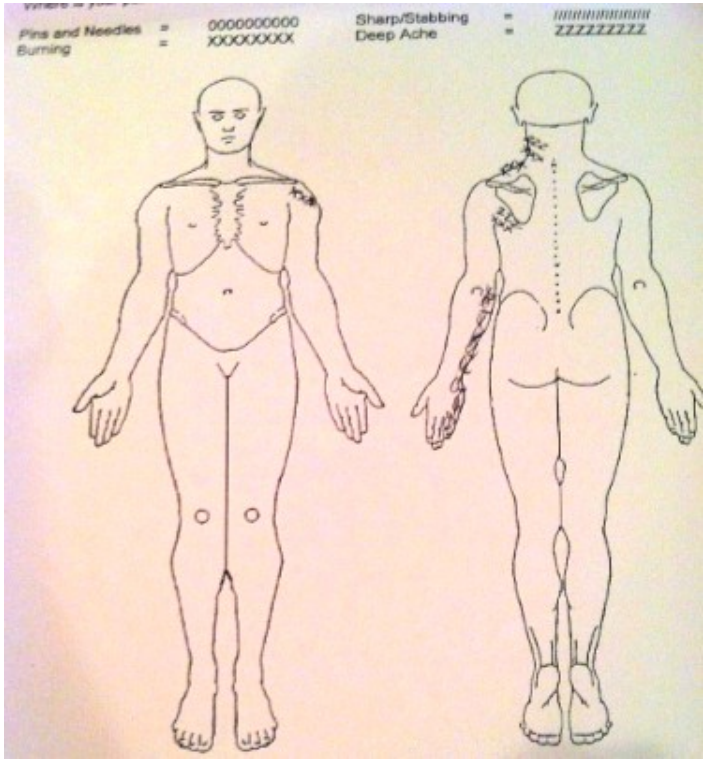
Clinical Reasoning Long Form

Pt: MH

2/5/2013

Body Chart - Initial Hypothesis:



- Outcome Tool/Measure: Quick DASH
  - MCID: 8
  - Score: 36 (93%)
- Outcome Tool/Measure: Quick DASH Sports/ Performing Arts Module
  - MCID: 8
  - Score: 81

- Cervical radiculopathy (C7)
  - Brachial plexus injury
- Peripheral nerve injury (ulnar)
  - GH Jt dysfunction
    - C6/C7 facet
  - AC joint injury
  - Upper trap strain

Subjective Exam

Subjective

- 36 year old female referred for left rotator cuff tear (supraspinatus), left shoulder pain, neck pain.
- Occupation: trades utilities (heavy lifting, flooring, painting, etc). Injured on job.
- L hand dominant

**Subjective Asterisks Signs/Symptoms **

-
  - aching and burning in L side of neck, down back, and to tip of shoulder
  - following injury (sitting in MD waiting room) had burning in neck and into shoulder with tingling, numbness in elbow and digits 4 and 5.
  - Anterior shoulder pain with overhead motions and behind back.
  - Mechanical signs/symptoms (popping) with overhead/behind back.
-
  - Lifting
  - Overhead activities

STRUCTURE at Fault

Joints in/refer to the painful region	**Myofascial tissue** in/refer to the painful region	**Non Contractile tissue** in/refer to the painful region	**Neural tissue** in/refer to the painful region	Other structures that must be examined - **non MSK**
- Glenohumeral - 1st Rib - Cervical Spine (C7/C8) -AC joint -Elbow - Wrist	- Upper trap - Biceps - Pec - Supraspinatus - Scalenes	- Labrum - GH superior ligaments - Inferior capsule - AC ligaments	- Brachial plexus (C7) - Cervical nerve root - Ulnar nerve - Double crush?	

Primary HYPOTHESIS after Subjective Examination: **GH pathology – traction injury with biceps/labral involvement.**

Differential List

(List in ranking order to screen/clear – Rule out)

- Cervical spine
- Brachial plexus injury
- Peripheral nerve involvement
- TOS
- GH
  - Impingement (Neer, H-K to rule out).
  - RTC pathology (Drop Arm, Painful Arc, Lift Off, Infraspinatus MMT, ER Lag sign, Belly press,
  - Instability (Sulcus Sign, Load and Shift, Apprehension)
  - Labral pathology (**Speeds, Active Compression**, Biceps Load II, Compression/Rotation, Crank, Anterior Slide).

