PowerTrack II™ Commander™
MMT Flip Chart

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Contents

TEST 1

Neck Extension

For sequential testing begin with Commander Console set to TEST 1, REP 1, RIGHT. This is not a bilateral test, so after completing repetitions for the right, use the NEXT button to advance to the next test.

Patient Position and Transducer Placement

Patient is prone with the head over the table end. Examiner stabilizes the upper thorax and places the transducer over the occiput. Patient extends neck and examiner breaks extension.

Involved Muscles	***Innervations/Nerve Roots***
Trapezius (sup)	Accessory (Cr. 11) Ventral ramus (C2, 3, 4)
Semispinalis capitis	(C1-8)
Splenius capitis	(C4-8)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 319.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 17-18.

TEST 2

Neck Flexion

For sequential testing begin with Commander Console set to TEST 2, REP 1, RIGHT. This is not a bilateral test, so after completing repetitions for the right, use the NEXT button to advance to the next test.

Patient Position and Transducer Placement

Patient is supine. Examiner stabilizes upper chest and places transducer in the center of the forehead. Patient flexes neck and examiner breaks flexion. If patient appears weak, examiner should place free hand behind the head to prevent sudden movement from loss of strength.

Involved Muscles	***Innervations/Nerve Roots***
Sternocleidomastoid	Accessory (Cr.11) Ventral prim (C2,3)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 319.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 17-18.

TEST 3

Neck Anterolateral Flexion

For sequential testing begin with Commander Console set to TEST 3, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is supine with the head rotated to the opposite side being tested. Examiner stabilizes the upper chest and places the transducer on the temporal area. Patient flexes neck with the head rotated and examiner breaks flexion. If patient appears weak, examiner should place free hand behind the head to prevent sudden movement from loss of strength.

Involved Muscles	***Innervations/Nerve Roots***
Sternocleidomastoid	Accessory (Cr.11) Ventral prim (C2,3)

References

Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1995: 30.

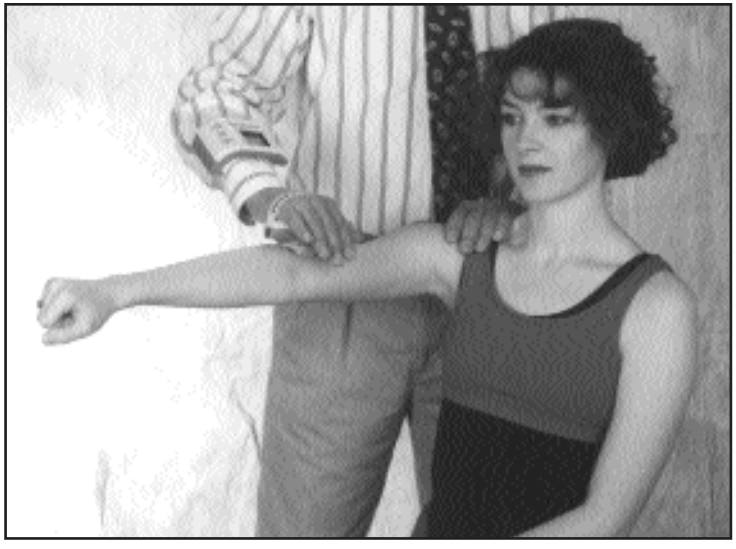
TEST 4

Shoulder Flexion

For sequential testing begin with Commander Console set to TEST 4, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with the shoulder at 90 degrees flexion. Examiner stabilizes the shoulder, places the transducer proximal to the elbow joint on the lateral surface of the upper arm, and breaks shoulder flexion.



Involved Muscles	*Innervations/Nerve Roots*
Anterior deltoid	Axillary (C5,6)
Coracobrachialis	Musculocutaneous (C5,6,7)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 273-275.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 102-103.

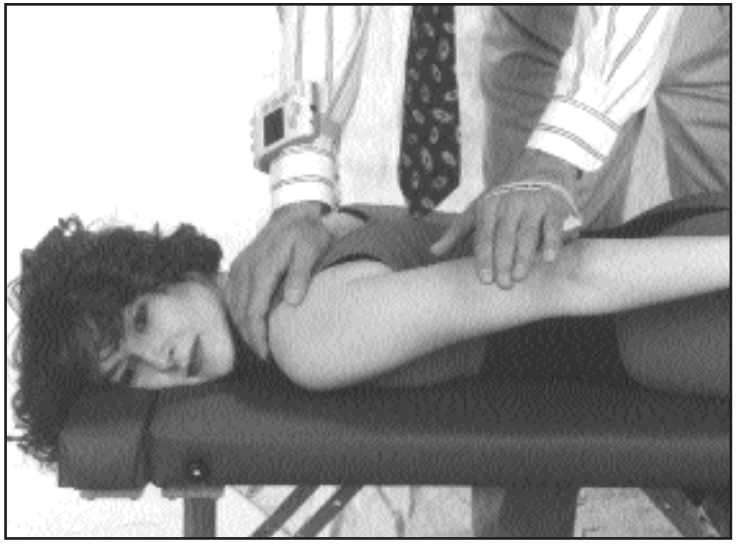
TEST 5

Shoulder Extension

For sequential testing begin with Commander Console set to TEST 5, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with the shoulder in extension and internally rotated, and the elbow in neutral. Examiner stabilizes the shoulder, places the transducer proximal to the elbow joint on the posterior surface of the upper arm, and breaks shoulder extension.



Involved Muscles	*Innervations/Nerve Roots*
Latissimus dorsi	Suprascapular (C4,5,6)
Teres major	Lower subscapular (C5,6,7)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 279.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 106-107.

TEST 6

Shoulder Abduction

For sequential testing begin with Commander Console set to TEST 6, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with shoulder abducted to 90 degrees. Examiner stabilizes the superior shoulder, places the transducer proximal to the elbow on the lateral surface of the upper arm, and breaks shoulder abduction.

