Neck and Upper Extremity Pain in Occupational Medicine

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Objectives

• Differentiate between
  – Axial neck pain
  – Cervical radiculopathy
  – Cumulative trauma disorders (CTD) of the neck and upper extremity

• Identify ‘red flags’ to evaluate for serious medical problems.

• Identify ‘yellow flags’ to help keep yourself well and productive.

• Understand criteria for appropriate diagnostic tests, imaging, and treatment referral.
Benefits

• GAME PLAN:
  – Strategically apply a ‘game plan’ to become more time efficient.
  – Pain diagrams, focused history and exam

• CONFIDENCE:
  – Improved confidence when ruling-out red flags, identifying yellow flags, ordering labs and imaging studies and referring to a specialist.

• COMMUNICATE:
  – Improve patient’s understanding of their diagnosis and treatment plan with a clear/concise explanation.
Differential Diagnosis of Neck/UE Pain

- Muscular strain
- Whiplash injury
- Facet or zygapophysial joint arthropathy
- Degenerative disc disease
- Disc herniation
- Cervical spinal stenosis
- Cervical radiculopathy
- Cervical myelopathy
- Thoracic Outlet Syndrome
- Brachial Plexus injury
- CTD/RMI
- Fibromyalgia/myofascial pain
- Referred pain from shoulder
- Cancer
- Infection
Definition of Terms

• Axial (mechanical) neck pain
  – Pain localized to the cervical spine and surrounding tissues, usually involving the intervertebral disc, vertebral body, facet/zygapophysial joints, joint capsules, ligaments, or muscles.

• Cervical Radiculopathy
  – Pain and neurologic symptoms in the UE arising from compression or inflammation/irritation of the cervical nerve roots.

• CTDs of the neck or upper extremity (UE)
  – Pain in widespread distribution throughout neck and UE, (aka) *Repetitive Motion Injuries* (RMI), often the result of rapid, repetitive movements of the hands/arms, commonly occurring in the Occupational Medicine setting.
Side View

Bird's-eye View

Spinal cord
Nerve Roots
Vertebral facet

Normal anatomy of a cervical vertebra
The Pain Diagram
PAIN DIAGRAM Please use a pen

PATIENT'S NAME

DATE

IMPRINT AREA

Sample 2

DRAW YOUR PAIN

Using a pen - mark in the areas on the diagrams where you have pain/numbness.

X = Pain
O = Numbness

RATE YOUR PAIN ON THIS SCALE. (Mark with an X)

0 = No Pain  10 = Worst possible pain

PAIN TODAY

0    1    2    3    4    5    6    7    8    9    10

LEAST (pain in last 2 weeks)

0    1    2    3    4    5    6    7    8    9    10

WORST (pain in last 2 weeks)

0    1    2    3    4    5    6    7    8    9    10

Dominant hand: □ Left □ Right

LIST ALL DRUG, ENVIRONMENTAL, AND FOOD ALLERGIES

Sulfas

LIST ALL MEDICATIONS YOU TAKE (including nonprescription)

(Check the box for those meds that you take for this problem.)

Medication

Dosage

Naproxen

3

Flexeril

1.2
Axial pain patterns provoked during discography at each cervical level:

- C2-3
- C3-4
- C4-5
- C5-6
- C6-7
Axial pain patterns produced by injections into the facet joints
PAIN DIAGRAM  Please use a pen

DRAW YOUR PAIN

Using a pen - mark in the areas on the diagrams where you have pain/numbness.

X = Pain
0 = Numbness

RATE YOUR PAIN ON THIS SCALE. (Mark with an X)
0 = No Pain  10 = Worst possible pain

PAIN TODAY


LEAST (pain in last 2 weeks)

WORST (pain in last 2 weeks)

Dominant hand: □ Left □ Right

LIST ALL DRUG, ENVIRONMENTAL, AND FOOD ALLERGIES

None

LIST ALL MEDICATIONS YOU TAKE (including nonprescription)
(Show the box for those meds that you take for this problem.)

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ibuprofen</td>
<td>as needed</td>
</tr>
</tbody>
</table>

DATE

UNIT
CERVICAL RADICULOPATHY PAIN REFERRAL PATTERNS

A

B

C

D

C5

C6

C7

C8
PAIN DIAGRAM  Please use a pen

PATIENT'S NAME

DATE

IMPRINT AREA

Sample 3

DRAW YOUR PAIN
Using a pen - mark in the areas on the diagrams where you have pain/numbness.
X = Pain
0 = Numbness

RATE YOUR PAIN ON THIS SCALE. (Mark with an X)
0 = No Pain  10 = Worst possible pain

PAIN TODAY

0
0
0

LEAST (pain in last 2 weeks)

0

WORST (pain in last 2 weeks)

0

LIST ALL DRUG, ENVIRONMENTAL, AND FOOD ALLERGIES
Cipro  All NSAIDs
PCN  iodine
ECN  Cadlewe
Sulfas

LIST ALL MEDICATIONS YOU TAKE (Including nonprescription) (Check the box for those meds that you take for this problem.)

