

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

RHS 221
Manual Muscle Testing
Theory – 1 hour
practical – 2 hours
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The Scapula

- ▶ The scapulae lie against the thorax approximately between the levels of the second and seventh ribs.

Pre Examination

- ▶ Observation of the scapulae, both at rest and during active and passive shoulder flexion, is a routine part of the test. Examine the patient in short sitting position with hands in lap.
- ▶ Palpate the vertebral borders of both scapulae with the thumbs; place the web of the thumb below the inferior angle; the fingers extend around the axillary borders.
- ▶ Specific Elements:
 1. Position and symmetry of scapula: determine the position of the scapulae at rest and whether the two sides are symmetrical.
 2. Scapular range of motion: within the total arc of 180° of shoulder forward flexion, 120° is glenohumeral motion, and 60° is scapular motion.

Scapular motions

SCAPULAR MOTIONS

NEUTRAL

ELEVATION

ABDUCTION

ADDUCTION

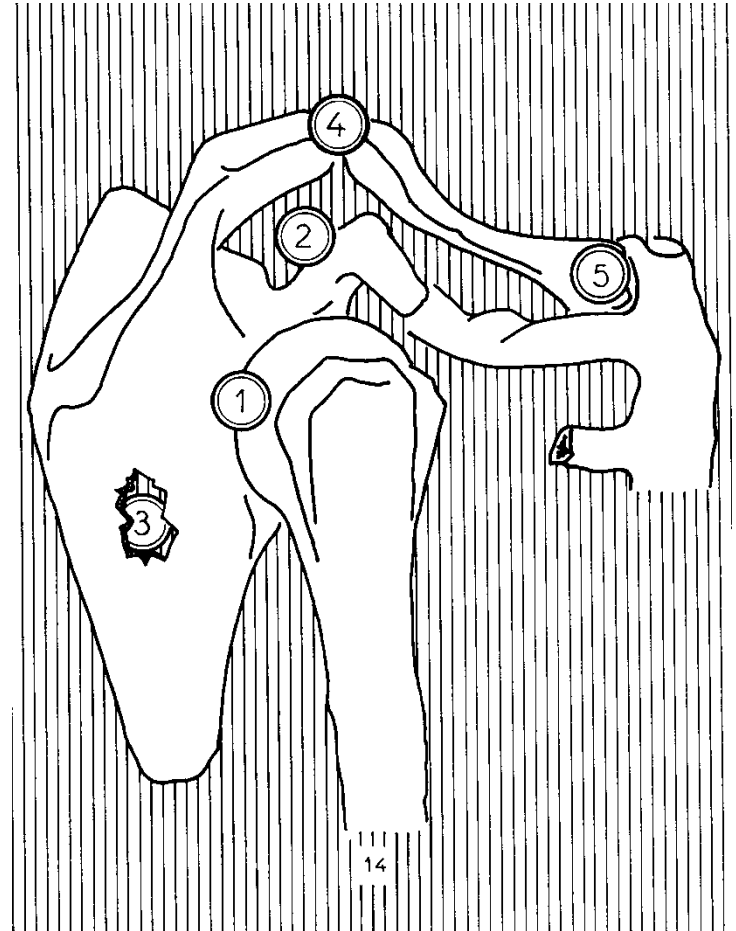
DEPRESSION AND
DOWNWARD ROTATION

ABDUCTION AND
UPWARD ROTATION

Shoulder Girdle

Includes:

- ▶ G-H joint
- ▶ A-C joint
- ▶ S-T articulation
- ▶ S-C joint
- ▶ Subacromial space



Laboratory

1. **Scapula Abduction and Upward Rotation**
2. **Scapula Elevation**
3. **Scapula Adduction**
4. **Scapula Depression and Adduction**
5. **Scapula Adduction and Downward Rotation**

Scapula Abduction and Upward Rotation

1. Prime mover/agonist:

| | origin | insertion |
|-------------------|-----------------------------|---|
| Serratus anterior | ribs 1–8 intercostal fascia | Scapula (ventral surface of vertebral border) |

2. Synergist/ Accessory muscles:

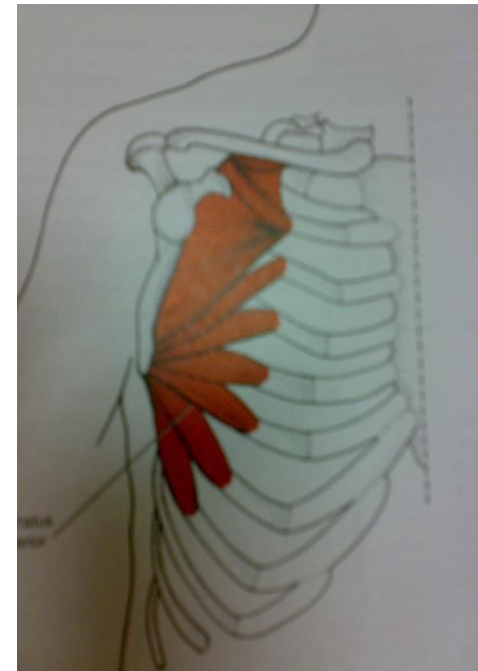
Pectoralis minor.

