

Manual Therapy: Early Intervention for Shoulder and Cervicothoracic Dysfunction

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Objectives

- Summarize prevalence of chronic pain in the SCI population and discuss lack of research for treatment
- Identify common impairments relative to the shoulder, scapula, cervical spine, and thoracic spine noted in patients with SCI
- Define functional dry needling and it's application in physical therapy treatment
- Explore techniques to treat shoulder and cervicothoracic pain and dysfunction using manual therapy and corrective exercise in the inpatient SCI rehabilitation setting
- Discuss two case studies incorporating manual therapy techniques, functional dry needling, and corrective exercise to address both pain and dysfunction in inpatient rehab plan of care

Pain in the Spinal Cord Injury Population

- Patients with SCI:
(Compared to US national norms)
 - Pain statistically and substantially greater
 - Overall pain not found to increase or decrease over time
 - EXCEPT shoulder pain found to INCREASE
- Cervicogenic pain often missed
 - Tetraplegia: 33%
 - Paraplegia: 13%

Table 2 Frequency and intensity of pain

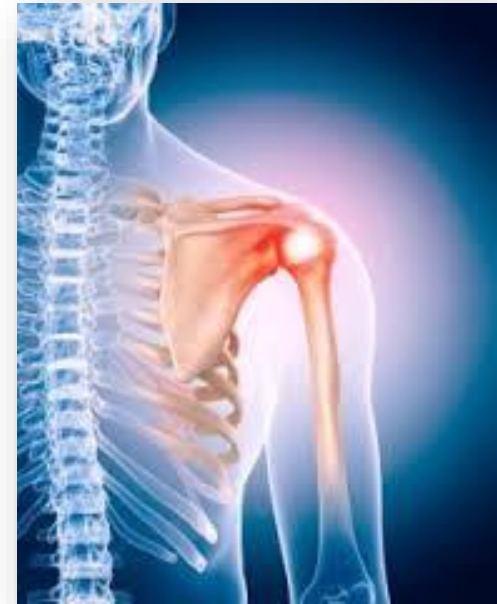
Percent reporting pain	79.6
<i>Percent with pain at specific pain sites</i>	
Neck	43.6
Shoulder	60.7
Back	58.1
Arms/hands	29.9
Buttocks/hips	47.9
Abdomen	37.6
Legs/feet	48.7
Intensity of pain (mean \pm SD)	5.08 \pm 2.32
Percent reporting mild pain	36.7
Percent reporting moderate pain	28.2
Percent reporting severe pain	32.5

CONSIDERATIONS IN THE SCI POPULATION:

- Wheelchair propulsion as 1^o means of mobility
- Multiple transfers throughout the day
- Quality of life
- High impact trauma (orthopedic and neurological)

SCI and Shoulder Pain

- Shoulder pain prevalence in SCI
 - 36-71%
- Subjects with tetraplegia have a higher incidence of pain than those with paraplegia
- Pain develops quickly in SCI, indicating it is not just from overuse
- Early onset of shoulder pain during inpatient rehab → predictive of chronic pain



SCI and Shoulder Pain

- Early onset of shoulder pain: most important predictor of pain later
- Inpatient rehab →
 - Need to be careful to avoid increasing shoulder pain
 - Focus on balanced shoulder training

“Shoulder strength and physical activity predictors of shoulder pain in people with paraplegia from spinal injury: prospective cohort study” (Mulroy 2015)

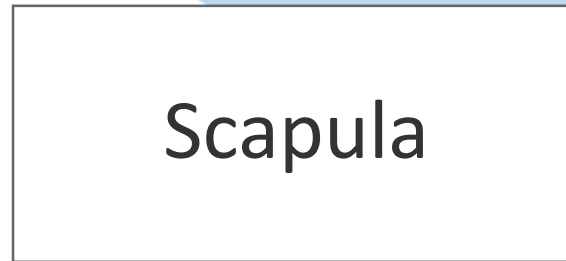
- 223 subjects with SCI
- 39.8% developed shoulder pain
 - Found to have weaker shoulder muscles, specifically adductors
 - This accounted for *only* 7.5% of variability
- It’s not just a strength issue!

Pain versus Dysfunction

- Need to differentiate site versus source of pain
 - “Where does it hurt?”
 - “Why does it hurt?”
 - Important to assess big picture
- Assessment: Both area of pain and joints above and below
 - Biomechanics
 - Strength and ROM
 - Pain pattern



Shoulder



Scapula



Cervical and
Thoracic Spine

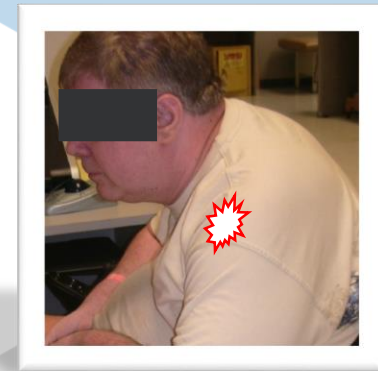
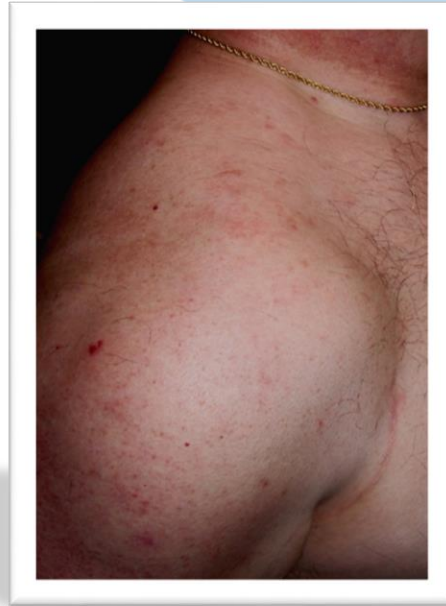


→ Additional Assessment/Tx Considerations:
Lumbar Spine, Sacroiliac joint, Hips

SHOULDER:

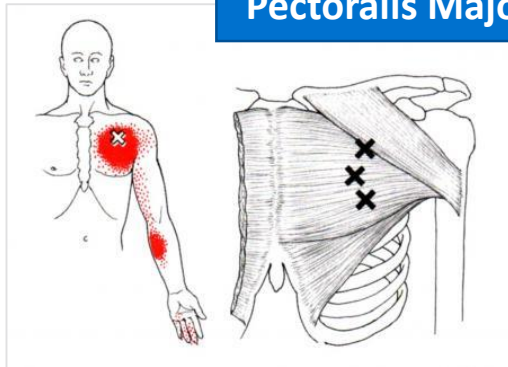
Common issues noted during inpatient rehabilitation

- Muscular imbalance
- Subluxation
- Subacromial impingement
- Forward, rounded posture/translated humeral head
- Posterior capsule tightness
- MTrPs
- Biceps Impingement, tendonitis