Norco
Vicodin
Pani
Morphine Sulfate

Medication

Dosage

□

□

□

□
History

• Onset? Duration? Trauma? Mechanism of Injury?
• Recurrence? Previous similar episode?
• Aggravating and relieving factors?
• Pain, numbness, weakness
  – (pain diagram, visual analog scale)?
• Previous and current treatments?
• Bowel/Bladder incontinence?  
• Saddle paresthesias?
• Imbalance, difficulty walking/standing? 
• Constitutional symptoms?
Axial Neck Pain, Historical Pearls

- Often preceded by trauma, acute event.
- May develop slowly, hours to days after acute event.
- Pain localized to cervical spine.
- Pain reproducible with specific movements.
- Often recurrent episode.
Radiculopathy, Historical Pearls

- Insidious onset of neck pain and arm discomfort, ranges from dull ache to severe burning pain.
  - Often progresses from neck, to shoulder blade, then down arm into hand.
- Positional; worse w/ ext.+lat.bend+rotation to affected side.
- May have associated numbness/tingling in dermatomal distribution.
- May have associated weakness.
CTD, Historical Pearls

• Pain initially localized, then becomes widespread.
• Often associated with repetitive tasks.
• May describe symptoms as numbness, tingling, cold, swelling, or cramping sensations in non-dermatomal distribution.
• Varying degrees of associated psychological distress?
• Secondary gain?
Red Flag: Cancer

- Prior history of cancer?
- Unexplained weight loss?
- Age greater than 50 y.o.?
- Pain greater than 4-6 weeks?
- Night Pain?
- Failure to improve with appropriate treatment?
Red Flag: Infection

- Fever?
- Previous history of I.V. drug use?
- Recent bacterial infection?
  - (i.e. UTI, cellulitis, pneumonia)
- Immunocompromised?
  - Steroids, chemo, diabetes, transplant, AIDS
- Rest pain?
Red Flag: Myelopathy

• Symmetric neurologic deficits
• Upper Extremities:
  – Decreased sensation
  – Hypo-reflexia
  – Weakness
• Lower Extremities:
  – Decreased sensation
  – Hyper-reflexia
  – Weakness
• Bowel/bladder symptoms
• Abnormal gait, ATAXIA
Yellow Flags…Caution!

Do not ignore them!

- Wheelchair sign
- Slipper sign
- Pharmacist sign
- Stack of paper sign
- Family history of disability
- Angry employee sign
- Litigation
5 “Classic” Waddell signs

• 1. **Tenderness**
  – Superficial
  – Non-anatomic

• 2. **Simulation**
  – Axial loading
  – Rotation

• 3. **Distraction**
  – Straight leg raising

• 4. **Regional**
  – Weakness
  – Sensory

• 5. **Overreaction**
“All patient’s with pain show some emotional and behavioral reaction.”

A biopsychosocial model of low back pain and disability, Waddell et al
Focused Physical Examination

• Formulate a focused differential based on the pain diagram and history.

• Your examination should allow you to key in on your diagnosis.
Physical Examination

- Passively observed movements
- Shirt removed, gown
- Alignment, asymmetry, deformity, atrophy
- Active and Passive range of motion
  - AROM, PROM
- Spurling’s test
FIGURE 4. In the Spurling test, the patient extends the neck and then rotates and laterally bends the head to the same side while the examiner applies downward pressure to the top of the head. If this position, with or without pressure, reproduces radicular symptoms into the upper limb, a cervical radiculopathy is suggested.
Physical Exam

• Palpation: "Touch them where it hurts!"
  – Bone:
    • Spinous process, occiput, SC/AC joints, acromion
  – Soft Tissue:
    • Cervical paraspinals, trapezius, Para scapular, deltoid muscles
  – Tender points
  – Trigger points
Physical Exam

• Upper Extremity
  – Shoulder:
    • AROM, painful arc? Limitation of motion?
    • Impingement
    • Rotator cuff strength
  – Elbow:
    • Lateral and medial epicondyle
    • Extensor and flexor muscle compartments
    • Ulnar neural tension? Ulnar Tinel’s?
  – Wrist/Hand:
    • Carpal tunnel compression test?
    • Phalen’s?
    • Finkelstien’s?
    • 1st CMC joint tenderness, Grind Test?, Watson’s stress test?
PEx: Neurologic Exam

