



20

Musculoskeletal System

LEARNING OBJECTIVES

After studying Chapter 20 in the textbook and completing this section of the workbook, students should be able to:

1. Conduct a history related to the musculoskeletal system.
2. Discuss examination techniques for the musculoskeletal system.
3. Identify normal age and condition variations of the musculoskeletal system.
4. Recognize findings that deviate from expected findings.
5. Relate symptoms or clinical findings to common pathologic conditions.

TEXTBOOK REVIEW

Chapter 20 Musculoskeletal System (pages 694–765)

CONTENT REVIEW QUESTIONS

Multiple Choice

Circle the correct answer for each of the following questions.

1. While examining range of motion (ROM) on a patient, the examiner should remember that:
 - a. reverse tailor position is encouraged in adults with limited ROM to the hip.
 - b. active ROM is used to assess extremities with complete paralysis.
 - c. full muscle strength can be maintained with up to 75% of ROM to the related joint.
 - d. passive ROM is normally 5 degrees greater than active ROM.
2. The spine of a newborn infant should be palpated with the examiner noting the shape of each spinal process. If a split is noted in one of the spinal processes, which problem is suspected?
 - a. bifid defect
 - b. lordosis
 - c. Down syndrome
 - d. spina bifida

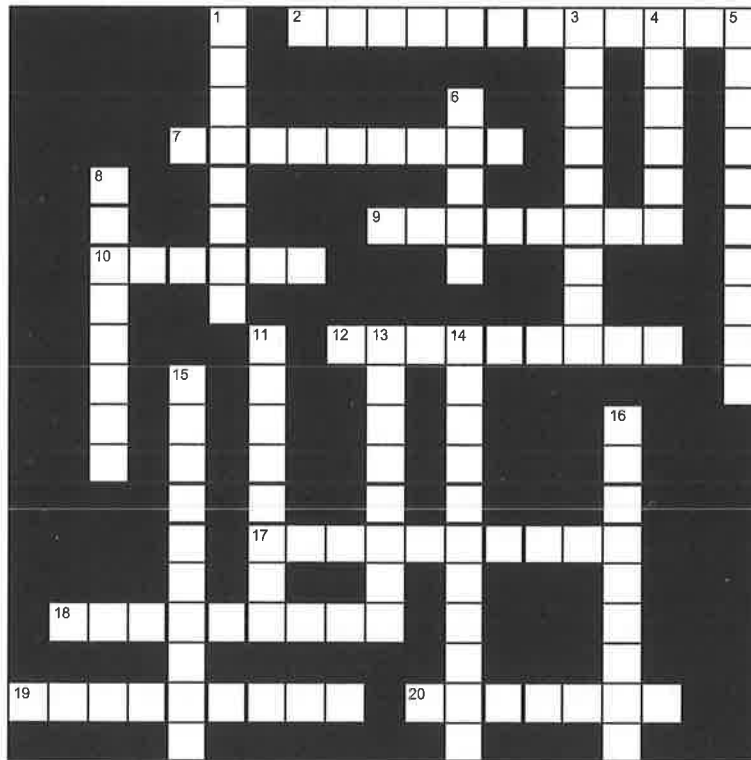
3. The examiner observes a 6-month-old infant. Which of the following observations should be considered an expected finding at this age? The infant:
 - a. walks around the room holding onto objects.
 - b. feeds self with cup and spoon.
 - c. holds a rattle or spoon.
 - d. sits without support.
4. Which of the following questions asked by the examiner would be most helpful in understanding a patient complaining of acute back pain?
 - a. "What medications do you currently take?"
 - b. "Was there any activity or injury that occurred prior to the onset of the pain?"
 - c. "Were you born with any congenital deformities of the spine?"
 - d. "Have you recently lost weight?"
5. Which spinal finding would be considered normal for a 72-year-old patient?
 - a. meningocele
 - b. myelomeningocele
 - c. kyphosis
 - d. scoliosis
6. Which of the following data from a patient's history indicates an increased risk of osteomyelitis?
 - a. severe gout
 - b. rheumatoid arthritis
 - c. severe osteoporosis
 - d. open fracture of the radius
7. What degree of knee flexion is considered a normal finding?
 - a. 15
 - b. 90
 - c. 130
 - d. 160
8. Which of the following is considered a normal finding for a woman in her eighth month of pregnancy?
 - a. stronger ligaments and spinal joints
 - b. hypercalcemia
 - c. 25% loss of muscle strength
 - d. lordosis
9. Which of the following conditions would be considered rare among black women?
 - a. rheumatoid arthritis
 - b. severe osteoporosis
 - c. contractures
 - d. lordosis
10. When assessing for carpal tunnel syndrome, Tinel's sign can be performed by tapping the:
 - a. dorsal aspect of the wrist.
 - b. volar carpal ligament.
 - c. radial artery.
 - d. median nerve.
11. Which group is susceptible to subluxation of the head of the radius?
 - a. infants/toddlers
 - b. adolescents
 - c. pregnant women
 - d. older adults

