

CHAPTER 34

NUTRITION IN HEALTH AND DISEASE

Overview

Medical assisting students learn the elements of the digestive system and the role each element plays in digestion. The seven basic nutrient types and how each contributes to a healthy diet are discussed. The elements that make up fats, proteins, and carbohydrates are discussed. The differences between water-soluble and fat-soluble vitamins are explored, as are the foods in which each vitamin is found. The importance of nutrition labels is emphasized; students learn to analyze food labels from the perspective of good nutrition and health. This knowledge of the nutritive value of processed and other foods leads students to an awareness of the profound effect of nutrition on health. Students will be better able to educate patients on the importance of complying with the provider's treatment plan concerning nutrition and diet issues. Various therapeutic diets are discussed as well as the role each can play in controlling a disease state. The need for an individual to modify diet throughout the life span is explored. Medical assisting students learn to become nutrition advocates, encouraging patients to adopt healthy eating habits in their lifestyles.

Lesson Plan

I. LEARNING OUTCOMES	ABHES	CAAHEP
A. Define, spell, and pronounce the key terms as presented in the glossary.		
B. Describe the relation of nutrition to the functioning of the digestive system.	MA.A.1.2. a, b	I.C.5
C. Identify the seven basic nutrient types.	MA.A.1.2.a	
D. Explain the relationship and balance among the three energy nutrients.	MA.A.1.2.a	
E. Distinguish between water-soluble and fat-soluble vitamins.	MA.A.1.2.a	
F. Discuss herbal supplements.	MA.A.1.2.a	
G. Explain the reason for nutrition labels on food packaging.	MA.A.1.2.a	
H. Read and interpret nutrition facts and ingredients on three food packages.	MA.A.1.2.a	
I. Discuss various therapeutic diets, and explain how each can help to control a particular disease state or accommodate a change in the life cycle.	MA.A.1.2. a-c	IV.P.5
J. Analyze the professionalism questions and apply them to this chapter's content.		

II. PROFESSIONALISM QUESTIONS

- A. Communication
 1. Did you introduce yourself? Did you identify the patient through name and birth date or other identifying feature?
 2. Did you listen to and acknowledge the patient?
 3. Did you speak at the patient's level of understanding?
 4. Did you respond honestly and diplomatically to the patient's concerns?
 5. Did you refrain from sharing your personal experiences?
 6. Did you include the patient's support system as indicated?
- B. Presentation
 1. Did your actions attend to both the psychological and the physiological aspects of the patient's illness or condition?
 2. Were you courteous, patient, and respectful to the patient?
 3. Did you display a positive attitude?
 4. Did you display a calm, professional, and caring manner?

- C. Competency
 - 1. Were you knowledgeable and accountable?
- D. Initiative
 - 1. Did you direct the patient to other resources when necessary or helpful, with the approval of the provider?
- E. Integrity
 - 1. Were you respectful of others?
 - 2. Did you demonstrate respect for individual diversity?

III. REFERENCES

- A. Lindh, Wilburta Q., Pooler, Marilyn S., Tamparo, Carol D., Dahl, Barbara M., & Morris, Julie A., *Delmar's Comprehensive Medical Assisting: Administrative and Clinical Competencies*, 5e
- B. See text Chapter 34, References/Bibliography
- C. Any other teacher-preferred reference material

IV. VISUAL AIDS

- A. Computer access to identified Internet resources
- B. Any teacher-preferred visual aids (PowerPoint, etc.)

V. EQUIPMENT AND MATERIALS

- A. Computer, TV monitor, and Internet access
- B. Handouts and pamphlets on special diets, exercise, and the food guide pyramid
- C. See IV: Visual Aids

VI. SAFETY

- A. Basic classroom procedures
- B. Advise about following provider's orders
- C. Follow Standard Precautions
- D. Attend to patient
- E. Set a good example

VII. PREPARATION

- A. Arrange for visual aids equipment.
- B. Collect materials.
- C. Review Chapter 34 in the text, the Study Guide, the Competency Manual, and the Instructor's Manual.

VIII. INTRODUCTORY REMARKS/ACTIONS

- A. Read Learning Outcomes in the text with students to introduce the chapter.
- B. Display handouts and pamphlets to gain the interest of the class for discussion.
- C. Ask students to list their typical menu for a given day and the type and amount of exercise done, and have them share this information.

