



Western Technical College

10524157 PTA Applied Kinesiology 2

Course Outcome Summary

Course Information

Description	Applies basic principles from PTA Kinesiology 1 to the axial skeleton and upper quadrant including location and identification of muscles, joints and other landmarks. Assess range of motion and strength of the axial skeleton and upper quadrant. Integrate analysis of posture and gait.
Career Cluster	Health Science
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	72

Pre/Corequisites

Prerequisite 10524156 PTA Applied Kinesiology 1

Textbooks

Fundamentals of Tests and Measures for the Physical Therapist Assistant. Copyright 2020. Fruth, Stacie J. and Carol Fawcett. Publisher: Jones & Bartlett. **ISBN-13**: 978-1-284-14713-1. Required.

Clinical Kinesiology and Anatomy – with Access. 7th Edition. Copyright 2023. Lippert, Lynn S. Publisher: F.A. Davis Co. **ISBN-13**: 978-1-71964-452-5. Required.

Clinical Kinesiology and Anatomy - Laboratory Manual. 5th Edition. Copyright 2023. Lippert, Lynn S. Publisher: F.A. Davis Co. **ISBN-13**: 978-1-71964-453-2. Required.

Kinesiology Flash Cards. 5th Edition. Copyright 2023. Lippert, Lynn S. Publisher: F.A. Davis Co. **ISBN-13**: 978-1-71964-454-9. Optional.

Learner Supplies

12" Goniometer - \$10.00. **Vendor:** To be discussed in class. Required.

Success Abilities

1. Refine Professionalism: Improve Critical Thinking
2. Refine Professionalism: Participate Collaboratively

Program Outcomes

1. Function under the supervision of a physical therapist in a safe, legal, professional, and ethical manner to ensure the safety of patients, self, and others throughout the clinical interaction
2. Demonstrate clear and collaborative communication with patients, families, and health care team
3. Produce documentation to support the delivery of physical therapy services
4. Demonstrate critical thinking skills to implement and modify treatment within a plan of care under the direction and supervision of a physical therapist
5. Perform data collection essential for carrying out the plan of care under the direction and supervision of the physical therapist
6. Integrate components of operational and fiscal practices of physical therapy service in a variety of settings

Course Competencies

1. Describe the anatomy and kinematics of the shoulder complex.

Assessment Strategies

- 1.1. by locating on diagrams or models
- 1.2. by analysis (format may be oral, written, or graphic)
- 1.3. by answering questions on one or more exams

Criteria

You will know you are successful when

- 1.1. you identify the components of the shoulder complex.
- 1.2. you apply the basic principles of kinesiology to the shoulder complex.
- 1.3. you identify origin, insertion, action and innervation of the muscles of the shoulder complex.
- 1.4. you describe movement of the shoulder complex.
- 1.5. you palpate anatomical structures of the shoulder complex.

Learning Objectives

- 1.a. Describe the structures of the shoulder complex and glenohumeral joint.
- 1.b. Identify the ligaments of the shoulder complex and glenohumeral joint.
- 1.c. Explain the function of the ligaments, cartilage and capsule of the shoulder joint.
- 1.d. Identify the origin, insertion, action and innervation of the muscles affecting the shoulder complex and glenohumeral joint.
- 1.e. Identify the muscles involved in upward and downward rotation of the scapula.
- 1.f. Demonstrate flexion, extension, abduction, adduction, internal rotation, external rotation, horizontal abduction and horizontal adduction of the shoulder.
- 1.g. Demonstrate scapular protraction, retraction, depression, elevation, upward rotation, downward rotation.
- 1.h. List the humeral movements with the associated component scapular movement correctly.
- 1.i. Palpate the major bony and soft tissue landmarks of the shoulder complex.

- 1.j. Describe the forces in the shoulder complex and how they relate to principles of kinesiology.
- 1.k. Identify the degrees of range of motion for each plane of motion in the shoulder.
- 1.l. Describe common pathologies of the shoulder complex including etiology.

2. Describe the anatomy and kinematics of the elbow.

Assessment Strategies

- 2.1. by analysis (format may be oral, written, or graphic)
- 2.2. by locating on diagrams or models
- 2.3. by answering questions on one or more exams

Criteria

You will know you are successful when

- 2.1. you identify the components of the elbow.
- 2.2. you apply the basic principles of kinesiology to the elbow.
- 2.3. you identify origin, insertion, action and innervation of the muscles of the elbow.
- 2.4. you describe movement of the elbow.
- 2.5. you palpate anatomical structures of the elbow.

