23
The Endocrine System

1. Define important words in this chapter
2. Explain the structure and function of the endocrine system
3. Discuss changes in the endocrine system due to aging
4. Discuss common disorders of the endocrine system
5. Describe care guidelines for diabetes
6. Discuss foot care guidelines for diabetes

Supplemental Tools
TRANSPARENCY 23-1 THE ENDOCRINE SYSTEM
CHAPTER 23: EXAM

Assignments
TEXTBOOK READING, PP. 421-428
WORKBOOK EXERCISES, PP. 127-129

Overview of Teaching Strategies
This chapter focuses on the endocrine system. Students will learn about the structure and function of the endocrine system, including normal changes of aging that will enable them to better recognize abnormal changes that might signal a potential problem. Disorders of the endocrine system are described, with detailed information on care for diabetic residents, including foot care.

1. Define important words in this chapter

Meeting the Learning Objective
TEXTBOOK P. 421
WORKBOOK P. 127

Lecture
Pronounce and define each of the key terms listed in the Learning Objective on page 421.

2. Explain the structure and function of the endocrine system

Meeting the Learning Objective
TEXTBOOK PP. 421-422
WORKBOOK P. 127

Lecture
Display Transparency
23-1 THE ENDOCRINE SYSTEM

Review the following points about the endocrine system:
• Glands secrete hormones, which are chemical substances that control numerous body functions.
• Hormones are carried in the blood for delivery to target tissues or organs.
• The pituitary gland controls the hormone production of other glands.
• The pancreas produces the hormone insulin, which regulates the amount of glucose available to the cells for metabolism.

Review the functions of the endocrine system:
• Maintains homeostasis through hormone secretion
• Influences growth and development
• Regulates levels of calcium in the blood
• Maintains blood sugar levels
• Regulates the body’s ability to reproduce
• Determines how quickly cells burn food for energy

3. Discuss changes in the endocrine system due to aging

Meeting the Learning Objective
TEXTBOOK PP. 422-423
WORKBOOK P. 127
Review normal changes of aging:

- Levels of estrogen and progesterone decrease, which signal the onset of menopause in women.
- Testosterone levels in males usually decrease, but production does not stop.
- Insulin production decreases.
- Body is less able to handle stress.

4. Discuss common disorders of the endocrine system

Meeting the Learning Objective

**Textbook pp. 423-425**

**Workbook pp. 127-128**

**Lecture**

Pronounce and define the following key terms:

- Diabetes
- Pre-diabetes

Review the following points about diabetes:

- Condition in which the pancreas does not produce insulin or does not produce enough insulin
- Risk factors: family history of the disease, advanced age, obesity
- Complications caused by diabetes: hypoglycemia; DKA; problems with circulation; increased risk of heart attack; stroke, or impaired circulation of the legs; increased risk of infection and gangrene; diabetic retinopathy, damage to vital organs including the kidneys; diabetic peripheral neuropathy

Review the following points about pre-diabetes:

- Condition in which glucose levels are elevated, but not high enough to establish a diagnosis of diabetes
- People with pre-diabetes may already have damage to the vital organs.
- Change in diet can reduce weight and lower the risk of pre-diabetes or diabetes.

Review the following points about type 1 diabetes:

- Usually diagnosed in children and young adults
- Cause: pancreas does not produce any insulin
- Condition will continue throughout person’s life
- Treatment: daily injections, special diet, monitoring blood glucose level

Review the following points about type 2 diabetes:

- Most common form of diabetes
- Cause: body does not produce enough insulin or fails to properly use insulin
- Treatment: monitoring blood glucose levels, diet, weight loss, medication, stopping smoking, exercise

Describe signs and symptoms of diabetes, including:

- Excessive thirst
- Excessive hunger
- Excessive urination
- High blood sugar levels
- Glucose in the urine
- Very dry skin
- Fatigue
- Blurred vision or visual changes
- Slow-healing sores, cuts, or bruises
- Tingling or numbness in the hands or feet
- Unexplained weight loss
- Increased number of infections

Pronounce and define the following key term:

- Hypothyroidism

Review the following points about hypothyroidism:

- Condition in which the body lacks thyroid hormone
- Autoimmune disorder
- Causes: Hashimoto’s disease, surgical removal of the thyroid gland, radioactive iodine therapy, thyroiditis
- Symptoms: fatigue and weakness, weight gain, constipation, intolerance to cold, dry skin, thinning hair or hair loss, brittle hair or fingernails, slow heart rate, low blood pressure, abnormal temperature, goiter, hoarseness, heavier menstrual periods, absent menses, depression
- Treatment: thyroid replacement therapy

Pronounce and define the following key term:

- Hyperthyroidism

Review these points about hyperthyroidism:

- Condition in which thyroid gland produces too much thyroid hormone
- Primary cause: Grave’s disease
5. Describe care guidelines for diabetes

Meeting the Learning Objective

**Lecture**
Explain to students that diabetes must be carefully controlled to prevent complications and serious illness, and that care guidelines include a plan of care associated with every system in the body.