** Physical Exam “Asterisks” Signs/Symptoms**

(Special Tests, Movement/Joint Dysfunction, Posture, Palpation, etc.)

- Cervical
  - R SB (active and passive): burn in L lateral neck, shoulder, down arm.
- GH
  - MMT: Scaption, abduction: strong/painful.
  - AROM: min pain with flexion, abd
  - (-) Drop Arm, painful arc, Lift off, Infraspinatus MMT
  - (-) Apprehension, Load and Shift
  - (-) Compression/Rotation, Speeds, Biceps Load II
- Elbow:
  - MMT: Flexion: strong/painful at biceps tendon
- Palpation:
  - Painful – Biceps tendon, subscap insertion, supraspinatus insertion, upper trap
  - 1st rib (tender; minimally elevated)
  - Minimal hypertonicity of pec
- Neuro
  - (+) ULTTA
  - (+) ULTTA 3
- Sensation: Sharp touch: diminished C8 dematome
- Posture: Rounded shoulders; minimally increased tone in pec.

- **Traction injury of ulnar nerve or lower trunk of brachial plexus.**

Assessment rating of Severity and Irritability

- **Severity:** Non Min **Mod** Severe
  - Minimal pain (2/10)
  - No current neurological symptoms at rest
  - Hasn't worked since injury (1/10/2013).
  - Quick DASH: 36. Sports/performing arts: 81.

- **Irritability:** Non **Min** Mod Severe
  - Neuro symptoms only provoked with lengthening of nerve and diminish when out of position.
  - Minimal pain with active GH elevation which diminishes immediately following motion.

Stage and Stability?

- Acute **Subacute** Chronic Acute on chronic

- Stable **Improving** Worsening Fluctuating Red Flags

- Are the relationships between the areas on the body chart, the interview, and physical exam consistent?
  - "Do the "Features Fit" a recognizable clinical pattern?"
- No, the subjective and objective asterisk signs do not fit a clinical pattern and lead to different hypotheses.
  - Subjective history: GH pathology due to traction injury involving biceps and labrum.
  - Physical Exam: Neural traction injury

Continued assessment needed.

- Thoughts on given findings and/or differential diagnosis?
- Additional tests/measures to further differentiate between diagnoses?
- Thoughts on inconsistencies between subjective vs. objective exam?

Identify any potential risk factors

(Yellow, Red flags, non MSK involvement, biopsychosocial)

- Yellow: Subjective history doesn't match physical exam.

- Follow up visits:
  - Visit 1
    - burning from neck to shoulder, elbow, digits 4 and 5 and soreness after cleaning up small fire at home.
    - Nerve glides increased in symptoms.
  - Visit 2
    - Burning with ADLs (driving, computer). Improve with chin tuck. L scaleni tender to palpation
  - Visit 3
    - Improvement in symptoms with disuse. Pain/cold sensation down arm with use; arm feels heavy occasionally. Onset of headaches.
      - Positive Roos (< 1 min), Adson maneuver
    - Dec use of arm; contact referring physician.
  - Visit 4
    - Scapular retraction provokes radiating pain/burn.
    - Tender to palpation: 1st rib, scaleni, L cervical paraspinals
    - Contralateral +ULTT1 -> bilat nerve glides
  - Visit 5
    - (-) contralateral nerve glide.
    - Appointment scheduled with ortho (recall partial thickness tear of supraspinatus and infraspinatus (30-40% thickness), irregularity of post and ant-inf labrum).
    - Decreased symptoms with shoulder elevation.
    - Reproduce elbow/finger symptoms with pec STM.
  - Visit 6 (2 weeks later)
    - ORTHO -> IMP; subacromial injection
      - Improvement in symptoms. Weakness of arm.
    - Burning with abd, + ULTT (improved)
    - Tolerates submax scapular retraction.
  - Visit 7
    - Arm feels heavy. Forearm gets cold.
    - Refer for vascular studies

Follow up visits:

- Visit 8
  - Neurodynamics improved.
  - Pain and stretch in forearm/hand with scaption/abd which improved with scapular retraction/post tilt.
    - Upper trap over-recruitment
  - STM to pec provoked fatigue in arm.
  - (+) Sulcus Sign, Load and shift -> taping
- Visit 9 (Apr 2)
  - Symptoms primarily in lateral neck and upper trap. Rarely burning to fingers; stop at palm.
- Visit 10
  - 1st rib depression, GH abd produce cold in forearm and hand
- Visit 11 (2 weeks)
  - STM to scaleni, pec, 1st depression -> cold sensation in forearm/under scap.
- Visit 12
  - Left her husband yesterday.

