83b Orthopedic Massage:
Technique Review and Practice - Thoracic Outlet

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Class Outline

15 minutes	Break
5 minutes	Attendance, Breath of Arrival, and Reminders
75 minutes	1st trade technique demo and practice
20 minutes	Break and switch tables
75 minutes	2nd trade technique demo and practice
20 minutes	Break down, clean up, and discussion

Total time: 3 hours 30 minutes

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Class Reminders

Early Warning:

- 85a Orthopedic Massage: Outside Massages – Begin these now!

Quizzes:

- 84a Kinesiology Quiz (pectoralis major, pectoralis minor, coracobrachialis, biceps brachii, sternocleidomastoid, scalenes, rotator cuff, flexor digitorum superficialis, extensor digitorum, Flexor pllicis longus, and flexor digitorum profundis)

  – 50 questions in 40 minutes

Spot Checks and Assessments:

- 84b Orthopedic Massage: Spot Check – Thoracic Outlet

Assignments:

- 85a Orthopedic Massage: Outside Massages (2 due at the start of class)

Preparation for upcoming classes:

- 84a Kinesiology Quiz
- 84b Orthopedic Massage: Spot Check – Thoracic Outlet
- 85a Orthopedic Massage: Introduction – Neck Pain
  - Packet J: 109-112
- 85b Orthopedic Massage: Technique Demo and Practice – Neck Pain
- 86a MBLEx Prep – Special Populations – all 7 topics
- 86b Orthopedic Massage: Technique review and Practice – Neck Pain

Classroom Rules

Punctuality - everybody's time is precious

- Be ready to learn at the start of class; we'll have you out of here on time
- Tardiness: arriving late, returning late after breaks, leaving during class, leaving early

The following are not allowed:

- Bare feet
- Side talking
- Lying down
- Inappropriate clothing
- Food or drink except water
- Phones that are visible in the classroom, bathrooms, or internship

You will receive one verbal warning, then you'll have to leave the room.

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The following information is an example on how to use the HOPRS method specific to TOS.

History:

- In some cases, the client reports acute injury as cause for symptoms
- More likely due to postural problem, chronic holding pattern
- Symptoms increase the longer left untreated; nerve damage can result even at minor levels of entrapment

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History (continued)

- Aggravating Factors include:
  - Chronic postural stress of upper thoracic or cervical regions-heavy backpack or purse, equipment strap causing shoulder girdle depression
  - Sleep positions-side sleeping, arm draped over head, etc.
- Primary neurovascular symptoms include:
  - Pain
  - Paresthesia (pins and needles)
  - Burning or tingling sensation in upper extremity
  - Ulnar nerve disruption
  - Coldness
  - Feeling of fullness
  - Swelling

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Observation:

- No direct observable signs that verify TOS
- X-ray needed to verify cervical rib (true neurogenic TOS)
- However, vascular compression may cause discoloration in upper extremity
- In severe cases muscle atrophy may be visible
- Postural distortions may be present, but alone do not indicate TOS

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Palpation:

- True Neurogenic TOS – cervical rib may be palpable near lower margin of scalene muscles
- Anterior Scalene Syndrome – Scalenes commonly feel hypertonic-esp. Ant., mid scalene
- Costoclavicular Syndrome – Hypertonic scalenes may also occur
- Pectoralis Minor Syndrome – Pec major and or Pec minor are tight
- **Be cautious** as palpation may reproduce symptoms
  - If reproduced discontinue pressure
  - Reproduction with minimal pressure is a valuable finding – indicates tissues more sensitive than normal

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Range-of-Motion (ROM) & Resistance Testing

- **A.ROM**:
  - may produce symptoms if brachial plexus is stretched
  - most likely when client laterally flexes to opposite side of symptoms
  - Infrequently there may be symptoms during neck extension or flexion due to tension in upper dura mater transmitting to brachial plexus nerve roots
  - Pec Min Syn may increase symptoms during Active and Passive Abduction

- **P.ROM:** Same principles as A.ROM

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- **MRT:**
  - Pain unlikely in MRTs
  - Muscle weakness less likely in brachial plexus but more common distally due to ulnar nerve compression
  - Symptoms possible due to compression of fibers that supply ulnar nerve

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Special Orthopedic Tests

Special Orthopedic Tests determine potential tissues or structures involved in reported pain or dysfunction.