Involved Muscles	***Innervations/Nerve Roots***
Middle deltoid	Axillary (C5,6)
Supraspinatus	Suprascapular (C4,5,6)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 273.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 108-109.

TEST 7

Shoulder Horizontal Abduction

Alternate Position

For sequential testing begin with Commander Console set to TEST 7, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with the shoulder abducted to 90 degrees and the elbow flexed to 90 degrees. Examiner stabilizes the scapula, places the transducer just proximal to the olecranon process on the posterior aspect of the upper arm, and breaks horizontal abduction.

Involved Muscles	***Innervations/Nerve Roots***
Posterior Deltoid	Axillary (C5,6)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 273-275.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 110-111.

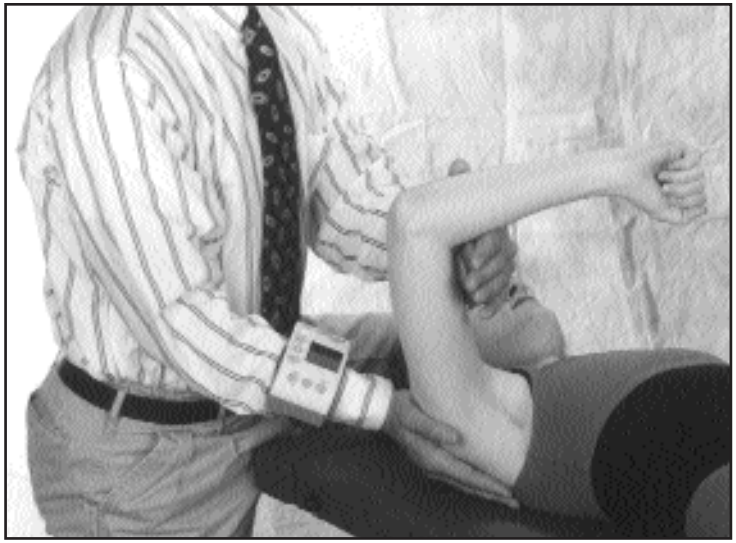
TEST 8

Shoulder Horizontal Adduction - all

For sequential testing begin with Commander Console set to TEST 8, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is supine with shoulder in neutral adduction and 90 degrees flexion with elbow neutral. Examiner stabilizes the thorax, places the transducer on the anterior medial aspect proximal to the elbow, and breaks horizontal adduction in an outward direction



Involved Muscles	***Innervations/Nerve Roots***
Pectoralis major - lower	Medial pectoral (C6,7,8,T1) Lateral pectoral (C5,6,7)
Pectoralis major - upper	Lateral pectoral (C5,6,7)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 276-277.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 112-113.

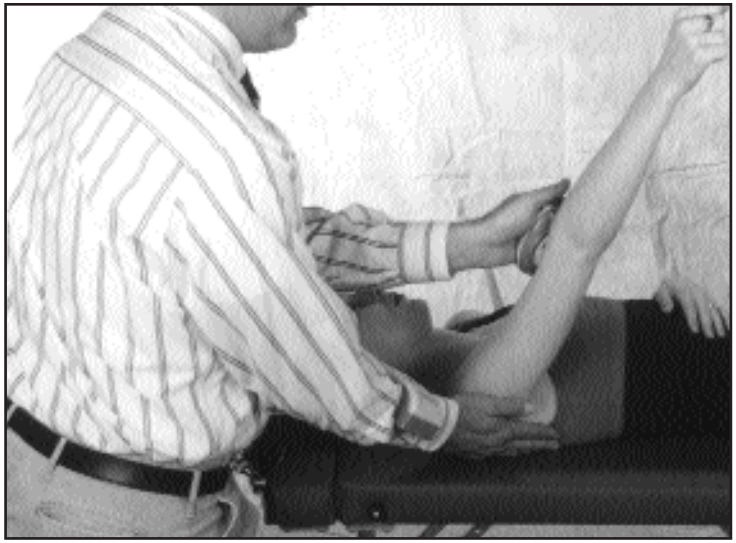
TEST 9

Shoulder Horizontal Adduction - upper

For sequential testing begin with Commander Console set to TEST 9, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is supine with shoulder in neutral adduction and 90 degrees flexion with elbow neutral. Examiner stabilizes the thorax, places the transducer on the anterior medial aspect proximal to the elbow, and breaks horizontal adduction in a downward and outward direction.



Involved Muscles	***Innervations/Nerve Roots***
Pectoralis major - upper	Lateral pectoral (C5,6,7)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 276-277.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 112-113.

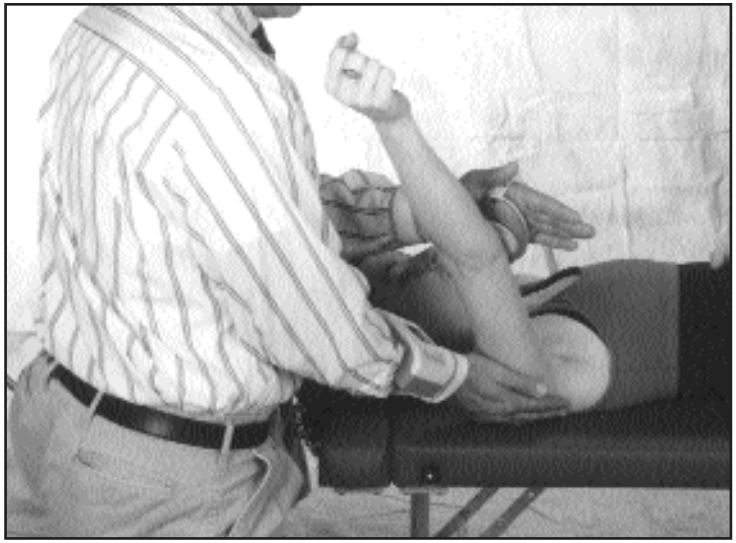
TEST 10

Shoulder Horizontal Adduction - lower

For sequential testing begin with Commander Console set to TEST 10, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is supine with shoulder in neutral adduction and 90 degrees flexion with elbow neutral. Examiner stabilizes the thorax, places the transducer on the anterior medial aspect proximal to the elbow, and breaks horizontal adduction in an upward and outward direction.