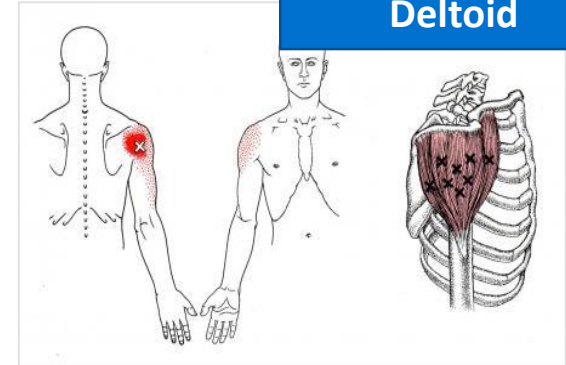


Trigger Point Referral Patterns: Shoulder

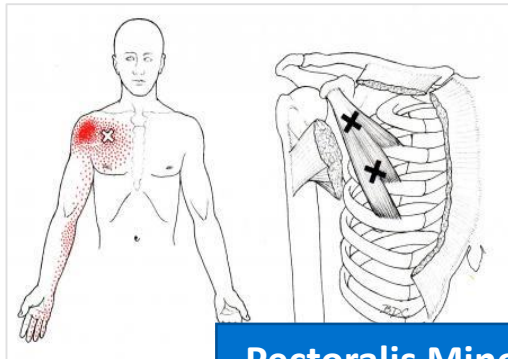
Pectoralis Major



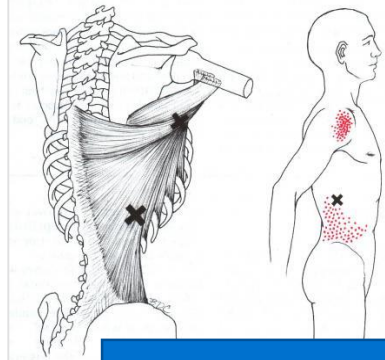
Deltoid



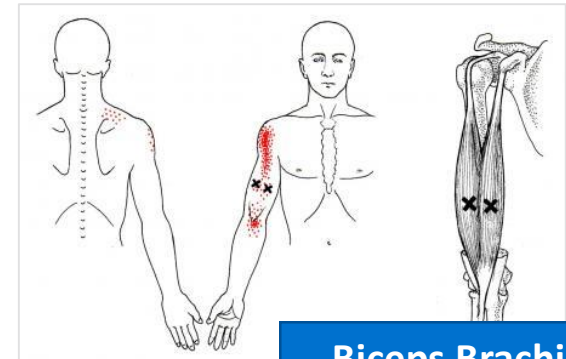
Pectoralis Minor



Latissimus Dorsi



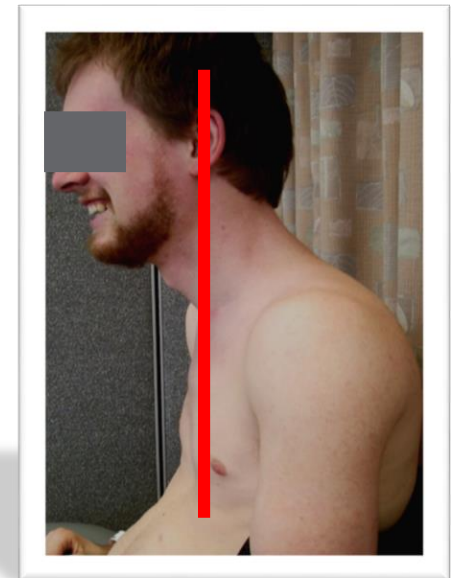
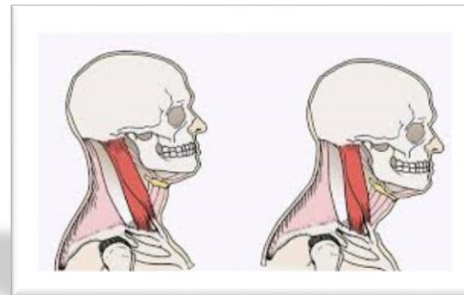
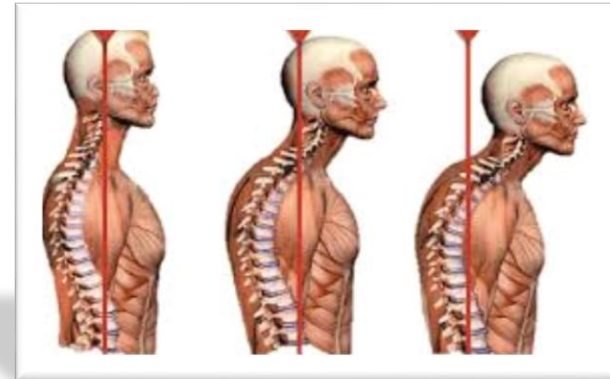
Biceps Brachii



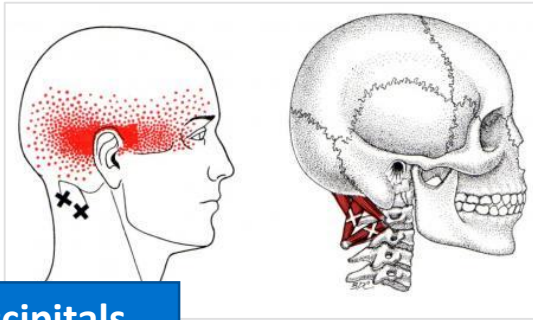
CERVICAL SPINE:

Common issues noted during inpatient rehabilitation

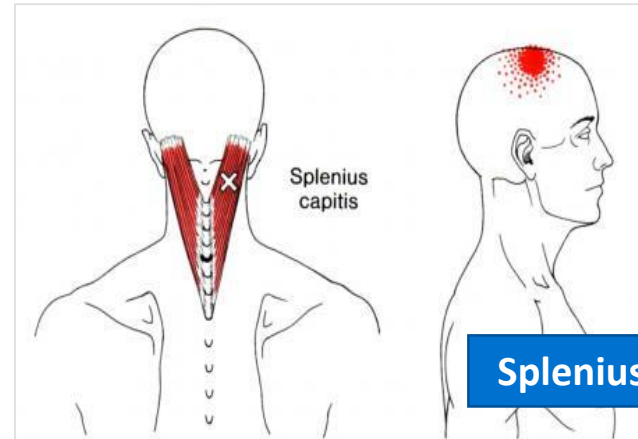
- Forward head
- ROM limitations
- Postural Asymmetries
- OA hyperextension
- Overuse of upper traps/
scalenes
- Neural tension
- Immobility: fusion, collar
- Referral headaches
- Active MTrPs



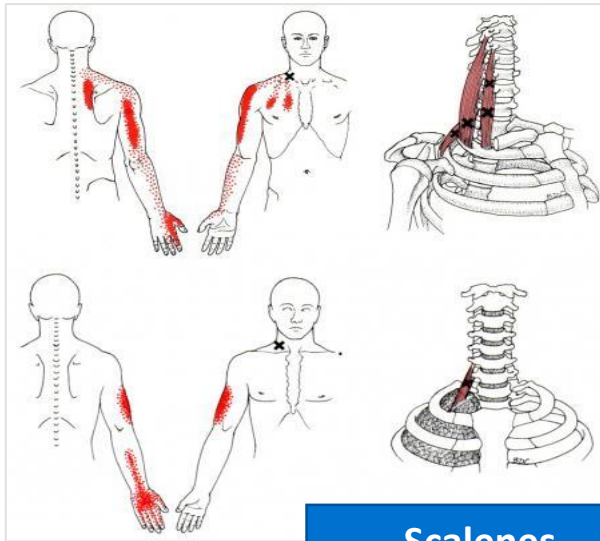
Trigger Point Referral Patterns: Cervical Spine



