360

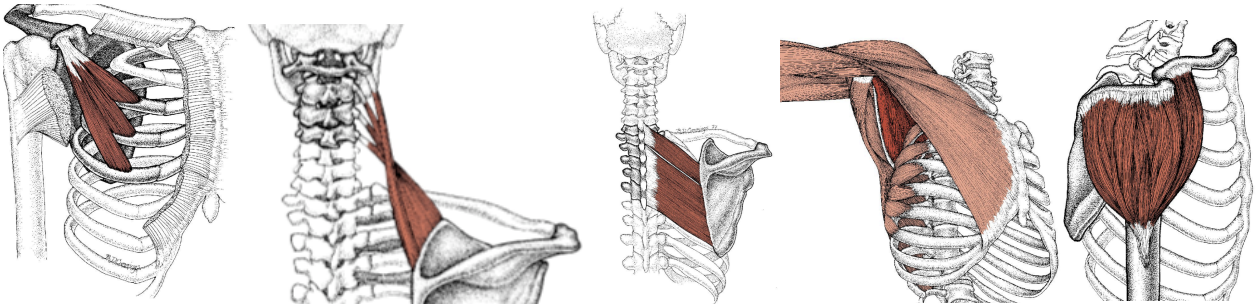
NEURO MUSCULAR THERAPY

problem solving massage

Integrating Manual Therapy & Soft-Tissue Techniques for Shoulder Dysfunction

Boston Sports Medicine Symposium

October 26, 2013



Katie Adams, CNMT, CMTPT
360 NeuroMuscular Therapy
35 Highland Circle
Needham, MA 02494

kadams@360nmt.com
@KatieAdams360
360nmt.com

If pain is a puzzle, we should not throw away pieces of the jigsaw just because we are obsessed with a preconceived single solution.

Patrick Wall (1925-2001)

NEUROMUSCULAR THERAPY

1. **Four Cornerstones of NMT**
    - Myofascial Trigger Points (TrPs)
    - Muscular Dysfunction
    - Neurological Influences
    - Postural / Biomechanical Dysfunction

2. **Solving Puzzles**
    - TrPs: diagnostic criteria
    - TrPs: rarely occur in isolation
        - Referral patterns
        - 'Cascades'
        - Functional Muscle Units (FMU)
            - Agonist / antagonist
        - Precipitating and perpetuating factors
            - Posture, habits, trauma, whiplash, ergonomics, stress, diet, fitness, biochemistry, hormones, medications, hypermobility
3. **Successful Outcomes**
    - The deactivation of TrPs
    - Stretching of the tight structures
    - Activation of the weak structures
    - Postural re-education and dynamic re-education
    - Revision of the patient's work positions, routines, habits
    - A home-care program with monitoring for compliance

TRIGGER POINTS: confirmation and manual deactivation methods for shoulder muscles

Manual methods of confirmation include, in order:

1. Presence of a taut band – found primarily by palpation
2. Presence of an exquisitely tender spot within the taut band – found with a combination of palpation and verbal feedback
3. Patients recognition of familiar pain – found only by verbal feedback

Additionally:

A. Local twitch response (LTR)
B. Painful end-range of stretch – found with passive ROM and verbal feedback
C. Referred pain that follows classic, documented pathways
D. Pain that eases after the pressure is relieved
E. Muscle dysfunction
F. Muscle weakness

Trigger Points: Palpation

- All palpation is performed perpendicular to the direction of the muscle fibers
- Flat palpation
- Pincer / Grasping palpation (muscle is held between the examining fingers and pulled through or rolled between the fibers, as per the upper fibers of trapezius).
- Seek out taut bands: may be thread-like in some muscles or thick bands in others.
- Local twitch response
- Ask patient to describe any sensations (pain or tingling) that occur away from the palpating fingers.
- Ask patient if pain is familiar

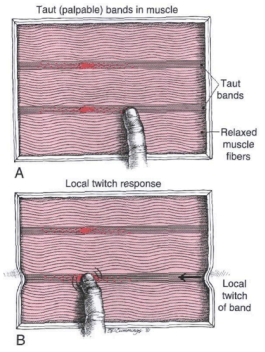


Figure 3.6. Longitudinal schematic drawing of taut bands, myofascial trigger points (*dark red spots*), and a local twitch response seen in longitudinal view of the muscle (*light red*). **A,** palpation of a taut band (*straight lines*) among normally slack, relaxed muscle fibers (*wavy lines*). The density of *red stippling* corresponds to the degree of tenderness of the taut band to pressure. The trigger point is the most tender spot in the band. **B,** rolling the band quickly under the fingertip (snapping palpation) at the trigger point often produces a local twitch response that usually is most clearly seen as skin movement between the trigger point and the attachment of the muscle fibers.