Review care guidelines for diabetes:
- Keep skin clean and dry.
- Observe carefully for breaks in skin.
- Encourage resident to follow exercise plan.
- Report complaints of pain, numbness, or tingling in the arms or legs.
- Perform foot care carefully.
- Encourage proper footwear.
- Carefully follow diet instructions.
- People with diabetes can work with a registered dietitian (RDT) or a certified diabetes educator (CDE).
- Keep track of residents’ tests.
- Report if resident does not follow care plan.
- Perform blood glucose tests only as directed and if trained.
- Report the following: signs of skin breakdown; visual changes; changes in mobility; nervousness or anxiety; dizziness or loss of coordination; numbness or tingling in arms and legs; irritability or confusion; changes in appetite; increased thirst; fruity or sweet-smelling breath; weight change; nausea or vomiting; change in urinary output or signs of UTI; or fruity- or sweet-smelling urine.

6. Discuss foot care guidelines for diabetes

Meeting the Learning Objective

**Lecture**
Review the guidelines for safe diabetic foot care:
- Inspect and clean resident’s feet each day during bathing.
- Avoid harsh soaps and hot water.
- Always dry feet carefully.
- Never cut toenails, corns, or calluses.
- Do not use objects to remove dirt from toenails.
- Use doctor-recommended cream or lotion on feet, but not between the toes.
- Check shoes for rocks or other objects.
- Remind resident not to go barefoot.
- Report the following: excessive dryness of the skin; breaks or tears in skin; ingrown nails; reddened areas on feet; drainage or bleeding; change in color of skin or nails; change in temperature of the skin; corns; blisters; calluses; warts; blood or drainage on the feet or toes; painful, tender, soft, or fragile areas on feet; or burning in the feet.

**Demonstration**
Demonstrate the procedure: Providing foot care. Include all of the numbered steps in your demonstration.

Have the students return the demonstration. Procedure checklists are located at the end of the Student Workbook.

**Chapter Review**

**Exam**
Distribute chapter 23: exam
(appendix c, p. 336)

Allow students enough time to finish the test. See Appendix D for answers to the chapter exams.

**Answers to Chapter Review in Textbook**

1. The pituitary gland
2. Insulin is produced in the pancreas.

3. Answers include: maintains homeostasis through hormone secretion; influences growth and development; regulates levels of calcium in the blood; maintains blood sugar levels; regulates the body's ability to reproduce; determines how quickly cells burn food for energy

4. Answers include: Levels of estrogen and progesterone decrease, which signal the onset of menopause in women. Testosterone levels in males usually decrease but production does not stop. Insulin production decreases. Body is less able to handle stress.

5. Family history, advanced age, obesity

6. Answers include: hypoglycemia; DKA; problems with circulation; increased risk of heart attack; stroke, or impaired circulation of the legs; increased risk of infection and gangrene; diabetic retinopathy, damage to vital organs including the kidneys; or diabetic peripheral neuropathy

7. Answers include: change in diet; daily exercise; reduction in weight

8. Type 2

9. Answers include: excessive thirst; excessive hunger; excessive urination; high blood sugar level; glucose in the urine; very dry skin; fatigue; blurred vision or visual changes; slow-healing sores, cuts, or bruises; tingling or numbness in the hands or feet; unexplained weight loss; or increased number of infections

10. Answers include: fatigue and weakness; weight gain; constipation; intolerance to cold; dry skin; thinning hair or hair loss; brittle hair or fingernails; slow heart rate; low blood pressure; abnormal low temperature; goiter; hoarseness; heavier menstrual periods; absent menses; or depression

11. Answers include: nervousness; restlessness; fatigue; visual problems or eye irritation; bulging or protruding eyes; trembling; intolerance to heat; excessive perspiration; rapid heartbeat; high blood pressure; increase in appetite; weight loss; changes in bowel movements; irregular or absent menses; or goiter

12. Answers include: Observe carefully for breaks in skin. Encourage resident to follow exercise plan. Report complaints of pain, numbness, or tingling in the arms or legs. Perform foot care carefully. Encourage proper footwear. Carefully follow diet instructions. People with diabetes can work with a registered dietitian (RD) or a certified diabetes educator (CDE). Keep track of residents' tests. Report if resident does not follow care plan. Perform blood glucose tests only as directed and if trained. Report signs of skin breakdown, visual changes, changes in mobility, nervousness or anxiety, dizziness or loss of coordination, numbness or tingling in arms and legs, irritability or confusion, changes in appetite, increased thirst, fruity or sweet-smelling breath, weight change, nausea or vomiting, change in urinary output, or signs of UTI, or fruity- or sweet-smelling urine.

13. Answers include: Inspect and clean resident's feet each day during bathing. Avoid harsh soaps and hot water. Always dry feet carefully. Never cut toenails, corns, or calluses. Do not use objects to remove dirt from toenails. Use doctor-recommended cream or lotion on feet, but not between the toes. Check shoes for rocks or other objects. Remind resident not to go barefoot.

14. Report the following: excessive dryness of the skin; breaks or tears in skin; ingrown nails; reddened areas on feet; drainage or bleeding; change in color of skin or nails; change in temperature of the skin; corns; blisters; calluses; warts; blood or drainage on the feet or toes; painful, tender, soft, or fragile areas on feet; or burning in the feet.