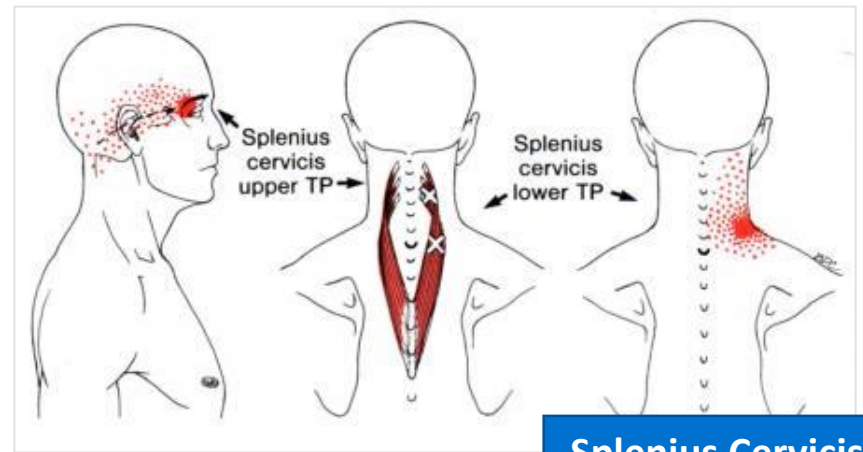
Sub occipitals



Splenius Capitis



Scalenes

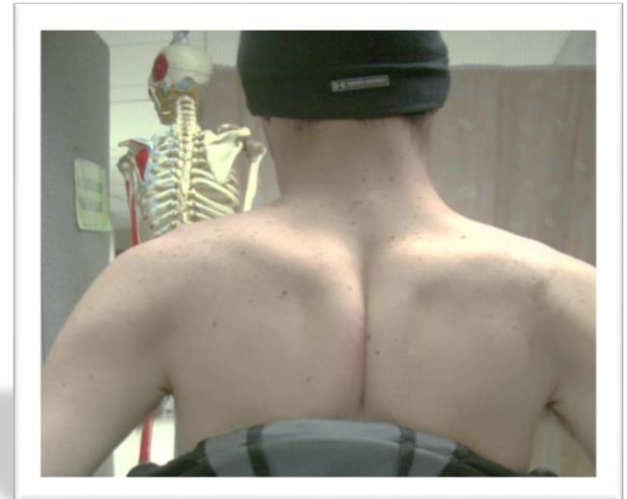
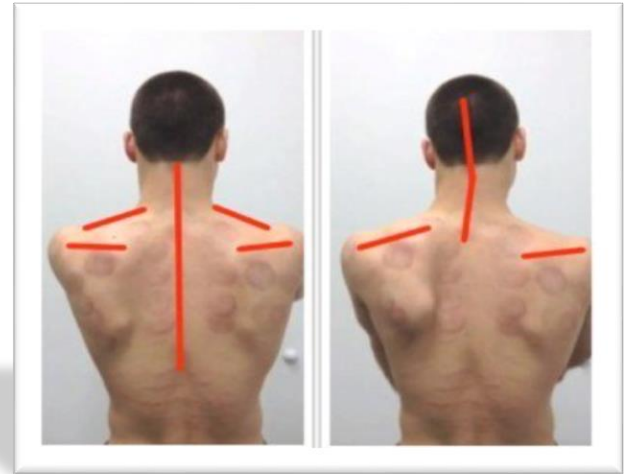


Splenius Cervicis

SCAPULA:

Common issues noted during inpatient rehabilitation

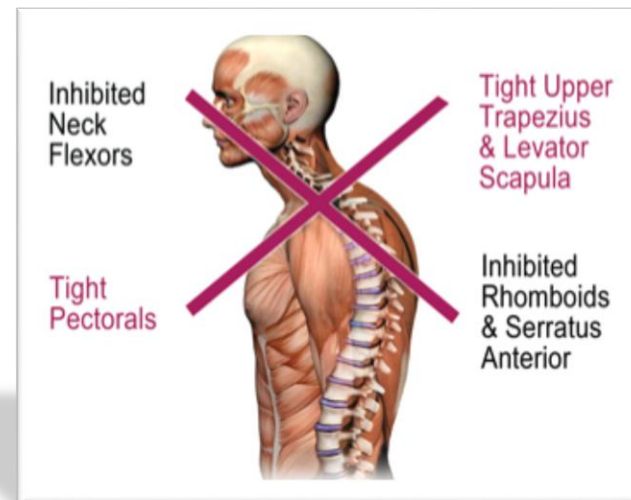
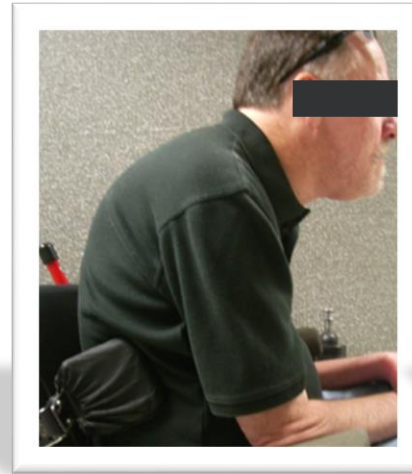
- Muscular imbalance
 - Tight pec minor, biceps short head
 - Weak (-) serratus anterior, lower/middle trapezius, rhomboids
- Postural Abnormalities
 - Scapular winging
 - Excessive scapular retraction
 - Scapular elevation
- Impaired scapular-humeral rhythm
 - Glenohumeral IR Deficit
 - Decreased scapular mobility
 - Posterior capsule tightness
 - Impaired proprioception
 - Acromioclavicular joint impairment
- Active MTrPs/Pain



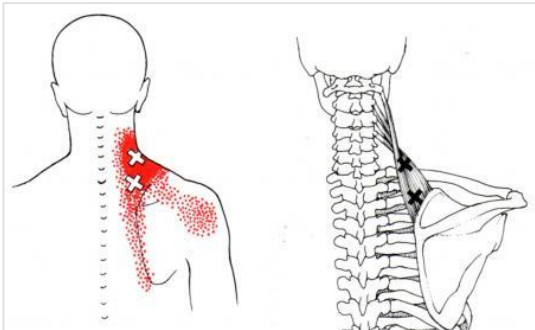
THORACIC SPINE:

Common issues noted during inpatient rehabilitation

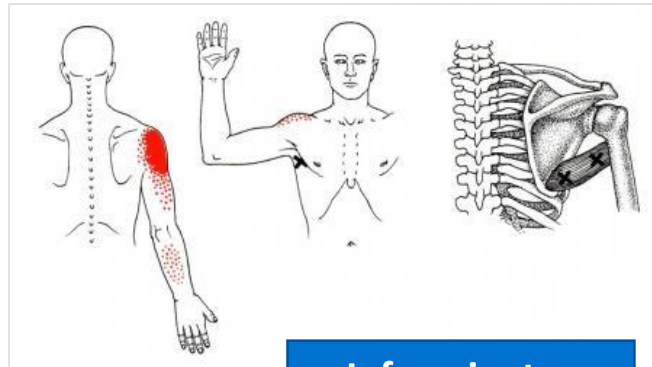
- Impaired mobility:
 - Rotation
 - Side bending
 - Extension
- Postural Asymmetries
 - Thoracic kyphosis
 - Upper Crossed Syndrome
- Impaired rib mobility
- Immobility
 - Spinal Fusion
 - Brace: TLSO, CTLSO, C-Collar
- Active MTrPs/Pain
- Referral Pain



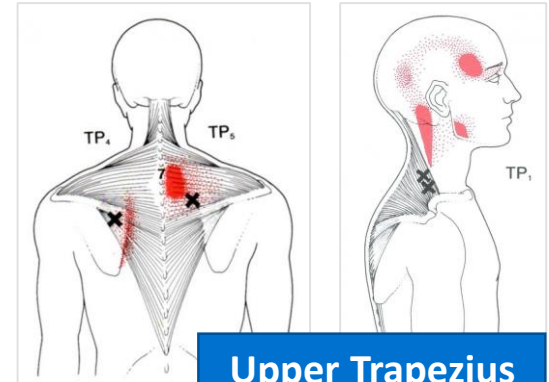
Trigger Point Referral Patterns: Scapula & Thoracic Region