Travell & Simons Volume 1

Trigger Points: Deactivation (compressive force techniques)

- Directed pressure onto the densest part of the taut band
- Static component; gently press and hold for at least 15-20 seconds & to up 2 minutes
    - Ask for patient help with angles and accuracy, and referred pain occurrence
- Active component: compression with active contraction (CoCo); ask for a small repeated pulsing action of the muscle

Myofascial Reinforcement Techniques (mostly tensile / shearing force techniques)

- Opposing thumb glides starting at the actual trigger point location
- Repeat many times *along* the line of the muscle fibers
- Lubricated Neuromuscular Glides in multiple directions using a lotion
- Broad cross-fiber friction on muscle belly or vigorous XFF on attachments
- "Muscle play" Separation of inter-muscular divisions or fascial compartments

Other Techniques

- Prolonged specific compression along with directed client active movements
- Global joint stretch
- Post-Isometric Relaxation
- Muscle Energy or Contract/Relax techniques
- Reciprocal Inhibition

Homecare Activities

- Self-help pressure on balls and rollers
- Contrast hot/cold
- Sleep hygiene, breathing optimization, relaxation techniques
- Stretching & NeuroMuscular Re-education as per PT prescription

Soft Tissue Technique live demonstration for the 'shield' of the shoulder

At least eleven muscles refer pain into the shield region (mid-delt)

Trigger point referrals from these muscles can mimic pain and/or contribute to dysfunction associated with diagnoses such as bicipital tendinitis, bursitis, sub-acromial impingement syndrome, rotator cuff tears, labral tears, ligamentous sprains, adhesive capsulitis, et al.

- Deltoid
- Supraspinatus
- Infraspinatus
- Teres minor
- Subscapularis
- Teres Major
- Serratus anterior
- Corocobrachialis
- Biceps brachii
- Brachialis
- SPS
- Pectoralis minor

Manual Technique Videos for select Shoulder Muscles can be found at:
360NMT.com/resources.php

Discussion

Trigger Points can spread through the axial kinetic chain as a result of postural dysfunction and mechanical stress on muscle. Key TrPs can activate Satellite TrPs found within the referral zones. Overloaded agonists, antagonists or synergists can also develop TrPs as a result of mechanically stressed compensation within the functional unit.

Functional Muscle Units

FMUs are muscles working together to exert a force vector or to stabilize a part, either as agonists or synergists, or as antagonists in opposition. Muscles may have to compensate for other muscles containing TrPs. They themselves may develop TrPs (Gerwin 2001).

Treatment should address all the component parts of the functional muscle unit, including, in many cases, the seemingly unaffected extremity or side. Under-treatment or partial treatment of the muscle unit may result in an incomplete outcome.

Sample manual technique pages are attached.

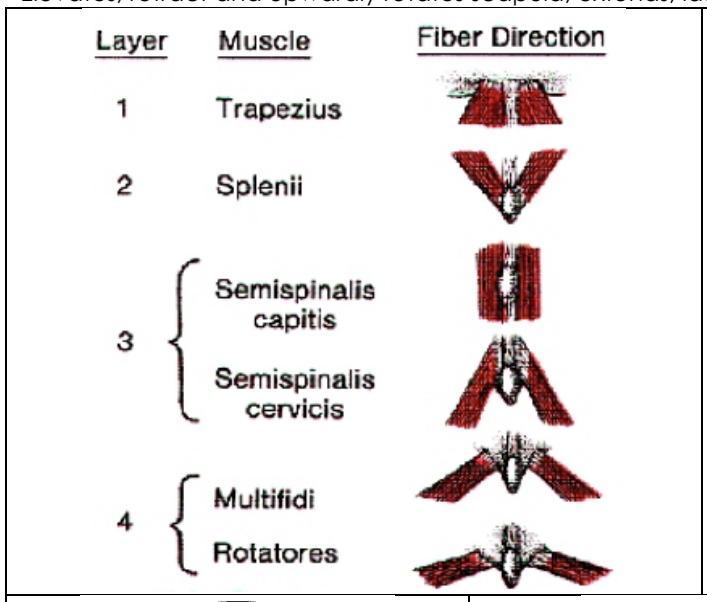
Video demonstrations can be found at:
360NMT.com/resources.php