IX. PRESENTATION

- A. Nutrition and Digestion
 - 1. Nutrition
 - a. Good nutrition results in a better-quality and longer life
 - b. Patient education is important in modifying a diet to treat illness
 - 2. Digestion
 - a. Physical and chemical changes in food for absorption
 - b. Absorption is transfer of nutrients to the bloodstream
- B. Types of Nutrients
 - 1. Energy Nutrients
 - a. Carbohydrates
 - (1) Utilization in body
 - b. Fats
 - (1) Characteristics of triglycerides
 - (a) Whether or not they are essential to diet
 - (b) Saturation
 - (c) Trans fats

- c. Proteins
 - (1) Amino acids
 - (2) Complete proteins
- d. Energy balance
 - (1) Amount of energy, measured in calories
 - (2) Formula for measuring calories
 - (3) Basal metabolic rate (BMR)
 - (4) Storage of calories as fat
 - (5) Depleting stores of fat
 - (6) Optimal energy balance
 - (a) 20% from fat
 - (b) 10–20% percent from proteins
 - (c) 50–60% from carbohydrates
 - (7) Diet of Americans
 - (a) High in fat and calories
- 2. Food pyramid/MyPlate
- 3. Other Nutrients
 - a. Vitamins
 - (1) Complex molecules
 - (2) Functions
 - (a) Facilitate cellular metabolism
 - (b) Act as component of tissue structure
 - (3) Classes of vitamins
 - (a) Fat soluble
 - (b) Water soluble
 - (c) Antioxidants
 - b. Herbal supplements
 - c. Minerals
 - (1) Singular elements
 - (2) Some required in large amounts
 - (3) Electrolytes
 - (4) Must be balanced in body
 - (5) Major minerals
 - (a) Calcium
 - (b) Phosphorus
 - (c) Potassium
 - (d) Sodium
 - (e) Chloride
 - (f) Magnesium
 - (g) Sulfur
 - (6) Trace minerals
 - d. Water
 - (1) Most important nutrient
 - (2) Functions in human body
 - (a) Major solvent
 - (b) Medium in which most biochemical reactions of the body take place
 - (c) Essential for removal of toxic waste
 - (d) Component of many structures
 - (e) Composes 50%–60% of human body
 - (f) Major component of blood
 - (g) Lubricates
 - (h) Helps control temperature of body
 - (3) Must be replenished daily
 - (4) Six to eight glasses per day
 - e. Fiber
 - (1) Carbohydrate in nature
 - (2) From plant sources

- (3) Not digested or absorbed into body
- (4) Adds bulk to fecal material
- (5) Conditions caused by lack of fiber
 - (a) Diverticulitis
 - (b) Colorectal cancer
- (6) Types
 - (a) Carbohydrates
- (7) Cellulose
 - (a) Lignin
- (8) Often removed during processing

C. Reading Food Labels

1. Items on the Nutrition Label (discuss the Critical Thinking box)

- a. Serving size
- b. Calories
- c. The percentage daily value
- d. Total saturated fat, trans fat, and cholesterol
- e. Sodium
- f. Carbohydrates
- g. Other information
 - (1) Fiber
 - (2) Protein
 - (3) Some vitamins and minerals
- h. Ingredients
 - (1) Largest quantity listed first
 - (2) Preservatives

2. Comparing Labels

- a. Look for lowest amount of fat
- b. Low sodium content
- c. High fiber
- d. Vitamins and minerals

D. Nutrition at Various Stages of Life

1. Pregnancy and Lactation (discuss the Critical Thinking box)

- a. Require increase in various nutrients
- b. Double protein intake
- c. Increase intake of vitamins, calcium, phosphorus, and iron
- d. Do not skimp on calories

2. Infancy

- a. Continuous growth
- b. Triple birth weight in first year of life, but avoid overfeeding
- c. Need for two to three times more protein and calories per kilogram of body weight than normal adult
- d. Breast milk
- e. Need for iron

3. Childhood

- a. Healthy eating habits
- b. Importance of regular exercise
- c. Childhood obesity
- d. Fast foods
- e. Parental education

4. Adolescence (discuss the Critical Thinking box)

- a. Greatest levels of growth
- b. Generally begins sooner with females
- c. Growth spurts
- d. Iron requirements increase for females
- e. Calcium requirements increase because of rapid bone development

5. Elderly
 - a. Cellular metabolism tends to slow
 - b. Decreased requirement for calories
 - c. Increased requirement for nutrients, vitamins, and protein during illness
 - d. Decreased absorption in digestive tract
 - e. Difficulties presented because of
 - (1) Individual's psychological state
 - (2) Economic status
 - (3) Physiologic factors
 - (4) General unwillingness to change eating habits
- E. Therapeutic Diets
 1. Weight Control
 - a. Obesity
 - b. Bulimia and anorexia nervosa
 2. Diabetes Mellitus
 - a. Insulin production
 - b. Controlling effects
 3. Cardiovascular Disease
 - a. Hypertension
 - b. Atherosclerosis
 - c. Arteriosclerosis
 - d. Lipoproteins
 - e. Serum cholesterol
 - f. Myocardial infarction
 - g. Healing of heart after myocardial infarction
 4. Cancer
 - a. Normal regulatory mechanisms within cell have broken down
 - b. Total Parenteral Nutrition (TPN)
- F. Diverse Food Choices
 1. Various cultural, regional, and ethnic groups

X. APPLICATION

- A. Use the Learning Outcomes at the beginning of Chapter 34 in the text as the basis for questions to assess comprehension.
- B. See the Classroom Activities section below for numerous application activities.
- C. Assign students to complete Chapter 34 in the Study Guide.
- D. Complete the Procedure in Chapter 34, using the Competency Manual to evaluate.