Involved Muscles	*Innervations/Nerve Roots*
Pectoralis major - lower	Medial pectoral (C6,7,8,T1) Lateral pectoral (C5,6,7)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 276-277.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 112-113.

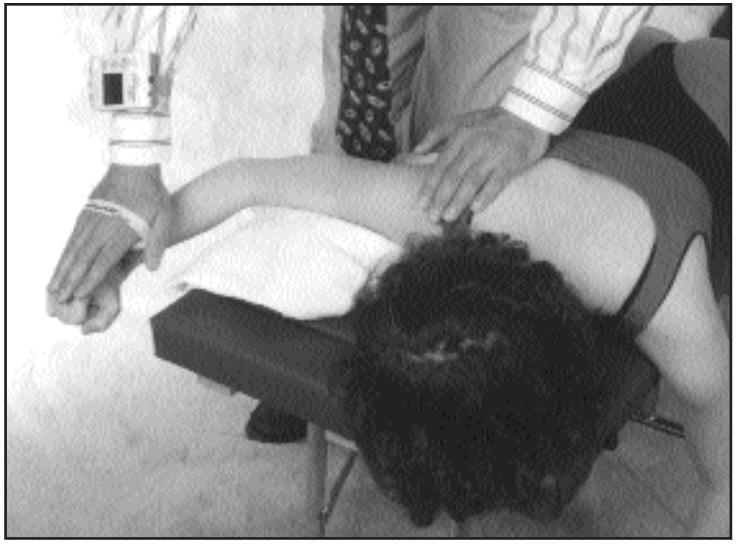
TEST 11

Shoulder Lateral Rotation

For sequential testing begin with Commander Console set to TEST 11, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with a pillow or towel roll supporting the upper arm. The shoulder is in 90 degrees abduction and 90 degrees external rotation with the elbow flexed to 90 degrees. Examiner stabilizes the shoulder at the superior aspect, places the transducer just proximal to the wrist joint on the dorsal surface of the lower arm, and breaks shoulder lateral rotation.



Involved Muscles	*Innervations/Nerve Roots*
Infraspinatus	Suprascapular (C4,5,6)
Teres minor	Axillary (C5,6)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 281.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 114-115.

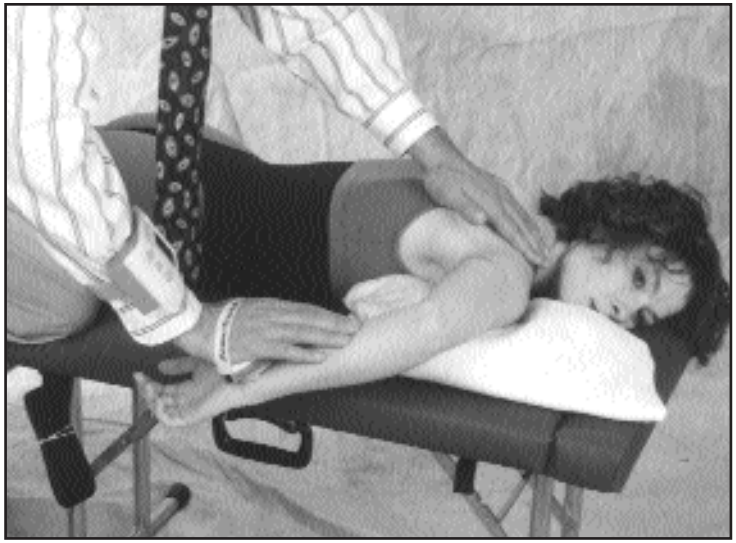
TEST 12

Shoulder Medial Rotation

For sequential testing begin with Commander Console set to TEST 12, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with the shoulder in 90 degrees abduction and 90 degrees internal rotation, and the elbow flexed to 90 degrees. A pillow or towel roll is placed under the upper arm. Examiner stabilizes the shoulder at the superior aspect, places the transducer just proximal to the wrist joint on the anterior surface of the lower arm, and breaks shoulder medial rotation.



Involved Muscles	*Innervations/Nerve Roots*
Subscapularis	Superior and inferior subscapular (C5,6)
Pectoralis major - lower	Medial pectoral (C6,7,8,T1) Lateral pectoral (C5,6,7)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 280.

Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 116-117.

TEST 13

Scapula Adduction

For sequential testing begin with Commander Console set to TEST 13, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with shoulder abducted and externally rotated to 90 degrees, and elbow flexed to 90 degrees. Examiner stabilizes the thorax on the posterior side and places the transducer over the lateral angle of the scapula. Patient lifts scapula off table and examiner breaks scapula adduction.

Involved Muscles	***Innervations/Nerve Roots***
Trapezius (middle)	Accessory (Cr.11) Ventral ramus (C2,3,4)
Rhomboids	Dorsal scapular (C4,5)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 282 and 284.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 94-95.

TEST 14

Scapula Adduction w/Downward Rotation

For sequential testing begin with Commander Console set to TEST 14, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with shoulder internally rotated and adducted across the lower back. Examiner stabilizes the thorax and places the transducer on the vertebral border of the scapula. Patient raises the arm and adducts the scapula. Examiner breaks scapula adduction and downward rotation in an outward and upward direction.

Involved Muscles	*Innervations/Nerve Roots*
Rhomboids	Dorsal scapular (C5)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 282 and 285.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 100-101.