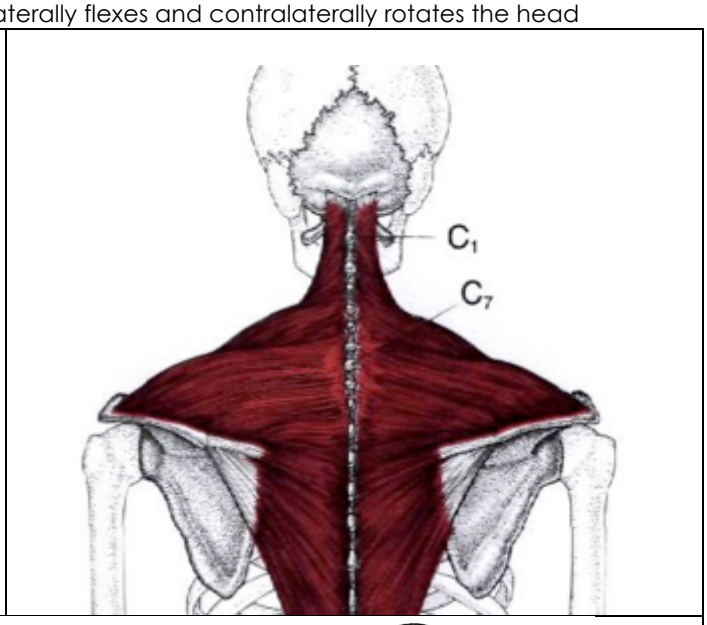
Research, Cases Examples, Workshops:
360NMT.com

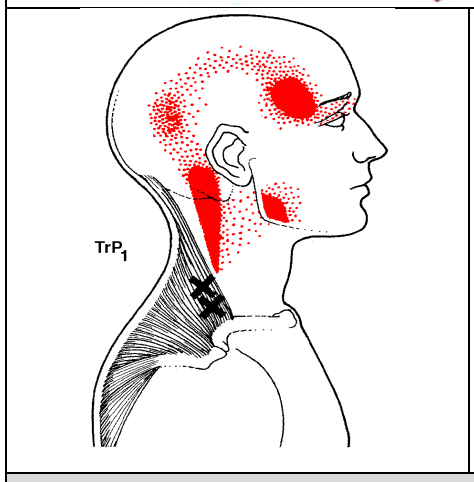
Manual Trigger Point and Dry-Needling Courses:
MyopainSeminars.com

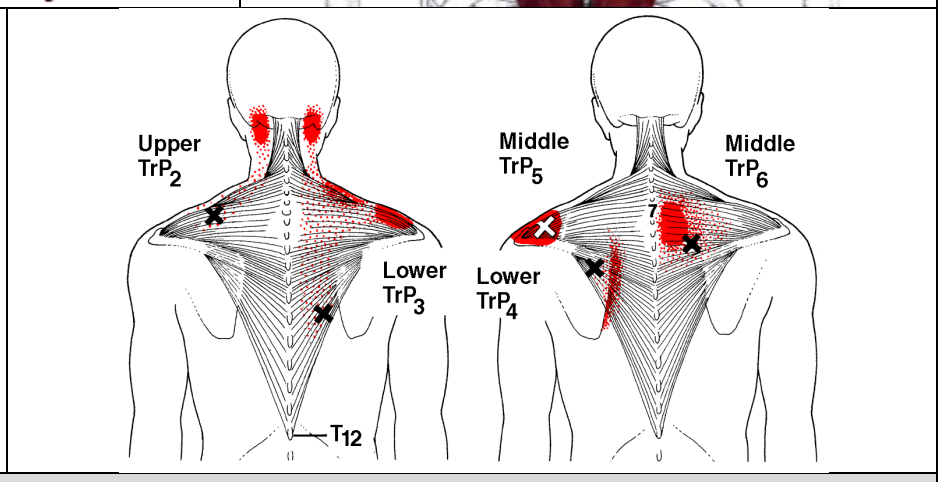
UPPER TRAPEZIUS

Elevates, retract and upwardly rotates scapula; extends, laterally flexes and contralaterally rotates the head

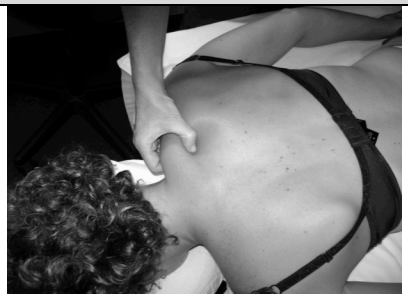








Upper Trap is considered the muscle most commonly found to have TrPs in the body.