XI. EVALUATION

- A. Evaluate any assigned application activities.
- B. Evaluate student participation during class.
- C. Grade responses to Chapter 34 in the Study Guide.
- D. Evaluate student performance in Chapter 34 Procedure.

Classroom Activities

1. Have students research popular diet programs and give the pros and cons of each.
2. Ask a registered dietitian to give a presentation regarding nutrition, meal planning, cooking tips, or whatever you feel the class might be interested in. You might also ask the presenter to explain special diets.
3. Encourage students to bring in newspaper and magazine articles regarding diet and exercise to share with the class. Keep a file or notebook for this purpose.
4. Invite a gastroenterologist or medical assistant employed by one to speak to the class about eating disorders and treatments used for various digestive tract disorders.
5. Have students make posters with health tips about diet and exercise.
6. Have students keep track of their daily diet and exercise routines for two weeks and then discuss them in class.

7. Assign students to research the digestive system and prepare a paper on one of the four processes that this system performs. Students should accompany the project with some type of visual aid: a model, a transparency, a poster, or something similar.
8. Assign students to chart what they eat for one week. Students should then analyze what they eat by comparing their intake with the Food Guide Pyramid.
9. Have students bring various food labels to class. In small groups, students should compare the features listed on each label and determine the nutritional value of the product.
10. There has been a change in the recommendations by the United States Department of Agriculture for recommended dietary intake. Have students compare and discuss the MyPyramid guidelines versus the new MyPlate guidelines.
11. Lead the class in the review of their food diary. Assist the students to calculate the protein, carbohydrate, and fat content of their recorded intake. Remind them of sources for information re: content of fast food, prepared foods, and food ordered in a restaurant.

Answers to Critical Thinking Boxes

The following is information from a label for peanut butter. Calculate the percentage of calories from fat, protein, and carbohydrate.

Serving size	2 tbsp
Calories	204
Protein	9 g
Carbohydrates	6 g
Fat	16 g

<u>Serving Size</u>	<u>2 tbsp</u>
<u>Calories</u>	<u>204</u>
<u>Protein</u>	<u>$9\text{g} \times 4 \text{ calories} = 36 \text{ calories}$</u>
<u>Carbohydrates</u>	<u>$6\text{g} \times 4 \text{ calories} = 24 \text{ calories}$</u>
<u>Fat</u>	<u>$16\text{g} \times 9 \text{ calories} = 144 \text{ calories}$</u>
	<u>Total = 204 calories</u>
<u>Protein</u>	<u>36 calories</u>
	<u>$204 \text{ total calories} = 18\% \text{ calories from protein}$</u>
<u>Carbohydrates</u>	<u>24 calories</u>
	<u>$204 \text{ total calories} = 12\% \text{ calories from carbohydrates}$</u>
<u>Fat</u>	<u>144 calories</u>
	<u>$204 \text{ calories} = 70\% \text{ calories from fat}$</u>

Evaluate your own diet. Write down every item you eat in a day and find the values of the nutrients contained in the foods. A medical dictionary is a good source for listing the nutrient value of selected foods. If you are eating prepared foods, read the package food label. Remember, you are trying to get an idea of your average daily diet, so do not change your diet for your analysis unless you plan to maintain it. What is the balance of your energy nutrients? Are you getting enough vitamins and minerals? Are you getting adequate fiber? What modifications could you make?

Answers will vary according to each student's individual dietary intake for that day.

Write a response to a teenage girl who refuses to gain weight during her pregnancy.

The growth of the fetus, the mother, the placenta, and the breast tissue, as well as the increased volume of blood, all require additional nutrients. There is an increase in calorie and specific nutrient demand, most notably from protein. It is an important time for mother and fetus, and it is normal and healthy for the mother to gain weight. A baby born to a mother who has had good nutritional habits is more likely to develop normally and be healthy. A baby born to a mother who has poor nutritional habits (perhaps malnourished) may suffer from mental retardation and weigh less at birth. Babies who weigh less at birth (less than 5.5 lbs) have a greater mortality rate than babies of normal weight.

Answers to Case Studies

Case Study 34-1

Refer to the scenario at the beginning of the chapter.

1. What aspects of nutrition must be considered when Becky Slack, RMA (AMT), is considering the nutritional needs of an adolescent?

Adolescent females require additional calories as they experience growth earlier than males. Adolescence is the time that a human experiences the greatest levels of growth and the appropriate nutrition is required. Iron and calcium are crucial during this period of time.