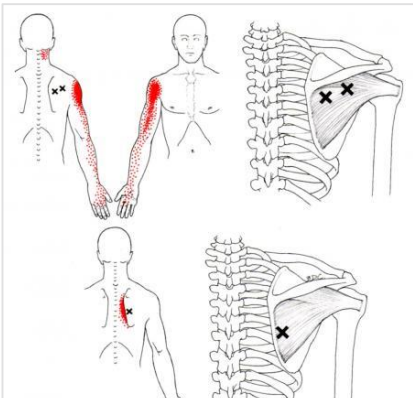
Levator Scapulae



Infraspinatus



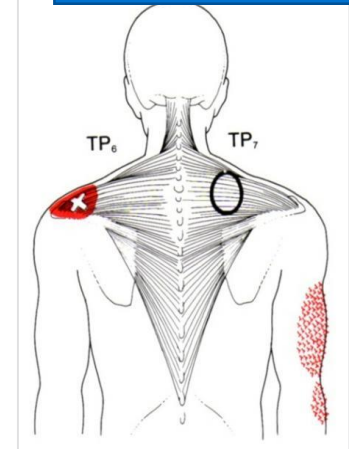
Upper Trapezius



Teres Major/Minor

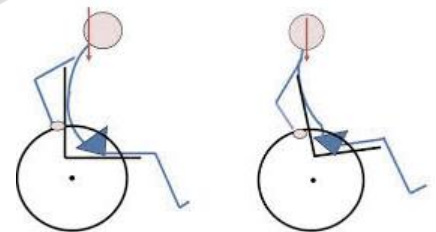


Supraspinatus



Interventions

- Manual Therapy
 - Shoulder and Scapula
 - Cervical spine
 - Thoracic spine and Rib cage
 - **Functional dry needling**
- Corrective Techniques & Exercise
 - Postural taping
 - Strengthening
 - Neuromuscular Re-education
- Other Considerations:
 - Wheelchair seating and positioning
 - External postural supports



Shoulder Manual Therapy

- Glenohumeral joint mobilizations
 - Inferior
 - Lateral
 - Posterior
- 1st rib mobilizations
- Biceps Tendon Transverse Friction Massage
- Acromioclavicular A-P Glides
- Sternoclavicular A-P or S-I glides



Lateral Distraction
(whole capsule)
↑ all motions



Posterior Glide
(posterior capsule)
↑ flexion, IR,
horizontal ADD



Caudal glide
(inferior capsule)
↑ abduction

Shoulder Manual Therapy

What's the evidence say?

- Manual therapy vs strengthening exercises alone:
 - Both led to decrease in pain, increase in function
 - Manual therapy led to significantly more improvement
- Shoulder mobilizations and mobilization with movement compared to therapeutic exercise:
 - Both manual therapy groups had decreased pain and increased function vs exercise only

Cervical Spine Manual Therapy

- Segmental joint mobility
 - A-P joint mobilizations
 - Side glides
 - Rotational joint mobilizations
- Occipital Release
- Soft Tissue, Transverse Friction massage
 - Scalenes
 - Sternocleidomastoid
- Upper limb neural tension
 - Can address this when C-spine is immobilized

“Management of a patient with shoulder pain and disability: a manual physical therapy approach addressing impairments of the cervical spine and upper limb neural tissue”

- Initial Assessment:
 - SPADI score 83%
 - 50° S' Flexion; 45° S' Abduction; 25° S' External Rotation
 - (+) ULTT
 - ↓ Segmental Mobility C5-6
- Treatment:
 - Segmental cervical mobilizations
- Results:
 - SPADI score 1.5%
 - S' ROM WNL

Thoracic Spine Manual Therapy

- Joint mobilizations of thoracic spine/rib cage
 - Rotation; (+) Breath Work
 - A-P
- Regional interdependence
 - Check joints above and below:
 - Above: Cervical, Shoulder, Scapula
 - Below: Lumbar spine, hips, SI joint



“The immediate effects of thoracic spine and rib manipulation on subjects with primary complaints of shoulder pain”

- 21 subjects with shoulder pain.
- Treatment: thoracic spine/rib cage manipulation
- Test-retest: immediate decrease in pain (51% on VAS), increase in shoulder ROM (30-38 degrees)

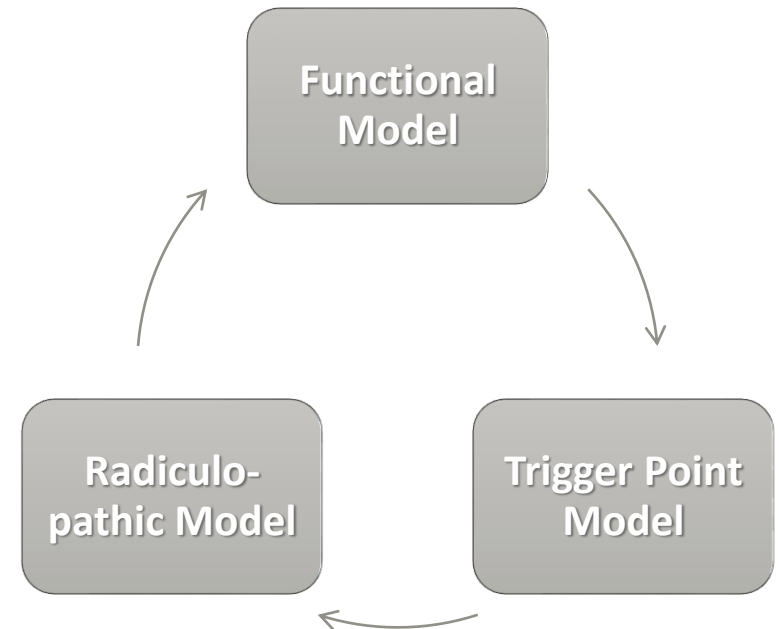
Functional Dry Needling

What is it & Where does it fit in?

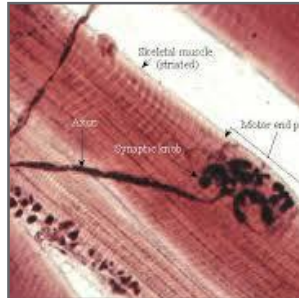
DEFINITION

Dry Needling is a skilled technique performed by a physical therapist using thin filiform needles to penetrate the skin and/or underlying tissues to *affect change in body structures and functions* for the evaluation and management of neuro-musculoskeletal conditions, pain, movement impairments, and disability

(Federation of State Boards of Physical Therapy, May 2015)

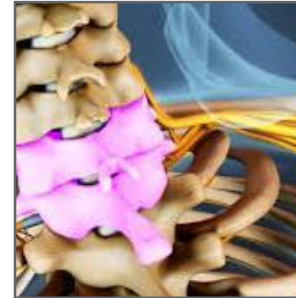


Current Dry Needling Practice Models



Trigger Point Model
Focus on tissue changes

Radiculopathic Model
Focus on the spinal segment



Functional Model
Focus on function; treating the
why not just the *what*

Physiological Effects of Functional Dry Needling

LEVEL OF CHANGE	INCREASE	DECREASE
Muscle Tissue	<ul style="list-style-type: none"> • Blood Flow • Restore sarcomere length and length/tension relationship 	<ul style="list-style-type: none"> • Muscle Banding • Spontaneous electrical activity
Biochemical	<ul style="list-style-type: none"> • B-Endorphin levels • Capillarity of Tissue 	<ul style="list-style-type: none"> • Nociceptive Sensitizing Agents: Substance P, CGRP
Central Nervous System	<ul style="list-style-type: none"> • Sensory stimulus drives gate control theory • PAG and Limbic Activation • Sympathetic Response 	<ul style="list-style-type: none"> • Changes in Neurotransmitters, cytokines, chemokines

↑ ROM

↓ PAIN

RESTORE FUNCTION

When is FDN *not* indicated for my patient?