Pincer palpation: compress upper trap from C7 to AC joint. "Uncoil" fibers by dragging fingers on anterior surface against thumb pressure

Apply static pressure to any trigger points found. Utilize contract & compress (CoCo) techniques.

Glide up towards occiput with thumb. Resist tissue with 2nd hand. Keep wrist low and thumb in line with wrist.

		
Glide – end position Remember that Up Trap is quite medial and attaches to occiput and nuchal ligament	Resisted Extension lift upper trap with one hand Cranial / caudal and horizontal friction at occipital protuberance	Manual Stretch
HOMECARE ACTIVITY (HCA); self-stretch, self-pressure (ball, roller, cane), gentle ROM & chin tucks		

Notes on upper trapezius:

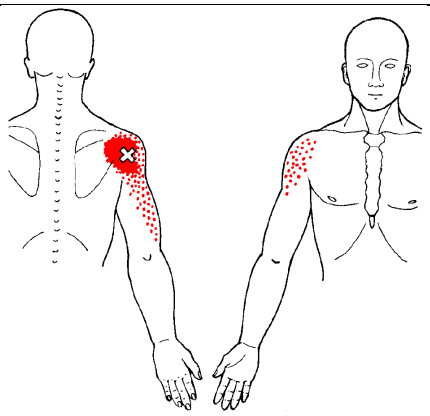
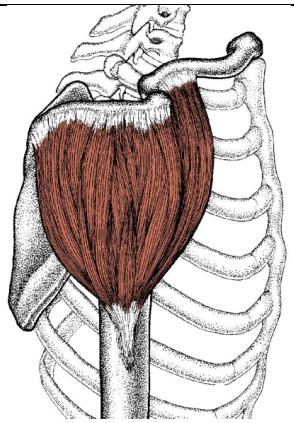
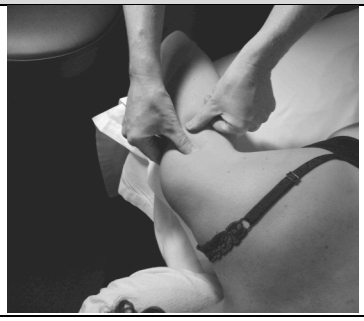
Toothpick size taut bands of upper trapezius at angle of neck produce noxious referrals into face and eyes. This is a very productive area to treat. Upper trapezius can be treated supine or prone.

Associated TrPs are often found in underlying supraspinatus and contralateral trapezius

Perpetuating Factors: habitual elevation of shoulders, stomach sleeping, backpacks, driving with hands on top of wheel, FHP, desk too high, cold weather, weakness.

For very sensitive patients: even pressure of a bra or clothing can exacerbate pain