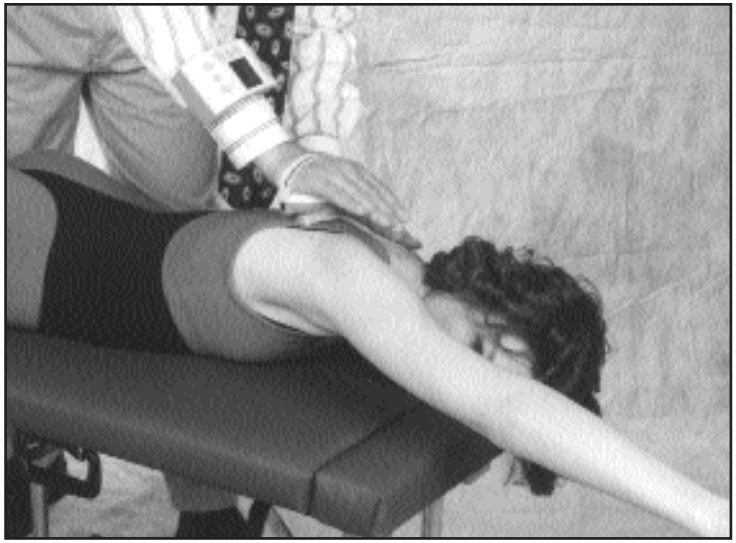
TEST 15

Scapula Depression/ Adduction

For sequential testing begin with Commander Console set to TEST 15, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with shoulder abducted to at least 130 degrees. Examiner places the transducer on the lateral angle of the scapula. Patient raises the arm and examiner breaks the motion in an upward and outward direction.



Involved Muscles	***Innervations/Nerve Roots***
Trapezius (inferior)	Accessory (Cr.11)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 282 and 286.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 98-99.

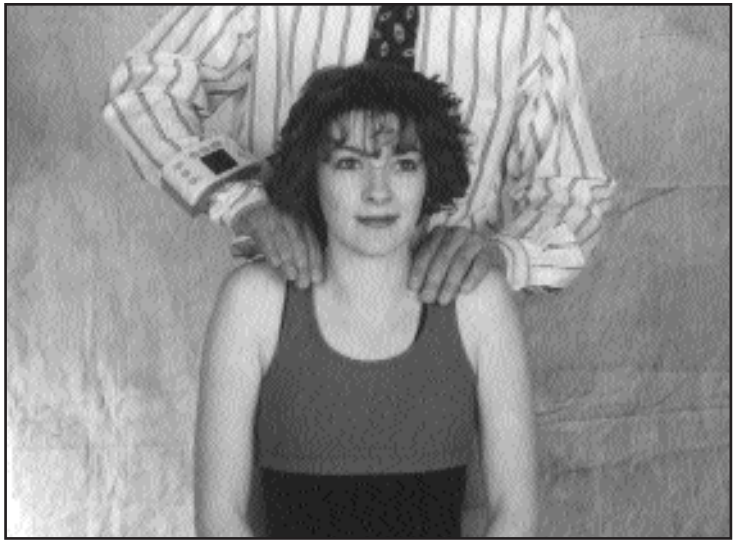
TEST 16

Scapula Elevation

For sequential testing begin with Commander Console set to TEST 16, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with arms at the sides. Examiner places the transducer just proximal to the AC joint and the other hand on the superior aspect of the shoulder. Patient elevates shoulders and examiner breaks scapula elevation.



Involved Muscles	*Innervations/Nerve Roots*
Trapezius (sup)	Accessory (Cr.11) Ventral ramus (C2,3,4)
Levator scapulae	(C2,3) Dorsal scapular (C4,5)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 282 and 287.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 92-93.

TEST 17

Elbow Flexion (Forearm Neutral)

For sequential testing begin with Commander Console set to TEST 17, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with the forearm and shoulder neutral, and the elbow flexed. Examiner stabilizes the upper arm, places the transducer on the radial aspect of the lower arm just proximal to the wrist joint, and breaks elbow flexion.

Involved Muscles	*Innervations/Nerve Roots*
Biceps brachii	Musculocutaneous (C5,6)
Brachialis	Radial (C5,6)
Brachioradialis	Radial (C5,6)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 268.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 118-119.

TEST 18

Elbow Flexion (Forearm Supinated)

For sequential testing begin with Commander Console set to TEST 18, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with the forearm supinated, shoulder neutral, and the elbow flexed. Examiner stabilizes the upper arm, places the transducer on the anterior surface of the lower arm just proximal to the wrist joint, and breaks elbow flexion.

Involved Muscles	*Innervations/Nerve Roots*
Biceps brachii	Musculocutaneous (C5,6)
Brachialis	Radial (C5,6)
Brachioradialis	Radial (C5,6)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 268.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 118-119.

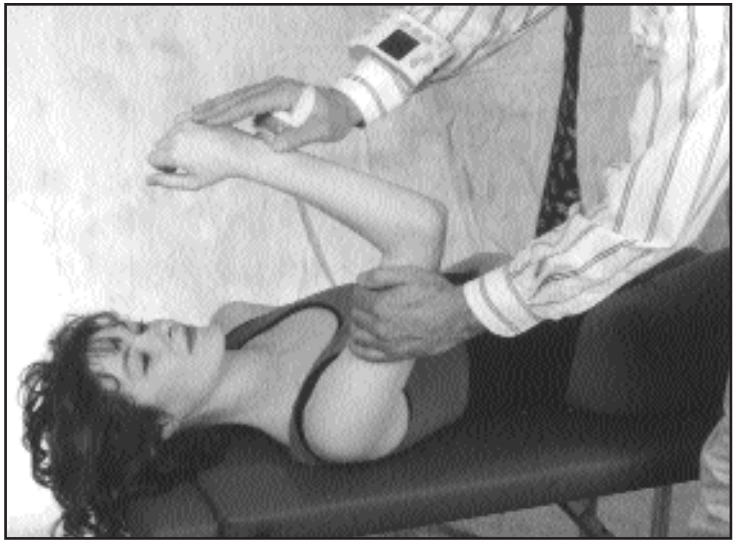
TEST 19

Elbow Extension

For sequential testing begin with Commander Console set to TEST 19, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is supine with shoulder flexed to 90 degrees and elbow in neutral. Examiner stabilizes the upper arm, places the transducer just proximal to the wrist on the ulnar surface of the forearm, and breaks elbow extension.