Special tests are designed to evaluate the likelihood of a specific problem.

Example: Thoracic Outlet Syndrome (TOS)

Two factors determine the accuracy of a special test:

1. ***Sensitivity*** – measure of how accurate test is at identifying everyone who may have a condition.

2. ***Specificity*** - measure of how accurate test is at producing a negative result, ruling out those that do not have condition.

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- **Special Tests specific to TOS**
  - Adson Maneuver - General test for TOS; more specific to Ant., Scalene Syndrome
  - Allen Test – Indicates Anterior Scalene Syndrome
  - Military Brace Test – Indicates Costoclavicular Syndrome
  - Wright Abduction Test – Indicates Pectoralis Minor Syndrome

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Adson Maneuver

Adson's test is a provocative test for thoracic outlet syndrome, which is accompanied by compression of the subclavian artery by a cervical rib or tightened anterior and middle scalene muscles.

Starting Position

The test can be performed with the client in either sitting or standing with their arm at their side palm facing forward. Therapist should be behind client to the side being tested.

Procedure

1. Therapist locates radial pulse of affected side, in the wrist, proximal to the thumb with one hand.
2. Supporting client's arm, just above the elbow, with the other hand. Therapist abducts client's shoulder to 90 degrees, keeping arm fully extended and laterally rotated (palm facing forward).
3. Instruct client to turn their head towards the side being tested as far as possible and tilt chin up, placing cervical region in to extension and ipsilateral rotation.
4. Therapist should pay attention to changes in the strength of the pulse (Not rate).
5. Sometimes having clients turn their head away from the side being tested is recommended (this is a separate test called the Halstead Maneuver).

Positive Test

- The test is positive if the radial pulse significantly decreases or disappears. Check the client's radial pulse on the other arm to recognize the patient's normal pulse.
- A positive test should be compared with the non-symptomatic side.

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Allen Test

Evaluates presence of neuromuscular compression in TOS, specifically Anterior Scalene Syndrome.

- **Starting Position**
  - Client is seated or standing. Therapist stands behind client and to the side of the being tested.
- **Procedure**

  Therapist locates radial pulse. Bring the arm into 90° abduction, with the elbow flexed to 90° and externally rotated
  - The therapist finds a radial pulse just proximal to the thumb on the wrist
  - Instruct the client to rotate their head to the opposite side
  - Monitor the pulse, watching for changes in strength
- **Positive Test**
  - Diminishment or disappearance of the strength of pulse, not pulse rate, indicates impingement of neurovascular bundle in general, and,
  - More specifically, impingement by the Anterior Scalene in the Thoracic outlet.

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Military Brace Test

Specifically tests for Costoclavicular Syndrome.

- **Starting Position**

  The client is standing or seated

- **Procedure**

  1. The client pulls their scapular together so that they are fully retracted, and arms are extended
  2. The client is instructed to hold this position for 30-60 seconds
  3. The test can be performed at varying degrees of shoulder abduction

- **Positive Test**

  - Reproduction of neurologic symptoms in distal upper extremity
  - Pain, numbness, or tingling is likely indicative of Costoclavicular Syndrome
  - If compression is significant symptoms are felt almost immediately
  - If compression is not as severe it may take more time for symptoms to be felt

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Wright Abduction Test

The Wright test, or hyper-abduction test, is a provocative test for Thoracic Outlet Syndrome and is thought to implicate the axillary interval (space posterior to pectoralis minor), specifically Pectoralis Minor Syndrome.

- **Starting Position**

  The client is seated.

- **Procedure**

  The client lifts the arm on the affected side as far into abduction as possible and holds this position for about a minute.

  To determine which nerve is involved, use the following variations:

  1. Ulnar nerve: shoulder abducted, elbow flexed, wrist fully extended
  2. Radial nerve: shoulder abducted, elbow extended, wrist is flexed
  3. Median nerve: shoulder abducted, elbow and wrist fully extended

- **Positive Test**

  Recreation of pain, neurologic symptoms, numbness, and tingling in the distal upper extremity due to the stress placed on the Neurovascular Path by the Pectoralis Minor.