3. Nerve supply:

Long thoracic n. C5–C7

4. Range of motion:

measure the distance between spine process and medial border of scapula.



Scapula Abduction and Upward Rotation

5. Fixation:
 - a. in strong scapular abduction, by pull of obliquus externus abdominis on same side.
 - b. By weight of thorax.
6. **Effect of weakness ancontracture:–Video?**
Effect of weakness result in:
 - **Winging of Scapula** (due to paralysis of serratus anterior)
 - In ability to raise the arm overhead.
7. Factor limited range of motion:
 - a. Tension of trapezoid ligament.
 - b. Tension of trapezius and rhomboid major and rhomboid minor muscles.
8. Substitution:

None.

Scapula Abduction and Upward Rotation

9. Procedures:

a– observation for scapula position: At Rest and with motion.

b– patient position (pt):

c– Therapist Position:

inner hand:

Outer hand:

Direction of Resistance :

Instruction to patient:

c– grading system:

Normal(5), Good(4), Fair(3), Poor(2), Trace(1), Zero(0)

make sure patient tolerates maximal resistance plus
hold 3 sec.

e. Palpation site:

Scapula Elevation

1. Prime mover/agonist:

| | origin | insertion |
|--------------------------------|--|--|
| Trapezius (superior fibers) | Occiput C7 Vert.SP. Ligamentum nuchae | Clavicle (post. border) |
| Levator scapulae | C1–C4 vert tp. | Scapula (vert. border superior angle and root of spine) |

2. Synergist/ Accessory muscles:

Rhomboid major and minor.

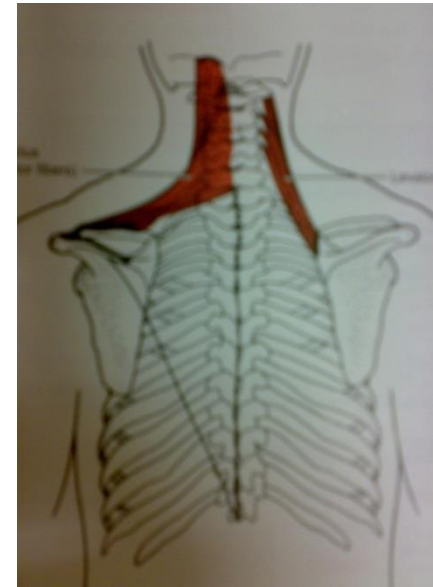
3. Nerve supply:

XI Accessory(C3–C4) and Dorsal Scapular n.(C5) for Levator scapulae,

XI Accessory(C3–C4) n. for Trapezius (superior fibers)

4. Range of motion:

measure the distance between top of the shoulder
and loops of ear.



Scapula Elevation

5. Fixation:

- a. By flexor muscles of cervical spine..
- b. By weight of head.

6. Effect of weakness/contracture/shortening:

Effect of weakness result in:

effect of weakness result in: In ability to raise shoulder upwards; either bilateral or unilateral weakness.

7. Factor limited range of motion:

- a. Tension of costoclavicular ligament.
- b. Tension of scapular depression muscle and clavicle: pectoralis minor, subclavius, and trapezius (lower fibers) muscles.

8. Substitution:

by Rhomboids (scapula adduction and downward rotation)
inferior angle will move medially.

Scapula Elevation

9. Procedures:

a– observation for scapula position: At Rest and with motion.

b– patient position (pt):

c– Therapist Position:

inner hand:

Outer hand:

Direction of Resistance :

Instruction to patient:

c– grading system:

Normal(5), Good(4), Fair(3), Poor(2), Trace(1), Zero(0)

make sure patient tolerates maximal resistance plus hold 3 sec.

e. Palpation site:

Scapula Adduction (Retraction)

1. Prime mover/agonist:

| | origin | insertion |
|------------------------------|---------------|---------------------------------|
| Trapezius (middle fibers) | T1–T5 vert.sp | Scapula (superior lip of spine) |