Learning Objectives

- 2.a. Examine the structures of the elbow joint.
- 2.b. Identify the major ligaments of the elbow.
- 2.c. Palpate the bony and soft tissue landmarks of the elbow.
- 2.d. Know the function of the ligaments, cartilage and joint capsule of the elbow.
- 2.e. Identify the origin, insertion, action and innervation of the muscles affecting the elbow.
- 2.f. Identify the prime movers for each motion at the elbow.
- 2.g. Demonstrate flexion, extension, supination and pronation at the elbow and forearm.
- 2.h. Identify the degrees of range of motion for each plane of motion in the elbow.
- 2.i. Describe carrying angle in males and females.
- 2.j. Explore common pathologies in the elbow including etiology.

3. Describe the anatomy and kinematics of the wrist/hand.

Assessment Strategies

- 3.1. by analysis (format may be oral, written, or graphic)
- 3.2. by locating on diagrams or models
- 3.3. by answering questions on one or more exams

Criteria

You will know you are successful when

- 3.1. you identify the components of the wrist and hand.
- 3.2. you apply the basic principles of kinesiology to the wrist and hand.
- 3.3. you identify origin, insertion, action and innervation of the muscles of the wrist and hand.
- 3.4. you describe movement of the wrist and hand.
- 3.5. you palpate anatomical structures of the wrist and hand.

Learning Objectives

- 3.a. Describe the structures of the wrist and hand.
- 3.b. Describe the ligaments of the wrist/hand, including function of each.
- 3.c. Identify the origin, insertion, action and innervation of the extrinsic muscles of the wrist and hand.
- 3.d. Identify the intrinsic muscles of the hand by name and function.
- 3.e. Identify the prime movers for each motion of the wrist and hand.
- 3.f. Demonstrate flexion, extension, radial deviation, ulnar deviation of the wrist.
- 3.g. Demonstrate flexion, extension, abduction and adduction of the digits including the thumb.
- 3.h. Identify the degrees of range of motion for each plane of motion in the wrist and hand.
- 3.i. Palpate the major bony and soft tissue landmarks in the wrist and hand.
- 3.j. Identify the structures of the carpal tunnel.
- 3.k. Describe the common pathologies associated with the wrist and hand including etiology.

4. Describe the anatomy and kinematics the axial skeleton.

Assessment Strategies

- 4.1. by analysis (format may be oral, written, or graphic)

- 4.2. by locating on diagrams or models
- 4.3. by answering questions on one or more exams

Criteria

You will know you are successful when

- 4.1. you identify the components of the axial skeleton.
- 4.2. you apply the basic principles of kinesiology to the axial skeleton.
- 4.3. you identify origin, insertion, action of the muscles of the axial skeleton.
- 4.4. you describe movements of the axial skeleton.
- 4.5. you palpate anatomical structures of the axial skeleton.

Learning Objectives

- 4.a. Describe the normal vertebral curves.
- 4.b. Demonstrate flexion, extension, lateral flexion and rotation of the spine.
- 4.c. Identify the bony landmarks of the axial skeleton.
- 4.d. Label the ligaments of the axial skeleton.
- 4.e. Identify the origin, insertion, innervation and action of the muscles of the axial skeleton.
- 4.f. Identify the prime movers for all motions of the axial skeleton.
- 4.g. Palpate major bony and soft tissue landmarks of the axial skeleton.
- 4.h. Describe forces in the axial skeleton including how they relate to principles of kinesiology.
- 4.i. Identify the degrees of motion for each plane of motion of the axial skeleton.
- 4.j. Describe common vertebral column pathologies including etiology.

5. Describe features of normal gait.

Assessment Strategies

- 5.1. by analysis (format may be oral, written, or graphic)
- 5.2. by answering questions on one or more exams

Criteria

You will know you are successful when

- 5.1. you describe normal muscle firing in each stage of gait.
- 5.2. you identify common abnormal gait deviations.
- 5.3. you describe the stages and phases of normal gait.
- 5.4. you describe normal range-of-motion required for normal gait.
- 5.5. you describe abnormal gait patterns associated with weakness and restricted range of motion.

Learning Objectives

- 5.a. Describe trunk and Upper quadrant action in each phase of gait.
- 5.b. Identify range of motion of all extremities and trunk with each phase of gait.
- 5.c. Describe type of muscle contraction in all extremities and the trunk in each phase of gait and in transitional phases.
- 5.d. Describe deviations to normal gait with trunk, lower or upper quadrant weakness.