  Symptoms that worsen within 20-30 seconds indicate a degree of brachial plexus compression.

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SEATED

1. Vertebrobasilar insufficiency test (VBI test)

SUPINE

2. Upper chest: superficial fascia assessment

3. Upper chest: myofascial release

4. Upper chest: warming and softening

5. Pectoralis minor: deep longitudinal stripping

6. Pectoralis minor: pin and stretch

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SUPINE, continued

7. Anterolateral neck: superficial fascia assessment

8. Anterolateral neck: myofascial release

9. Anterolateral neck: warming and softening

10. Scalenes: deep longitudinal stripping

11. Scalenes: deep longitudinal stripping with active lengthening after PIR

12. Brachial plexus: mobilization

13. Passive stretches: neck lateral flexion

14. Passive stretches: neck rotation

The following slides are included in this presentation so that you may refer to the details of techniques during review classes.

Soft-Tissue Manipulation
Seated Details

SEATED DETAILS - Thoracic Outlet

1. Vertebrobasilar insufficiency test (VBI test)

- Perform while client is seated during interview
- Instruct the client:
  - "Look up and over your shoulder to one side"
  - "Hold this position for 30 seconds"
- The test is positive if the client experiences any of the following:
  - **Vertigo** Perception of a spinning motion (due to dysfunction of the vestibular system)
  - **Dizziness** Sensation of feeling off balance
  - **Nausea** Sensation of unease and discomfort in the upper stomach with an involuntary urge to vomit
  - Double vision or blurred vision
- **NOTE:** Vertebrobasilar insufficiency is a contraindication for active cervical flexion with longitudinal stripping

Soft-Tissue Manipulation
Supine Details

SUPINE DETAILS - Thoracic Outlet

2. Upper chest: superficial fascia assessment

- Work without lubricant
- Use your palm and fingers to apply light tangential pulling pressure
- Place your fingertips flatly on the skin surface
- Press in just enough to traction the superficial fascia without sliding
- Slowly traction in all directions taking note of restrictions
- Use before and after treating superficial fascia to gauge progress

SUPINE DETAILS - Thoracic Outlet

3. Upper chest: myofascial release

- Work without lubricant
- Sit at the head of the table facing down toward the feet
- Place each hand flatly on the skin surface working bilaterally
- Use your fingers to apply light tangential pulling pressure
- Press in just enough to traction the superficial fascia without sliding
- Hold. Wait for a subtle tissue release or indication from the client
- Repeat in different directions and areas to address restrictions in the anterior, lateral, and posterior cervical areas.

SUPINE DETAILS - Thoracic Outlet

4. Anterolateral neck: superficial fascia assessment

- Work without lubricant
- Use your palm and fingers to apply light tangential pulling pressure
- Place your fingertips flatly on the skin surface
- Press in just enough to traction the superficial fascia without sliding
- Slowly traction in all directions taking note of restrictions
- Use before and after treating superficial fascia to gauge progress

SUPINE DETAILS - Thoracic Outlet

5. Anterolateral neck: myofascial release

- Work without lubricant
- Sit at the head of the table facing down toward the feet
- Place each hand flatly on the skin surface working bilaterally
- Use your fingers to apply light tangential pulling pressure
- Press in just enough to traction the superficial fascia without sliding
- Hold. Wait for a subtle tissue release or indication from the client
- Repeat in different directions and areas to address restrictions in the anterir, lateral, and posterior cervical areas.