Involved Muscles	***Innervations/Nerve Roots***
Triceps brachii	Radial (C5,6,7,8,T1)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 270.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 121-122.

TEST 20

Wrist Flexion

For sequential testing begin with Commander Console set to TEST 20, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with the forearm placed on a table in supination, wrist in flexion, and the thumb and fingers relaxed. The examiner stabilizes the forearm, places the transducer on the midline of the palmer surface of the hand just distal to the wrist joint, and breaks wrist flexion.

Involved Muscles	***Innervations/Nerve Roots***
Flexor carpi radialis	Median (C6,7,8)
Flexor carpi ulnaris	Ulnar (C7,8,T1)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 258.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 126-127.

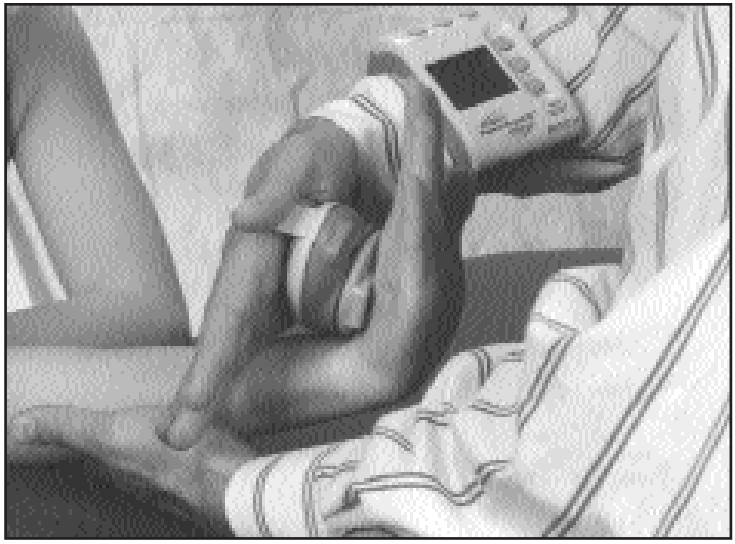
TEST 21

Wrist Extension

For sequential testing begin with Commander Console set to TEST 21, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with the forearm placed on a table in pronation, wrist in extension, and the thumb and fingers relaxed. The examiner stabilizes the forearm, places the transducer on the dorsal aspect of the hand in the midline just distal to the wrist joint, and breaks wrist extension.



Involved Muscles	***Innervations/Nerve Roots***
Extensor carpi radialis longus/brevis	Radial (C5,6,7,8)
Extensor carpi ulnaris	Deep radial (C6,7,8)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 260.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 128-129.

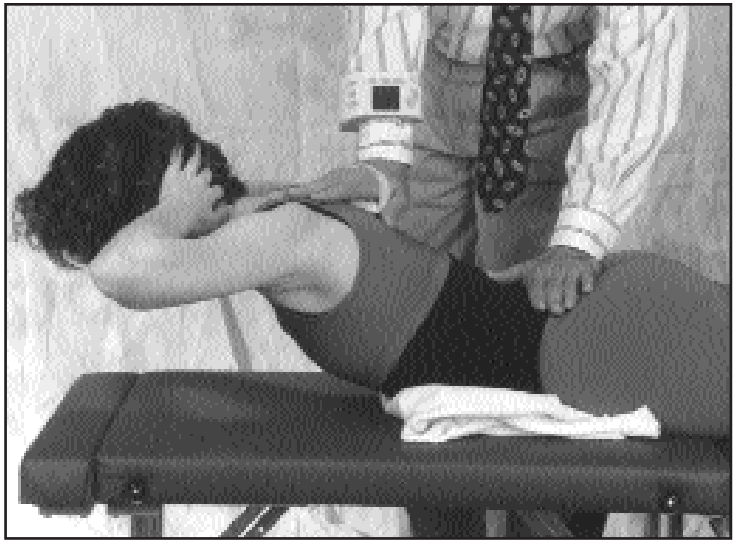
TEST 22

Trunk Extension

For sequential testing begin with Commander Console set to TEST 22, REP 1, RIGHT. This is not a bilateral test, so after completing repetitions for the right, use the NEXT button to advance to the next test.

Patient Position and Transducer Placement

Patient is prone with pillow under the abdomen and arms off the table to prevent substitution. Examiner stabilizes pelvis with one hand and places transducer in the midline between the inferior angles of the scapula on the caudal portion of the thoracic area. Patient extends trunk and examiner breaks extension.



Involved Muscles	***Innervations/Nerve Roots***
Erector spinae	(T1-12,L1-5,S1-3)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 139-141.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 30-31

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TEST 23

Hip Flexion

For sequential testing begin with Commander Console set to TEST 23, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with the hip flexed. Examiner stabilizes the pelvis in slight posterior tilt, places the transducer over the distal thigh just proximal to the knee, and breaks hip flexion. If breaking hip flexion is difficult, examiner may use two hands on the transducer and stand close to patient.

Involved Muscles	***Innervations/Nerve Roots***
Psoas major	(L1,2,3,4)
Iliacus	Femoral (L1,2,3,4)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 214-15.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 38-39.