6. Analyze features of normal posture.

Assessment Strategies

- 6.1. by performing an analysis (written, graphic, or 3D model)
- 6.2. by answering questions on one or more exams
- 6.3. in a skill demonstration

Criteria

You will know you are successful when

- 6.1. you identify features of normal postural alignment.
- 6.2. you describe common abnormal postural deviations.
- 6.3. you identify the effects of posture on the musculoskeletal system.
- 6.4. you differentiate normal and abnormal posture.
- 6.5. you perform and record anthropomorphic measurements.

Learning Objectives

- 6.a. Describe normal vertebral alignment.
- 6.b. Describe development of postural curves.

- 6.c. Assess posture of a patient from anterior, posterior and lateral view.
- 6.d. Assess sitting posture in a patient from anterior, posterior and lateral view.
- 6.e. Describe forces in spine with different postures including how this relates to pathology.
- 6.f. Describe common postural deviations.

7. Conduct gait assessment.

Assessment Strategies

- 7.1. in a skill demonstration
- 7.2. by answering questions on one or more exams
- 7.3. by performing an analysis (written, graphic, or 3D model)

Criteria

You will know you are successful when

- 7.1. you analyze the motion of the hip, knee, and ankle during stance phase of gait.
- 7.2. you analyze the motion of the hip, knee, and ankle during the swing phase of gait.
- 7.3. you differentiate between abnormal and normal movement of each phase of gait.

Learning Objectives

- 7.a. Analyze stance phase of gait in a patient.
- 7.b. Analyze swing phase of gait in a patient.
- 7.c. Describe deviation observed in gait and when it occurs.
- 7.d. Identify all possible reasons for observed deviation.
- 7.e. Identify data collection methods to confirm or refute possible reasons for deviations.
- 7.f. Describe age related changes to gait pattern.
- 7.g. Describe atypical gait patterns due to weakness including gluteus maximus gait, gluteus medius gait, equinus gait, foot slap, steppage gait, waddling gait, quadricep weakness gait pattern and hamstring weakness gait pattern.
- 7.h. Describe atypical gait patterns due to loss of range of motion including gait with hip flexor contracture, knee flexor contracture, vaulting gait, circumducted gait, abducted gait.
- 7.i. Describe atypical gait patterns due to neurological involvement including hemiplegic gait, ataxic gait, parkinsonian gait, festinating gait, scissors gait and crouch gait.
- 7.j. Demonstrate how to measure leg length on a patient correctly.
- 7.k. Describe gait deviations due to leg length discrepancy.

8. Analyze normal movement in the upper quadrant.

Assessment Strategies

- 8.1. by developing an analysis (written, graphic, or 3D model)
- 8.2. by answering questions on one or more exams

Criteria

You will know you are successful when

- 8.1. you identify movement at each joint.
- 8.2. you analyze movement at each joint and how it affects other joints in the kinetic chain.

Learning Objectives

- 8.a. Identify normal functional patterns for reaching, writing, eating, gripping.
- 8.b. Identify types of grasp including power grip, precision grip, cylindrical grip, spherical grip, hook grip, pad to pad grip, pinch grip, three jaw chuck, tip to tip grip and pincer grip.
- 8.c. Describe the range of motion at the trunk, shoulders, elbows, wrists and hands with a functional upper quadrant activity.
- 8.d. Describe the type of muscle contraction at the trunk, shoulders, elbows, wrists and hands with a functional activity.
- 8.e. Analyze a functional activity in a patient including identification of compensatory strategies.

9. Assess joint range of motion for the axial skeleton.

Assessment Strategies

- 9.1. in a skill demonstration
- 9.2. by answering questions on one or more written exams

Criteria

You will know you are successful when

- 9.1. you position yourself and subject.
- 9.2. you align and read goniometer correctly.
- 9.3. you document data.
- 9.4. you instruct subject in correct motion.
- 9.5. you differentiate between normal and restricted range of motion.
- 9.6. you verbalize an explanation of the process.

Learning Objectives

- 9.a. Demonstrate correct positioning of the patient and the therapist prior to performing axial range of motion.
- 9.b. Instruct patient in completing correct range of motion for the axial skeleton.
- 9.c. Demonstrate correct alignment of the goniometer or tape measure for measuring range of motion of the axial skeleton.
- 9.d. Demonstrate accurate reading of the goniometer or tape measure when measuring range of motion of the axial skeleton.
- 9.e. Analyze the results of the range of motion correctly.
- 9.f. Explain the process and results of the testing correctly to the patient.
- 9.g. Demonstrate correct documentation of the range of motion testing results.

