meals and drinking cool clear beverages like ginger ale, popsicles and gelatin desserts may help. Doctors may prescribe anti-nausea medicines.

4. **Prevent Food Aversions**

A food aversion is being turned-off to a certain food that you usually like. Because it is important for clients with cancer and HIV/AIDS to eat well, they should be careful not to eat their favorite foods during times of day that they have nausea or vomiting. Clients should avoid favorite foods just before or right after chemo or radiation treatments that they think may cause nausea.

5. **Treat Diarrhea**

Strategies for treating diarrhea focus on reducing dietary fiber, (Table 14 - 4 on page 349 in the textbook lists low fiber foods and provides a sample menu), replacing fluids and electrolytes particularly sodium and potassium, avoiding spicy, fatty or gas-causing foods. Including certain foods like applesauce, bananas, oatmeal and rice may help curb diarrhea. Some persons having diarrhea may need to avoid milk products until the diarrhea goes away.

6. **Solve Problems with Chewing and Swallowing**

Soreness in the mouth and throat are common to both clients taking cancer treatment or HIV/AIDS clients that have infections in the mouth or throat. Solving these problems focuses on using softer foods that are easier to handle, moistening foods, and avoiding spicy, sticky or acidic foods. Mouth rinses and mouth care may also help. Clients should check with their doctor or dentist for specific recommendations.

7. **Increase Kcalories and Protein**

Because nutritional needs for both kcalories and protein are higher in clients with cancer or HIV/AIDS, it is important to help them get the best nutrition from food. Hints for boosting kcalories and protein focus on using extra butter, margarine, mayonnaise or cream if tolerated, adding ground meats, grated cheese, chopped egg or dry milk powder to foods, having high calorie, convenient
snacks handy and having nutritional supplements or milkshakes between meals.

8. **Special Food Handling Considerations for HIV/AIDS**

Preventing food-borne illnesses is always important but especially for clients whose immune systems are weakened by HIV/AIDS or cancer treatment. Suggestions for preventing food-borne illnesses focus on careful food selection, proper food handling during storage and preparation, keeping foods at safe temperatures, cooking meat and poultry thoroughly and cleanliness of hands, utensils, and food-contact surfaces.
REFERENCES

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