21
The Musculoskeletal System

1. Define important words in this chapter
2. Explain the structure and function of the musculoskeletal system
3. Discuss changes in the musculoskeletal system due to aging
4. Discuss common disorders of the musculoskeletal system
5. Describe elastic bandages

Supplemental Tools
- TRANSPARENCY 21-1 THE MUSCULOSKELETAL SYSTEM
- CHAPTER 21: EXAM

Assignments
- TEXTBOOK READING, pp. 367-382
- WORKBOOK EXERCISES, pp. 111-114

Overview of Teaching Strategies
This chapter focuses on the musculoskeletal system. Types and functions of muscles, bones, and joints are explained. Normal changes of aging are described so that students will be well-prepared to recognize abnormal changes that may signal a problem. Specific disorders of the musculoskeletal system are addressed. Emphasis is placed on maintaining resident independence and mobility. The physical and psychological effects of falls are discussed, as well as how to prevent them.

1. Define important words in this chapter

Meeting the Learning Objective
- TEXTBOOK PP. 367-368
- WORKBOOK P. 111

Lecture
Pronounce and define each of the key terms listed in the Learning Objective on pages 367-368.

2. Explain the structure and function of the musculoskeletal system

Meeting the Learning Objective
- TEXTBOOK PP. 368-370
- WORKBOOK PP. 111-112

Lecture
Pronounce and define the following key terms:
- Muscles
- Bones
- Joints
- Cartilage
- Bursae
- Tendons
- Ligaments

Display Transparency
21-1 THE MUSCULOSKELETAL SYSTEM
Discuss the three types of muscles:
- Skeletal muscles
- Smooth muscles
- Cardiac muscle

Discuss the four types of bones:
- Long bones
- Short bones
- Flat bones
- Irregular bones

Discuss the three types of joints:
- Immovable joints
- Slightly movable joints
- Movable joints

Review the functions of the musculoskeletal system:
- Gives shape and form to the body
- Maintains posture
- Permits movement
- Protects internal organs
3. Discuss changes in the musculoskeletal system due to aging

Meeting the Learning Objective

Textbook p. 370
Workbook p. 112

Lecture

Review normal changes of aging:
• Muscles weaken and lose tone.
• Bones lose calcium, causing them to become porous and brittle.
• Height is gradually lost due to shrinkage of space between the vertebrae in the spine.
• Loss of muscle mass in the body causes weight loss.
• Joints are less flexible and stiffer, which slows normal body movements and decreases range of motion.

4. Discuss common disorders of the musculoskeletal system

Meeting the Learning Objective

Textbook pp. 370-380
Workbook pp. 112-114

Lecture

Pronounce and define the following key term:
• Muscular dystrophy

Review the following points about muscular dystrophy:
• Hereditary, progressive disease in which muscle tissue is destroyed and muscles atrophy
• Symptoms: muscle weakness, stiffness, twitching of the hands and arms
• Cause: specific gene in the body
• Generally appears at birth or during childhood
• There is currently no cure.

Review care guidelines for muscular dystrophy:
• Allow time for movement.

Pronounce and define the following key terms:
• Arthritis
• Osteoarthritis
• Rheumatoid arthritis

Review the following points about arthritis:
• General term for inflammation of joints that cause pain, stiffness and swelling
• May cause decreased mobility

Review the following points about osteoarthritis:
• Condition in which cartilage between bones and the pads at the ends of bones begins to erode.
• Symptoms: pain, redness, swelling, stiffness, limited motion
• Generally occurs due to aging and may be due to joint injury
• Cold, damp weather can increase pain and stiffness.

Review the following points about rheumatoid arthritis:

Pronounce and define the following key term:
• Osteoporosis

Review the following points about osteoporosis:
• Bones lose mass, causing them to become brittle.
• Causes: lack of calcium in diet, loss of estrogen, lack of regular exercise, reduced mobility, age
• More common in women, especially after menopause
• Symptoms: low back pain, loss of height, fractures, stooped posture
• Treatment: medication, exercise, calcium supplements
• Be patient and reposition residents carefully.
• Report any decline in activity or movement.
Form of arthritis that may become crippling
Symptoms: stiffness, swelling, severe pain, deformities which may be severe and disabling, fever, fatigue, weight loss
Cause: autoimmune illness
Treatment: rest, controlled exercise, ROM exercises, medication, weight loss, heat applications, joint replacement

Review the care guidelines for arthritis:
- Assist with exercise program.
- Perform ROM exercises as directed.
- Let nurse know, before exercise, if pain medication is needed.
- Assist with ADLs as needed.
- Encourage use of handrails and safety bars in bathroom.
- Be positive and supportive; listen if resident wants to talk.
- Report stiffness, swelling, pain, reduced ability to perform ROM exercises, or decline in activity.

Pronounce and define the following key term:
- Bursitis

Review the following points about bursitis:
- Condition in which bursae become inflamed
- Symptoms: tissue around joint may become painful, swollen, and tender
- Treatment: application of ice, immobilization to rest joint, medication, removal of fluid from joint, and cortisone injections

Pronounce and define the following key terms:
- Amputation
- Prosthesis
- Phantom sensation
- Phantom limb pain
- Flexion

Review the following points about amputations:
- Surgical removal of an extremity
- Causes: disease, cancer, injury, accidents
- Person may have prosthesis or transplant.