CONTRINDICATIONS

- Consent denied
- 1st Trimester of pregnancy
- Uncontrolled anticoagulant usage
- Compromised immune system
- Local infection or tumor
- History of lymph node removal
- Occipital region of patients with Chiari Malformation
- Area over a cardiac pacemaker

RELATIVE CONTRAINDICATIONS

- Controlled Anticoagulants
- Post surgical but cleared by surgeon
- Autoimmune Disease
- History of lymph node removal with clearance from oncologist
- Respiratory illness (acute, subacute)

PRECAUTIONS

- Significant Cognitive Impairment
- Communication Barriers
- Needle aversion or phobia
- Metal allergy
- Severe hyperalgesia or allodynia
- Abnormal bleeding disorders
- Vascular disease
- Area of breast implant or spinal stimulator
- Area of laminectomy
- Post-Surgical
- Severe osteoporosis
- Scoliosis

KinetaCore Post Surgical Protocol:

- Do not treat local area of surgery with FDN for 12 weeks following surgery
- Do not use FDN for any tissue that has shared a vascular or lymphatic component to the area of surgery of 6 weeks following surgery

“Strength Exercises Combined With Dry Needling With Electrical Stimulation Improve Pain And Function In Patients With Chronic Rotator Cuff Tendinopathy: A Retrospective Case Series”

Estee Saylot-Pavkovich, PT, DPT, Cert. DN, Cert. SMT, Dip. Osteopractic, CIDN

- PURPOSE → Investigate DN to various non-trigger point-based anatomical locations coupled with strengthening exercises (SE) as a treatment strategies to decrease pain and increase function in patient with chronic RTC pathology.
- CASE DESCRIPTIONS → Eight patients with rotator cuff tendinopathy were treated 1-2x per week for up to 8 weeks. Outcomes were tested at baseline upon completion of therapy. Long term outcome measure follow-up averaging 8.75 months also performed.

Table 3. Demographic Characteristics of Patients with Chronic RTC Tendinopathy

Subject	Age (years)	Sex	Time Since Onset (days)	Number of Treatment Sessions Attended Weeks 1 4	Number of Treatment Sessions Attended Weeks 5 8
1	63	M	> 90 days	6	0
2	59	F	> 90 days	9	6
3	73	M	> 90 days	8	2
4	29	M	> 90 days	3	0
5	63	M	> 90 days	6	1
6	78	F	> 90 days	7	1
7	39	M	> 90 days	7	2
8	41	M	> 90 days	5	2
Average	55.62			9.75	1.75

Case Series → Intervention

Table 2. Strengthening Exercise Protocol

Variable	Intervention	Dosage	Illustration(s)
Strengthening Exercise Activities	1. Side-lying ER w/ Towel Roll	3 sets x 15 reps for all interventions.	See Appendix A for images of all exercises utilized in the case series.
	2. Supine Serratus Punch		
	3. Prone Horizontal Shoulder ABD at 100° FLEX & 10° ER. (V's)		
	4. Standing Shoulder FLEX (I's)		
	5. Standing Shoulder ABD (T's) with 10° ER.		
	6. Standing Full Can (V's) with 10° ER.		
	7. Standing Machine Shoulder EXT 90-0.		
	8. Standing Machine Rowing		
	9. Machine IR at 20° ABD.		
	10. Machine ER at 20° ABD.		
	11. Machine D1 FLEX & EXT.		
	12. Machine D2 FLEX & EXT.		

ER= external rotation; ABD= abduction; FLEX= flexion; IR= internal rotation; EXT= extension



Needle Number	Location
1	1.5 fingerbreadths medial to the medial acromial border angled inferior and slightly laterally.
2	Anterior "eye" dimple on the greater tuberosity (found by ABD the shoulder to 90 degrees).
3	Posterior "eye" dimple on the greater tuberosity (found by ABD the shoulder to 90 degrees).
4	1 fingerbreadth superior to the midpoint scapular spine angled inferior and posterior.
5	Deltoid tuberosity attachment on the Humerus.

Case Series → Outcomes

Table 1a. Outcome Measure Means for All Subjects

Outcome Measure	Mean for 8 Subjects
QD Initial	43.09
QD Final	16.04
QD Follow Up	6.59
VAS (mm)	
<i>Initial:</i>	
Best	22.5
Current	28.36
Worst	68.88
VAS (mm)	
<i>Final:</i>	
Best	2.36
Current	5
Worst	13.25
VAS (mm)	
<i>Follow Up:</i>	
Best	0.36
Current	4.88
Worst	17.88

QD= Quick DASH
VAS= Visual Analog Scale

- ❑ 8/8 patients improved shoulder ABD and ER MMT scores to 5/5
- ❑ 8/8 patients reported improvements in sleep
- ❑ 8/8 patients returned to independent exercise without limitation from shoulder pain

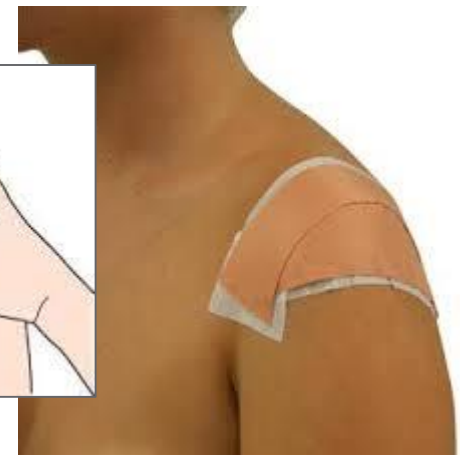
CONCLUSION

Clinically meaningful improvements in pain and disability were noted with the intervention protocol

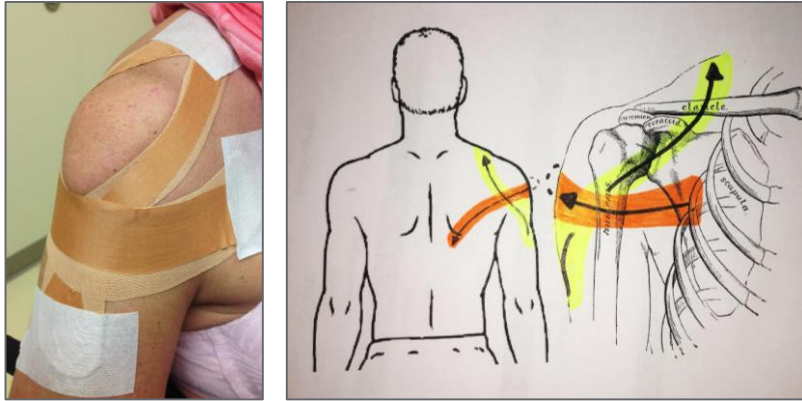
Study & Purpose	Participants & Methods	Outcomes	Results	Conclusion
“Inclusion of trigger point dry-needling in a multimodal physical therapy program for postoperative shoulder pain; a randomized controlled trial” (Arias-Buria et. Al. 2014)				
Objective is to compare the effect of dry needling and multimodal PT vs. PT alone in individuals who have undergone rotator cuff repair or proximal fracture repair	20 Patients experiencing post-op pain, 5 sessions <u>Control:</u> PT only; passive mobs, STM, strength and proprioceptive exercises <u>Experimental:</u> PT + DN DN applied in 1 st /5 sessions to palpated trigger points	Constant-Murley Score measured before each session and 1 week post final (5 th) session	PT + DN Group experienced significantly greater improvements in strength (28%, p<0.05) and ADLs (37.5%, p<0.001) No statistically significant differences in improvement of pain/ROM between groups found	Participants with post-op shoulder pain demonstrated significant improvements in strength, ROM, pain, and overall function following PT input, particularly if dry needling was included within the 1 st 6 months of rehab
“Effectiveness of dry needling for chronic nonspecific neck pain: a randomized, single-blinded, clinical trial” (Cerezo-Tellez et. Al. 2016)				
Aim of this study was to evaluate the effectiveness of DN on pain in people with chronic nonspecific neck pain attributed to MPS with active MTrPs in their cervical muscles, and to evaluate the effectiveness on DN on mechanical hyperalgesia, neck AROM, neck MMT, and perceived neck disability	128 participants total; 64 in each group; 4 sessions offered <u>Control:</u> Passive stretching to splenius cervicis, cervical multifidi, levator scapulae, trapezius <u>DN Group:</u> DN to identified MTrPs in above muscles followed by passive stretching	Visual Analogue Scale Pain Pressure Threshold Neck AROM/MMT (flex, ext, rot, SB) Neck Disability Index	Significant and clinically relevant differences found in favor of DN in all measured outcomes at both short and long term follow-up Mean Tx Sessions: Control: 3.6 DN Group: 3	Deep dry needling and passive stretching are more effective than passive stretching alone in people with nonspecific neck pain