2. Synergist/ Accessory muscles:

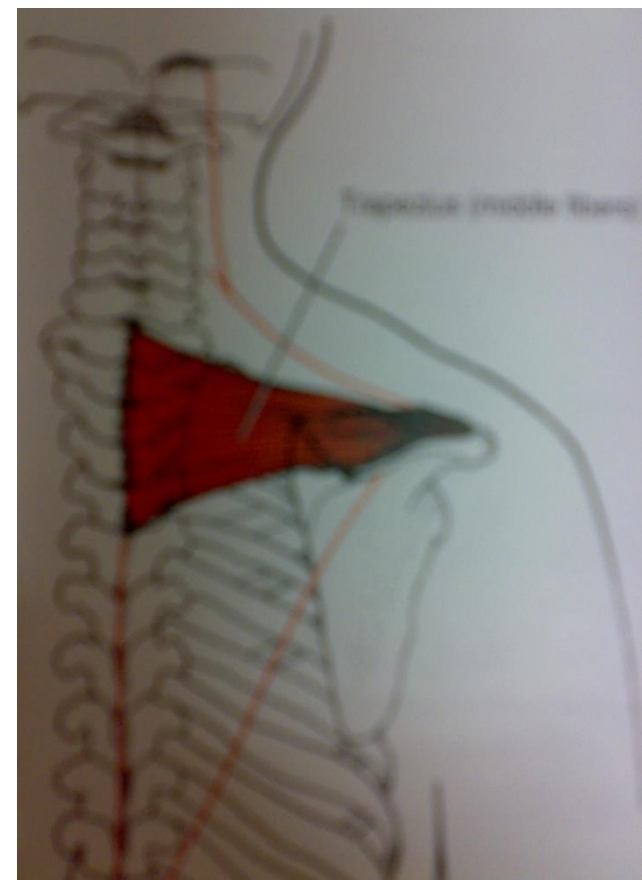
Rhomboid major and minor, and Trapezius
(upper and lower fibers)

3. Nerve supply:

XI Accessory(C3–C4) n.

4. Range of motion:

measure the distance between transverse process and
medial border of scapula



Scapula Adduction (Retraction)

5. Fixation:
 - a. By weight of thorax.
6. Effect of weakness/contracture/shortening:
effect of weakness result in:
In ability to adduct the scapula.
7. Factor limited range of motion:
 - a. Tension of conoid ligament.
 - b. Tension of pectoralis major and minor, and serratus anterior muscles.
 - c. Contact of vertebral border of scapula with spinal musculature.
8. Substitution:
 - ▶ by Rhomboids (scapula adduction and downward rotation)
inferior angle will move medially.
 - ▶ By the post. Deltoid if the scapular muscles are absent (horizontal adduction of shoulder will occur).

Scapula Adduction (Retraction)

9. Procedures:

a– observation for scapula position: At Rest and with motion.

b– patient position (pt):

c– Therapist Position:

inner hand:

Outer hand:

Direction of Resistance :

Instruction to patient:

c– grading system:

Normal(5), Good(4), Fair(3), Poor(2), Trace(1), Zero(0)

make sure patient tolerates maximal resistance plus
hold 3 sec.

e. Palpation site:

Scapula Depression and Adduction

1. Prime mover/agonist:

| | origin | insertion |
|-----------------------------|---------------|-----------------|
| Trapezius (lower fibers) | T1–T5 vert.sp | Scapula (spine) |

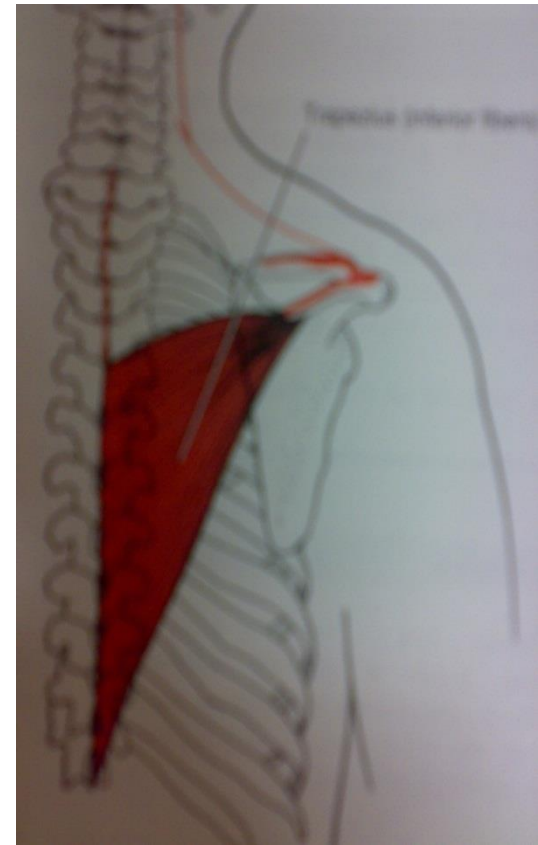
2. Synergist/ Accessory muscles: latissimus dorsi.