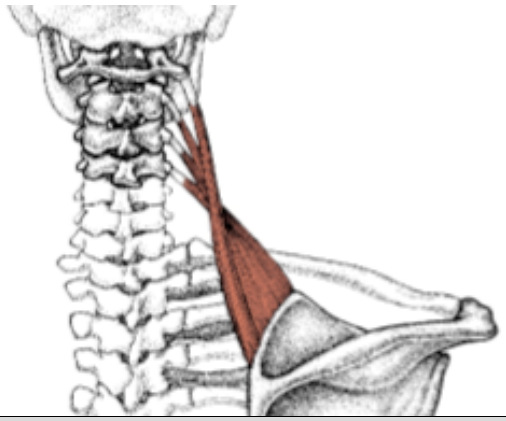
DELTOID

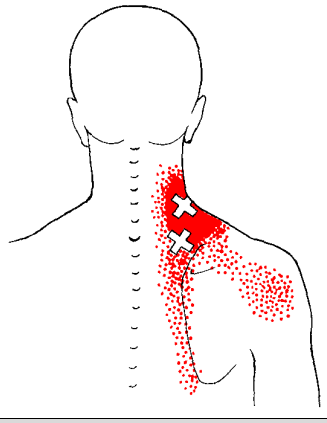
Functional Muscle Unit –FMU **Flexion: C'cob, clavicular head of Pec Maj. Long H of Biceps** **Extension: Long H of Triceps, Latissimus, Teres major** **Abduction: Supraspinatus**			
DEACTIVATION TECHNIQUES; static compression, compression with active muscle contraction (CoCo)			
Compression with active motion			
	Flat palpation	Pincer palpation	Search for bands in posterior
REINFORCEMENT TECHNIQUES; local stretch, MFR, NMT glides, pin & stretch, muscle play			
Reinforcement techniques			
	Opposing direction glides	Local Stretch	
Additional stretch or technique			
	Myofascial Manipulation	Manual stretching Note decompression	

LEVATOR SCAPULA

Elevates & downwardly rotates, assists extension of neck while helping to control flexion, lateral flex, ipsilatat rotation

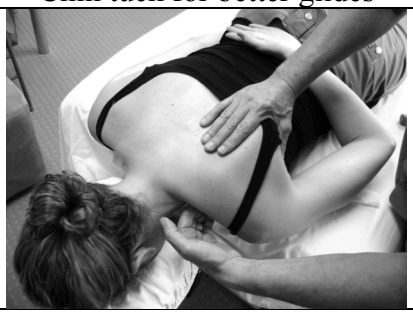
Note the spiral nature of the muscle, and the way it always found lateral to the transverse processes





PALPATION NOTE: The levator scapula is lateral to the lamina groove. It can be difficult to palpate the most superior aspect of the levator scapula that is deep to SCM.

Tip: slack SCM by slightly flexing, ipsilaterally rotating and laterally flexing neck.

		Use Broad contact with glides on the muscle belly at various levels.
Precise thumb compression on the C1-C4 transverse processes Gentle resisted elevation	With lotion, glide superiorly from upper angle of scap to TPs of C1-4 Chin tuck for better glides	XXF and Static Hold on superior angle
		To palpate anterior surface attachment on angle of scap: Passively move the scapula proximally and medially to put slack on tissue. Make sure to reach all the way around upper trap fibers to access correct point
Reverse direction and glide inferiorly	Treat anterior surface of superior angle of scapula	

NOTE: There are the two layers of the scapular attachment at medial border, and there might be a bursa in-between the anterior fibers and posterior fibers at medial border of scapula. It's often quite tender.

		
Muscle play **"DJ move on the record"** Active shrugging (resisted), rotation or extension of the neck in prone to separate LS from posterior scalene and Up Trap.	**Assisted Stretch** Thread the arm Head flexed, rotated and side-bent away. Do contract relax sequence.	**Self Stretch**
HOMECARE ACTIVITY (HCA); self-stretch, self-pressure (ball, roller, cane), exercise, movement		

Notes on levator scapula:

Differentiate referral patterns of TrPs from scalenes, rhomboids, supraspinatus and infraspinatus.