Identify “gap” in knowledge.

- PICO:
  - In patients with an UE traction injury what signs and symptoms differentiate nerve injury from glenohumeral pathology?

- Search Strategy???

Identify “gap” in knowledge - Search Strategy:

- (("Traction"[Mesh]) AND "Upper Extremity"[Mesh]) AND "Wounds and Injuries"[Mesh]
  - “traction” – dynamic, mechanical
  - Limits: “humans” -> more specific to traction injury, OLD -> related articles
- traction nerve injuries AND (Humans[Mesh])
  - Broad (primarily traction to other nerves- sciatic, suprascap)
- ((anterior shoulder instability AND (Humans[Mesh]))) AND thoracic outlet AND (Humans[Mesh])
- 2 articles – old; shoulder injuries athletes
- brachial plexus injury traction AND (Humans[Mesh])
  - Broad – birth injuries; surgeries
  - A sledgehammer on the **brachial plexus: thoracic outlet syndrome, subclavius posticus muscle, and traction in aggregate.Ozçakar L, Güney MS, Ozdağ F, Alay S, Kiralp MZ, Görür R, Saraçoğlu M.Arch Phys Med Rehabil. 2010 Apr;91(4):656-8**

- Related citations
- Thoracic Outlet
- Differential Diagnosis
- Double Crush – no MESH
  - Addition of Ulnar nerve -> cubital tunnel or cyclist
  - DC + traction -> 2 articles
  - DC +TOS -> 6 old articles
- (("Shoulder Joint"[Majr]) AND "Joint Instability"[Mesh]) AND "Thoracic Outlet Syndrome"[Majr] AND (Humans[Mesh])
  - **Levin LS, Dellon AL. Pathology of the shoulder as it relates to the differential diagnosis of thoracic outlet compression.**

    J Reconstr Microsurg. 1992 Jul;8(4):313-7

    .
- (Diagnosis/Broad[filter]) AND (stinger OR burner OR traction AND brachial plexus OR thoracic outlet AND shoulder)
  - -> Broad
  - Hit 46/199 sorted by pub date.

Identify “gap” in knowledge

- Article Reviewed:
  - Unlü MC, Kesmezacar H, Akgün I. Brachial plexus neuropathy (stinger syndrome) occurring in a patient with shoulder laxity. *Acta Orthop Traumatol Turc.* 2007;41(1):74-9.

What did you learn from article to apply to your specific patient/clinical case?

- Traction injuries due to joint laxity without major trauma are relatively rare and joint laxity not mentioned as a risk factor.
- Typically following trauma
  - Rule out – cervical fractures, dislocations and spinal cord contusion.
  - Differential diagnosis – clavicular fracture, shoulder dislocation and AC jt separation.
- Mechanisms
  - Traction injury of brachial plexus
  - Direct blow to supraclavicular fossa
  - Neck hyperextension with lateral flexion

- Primary symptoms
  - Burning and pain radiating from shoulder to upper extremity accompanied with numbness, paresthesia, and weakness.
  - Cervical nerve root lesions and upper trunk involvement typically reported.
  - Eletrodiagnositic studies to confirm, localize and determine severity of injury (minimum of 3 weeks following injury).
- Self-limiting but improvement may take several months in severe cases.
  - Neurotmesis (permanent nerve injury) not typical.

What did you learn from article to apply to your specific patient/clinical case?

- Brachial plexus traction injury following minor trauma and absence of other risk factors suggests GH laxity is responsible for injury and should be considered a risk factor for brachial plexus injuries.

Treatment Planning

Impairments	Functional Limitations	Goals
P! with GH elevation/reaching behind back	P! with overhead activities	Decreased pain with reaching overhead.
P! with resisted GH abd, scaption	Unable to perform overhead lifting/repetitive actions (work)	Painfree resisted GH elevation.
GH mechanical s/s	Difficulty performing heavy/repetitive household chores (laundry, cleaning)	Return to work (unable to modify duties).
Impaired neuro dynamics (+ ULTT1/ ULTT3)		Improved neuro dynamics; no complaint of paresthesias in UE.
Burning with R cervical SB		
Posture (IR shoulders)		Increased pec length; strengthen scapular muscles.

What is your **Primary Treatment Objective** after Initial Evaluation?