TEST 24

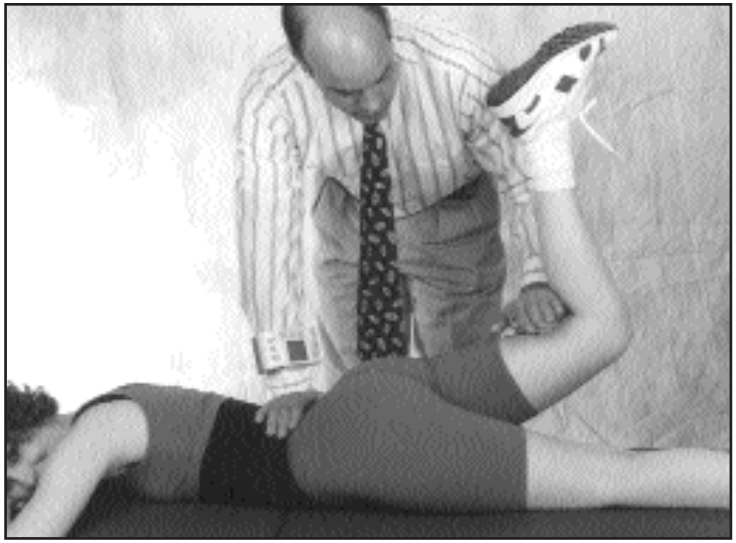
Hip Extension

(Knee Flexed)

For sequential testing begin with Commander Console set to TEST 24, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with knee flexed to de-emphasize the hamstrings and more efficiently isolate the gluteus maximus. Examiner stabilizes the pelvis with the hand on the sacrum and places the transducer at the posterior thigh proximal to the knee joint. Patient extends hip, and examiner breaks extension.



Involved Muscles	*Innervations/Nerve Roots*
Gluteus maximus	Inferior gluteal (L5,S1,2)
Semitendinosus	Sciatic (tibial) (L4,5,S1,2,3)
Semimembranosus	Sciatic (tibial) (L4,5,S1,2)
Biceps femoris (long head)	Sciatic (tibial) (L5,S1,2,3)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 226.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 44-45.

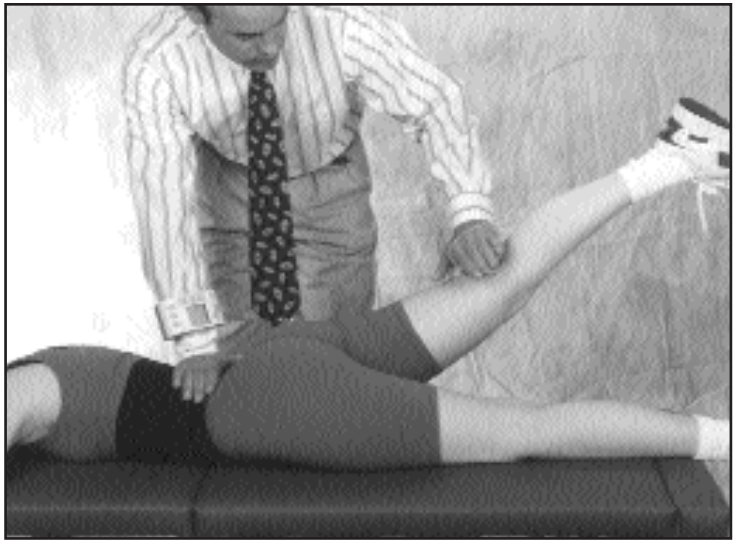
TEST 25

Hip Extension (Knee Neutral)

For sequential testing begin with Commander Console set to TEST 25, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone. Examiner stabilizes the pelvis with the hand on the sacrum and places the transducer at the posterior thigh proximal to the knee joint. Patient extends hip, and examiner breaks extension.



Involved Muscles	***Innervations/Nerve Roots***
Gluteus maximus	Inferior gluteal (L5,S1,2)
Semitendinosus	Sciatic (tibial) (L4,5,S1,2,3)
Semimembranosus	Sciatic (tibial) (L4,5,S1,2)
Biceps femoris (long head)	Sciatic (tibial) (L5,S1,2,3)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 226.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 44-45.

TEST 26

Hip Abduction (Hip Flexed to 45 Degrees)

For sequential testing begin with Commander Console set to TEST 26, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is side lying with lower knee flexed for balance. The upper hip is flexed approximately 45 degrees and the knee is straight. Examiner stabilizes the pelvis and places the transducer over the lateral epicondyle of the femur. Patient abducts the hip, and the examiner breaks the movement.

Involved Muscles	*Innervations/Nerve Roots*
Tensor fascia lata	Superior gluteal (L4,5,S1)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 216.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 52.

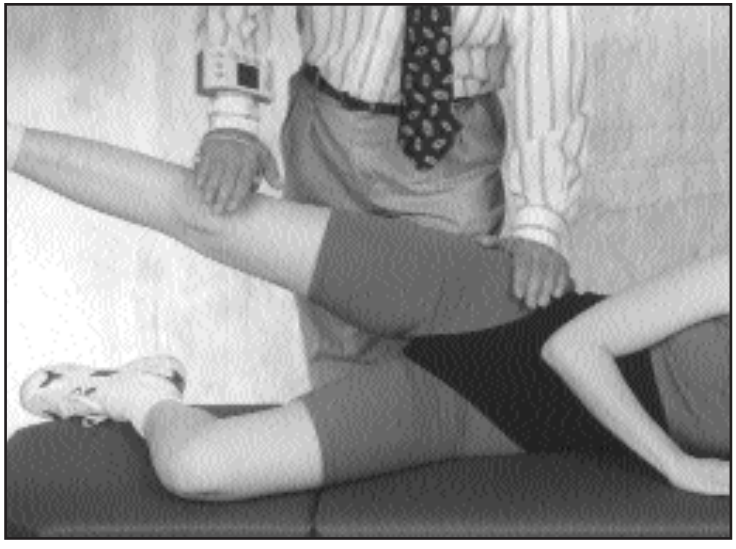
TEST 27

Hip Abduction (Hip Neutral)

For sequential testing begin with Commander Console set to TEST 27, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is side lying with lower knee flexed for balance and the upper knee straight. Examiner stabilizes the pelvis and places the transducer over the lateral epicondyle of the femur. Patient abducts the hip, and the examiner breaks the movement.