10. Assess joint range of motion for the upper quadrant.

Assessment Strategies

- 10.1. in a skill demonstration
- 10.2. by answering questions on one or more exams

Criteria

You will know you are successful when

- 10.1. you position yourself and subject.
- 10.2. you document data.
- 10.3. you align and read goniometer correctly.
- 10.4. you instruct subject in correct motion.
- 10.5. you differentiate between normal and restricted range of motion.
- 10.6. you verbalize an explanation of the process.

Learning Objectives

- 10.a. Demonstrate correct positioning of the patient and the therapist prior to performing upper quadrant range of motion.
- 10.b. Instruct patient in completing correct range of motion for the shoulder, elbow, wrist or hand.
- 10.c. Demonstrate correct alignment of the goniometer for measuring range of motion of the shoulder, elbow, wrist or hand.
- 10.d. Demonstrate accurate reading of the goniometer when measuring range of motion of the shoulder, elbow, wrist or hand.
- 10.e. Analyze the results of the range of motion correctly.
- 10.f. Explain the process and results of the testing correctly to the patient.
- 10.g. Demonstrate correct documentation of the range of motion testing results.

11. Assess muscle length for the upper quadrant and axial skeleton.

Assessment Strategies

- 11.1. through analysis (format may be oral, written, or graphic)
- 11.2. in a skill demonstration
- 11.3. by answering questions on one or more written exams

Criteria

You will know you are successful when

- 11.1. you differentiate between muscular and joint restriction.
- 11.2. you document data.
- 11.3. you assess passive range of motion.
- 11.4. you recognize abnormal and normal muscle length.
- 11.5. you position yourself and subject.

- 11.6. you demonstrate special tests.
- 11.7. you verbalize an explanation of the process.

Learning Objectives

- 11.a. Demonstrate correct positioning of the patient and the therapist prior to performing special flexibility testing of the upper quadrant or axial skeleton.
- 11.b. Instruct patient in correct range of motion of the upper quadrant or axial skeleton.
- 11.c. Demonstrate correct positioning of the patient and therapist prior to performing passive range of motion.
- 11.d. Describe end feel when there is a restriction in joint range of motion.
- 11.e. Demonstrate correct documentation of muscle length for upper quadrant and axial skeleton.
- 11.f. Explain clearly the process and results of special flexibility testing in the upper quadrant and axial skeleton.

12. Assess muscle strength for the upper quadrant and axial skeleton.

Assessment Strategies

- 12.1. in a skill demonstration
- 12.2. by answering questions on one or more written exams

Criteria

You will know you are successful when

- 12.1. you position and observe subject.
- 12.2. you identify presence or absence of muscle mass.
- 12.3. you apply correct manual resistance.
- 12.4. you perform all critical steps in the right order.
- 12.5. you identify the correct muscle grade.
- 12.6. you verbalize an explanation of the process.
- 12.7. you position yourself applying correct body mechanics.
- 12.8. you document data.

Learning Objectives

- 12.a. Demonstrate correct positioning of the patient and the therapist prior to performing strength testing of the upper quadrant or axial skeleton.
- 12.b. Instruct patient in correct range of motion of the upper quadrant or axial skeleton.
- 12.c. Describe correctly to patient the procedure for manual muscle testing of the axial skeleton, shoulders, elbows, wrists and hands.
- 12.d. Demonstrate application of appropriate amount of resistance to assess muscle strength in axial skeleton, shoulders, elbows, wrists and hands.
- 12.e. Demonstrate the steps of manual muscle testing in the correct order.
- 12.f. Demonstrate the correct positioning of a patient with grade 2 or less muscle strength for each muscle at the shoulders, elbows, wrists or hands.
- 12.g. List muscle grades and their definitions.
- 12.h. Identify the correct muscle grade on a patient example.
- 12.i. Correlate the prime movers for each direction of motion in the axial skeleton, shoulders, elbows, wrists and hands to manual muscle testing techniques.

13. Analyze functional movement.

Assessment Strategies

- 13.1. performing an analysis of a functional movement (written, oral or 3D model)
- 13.2. by answering questions on one or more exams

Criteria

You will know you are successful when

- 13.1. you analyze motion of all joints involved in the movement including upper and lower quadrant.
- 13.2. you analyze muscle activity involved with the movement.

Learning Objectives

- 13.a. Analyze range of motion of axial skeleton and appendicular skeleton during a functional activity such as transferring, kicking a ball, throwing a ball, etc..
- 13.b. Analyze types of muscle contraction in axial skeleton and appendicular skeleton during a functional activity such as transferring, kicking a ball, throwing a ball, etc..

- 13.c. Describe the forces involved in the functional activity including information on COG, BOS, inertia, momentum and leverage.