- **Education**: Involved anatomy based on type of injury. Improving neuro dynamics and importance of RTC and scapular strengthening.
- **Manual Therapy** (Specific Technique): Nerve glides (ULTT1). STM upper trap.
- **Exercise Prescription (Specific)**: TB bilat ERs with deep neck flexor activation (chin tuck). TB scapular retraction/low trap activation (rows, extension). Planks (GH/scapular stabilization – part of previous regular exercise program).
- **Other**: Avoidance of activities provoking neural symptoms.

What are you going to **reassess** at subsequent visit?

- Neurodynamics (ipsilateral, contralateral, global (slump)).
- Greater differentiation of location of nerve dysfunction (palpation, varying components of nerve tension tests).
- - TOS tests/measures
- Continued GH assessment.

Prognosis/Expectations

- **How do you expect to progress your treatment program over subsequent visits?**
  - Expectations: Improved neural tension and continued improvement in neural signs/symptoms
    - Advance RTC strengthening as tolerated
    - GH and scapular stabilization
  - Prognosis: Return to work (light duty -> full duty)
  - Presentation at follow up:
    - Cervical lateral glides
    - Thoracic manipulation.

Associated Factors for expected outcome

- **Favorable**
  - Previous level of function
  - Motivated
  - Minimal severity/irritability
  - Age
- **Unfavorable**
  - Mechanism
  - Impaired neurodynamics
  - Subjective vs objective exam
  - Workers comp case
  - **Inconsistencies** in presentation and care across health care providers

Thoughts on inconsistencies and differentiating between neural involvement, instability, double crush?

If referral to other providers is indicated, Identify:

Specific Recommendations.

- At time of initial evaluation, no further referral needed.
  - Further evaluation for possible vascular studies.

Identify the key subjective and physical features (i.e. **clinical pattern**) that would help you recognize this disorder in the future.

Subjective	Physical
Mechanism of injury (traction)	Reproduction of symptoms with contralateral SB
Nature of symptoms (burning, tingling, numbness)	(+) ULTTA
Location of symptoms (radiating from neck, shoulder, elbow, digits 4 and 5)	(+) ULTTA 3
	1st Rib tender to palpation, elevated
	Decreased soft tissue mobility of pec
	(-) Drop Arm, painful arc, Lift off, Infraspinatus MMT
	(-) Apprehension, Load and shift
	(-) Compression/Rotation, Speeds, Biceps Load II

Reflection : What would you do differently with a similar patient in the future?

- Tape shoulder (GH posterior glide, upper trap inhibition, mid-/low trap cueing) and reassess ULTT and shoulder motion
  - Treatment
  - Diagnosis
- Address biophychosocial involvement.

Shoulder Special tests Practice

- AROM +
  - Flexion
    - Neer Impingement: Rule out IMP
  - Scaption
    - Painful arc: 70-100 subacromial IMP; > 110 AC
    - Drop arm: RTC tear
  - Abd
  - ER- hand behind head
  - IR- hand behind back
    - Lift Off Test: subscap tear (rule out)
- Additional Special Tests
  - Sulcus Sign: multidirectional instability
  - Load and Shift: instability
  - Anterior Slide: SLAP tear
  - Hawkins-Kennedy: Rule out IMP
  - ER Lag Sign: Infraspinatus tear

- Resisted Tests +
  - Resisted ER (0, 45, 90)
  - Resisted IR
  - Belly Press: subscap tear (rule in)
  - Active Compression: AC or labral
  - Flexion, scaption, abduction
  - Speed's Test: SLAP, biceps involvement
- Supine
  - PROM
  - Apprehension Test: instability
  - Relocation: instability
  - Compression/Rotation Test: labral tear
  - Crank Test: SLAP tear
  - Bicep's Load II: SLAP (rule in)

Summary Special Tests

- **Impingement**
  - Neer
  - Hawkins-Kennedy
- **Rotator Cuff**
  - ER Lag sign
  - Drop Arm
  - Belly Press (subscap)
  - Lift Off (subscap)
- **Scapular Dyskinesia**
  - Scapular Assist Test
  - Scapular Retraction Test
- **SLAP**
  - Crank
  - Ant Slide
  - Biceps Load II
  - Compression-Rotation
  - Speed's
  - O'Brien/Active compression
- **Instability**
  - Sulcus
  - Load and Shift
  - Apprehension
  - Relocation
  - Anterior Release