Emphasize to students that phantom sensation, phantom limb pain, and stump pain are real and should not be ignored or ridiculed.

Review guidelines for amputation and prosthesis care:
- Be supportive during process of adjustment.
- Follow orders for bed elevation or positioning.
- Follow orders for positioning of the leg.
- Assist with ADLs.
- Encourage activity.
- Perform range of motion exercises as directed.
- Physical therapists will assist resident in learning to bear weight on prosthesis.
- Be careful when handling prostheses.
- Follow instructions to apply or remove prostheses.
- Apply special compression bandages and/or stump shrinkers as ordered.
- Change socks often and place seams on the sock to the outside to prevent abrasions.
- Give regular, careful skin care to avoid complications with the stump and the prosthesis.
- Bathe and rinse the stump.
- Clean and dry the socket of the prosthesis when it is removed.
- Before applying a prosthesis, make sure the area is completely dry.
- Provide support for phantom pain, phantom sensation, or stump pain. The pain or sensation is real and should be treated that way.
- Do not react negatively to the stump or the prosthesis during care.
- Report redness or swelling; drainage, bleeding or sores; stump pain, phantom pain, or phantom sensation; reduced ability to move extremity, cyanosis; or problems with the prosthesis.

Pronounce and define the following key terms:
- Fracture
- Sling

Review the following points about fractures:
- A fracture is a broken bone.
- Causes: trauma or accidents; falling is a common cause
- Symptoms: pain, swelling, bruising
- Generally diagnosed with x-ray
- Treatment: bone must be set and allowed to heal in normal alignment
• Can take four to eight weeks to heal; longer in elderly people

Review the types of fractures:
• Closed or simple fracture
• Hairline fracture
• Open or compound fracture
• Greenstick fracture
• Comminuted fracture
• Compression fracture

Review guidelines for cast care:
• Allow time for movement.
• Follow orders on moving and repositioning.
• Help with ROM exercises as ordered.
• Extremity may need to be elevated.
• Pad cast edges, as needed.
• Assist with use of cane, walker, or crutches.
• Do not get cast wet.
• Use bed cradles to reduce pressure from bed linens.
• Keep cast clean.
• Report numbness, tingling, or increased swelling; cyanosis or pale skin; redness, drainage, bleeding or sores; changes in temperature of skin; complaints that cast is too tight; pain, burning, or pressure; wetness in or around cast; odor, or resident placing sharp objects inside cast.

Pronounce and define the following key terms:
• Total hip replacement (THR)
• Partial weight-bearing (PWB)
• Non-weight-bearing (NWB)
• Full weight-bearing (FWB)
• Abduction
• Adduction

Review guidelines for total hip replacement (THR):
• Keep often-used items in easy reach.
• Follow care plan exactly.
• Follow orders regarding positioning and elevation of head of bed.
• Assist with dressing, starting with weaker side.
• Use adaptive devices.
• Ask resident to use handrails in shower.
• Encourage fluids.

• Assist with coughing and deep breathing exercises.
• Apply anti-embolic stockings as ordered.
• Never rush resident.
• Never perform ROM exercises on side of hip replacement without orders from nurse.
• Caution resident not to cross legs.
• Ask nurse for pain medication prior to moving and positioning.
• Report incisions that are red, draining, bleeding or warm; numbness or tingling; cyanosis or pale skin; increase in pain; burning sensation; edema of the legs; fever or other change in vital signs; constipation; problems with appetite; or resident not following doctor’s orders.

Pronounce and define the following key term:
• Total knee replacement (TKR)

Review care guidelines for total knee replacement:
• Apply special stockings to prevent blood clots.
• Do not perform special exercises unless trained and ordered.
• Assist with coughing and deep breathing exercises, as ordered.
• Encourage fluids.
• Ask nurse for pain medication prior to moving and positioning.
• Report incisions that are red, draining, bleeding or warm; numbness or tingling; cyanosis or pale skin; increase in pain; burning sensation; reduced mobility in the extremity; fever or other change in vital signs; constipation; problems with appetite; or resident not following doctor’s orders.

Review the following points about continuous passive motion (CPM) machines:
• May be used for people who have had TKR
• Moves joint through normal range of motion
• Notify nurse if the resident complains of pain or discomfort or if the extremity moves out of the proper position.

Review the following points about traction:
• Method of treating fractures that keeps bones in place
• Uses weights and pulleys to keep bones in proper position
Do not disconnect traction assembly or adjust the weights.

Keep resident in proper body alignment.

Report numbness or tingling, cyanosis or pale skin, wetness on sling, odor around sling or boot, sling or boot becomes loose or comes off, pain, burning, pressure, swelling, changes in skin temperature, redness, drainage, bleeding, sores, or resident moving to the side or sliding down.