Involved Muscles	*Innervations/Nerve Roots*
Gluteus medius	Superior gluteal (L4,5,S1)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 221.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 48-49.

TEST 28

Hip Adduction

For sequential testing begin with Commander Console set to TEST 28, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is side lying with the knees straight. Examiner stabilizes the pelvis by supporting the opposite leg in about 30 degrees abduction. On the side being tested, examiner places the transducer over the medial epicondyle of the femur. Patient adducts the hip to about 20 degrees, and the examiner breaks the movement.

Involved Muscles	*Innervations/Nerve Roots*
Adductor magnus	Obturator posterior (L2,3,4,5,S1)
Adductor brevis	Obturator anterior (L3,4)
Adductor longus	Obturator anterior (L3,4)
Pectineus	Femoral (L2,3,4 & access. obturator)
Gracilis	Obturator anterior (L3,4) Femoral (L2,3,4)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 228-229.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 54.

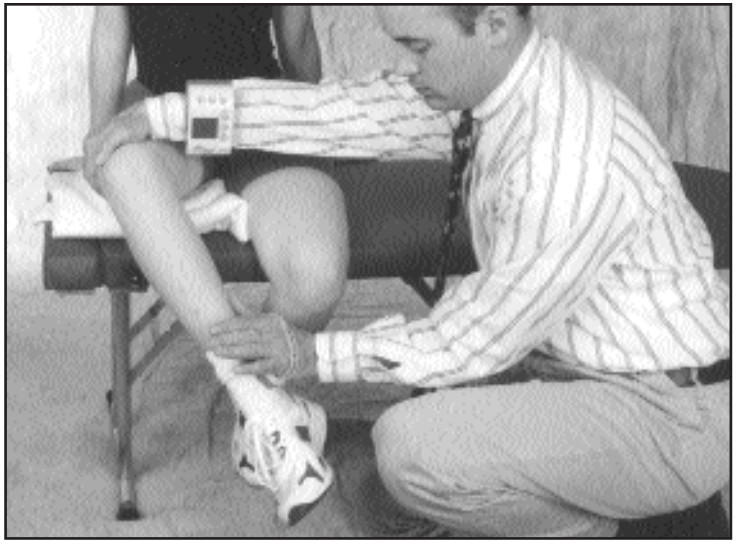
TEST 29

Hip Lateral Rotation

For sequential testing begin with Commander Console set to TEST 29, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with pad under the upper leg. Hip is internally rotated. Examiner provides resistance against the lateral thigh to prevent hip abduction, places the transducer just above the medial malleolus, and breaks hip lateral rotation. If possible, patient should grasp table edges to prevent pelvis lift.



Involved Muscles	*Innervations/Nerve Roots*
Obturator externus	Obturator posterior (L3,4)
Obturator internus	Nerve to obturator internus (L5,S1,2)
Quadratus femoris	Nerve to quadratus femoris (L4,5,S1,2)
Piriformis	(L5,S1,2)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 218-219.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 58-59.

TEST 30

Hip Medial Rotation

For sequential testing begin with Commander Console set to TEST 30, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with pad under upper leg. Hip is medially rotated. Examiner provides resistance against the medial thigh to prevent hip adduction. The examiner places the transducer just above the lateral malleolus and breaks hip medial rotation.

Involved Muscles	*Innervations/Nerve Roots*
Gluteus minimus	Superior gluteal (L5,S1,2)
Tensor fascia lata	Superior gluteal (L4,5,S1)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 217.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 62-63.

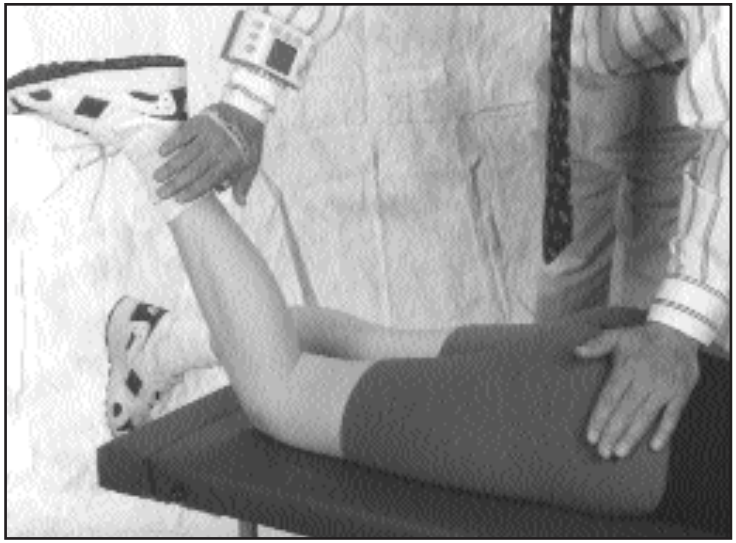
TEST 31

Knee Flexion (Laterally Rotated)

For sequential testing begin with Commander Console set to TEST 31, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with knee flexed and tibia in lateral rotation. Examiner stabilizes the pelvis, places the transducer over the achilles tendon, and breaks knee flexion. Avoid strong plantar flexion to prevent gastrocnemius substitution.



Involved Muscles	*Innervations/Nerve Roots*
Biceps femoris (long head)	Sciatic (tibial) (L5,S1,2,3)
Biceps femoris (short head)	Sciatic (peroneal) (L5,S1,2)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 209.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 64-65.

