Common neuromusculoskeletal disorders in the workplace

W. Shane Journeay, PhD, MD, MPH, FRCPC, BC-OEM

OEMAC – Calgary
September 23, 2018
OBJECTIVES

1. To name key diagnoses of neuromusculoskeletal conditions seen in the workplace

2. To describe the risk factors and mechanisms for common work-related neuromusculoskeletal conditions

3. To list key principles of management, rehabilitation and return to work in neuromusculoskeletal disorders
Two common disorders

- Shoulder
- Spine
- Other
Approach and causality

- Mechanism
- Timeline of injury (Acute / chronic)
- Type of occupation (dynamic, static postures)
- Biomechanics
- Medical history
- Epidemiology
Working towards a diagnosis

- Bone - fracture, contusion
- Muscle – strain, tear
- Tendon – tendinosis/-opathy, tear
- Bursa - bursitis
- Ligament – sprain
- Joint – arthritis
- Nerve – entrapment, radiculopathy, PN
Shoulder

- **History / Mechanism**
  - Insidious onset vs Traumatic
  - Outstretch arm, pulling, reaching
  - Static postures
  - Exacerbating and relieving factors
Examination

- Posture
- Active ROM
- Passive ROM
- Deformity
  - subluxed? A.C. deformity? Effusion?
ROTATOR CUFF DISORDERS

Subacromial Bursitis
→ Inflammation of bursa

Supraspinatus Tendinitis
→ Inflammation of tendon

Rotator Cuff Tears
→ Degenerative/traumatic

Impingement
→ One possible cause for pain
Supraspinatus

- Empty Can test
  - “Jobe’s test”
Subscapularis

- Belly Press off
Bicipital tendon

- Speed’s Test
Impingement

- Neer Sign

Jain et al. PMR 2013
Management

- Diagnosis?
  - Structure injured
  - Soft tissue?
- Rest, ROM, Ice, NSAID
- Investigation ➔ Ultrasound vs MRI
- Rehabilitation
  - May require focused rehab depending on job tasks
  - Otherwise pain management and maintain ROM
Question 1

A 50-year-old man sustains a left shoulder injury after falling from a ladder. A physical examination test to examine for this shoulder injury is found. What is the most likely diagnosis?

1. SLAP tear
2. Supraspinatus tear
3. Infraspinatus tear
4. Teres minor tear
5. Subscapularis tear
A 50-year-old man sustains a left shoulder injury after falling from a motorcycle. A physical examination test to examine for this shoulder injury is found. What is the most likely diagnosis?

1. SLAP tear
2. Supraspinatus tear
3. Infraspinatus tear
4. Teres minor tear
5. Subscapularis tear
Answer

- Belly-press and Lift-off maneuvers
Question 2
Rotator cuff tears (full thickness and partial thickness) in asymptomatic individuals are seen on MRI or ultrasound in what percentage of patients over the age of 60?

1. 0-5%
2. 5-30%
3. 30-55%
4. 55-80%
5. 80-100%
**Answer**

Rotator cuff tears (full thickness and partial thickness) in asymptomatic individuals are seen on MRI or ultrasound in what percentage of patients over the age of 60?

1. 0-5%
2. 5-30%
3. **30-55%**
4. 55-80%
5. 80-100%
Answer

The prevalence of asymptomatic rotator cuff tears diagnosed with MRI or ultrasound is quite high, with most studies noting tears in 30-54% of patients over the age of 60.
Spine and Back pain
Acute low back pain

- Lumbar strain with or without radicular symptoms
  - Common
  - Lifting
  - New workers
History

- Red flags → imaging
- Medical history & Mechanism
  - Lifting
  - Twisting
  - Fall
- Pain referral pattern (LBP +/- radicular symptoms)
  - Banding “Lumbago”
  - Radicular pain
Red Flags

Box 2
Red flags for lower back pain (also applicable to neck pain)

- Fever
- Unexplained weight loss
- History of cancer
- History of violent trauma
- History of steroid use
- Osteoporosis
- Aged younger than 20 years or older than 50 years
- Failure to improve with treatment
- History of alcohol or drug abuse
- HIV
- Lower extremity spasticity
- Loss of bowel or bladder function

Examination

- Posture
- Palpation/percussion -?Spasm
- ROM
- Neurological exam!
  - Bulk, Tone, Power, Reflexes, Sensation
  - Straight leg raise, Slump test, Femoral stretch
Case 1

**Hx:** 54M construction worker presents with back pain radiating down to the left ankle after lifting 75lb cement blocks. Severe pain with onset x 24h. No hx of cancer, diabetes. No history of neurogenic claudication. B/B normal. Tried NSAIDs.

**O/E:** antalgic gait. Forward flexed. Can’t get comfortable. SLR positive. 4+/5 left dorsiflexion.

**MRI** – posterolateral disc protrusion compressing exiting L4 nerve root on left
Lumbar Radiculopathy

- Rule of thirds
  - 1/3 traumatic events (I.e. heavy lifting)
  - 1/3 routine activity (walking, making bed)
  - 1/3 non-specific (I.e. arising from chair, at rest)
Lumbar disc herniation

A Normal lumbar disk, axial view

- Annulus fibrosus
- Nucleus pulposus
- Intervertebral disk
- Transverse process
- Spinous process

Deyo & Mirza NEJM 2016
Common Lumbar Dermatomes

Deyo & Mirza NEJM 2016
Gluteus medius & Longississimus (can mimic radiculopathy)
Management & Rehabilitation

- Monitor + Conservative modalities
- Counsel on recovery and red flags
- If persistent pain, loss of motor function obtain imaging, or red flags
- Regular activity +/- PT
- Epidural – If completed early can improve pain sooner but after 6-12 months everyone is the same
- Ergonomics
**Case 2**


**O/E:** Neuro intact. Full flexion and extension. Lateral bending to the right can only reach 3 cm proximal to fibular head and the left can reach fibular head. Point tenderness over left quadratus lumborum that reproduced his pain.

X-ray and SI joint views- normal. HLA B27 negative. Inflammatory markers normal.
Myofascial pain / Lumbar strain

- Myofascial low back pain: may have trigger points include the iliocostalis lumborum, longissimus thoracis, multifidus, the quadratus lumborum and gluteus medius are the most frequently involved
Role of Electrodiagnostics (EMG/NCS)

- Localizes peripheral nerve lesions
- Tests the integrity of the motor units and sensory nerves
- Can determine neurophysiology of multiple nerves or myotomes and chronicity
- Does not say ‘what’ is causing the problem
- Often concludes – “Suggest MRI of L/S spine “

- With good physical exam and MRI; little role for EDx
  - Caveats - neurorecovery and surgical planning
Summary

- Shoulder injuries are common with the majority comprising soft-tissue injury. Careful history and exam can narrow the differential and guide management.
- Management is generally conservative.
- Back pain is not always simple back pain - Neurology and function are a priority.
- Many rehabilitation strategies – ranging from pain management, exercise and focused rehabilitation strategies.

Questions & Discussion?

shane.journeay@utoronto.ca
wsj818@mail.harvard.edu
References

- Jain et al. PM&R 5:45-56, 2013
- Deyo & Mirza NEJM 374:1763-72, 2016
- Carette & Fehlings NEJM 353:4, 392-99, 2005
- Orthobullets
- Triggerpoints.net