5. Describe elastic bandages

Meeting the Learning Objective

Textbook pp. 380-381
Workbook p. 114

Lecture

Review the following points about elastic bandages:

- Bandages that are wrapped around a body part
- Used to keep dressings in place, hold splints in place, and provide protection, compression and support for body parts, decrease swelling from injuries and hold ice in place
- Must be snug enough to provide proper compression and support but not interfere with circulation
- Report pale, gray, cyanotic, or white skin; skin that is cold to the touch; swelling; complaints of bandage feeling too tight; pain or discomfort; numbness or tingling.

Demonstration

Demonstrate the procedure: Applying elastic bandages. 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 21: Exam
(Appendix C, pp. 330-331)

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

Answers to Chapter Review in Textbook

1. Skeletal muscles, smooth muscles, and cardiac muscle
2. Bones lend support to body structures, allow the body to move, and protect the organs.
3. Joints hold bones together and provide movement and flexibility.
4. Answers include: Muscles weaken and lose tone. Bones lose calcium, causing them to become porous and brittle. Height is gradually lost due to space between the vertebrae in the spine shrinking. Loss of muscle mass in the body causes weight loss. Joints are less flexible and stiffer, which slows normal body movements and decreases range of motion.
5. It wastes away, decreases in size, and weakens.
6. Muscle weakness, stiffness, and twitching of the hands and arms
7. Answers include: lack of calcium in the diet, loss of estrogen, lack of regular exercise, reduced mobility, and age
8. Bones can break with a simple movement.
9. Pain, stiffness and swelling
10. Answers include: rest, controlled exercise, ROM exercises, anti-inflammatory medications, other medications, weight loss, heat application, and joint replacement
11. With phantom sensation, the person may feel discomfort such as itching or a tingling sensation in the area where the limb existed. Phantom limb pain occurs when the person feels pain in a limb or extremity that has been amputated. Both are real.
12. Answers include: Be supportive during process of adjustment. Follow orders for bed elevation or positioning. Follow orders for positioning of the leg. Assist with ADLs. Encourage activity. Perform range of motion exercises as directed. Physical therapists will assist resident in learning to bear weight on prosthesis. Be careful when handling prostheses. Follow instructions to apply or remove prostheses. Apply special compression bandages and/or stump shrinkers as ordered. Change
socks often and place seams on the sock to the outside to prevent abrasions. Give regular, careful skin care to avoid complications with the stump and the prosthesis. Bathe and rinse the stump. Clean and dry the socket of the prosthesis when it is removed. Before applying a prosthesis, make sure the area is completely dry. Provide support for phantom pain, phantom sensation, or stump pain. Do not react negatively to the stump or the prosthesis during care. Report redness or swelling; drainage, bleeding or sores; stump pain, phantom pain, or phantom sensation; reduced ability to move extremity; cyanosis; or problems with the prosthesis.

13. A fracture is a broken bone.

14. In addition to causing fractures, falls can contribute to other problems related to physical injuries, such as immobility, dehydration, and pressure ulcers. Falls can have psychological consequences as well, such as triggering fear, anxiety, and depression.

15. They can pierce the skin and increase the chance of infection in the area under the cast.

16. THR may be performed due to a fractured hip that does not heal properly, a weakened hip due to age and decreased bone strength, or a hip that is painful and stiff and no longer able to bear weight.

17. Partial weight-bearing means the resident is able to support some body weight on one or both legs. Non-weight-bearing means the resident is unable to support any body weight on one or both legs.

18. Answers include: Keep often-used items within easy reach. Follow care plan exactly. Follow orders regarding positioning and elevation of head of bed. Assist with dressing starting with weaker side. Use adaptive devices. Ask resident to use handrails in shower. Encourage fluids. Assist with coughing and deep breathing exercises. Apply anti-embolic stockings as ordered. Never rush resident. Never perform ROM exercises on side of hip replacement. Caution resident not to cross legs or turn toes outward or inward. Ask nurse for pain medication prior to moving and positioning. Report incisions that are red, draining, bleeding or warm; numbness or tingling; cyanosis or pale skin; increase in pain; burning sensation; edema of the legs; fever or other change in vital signs; constipation; problems with appetite; or resident not following doctor's orders.

19. Answers include: incisions that are red, draining, bleeding or warm; numbness or tingling; cyanosis or pale skin; increase in pain; burning sensation; edema of the legs; fever or other change in vital signs; constipation; problems with appetite; or resident not following doctor's orders.

20. 90

21. TKR may be necessary due to damage from injuries or arthritis or to help stabilize a knee that buckles repeatedly.

22. To prevent complications of immobility, such as UTIs and constipation.

23. Answers include: to keep bones in place; to relieve muscle spasm.

24. Answers include: numbness or tingling; cyanosis or pale skin; wetness on sling; odor around sling or boot; sling or boot becomes loose or comes off; pain; burning; pressure; swelling; changes in skin temperature; redness; drainage; bleeding; sores; or resident moving to the side or sliding down.

25. Answers include: pale, gray, cyanotic, or white skin; skin that is cold to the touch; swelling; complaints of bandage feeling too tight; pain or discomfort; numbness or tingling.

26. Rest, ice, compression, elevation.