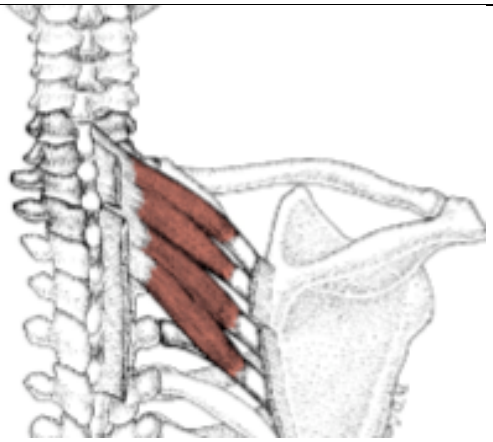
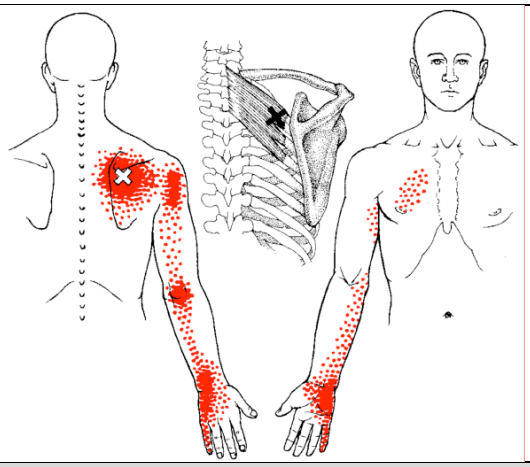
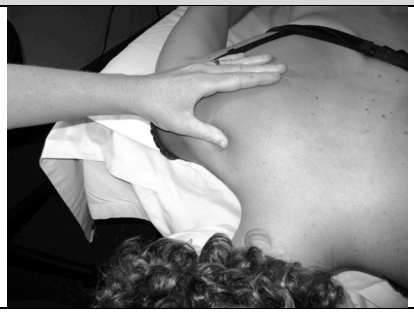
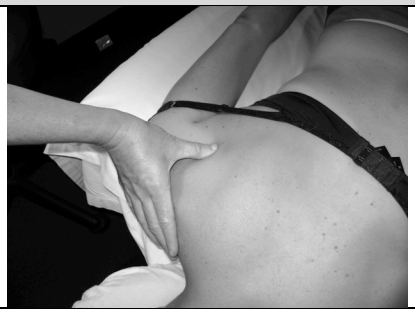
Anyone who works on a computer has a sore levator scap! Ergonomics are key!
Other perpetuation factors include: heavy purse, phone, crutches, FHP, whiplash, sitting in a chair with armrests too high.

Trigger points in levator scapula tend to produce a classic "stiff neck."

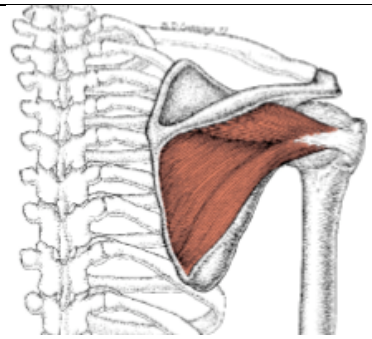
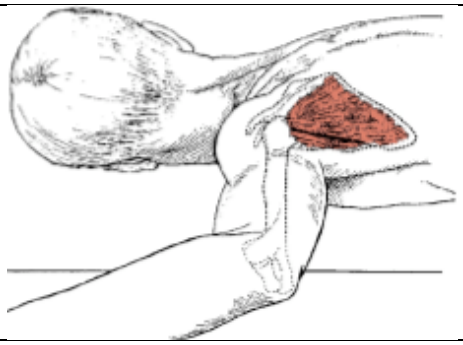
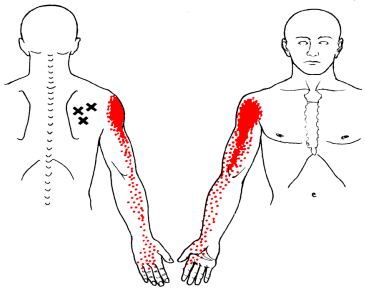
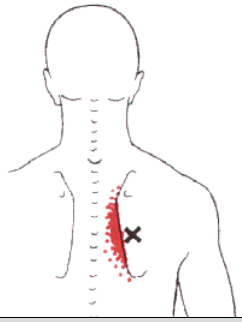
Myogenic Headaches (Fernandes de-las-Penas)

- The big three
  - **Trapezius 93%**
  - **SCM 69%**
  - Splenii 69%
  - Plus
    - **Levator scapulae 44%**
    - Semispinalis 35%
  - Note
    - Suboccipitals, Temporalis not mentioned

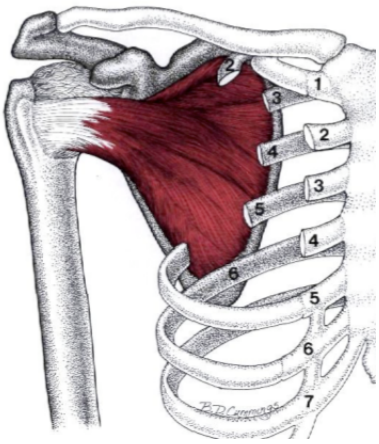
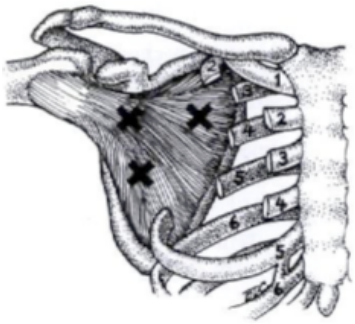
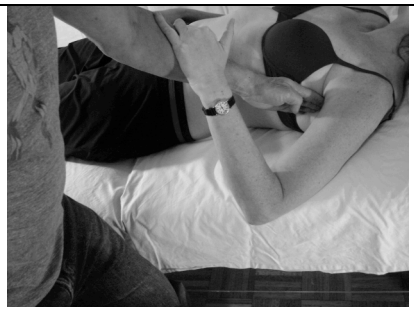
SERRATUS POSTERIOR SUPERIOR