3. Nerve supply:

XI Accessory(C3–C4) n.

4. Range of motion:

measure the distance between spine process and
inferior angle of scapula



Scapula Depression and Adduction

5. Fixation:

- a. By contraction of spinal extensor muscles.
- b. By weight of thorax.

6. Effect of weakness/contracture/shortening:

Effect of weakness result in:

- In ability to raise the arm overhead.

7. Factor limited range of motion:

- a. Tension of inter clavicular ligament and articular disk of sternoclavicular joint.
- b. Tension of trapezius muscle.

8. Substitution:

None.

Scapula Depression and Adduction

9. Procedures:

a– observation for scapula position: At Rest and with motion.

b– patient position (pt):

c– Therapist Position:

inner hand:

Outer hand:

Direction of Resistance :

Instruction to patient:

c– grading system:

Normal(5), Good(4), Fair(3), Poor(2), Trace(1), Zero(0)

make sure patient tolerates maximal resistance plus
hold 3 sec.

e. Palpation site:

Scapula Adduction and Downward Rotation

1. Prime mover/agonist:

origin

insertion

Rhomboid major T2–T5 vert. sp

Scapula (vertebral border
between root of spine and inferior angle)

Rhomboid minor C7–T1 vert sp

Scapula (vert border at root of spine)

2. Synergist/ Accessory muscles:

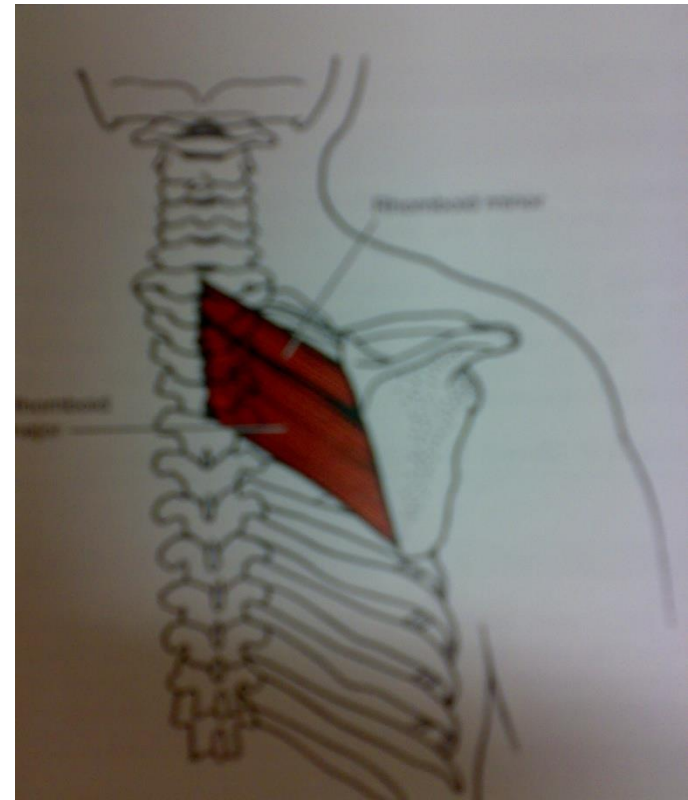
Levator scapulae.

3. Nerve supply:

dorsal scapular n. C5

4. Range of motion:

measure the distance between the vertebral
border of scapula and vert sp.



Scapula Adduction and Downward Rotation

5. Fixation:
 - a. By weight of thorax.
6. Effect of weakness/contracture/shortening:
effect of weakness result in:
 - The scapula will abduct and the inferior angle rotate outward.
 - In ability to adduct & downward rotate the scapula.
7. Factor limited range of motion:
 - a. Tension of conoid ligament.
 - b. Tension of pectoralis major and minor, serratus anterior muscles.
 - c. Contact of vertebral border of scapula with spinal musculature.
8. Substitution:
by middle trapezius (only adduct the scapula without downward rotation).

Scapula Adduction and Downward Rotation

9. Procedures:

a– observation for scapula position: At Rest and with motion.

b– patient position (pt):

c– Therapist Position:

inner hand:

Outer hand:

Direction of Resistance :

Instruction to patient:

c– grading system:

Normal(5), Good(4), Fair(3), Poor(2), Trace(1), Zero(0)

make sure patient tolerates maximal resistance plus
hold 3 sec.

e. Palpation site:

Thank You