- Manual Muscle Testing (MMT):
  - C5 Deltoid/Biceps
  - C6 Wrist extension
  - C7 Triceps
  - C8 Finger flexion
  - T1 Finger abduction

- Sensation:
  - C5 Lateral antebrachial fossa
  - C6 Thumb/index finger
  - C7 Middle finger
  - C8 Little finger
  - T1 Medial antebrachial fossa

- Muscle Stretch Reflexes (MSR):
  - C5 Biceps
  - C6 Brachioradialis
  - C7 Triceps

- Long Tract signs:
  - Hoffman’s sign
Figure 15-2  Skin Area Innervated by the Cervical and Thoracic Nerve Roots Showing Autonomous Zones
Figure 16-47 Motor Innervation of the Upper Extremity

Axial Neck Pain, PEx Pearls

- Specific, reproducible movements reproduce patient’s pain.
- Focused palpation reproduces patient’s pain.
- Neurologically intact.
- Negative shoulder/UE screening exam.
Cervical Radic, PEx Pearls

- Pain in upper extremity > neck.
- Positive Spurling’s Test.
- Negative shoulder/UE screening exam.
- Focal neurologic findings in reproducible neuro-anatomic distribution.
CTD, PEx Pearls

- + Upper Limb Tension Test
- Diffuse tenderness
- Hypersensitivity
- Tender points +/- trigger points
- Painful, limited AROM of neck and UE
- Diagnosis of exclusion
Medical Imaging

• X Rays
  – May be useful:
    • Fracture (trauma)
    • Degenerative changes (pain > 6 weeks)
    • When red flags present (tumor/infection).
  – Not recommended for axial neck pain or CTD in absence of red flags.

• Advanced Imaging, MRI/CT:
  – Recommended in presence of neurologic deficit or suspicion of tumor/infection in consultation w/ Spine Specialist.
Lab Studies

• If malignancy is suspected:
  – CBC, ESR

• If infection is suspected:
  – CBC, ESR, CRP, +/- UA
Electrodiagnostic Studies

• NERVE CONDUCTION STUDIES (NCS):
  – Quantify electrical properties of peripheral nerves using an electrical stimulus and a recording electrode.
  – Demyelination, conduction block, axon loss.

• ELECTROMYOGRAPHY (EMG):
  – Needle electrode samples electrical potentials of individual muscle fibers.
  – Denervation or neuropathic changes.
  – Myopathic changes.

• Abnormal only if pathology exists!
• Normal study does NOT mean there isn’t a problem!
Treatment Cervical Radiculopathy

• No Neurologic Deficit:
  – Educate/define/re-assure/outline treatment
  – Ice/rest/activity modification
  – Oral prednisone taper
  – NSAIDs, narcotic analgesics, muscle relaxants
  – PT program

• If improved at 2-4 weeks, then advance home program, PT neck class.

• If not improved at 2-4 weeks, then Spine Consult referral.
Treatment Cervical Radiculopathy

• Positive Neurologic deficits:
  – If progressive, or in presence of cervical myelopathic symptoms, then urgent consult, contact spine specialist on-call directly.
  – Consult spine specialist
  – Order cervical spine x-rays
  – Document careful neurologic examination
  – Discuss w/ spine specialist need for MRI, initiating course or oral prednisone, possible cervical epidural steroid injection.
Cervical Radiculopathy
What I tell the patient…
Treatment Axial Neck Pain

• Educate, review diagnosis, and reassure.
• Define source of pain, anatomically yet simplistically.
• Provide reassuring explanation as to why additional studies and referral are not indicated.
• Ice/Heat, rest, activity modification
• NSAIDs, narcotic analgesics, muscle relaxants.
• Physical Therapy program
Axial Neck Pain
What I tell the patient...
Treatment CTD

• Longer problem untreated, longer time required for improvement
  – Prompt recognition and intervention
• Self care and active participation critical
• Limit immobilization
• Ergonomics, biomechanics, micro-breaks
• Psychosocial issues must be addressed
CTD
What I tell the patient…
Conclusion

• GAMEPLAN:
  – Utilization of a pain diagram, a focused history and a focused physical examination will help you identify the appropriate diagnosis for neck/UE pain in a timely, effective manner.

• CONFIDENCE:
  – Identification of ‘red flags’ and knowing what studies to order will improve outcome and facilitate timely and appropriate coordination of care with your spine specialist.

• COMMUNICATE:
  – An accurate diagnosis will increase patient understanding, satisfaction, and compliance with treatment.
Thank You!