12. The extension of the patient's head against the examiner's hand is a test of:
 - a. cervical spine alignment.
 - b. passive ROM.
 - c. temporalis muscle strength.
 - d. sternocleidomastoid muscle strength.
13. A patient complains of pain and a clicking noise with jaw movement. The pain extends into the face. These symptoms are suggestive of what condition?
 - a. gout in the jaw
 - b. temporomandibular joint syndrome
 - c. rheumatoid arthritis of the jaw
 - d. bursitis of the temporomandibular joint
14. "Normal" muscle strength is documented as Grade _____.
 - a. 0
 - b. 1
 - c. 5
 - d. 10
15. While measuring the circumference of extremities of a 43-year-old patient, the examiner makes comparisons of the right and left sides. What findings should the examiner expect?
 - a. Measurements between right and left sides should be identical.
 - b. Measurement differences are nearly equal.
 - c. Measurement differences are within 2 inches.
 - d. All of the muscle groups are significantly larger on the dominant side.
16. Which of the following may be an early and subtle symptom of rheumatic fever?
 - a. joint pain occurring 10-14 days after a sore throat
 - b. swelling and inflammation of joints after exercise
 - c. muscle weakness following a fever
 - d. reduced ROM in joints occurring 2 weeks after a viral infection
17. To assess muscle strength of the temporalis and masseter muscles, the examiner will ask the patient to:
 - a. push the jaw forward while the examiner applies counterforce.
 - b. attempt to open his or her mouth while the examiner applies counterforce.
 - c. clench his or her teeth while the examiner palpates the contracted muscles.
 - d. clench his or her teeth together while the examiner attempts to open the mouth with a tongue blade.
18. For which type of problem does a family history have significance?
 - a. rheumatoid arthritis
 - b. dislocation of radius
 - c. lumbosacral radiculopathy
 - d. bursitis
19. The examiner sees two 9-month-old babies on the same day. Jeremy is a black 9 1/2-month-old who pulls himself to a standing position and holds onto a chair while standing. Nathan is a white 9 1/2-month-old who sits alone on the floor using hands for support; his mother states he is not yet scooting or creeping on the floor. What conclusion is appropriate for the examiner to make?
 - a. Jeremy is advanced for his age.
 - b. Nathan may have a developmental delay.
 - c. Jeremy has superior intelligence to Nathan.
 - d. Both findings are "normal," considering that Jeremy is black and Nathan is white.

20. Which statement made by a patient helps the examiner differentiate osteoarthritis from rheumatoid arthritis? "I:
- have swelling and pain in my joints."
 - notice a crackling sound when I move my joints."
 - get extremely tired by mid-morning, even when I sleep well."
 - used to play the piano when I was younger."

Terminology Review

Crossword Puzzle



Across

- Lateral deviation of the great toe with overlapping of the second toe
- Movement of the extremities toward the body
- Crackling sound is heard in the patient's joint with movement
- Single crease extending across the entire palm, associated with Down Syndrome
- "Flat foot"
- Position of the forearm when the palm faces upward
- Movement of the sole of the foot inward at the ankle
- Flexion deformity at the distal interphalangeal joint of the foot
- Hyperextension of the metatarsophalangeal joint with flexion of the toe's proximal and distal joints

Down

- Concave curvature of the lumbar spine
- Movement of the extremities away from the body
- Sharp angular deformity associated with a collapsed vertebra from osteoporosis
- Congenital fusion of digits
- Sign in children indicating generalized muscle weakness
- High arch on the sole of the foot
- Outward curvature of the thoracic spine
- Movement of the sole of the foot outward at the ankle
- Presence of more than five digits on hand or foot
- Calibrated device designed to measure the arc or range of motion of a joint
- Rotation of the arm so that the palm faces down

Matching

Match each examination technique to the problem or condition it is used to detect. Some answers may be used more than once.