Additional Interventions: Taping

- Purpose →
 - Subluxation
 - Anterior tilt of scapula
 - Anteriorly translated humeral head
 - Muscle inhibition or facilitation
- Technique:
 - Stretch
 - Increase proprioception
 - Provide positional stimulus through skin
 - Align fascial tissues
 - Decrease edema
 - Non-stretch
 - Protection
 - Joint support
 - Immediate pain relief



Additional Interventions: Taping



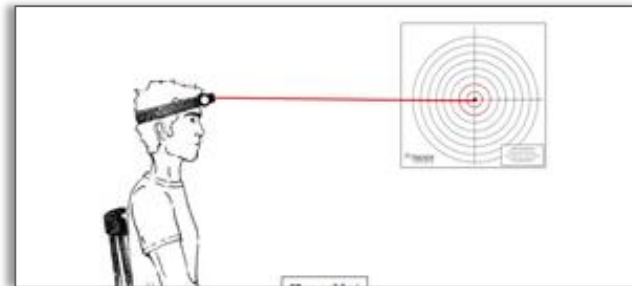
- Consider WHEN to apply
 - Postural Reinforcement
 - Pain free AROM with strengthening
 - Facilitation vs. Inhibition of muscles
- SCI Population
 - Possible proprioceptive effects
 - Compensation vs. Recovery

“The clinical efficacy of kinesiotape for shoulder pain: a randomized, double blinded clinical trial”

- Found to be immediately helpful (first 3 days of treatment) in increasing S' ABD ROM and decreasing pain
- May be useful to incorporate in early treatment of shoulder pain

Exercise & Neuromuscular Re-education

- Strengthening
 - Rotator cuff
 - Serratus anterior
 - Middle trap
 - Lower trap
 - Deep Cervical Flexors
- Stretching
 - **Posterior capsule**
 - Upper trapezius
 - Levator scapulae
 - Latissimus Dorsi
 - Pectoralis Major
 - Pectoralis Minor
- Neuromuscular Re-education
 - PNF
 - Biofeedback
 - Laser
 - Vibration Plate
 - E-Stim
 - Visual
 - Tactile/Manual



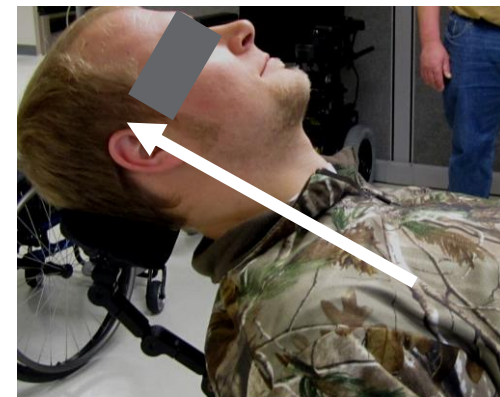
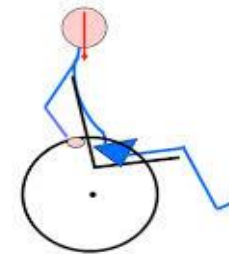
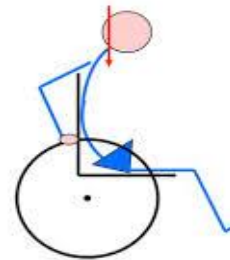
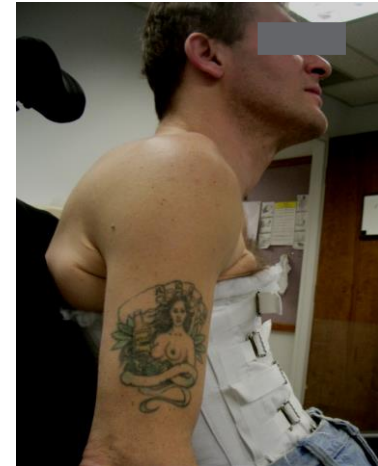
Proprioceptive Training with Laser



Prone on Elbows

Additional Interventions to Consider

- External Supports
 - Corset
- Wheelchair Positioning
 - Add structural support
 - Assess at rest *and* during function
 - Modify postural habits



CASE STUDIES (2)

Integration of manual therapy techniques and conventional treatment to address shoulder and cervicothoracic pain and dysfunction during inpatient SCI rehabilitation program

Case Study: G.C.

Patient:

- 23 year old female
- MMA Fighter; Highly Active
- No previous medical history

Mechanism of Injury:

- Fall from handstand position while participating in acroyoga
- Patient reports (-) LOC; Medical records report (+) LOC for minimum of 10 seconds
- Immediately lost motor function and sensation in bilateral UE/Les
- Loss of bowel/bladder control

ISNCSCI Exam = C1 AIS D

Diagnostic Imaging:

- Congenital absence of the C1 posterior arch
- Acute spinal cord injury at C1-2 with associated cord expansion and edema
- Small focus of hemorrhage within the cord at C2 and slight widening of the predental space measuring just under 4 mm
- Possible injury to the transverse ligament
- Mild discogenic degenerative changes C5-6
- CT angiogram: clear



Case Study: G.C.



Body System	Assessment
Bowel and Bladder	Independent
LE MMT	WNL
UE MMT	WFL
LE Sensation	Impaired
UE Sensation	Impaired
LE ROM	↓ hip extension, internal rotation to neutral
Posture	Elevated right shoulder/scapula; ↑ thoracic kyphosis; ↓ lumbar lordosis; posterior pelvic tilt

Functional Mobility	Level of Assist
Squat Pivot Transfer	Close supervision with use of hands
Sit to Stand Transfer	Contact Guard Assist
Ambulation	Contact Guard Assist – Min Assist
Balance	Fall Risk: FGA = 15/30 Sitting Balance: Independent Standing Balance: Contact Guard Assist

Treatment Session #1

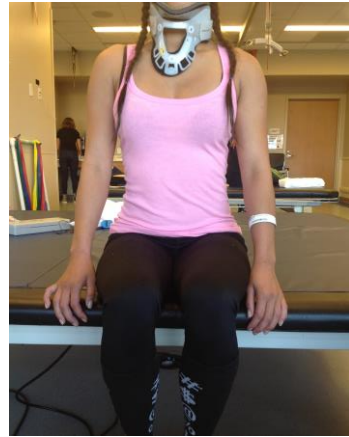
FDN	Manual techniques	Corrective Exercises
(R) Upper Trapezius with E-Stim	1 st Rib Jt. Mobs	Scapular PNF -AAROM
(R) Deltoid	Posterior Capsule Stretching	-AROM -Resisted AROM
(R) Latissimus Dorsi	Posterior and Inferior	Shoulder push-ups in side sit -AROM
(R) Teres Major	glenohumeral jt. mobs	-Isometric holds
(R) Infraspinatus	Scapular depression jt.	Anterior <> Posterior pelvic tilts in sitting
(R) Pectoralis Major	mobs	Short sitting with BUEs supporting behind trunk + Scapular retraction and depression AROM