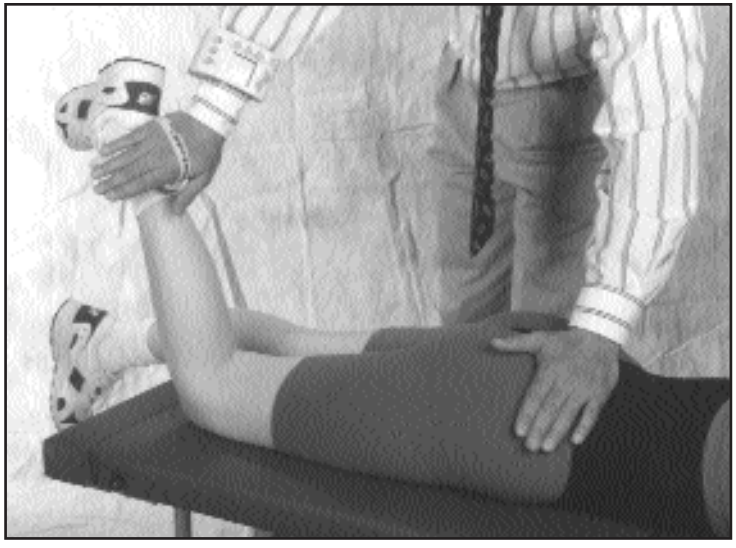
TEST 32

Knee Flexion (Medially Rotated)

For sequential testing begin with Commander Console set to TEST 32, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is prone with knee flexed and tibia in medial rotation. Examiner stabilizes the pelvis, places the transducer over the achilles tendon, and breaks knee flexion. Avoid strong plantar flexion to prevent gastrocnemius substitution.



Involved Muscles	*Innervations/Nerve Roots*
Semintendinosus	Sciatic (tibial) (L5,S1,2)
Semimembranosus	Sciatic (tibial) (L5,S1,2)

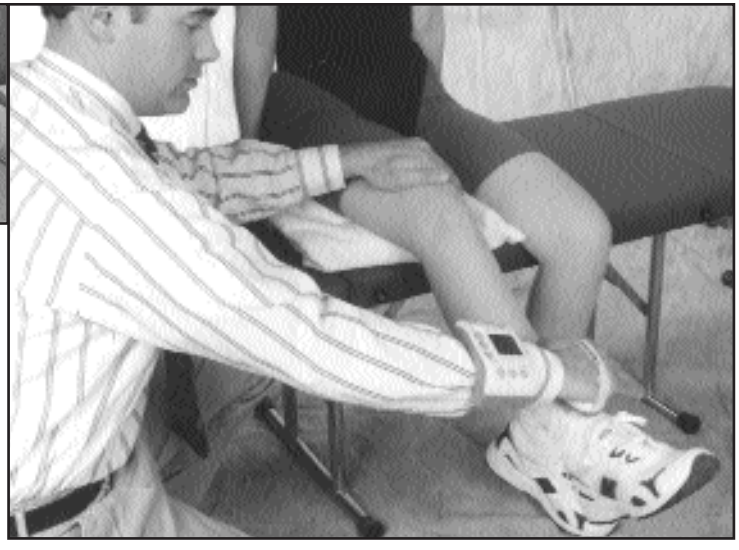
References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 260.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 128-129.

TEST 33

Knee Extension

Alternate Stabilization



For sequential testing begin with Commander Console set to TEST 33, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting and if necessary leaning backwards with arms supported on the table to relieve tension on the hamstrings. Patient extends knee about 5 degrees short of full extension lock. Examiner provides resistance above the knee or the hip without pressure on the quadriceps, places the transducer between the malleoli, and breaks knee extension.

Involved Muscles	***Innervations/Nerve Roots***
Quadriceps femoris	Femoral (L2,3,4)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 212-213.

Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 68.

TEST 34

Ankle Dorsiflexion/ Inversion

For sequential testing begin with Commander Console set to TEST 34, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is sitting with the legs over the table edge and foot in dorsiflexion and inversion. Examiner provides resistance on the posterior lower leg. Examiner places the transducer on the distal dorsal medial surface of the foot and breaks dorsiflexion.

Involved Muscles	***Innervations/Nerve Roots***
Tibialis anterior	Deep peroneal (L4,5 S1)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 201.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 77-76.

TEST 35

Foot Eversion

For sequential testing begin with Commander Console set to TEST 35, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is side lying with the foot in eversion. Examiner stabilizes the lower leg, places the transducer on the distal lateral border of the foot, and breaks eversion.

Involved Muscles	*Innervations/Nerve Roots*
Peroneus brevis	Superficial peroneal (L4,5,S1)
Peroneus longus	Tibial (S1,2)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 203.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 80-81.

TEST 36

Foot Inversion

For sequential testing begin with Commander Console set to TEST 36, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient is side lying with the foot inverted. Examiner stabilizes the leg, places the transducer on the distal medial forefoot, and breaks inversion.

Involved Muscles	***Innervations/Nerve Roots***
Tibialis posterior	Tibial (L4,5, S1)

References

Kendall FP, McCreary EK, Provance PG. *Muscles: Testing and Function*, Williams & Wilkins, 1993: 202.
Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1986: 78-79.

TEST 37

Great Toe Extension

For sequential testing begin with Commander Console set to TEST 3, REP 1, RIGHT. This is a bilateral test, so after completing repetitions for the right side the console will automatically advance to the left side.

Patient Position and Transducer Placement

Patient seated or supine with foot part way between plantar and dorsiflexion. Examiner stabilizes metatarsals, places transducer on dorsal surface of great toe distal to MP joint, and breaks extension.

Involved Muscles	***Innervations/Nerve Roots***
Extensor hallucis longus	Deep peroneal (L4,5,S1)

References

Daniels L, Worthingham C. *Muscle Testing: Techniques of Manual Examination*, W.B. Saunders Company, 1995: 232-233.