2. What are key ways that Becky can include parents in the educational process?

As parents are most often the shoppers when it comes to nutritional offerings for adolescents, it is important to include them in the nutritional counseling session. Introductions to MyPlate and other sources that outline the nutritional requirements provide key information that can be referred to when planning meals.

3. What guidelines should Becky follow when encouraging adolescents to incorporate exercise in their nutritional plans?

Adolescents should moderately exercise at least 60 minutes a day in order to develop healthy bone and muscle mass and maintain a healthy BMI. There are numerous websites that address the need for exercise at this developmental stage. Suggest that your patient research recommendations and exercise suggestions.

Case Study 34-2

Anita Ferguson is a new patient at Inner City Health Care. She is a 16-year-old girl who is 4 months pregnant and came to the urgent care center only a couple of weeks ago. After Wanda Slawson, CMA (AAMA), took Anita's medical history, and after Anita was examined by the provider, Wanda set aside time to answer any questions Anita might have about her pregnancy. Anita is obviously scared; she wants the baby, but she does not want her life to change. According to the history, Anita has lost a few pounds in the last 2 weeks.

1. What patient education can Wanda provide to alert Anita to the importance of diet and weight gain during pregnancy?

Wanda needs to gently educate Anita about the pregnant woman's need to increase various nutrients. Wanda should explain that during pregnancy the growth of the fetus, growth of the placenta, and growth of breast tissue, increased volume of blood and growth of breast tissue all create the need for additional nutrients. Wanda should try to persuade Anita that pregnancy is an important time for the baby and the mother. It is important for the health of each that the mother increases her nutritional intake and gain weight while the child is growing in order to preserve the mother's health and ensure a healthy newborn.

2. What foods should Wanda encourage Anita to eat?

The need during pregnancy is not just for extra calories but for specific nutrients, so Wanda should provide Anita with a range of foods that she can choose from, especially if Anita is a picky eater. The focus of nutritional education during pregnancy should be on adequate protein intake along with a variety of foods to provide micronutrients that are essential for the developing fetus. Prenatal vitamins are a key part of ensuring that the fetus has vitamins and minerals that are required to assure normal growth and development for the fetus. Iron is usually an additional supplement as the demands for red cell production increases during pregnancy.

3. If Anita resists Wanda's suggestions and has not gained any weight by the next visit, how should Wanda proceed?

Wanda should consult with the provider regarding the direction of patient education for Anita to ensure a healthy outcome to her pregnancy. Some possible reasons for inadequate nutrition may not be voluntary. It is important to assess the capability of Anita to have access to a variety of healthy food. If finances are an issue, a referral to community, state, and federal resources might be important to assist Anita in meeting her nutritional needs.

Elicit the encouragement from Anita's support group by including them in the patient education about nutrition. Remember that her friends are very important at this time in Anita's socialization. Include her peers as needed.

Case Study 34-3

Dr. Lewis prescribed an 1800-calorie ADA diet for Mrs. Johnson.

1. Describe what is included in an 1800-calorie ADA diet.

Mrs. Johnson's activity level, number of calories per day, and dosage of insulin would have to be considered. The 1800-calorie diabetic diet consists of 50 percent carbohydrates, 30 percent fat and 20 percent protein. Various foods can be exchanged (derived from a food exchange list) to have a wide selection of foods that come from each of the basic food groups.

2. Describe the patient education you would use to help Mrs. Johnson understand the diet and to help her reach her goal of improved health.

The patient needs to know how to select the correct foods in the correct quantities, how to incorporate a daily exercise routine, and the importance of taking insulin at the appropriate time of the day. The overall goal is geared toward providing sufficient calories to maintain normal body weight, while providing adequate nutrition. Lifestyle is also taken into consideration, as well as the patient's ability to comply with the prescribed diabetic diet. The prescribed amount of food should be eaten at prescribed times during the day. Meals should not be skipped. Encourage the patient to learn more about diabetes by enrolling in a class about the disease at a local hospital.

Answers to Certification Review

1. c. absorption
2. c. energy nutrient
3. b. metabolism
4. c. They may interact with over-the-counter and prescription medications.
5. d. ascorbic acid
6. b. fat, carbohydrates, and protein
7. a. A, D, E, and K
8. d. all of the above
9. b. remove free radicals from our bodies
10. a. Infancy

This project was funded at \$3,000,000 (100% of its total cost) from a grant awarded under the Trade Adjustment Assistance Community College and Career Training Grants, as implemented by the U.S. Department of Labor's Employment and Training Administration. Rogue Community College is an equal opportunity employer/program. Auxiliary aids and services, alternate form and language services are available to individuals with disabilities and limited English proficiency free of cost upon request.

This work is licensed under a Creative Commons Attribution 4.0 International License.