SUPINE DETAILS - Thoracic Outlet

6. Upper chest: warming and softening

- Address pectoralis major and pectoralis minor
- BMT: unilateral ribcage compression and mobilization
- BMT: bilateral upper ribcage compressions
- BMT: shoulder mobilizations with pectoral compressions
- Swedish: effleurage, kneading, fiber spreading, stripping, and skin rolling
- Deep tissue: compressive effleurage
- Deep tissue: superficial friction
- Deep tissue: deep friction and melting
- Continue until the muscles are thoroughly warmed and softened

SUPINE DETAILS - Thoracic Outlet

7. Pectoralis minor: deep longitudinal stripping

- Address all three bellies from coracoid process to ribs 3, 4, and 5
- This area can be tender, so adjust pressure accordingly
- Use thumbs or fingertips with hands stacked for stability
- Work inferiorly in 2 to 4 inch sections
- Melt in or repeat stripping in areas of palpated or reported tension
- Progressively work more deeply as tissues soften
- Immediately stop if neurovascular symptoms are reproduced

SUPINE DETAILS - Thoracic Outlet

8. Pectoralis minor: pin and stretch

- Immediately stop if neurovascular symptoms are reproduced
- This area can be tender, so adjust pressure accordingly
- Stand at the head of the table facing toward the feet
- Use thumbs or fingertips with hands stacked for stability
- Make positive contact with pectoralis minor, checking to see if neurovascular symptoms are exacerbated by this contact
    - "Keeping your arms alongside your torso, reach as far down toward your toes as possible" (scapulothoracic depression which concentrically contracts the pectoralis minor)
- Pin the pectoralis minor: apply pressure to pectoralis minor that is moderate to significant but within the client's comfort tolerance
    - "Bring your shoulders up toward your ears" (scapulothoracic elevation which lengthens the pectoralis minor)
- As the client does this, maintain your position and pressure
- **Variation: strip inferiorly as the client elevates the scapula**
- Repeat to address tension in all three bellies of pectoralis minor

SUPINE DETAILS - Thoracic Outlet

9. Anterolateral neck: warming and softening

- Address the anterolateral neck one side at a time
- Specifically, SCM, scalenes, levator scapula, and upper anterior trapezius
- BMT: head & neck rotation with posterior cervical compressions & release
- BMT: alternating scapular depression with trapezius compressions
- Swedish: effleurage, and broad cross-fiber with one thumb
- Continue until the muscles are thoroughly warmed and softened

SUPINE DETAILS - Thoracic Outlet

10. Scalenes: deep longitudinal stripping

- While working in this area, be cautious of:
  - Carotid artery and jugular vein (vascular structures)
  - Trachea (respiratory structure)
  - Cranial nerves (neural structures)
- Address the accessible portions of anterior and middle scalenes
- Roll head slightly away from the area to be addressed
- Use fingertip of first 2 fingers to work in 2 to 4 inch sections
- Work inferiorly to best avoid loosening any blood clots
- Melt in or repeat in areas of palpated or reported tension
- Progressively work more deeply as tissues soften

SUPINE DETAILS - Thoracic Outlet

11. Scalenes: deep longitudinal stripping with active lengthening after PIR

- Warning: Vertebrobasilar insufficiency contraindicates this technique
- If the client is not comfortable with their head hanging off the end of the table, use a bolster or pillow under the upper back so there is room to move the head into hyperextension
- Instruct the client:
  - "Move past the head of the table to hang your head off the edge"
  - "Rotate it slightly to the left (right) as I support it with one hand"
  - (This results in the practitioner holding the client's head in one hand with it rotated to one side)
  - "Now take the weight of your head"
  - "Lift your head slightly and hold for 5-8 seconds" (isometric)
  - "Slowly relax your head" (post-isometric relaxation)
  - "Slowly lower your head toward the floor" (active lengthening)
- As the client does this, longitudinally strip the accessible scalene fibers inferiorly with your 2nd and 3rd fingers.

SUPINE DETAILS - Thoracic Outlet

12. Brachial plexus: mobilization

- Stand by the hips facing toward the head of the table
- Instruct the client:
  - "Keeping your nose pointing toward the ceiling, slide your head toward your left (right) shoulder" (lateral neck flex)
- Bring the client into this position:
  - Abduct the arm 90 degrees
  - Flex the elbow 90 degrees and hold it with your outside hand
  - Hyperextend wrist and fingers with your inside hand so that the fingertips are pointing inferiorly.
  - Holding this configuration, bring the arm and hand toward the client's ear.
- <u>Do not hold the client in this final stretch position</u>
- Bring the arm back to neutral and repeat several times

SUPINE DETAILS - Thoracic Outlet

13. Neck passive stretches: lateral flexion

14. Neck passive stretches: rotation

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