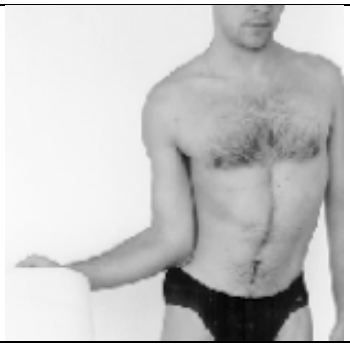
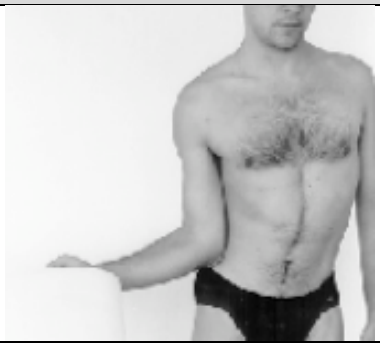
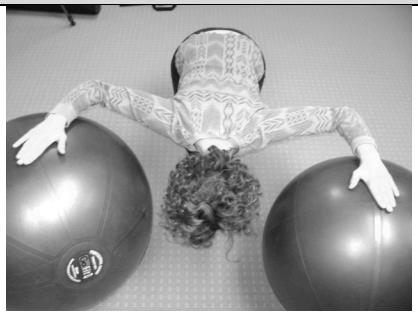
Note that SPS does not attach to the scapula **C7 – T3 (spans 4)** **Ribs 2-5** **SPS is active in 80-90% of all shoulder pain.** It is the sole cause of pain in 10%. (Travell)		
DEACTIVATION TECHNIQUES; static compression, compression with active muscle contraction (CoCo)		
Compression with active motion: **Ribs 2-5** **'sniff'**		
	Upper ribs	Ribs 4-5
		
	Alternative position with the arm off the front of the table	**Alternative position in side-lying**
REINFORCEMENT TECHNIQUES; local stretch, MFR, NMT glides, pin & stretch, muscle play		
Lubricated glide	As per rhomboids, but with deeper intent	
HOMECARE ACTIVITY (HCA); self-stretch, self-pressure (ball, roller, cane), exercise, movement		
	Lie supine with arm in full horizontal adduction, place ball or theracane between the medial border of the scapula and the spine. Fully exhale and hold the breath.	

INFRASPINATUS

Primary rotator cuff functions are centration and stabilization. **Rotational movements are secondary (Janda)**		
		
DEACTIVATION TECHNIQUES; static compression, compression with active muscle contraction (CoCo)		
Compression with active motion		
	Arm swinging internal to external	Arm rotating internal to external
REINFORCEMENT TECHNIQUES; local stretch, MFR, NMT glides, pin & stretch, muscle play		
Reinforcement techniques **Various soft tissue options**		
	Local Stretch – opposing thumbs	Myofascial Manipulation

SUBSCAPULARIS

		
DEACTIVATION TECHNIQUES; static compression, compression with active muscle contraction (CoCo)		
Static compression, followed by compression with active muscle contraction		
		
Side-lying –with active contraction	Supine – with active resisted contraction	Can do dynamic arm movement
REINFORCEMENT TECHNIQUES; local stretch, MFR, NMT glides, pin & stretch, muscle play		
Reinforcement techniques		
	Muscle play Separation of subscapularis from serratus anterior with various movements	

Reinforcement techniques **Manual stretch routines – assisted**		
	High position - picture should show bracing of the shoulder	Can also do in the low positon
HOMECARE ACTIVITY (HCA); self-stretch, self-pressure (ball, roller, cane), exercise, movement		
		For activation: Gerber's lift-off; laying prone, hand behind the low back, lift hand off the trunk.
Low position – contract / relax	**Self-stretch using balls in high position**	