Treatment Session #1

Anterior View

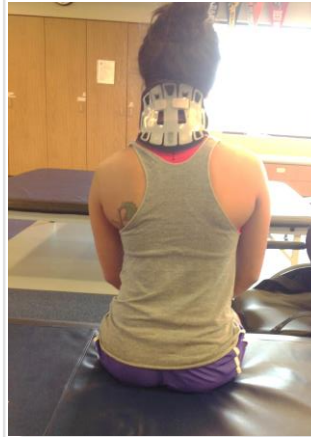


Pre

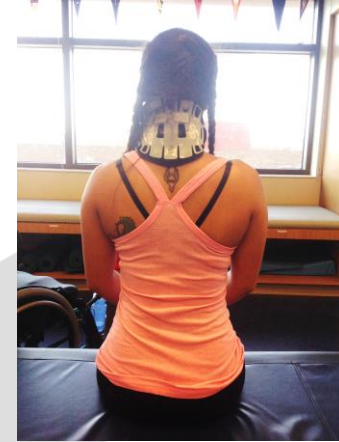


Post

Posterior View



Pre



Post

Treatment Session #2:

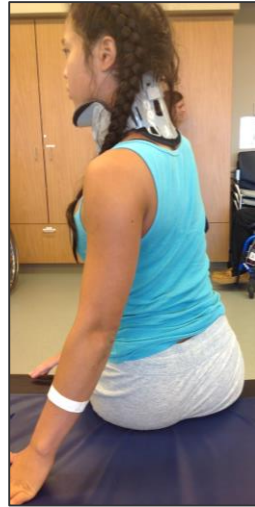
- Repeat of FDN/Manual Techniques/Corrective Exercises
- 2 days in between session #1 and #2

Treatment Session #3

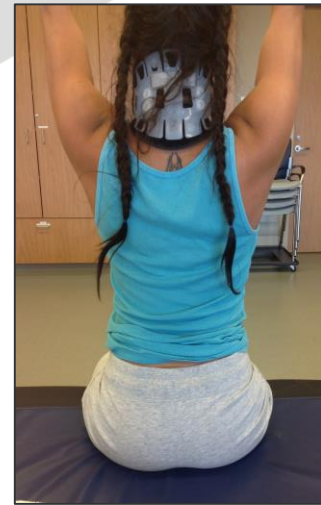
FDN	Manual techniques	Corrective Exercises
(R) Upper Trapezius (+) E-Stim (R) Deltoid (R) Latissimus Dorsi (R) Teres Major (R) Infraspinatus (R) Pectoralis Major (L) Gluteus Med/Min (L) TFL (B) L5, S1 Multifidus (+) E-Stim Circuit	1 st Rib Jt. Mobs Posterior Capsule Stretching Scapular depression jt. Mobs L1-L5 A-P Jt. Mobs Anterior Hip Mobs Thomas Test Stretch Thoracic rotation Jt. Mobs T1-10	Scapular PNF: AAROM, AROM (sitting, standing on foam) Anterior <> Posterior pelvic tilts in sitting Short sitting with BUEs supporting behind trunk + Scapular retraction and depression AROM AROM Trunk Rotation (+) Manual Resistance - Concentric/Eccentric Pelvic PNF: AAROM, AROM, (+) Resistance Tall Kneel: Eyes open/Eyes Closed Balance; Anterior <> Posterior Pelvic Tilts; Trunk Rotation AROM Half kneel: Eyes Open/Eyes Closed Balance; Unilateral hip hiking; Trunk Rotation AROM

Treatment Session #3

Pre



Post



Case Study: G.C.

Functional Mobility	
Functional Gait Assessment	23/30
Squat Pivot	Independent
Sit to Stand	Independent
Ambulation	Close stand by assist
Developmental Sequencing Positions	Sitting > Supine: no assist for neck support needed Sitting > Side lying: no pain Quadruped: can tolerate for 2-3 min without pain Prone: Can achieve position with pain; fear of moving neck

Postural/ROM Assessment
Elevated 1 st Rib; no change
Improved symmetry between R/L shoulder and scapula height
Improved rotation throughout thoracic spine
Bilateral hip extension 4-6 degrees (ROM)
Decreased left trunk lean and shift
Improved symmetry with scapular humeral rhythm

Case Study: J.G.

Patient:

- ❑ 33 y/o male
- ❑ Firefighter; Highly Active
- ❑ Past Medical History: T7, T8 compression fractures; (L) rotator cuff partial tear (2015)

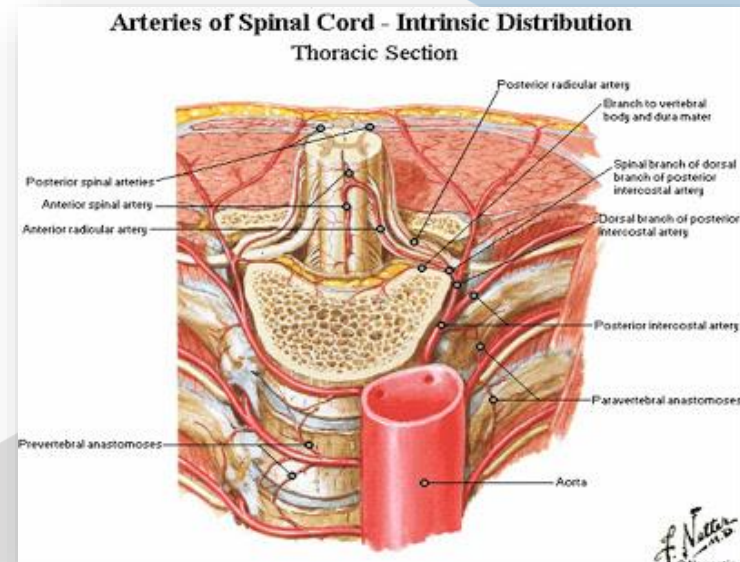
Mechanism of Injury:

- ❑ Fall on oryx horn that punctured (L) axilla resulting in immediate loss of sensation and motor function in his legs and trunk
- ❑ Suffered a left apical pneumothorax and left-sided pleural effusion due to the puncture
- ❑ Loss of bowel and bladder

ISNCSCI Exam = T4 AIS A

Diagnostic Imaging:

- ❑ MRI of his cervical, thoracic, and lumbar spine, showed a central cord infarction at the T2 and T3 levels with associated spinal cord edema
- ❑ CT of cervical, thoracic spine revealed chronic degenerative disc changes at C4-C7 with persistent kyphosis at C4-C5 and spondylosis at C6-C7



Case Study: J.G.

Test/Measure	Outcome	Pain
AROM	(L) Shoulder Elevation 104 degrees (L) Shoulder Abduction 110 degrees	(+) 2/10 (+) "Clicking" >90 degrees
PROM	(L) Shoulder Elevation 116 degrees (L) Shoulder Abduction 120 degrees (R) Trunk Rotation Limited 25-50%	(-) pain (+) "clicking" >90 degrees
MMT	5/5 WNL all shoulder muscles	(+) Shoulder ER 2/10
Shoulder Special Tests	(+) Impingement (+) Hawkins Kennedy	(+) 4/10 pain rating
Posture (sitting)	Thoracic Kyphosis Rounded Shoulders Forward Head Scapular Abduction, L>R (L) Shoulder Elevation Left Trunk Rotation	(+) Pain end of day at rest (+) Pain popping wheelie (+) AM muscle stiffness (+) Pain with overhead reaching on the left with "clicking" (+) Pain with floor transfers

Case Study: J.G.