Examination Technique	Possible Problem/Condition
21. _____ Allis' sign	a. Anterior cruciate ligament injury
22. _____ Apley test	b. Effusion of fluid in the knee
23. _____ Ballottement	c. Flexion contractures in the hip
24. _____ Barlow-Ortolani maneuver	d. L1, L2, L3, L4 nerve root irritation
25. _____ Bulge sign	e. Torn meniscus in knee
26. _____ Drawer test	f. Anteroposterior instability in knee
27. _____ Femoral stretch test	g. Mediolateral instability of knee
28. _____ Lachman test	h. Hip dislocation
29. _____ McMurray test	
30. _____ Thomas test	
31. _____ Vargus/valgus stress test	

CONCEPTS APPLICATION

Activity 1

Based on the symptoms and/or examination findings provided, list the corresponding problem to consider.

<i>Symptoms/Examination Findings</i>	<i>Problem to Consider</i>
Heberden's nodes and Bouchard's nodes noted on hands	
Low back pain that radiates to the buttocks and posterior thigh, with tenderness over the spine	
Heat, redness, swelling, and tenderness to the metatarsophalangeal joint of the great toe	
Subcutaneous nodules on the forearm near the elbow	
Tenderness, swelling, and boggy sensation with palpation along the grooves of the olecranon process; increased pain with pronation and supination	

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<i>Symptoms/Examination Findings</i>	<i>Problem to Consider</i>
A child with muscle atrophy and symptoms of progressive muscle weakness	
A child complaining of pain in the elbow and wrist; will not move his or her arm; maintains arm in a flexed and pronated position	

Activity 2

For each developmental task described in the following table, identify the expected age and indicate whether each is a fine motor task or a gross motor task.

<i>Developmental Task</i>	<i>Expected Age</i>	<i>Gross/Fine Motor</i>
Holds crayon; scribbles spontaneously		
Sits with shaky posture; uses tripod position; raises abdomen off table when prone.		
When supine, puts hands together; holds hands in front of face		
Builds a four-block tower; dumps a raisin from a bottle		
Walks alone well; sits self in chair		
Rolls from prone to side position; slight head lag when pulled to sitting position		
Hops on one foot; catches bounced ball; walks heel-to-toe		
Reaches and picks up an object; plays with toes		
Points with one finger		
Begins creeping; stands, holding on, when placed in position		

CASE STUDY

Mrs. Simmons is a 46-year-old female with rheumatoid arthritis (RA). Listed below are data collected by the examiner during an interview and examination.

Interview Data

According to the medical record, Mrs. Simmons was diagnosed with RA at the age of 30. Mrs. Simmons complains of a great deal of pain in her joints, particularly in her hands, and says she has just learned to live with the pain because it will always be there. She states that the stiffness and pain in her joints is always worst in the morning, or if she sits around too much. She denies muscle weakness other than the fact that her stiffness and soreness prevent her from doing much. Mrs. Simmons states that the RA is progressing to the point where she is having difficulty doing things requiring fine motor dexterity such as changing clothes, holding utensils to eat, and cutting up her food. She says she can still get cleaned up but had to have different faucet handles placed in her home so that she could turn the water on and off. Mrs. Simmons says she rarely goes out because she feels ugly.

Examination Data

Patient is able to stand, but standing up straight and erect is not possible. Gait is slow and purposeful, with jerky movements. Significant inflammation, swelling, and tenderness is noted with inspection and palpation at hip, knee, wrists, hands, and feet bilaterally. Subcutaneous nodules are noted at ulnar surface of elbows bilaterally.

1. What data deviate from normal findings, suggesting a need for further investigation?
2. What additional questions could the examiner ask to clarify symptoms?
3. What additional physical examination, if any, should the examiner complete?
4. What primary problems does the patient have?