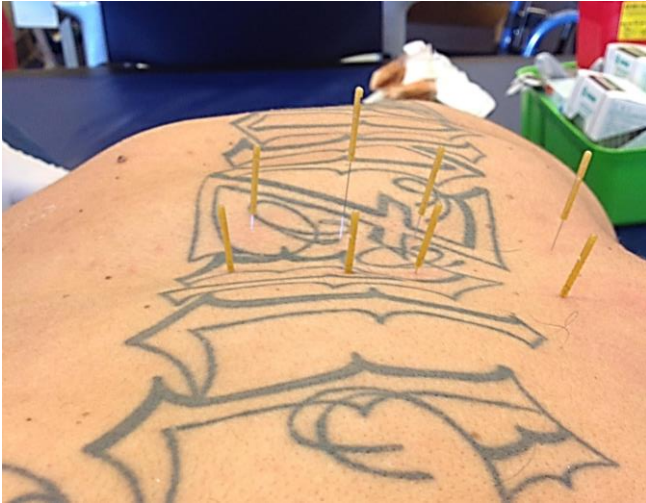
- **Initial Treatment:**

- FDN → (B) Upper Trapezius, (L) Latissimus, (L) Supraspinatus, (L) Infraspinatus, (L) Biceps, (L) Pectoralis Major
- Manual Techniques → Shoulder PROM, Posterior capsule stretching, Inferior glides of shoulder joint
- Corrective Exercise → Scapular PNF, Prone on elbows scapular and shoulder stabilization exercises, Rotator Cuff strengthening exercises

- **Outcome:**

- No change in subjective pain report with unlevel pop over transfers, initiating wheelie in MWC, overhead reaching, end of day pain/clicking

Treatment Session #1: Upper Thoracic



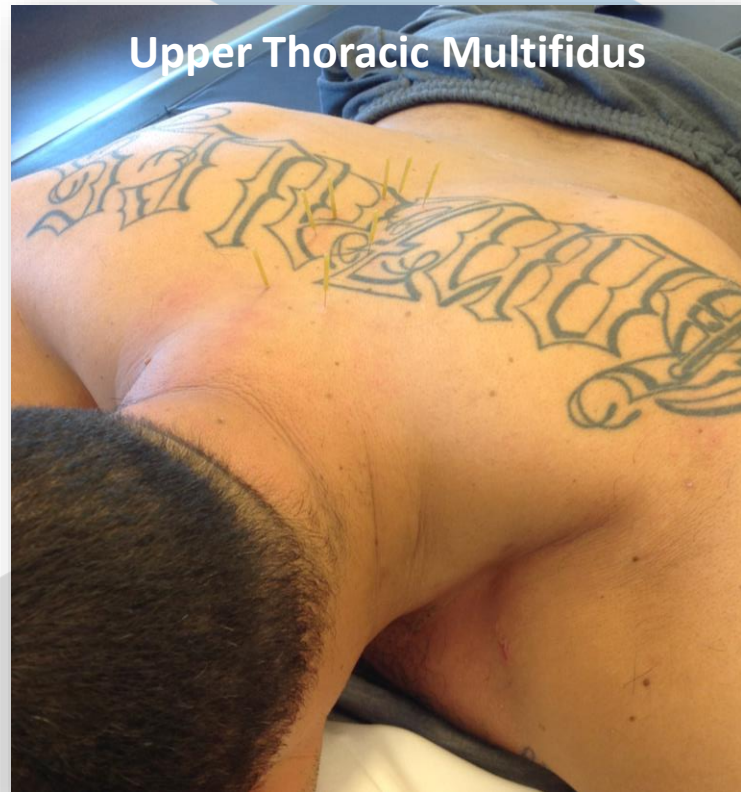
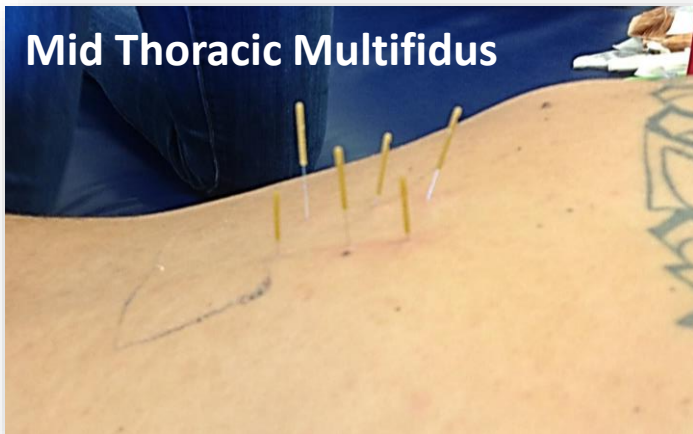
Treatment Details

FDN	T3-T6 Multifidus (+) E-Stim Bilateral Upper Trap, levator scapulae (L) Deltoid, Supraspinatus, Latissimus Dorsi, Teres Major/Minor
Manual Techniques	Thoracic rotation + extension jt. Mobs 1 st Rib Mobs (L) Posterior Capsule stretches (L) Posterior + Inferior Shoulder Jt. Mobs
Corrective Exercise	Trunk rotation AROM Scapular PNF AAROM, AROM, Isometrics Prone scapular push-ups AROM, Isometrics Prone and Seated Chin Tucks Rotator cuff strengthening exercises (L) Shoulder taping

Pre-Pain Scale: 5/10 with shoulder elevation
(+) “clicking” sensation 90-100 degrees

Post-Pain Scale: 1/10 end range shoulder elevation (+)
“clicking” sensation 90-100 degrees

Treatment Session #2



Additional Muscles Needed: Bilateral Upper Trapezius, Levator Scapulae, Sub-occipitals; (L) Latissimus Dorsi, Supraspinatus, Teres Major/Minor

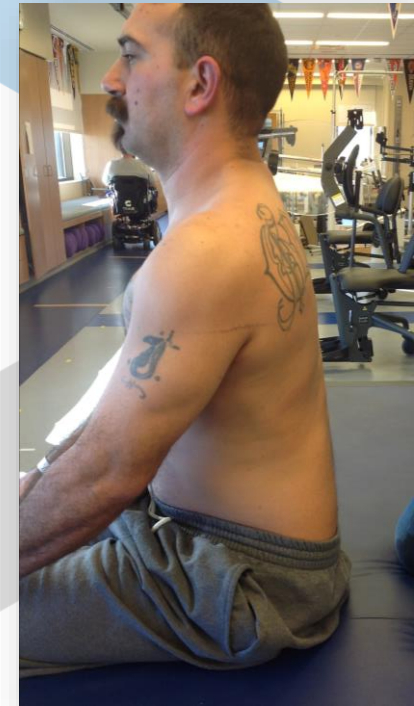
Case Study: J.G.



Baseline



Post Session 1



Post Session 2

Day 0

Day 7

Day 14

Case Study: J.G.

Test/Measure	Outcome	Pain
AROM	(L) Shoulder Elevation 118 degrees (L) Shoulder Abduction 122 degrees	(-) Pain (+) "Clicking" >90 degrees
PROM	(L) Shoulder Elevation 120 degrees (L) Shoulder Abduction 130 degrees (R) Trunk Rotation Limited <25%	(-) pain (+) "clicking" >90 degrees (+) Latissimus stretch
MMT	5/5 WNL all shoulder muscles	(+) Shoulder ER 1/10
Shoulder Special Tests	(+) Impingement (+) Hawkins Kennedy	(+) 1/10 pain rating
Posture (sitting)	Thoracic Kyphosis Rounded Shoulders Forward Head Scapular Abduction, L>R	(-) Pain end of day (+) AM muscle stiffness (-) Pain popping wheelie (+/-) Pain with floor transfers (-) Pain with overhead reaching on L; (+) "clicking"

Thank You

First Name Last Name

Email Address



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