Overuse Injury Treatment and Management
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Objectives
- Upon completion of this lecture, the nurse practitioner will:
  - Define the pathophysiology of overuse injuries
  - List the incidence of overuse injuries in the US workforce and the significance of overuse injury morbidity
  - Recognize the hallmark symptoms found in overuse injuries
  - Develop a common list of differential diagnoses
  - Complete a comprehensive initial workup to rule out other etiologies
  - Identify the importance of creating a comprehensive rehabilitation program for the patient with an overuse injury
  - Develop a list of acceptable medications that can be used appropriately for overuse injury

Impact of Overuse Injuries
- Repetitive motions in the workplace
  - 60 million US workers > 50% of work time
  - 26.8% of workers continually or almost continually
- Bending or twisting body
  - 25% exposed > 50% of work time
- Kneel, stoop, or crawl
  - 11% exposed > 50% of work time
- Climbing ladders, scaffolds, or poles
  - 3% exposed > 50% of work time
Highest Risk Occupations
- Repetitive motions
  - Dental hygienists, hairdressers, dancers
- Bending or twisting
  - Construction, mining, housekeeping
- Kneeling, stooping, or crawling
  - Tile, marble, carpet installers, and iron workers
- Climbing
  - Insulation workers, paperhangers, roofers
- Highest risk occupations overall
  - Construction, nursing, housekeepers

The “Occupational Athlete”
- Applying the principles of sports medicine to the evaluation and treatment of injured workers

The “Occupational Athlete”
- Advantages
  - Faster, more efficient return to participation
  - Enhances self-esteem of injured worker
  - Team provider concept
Overuse: force vs. time

- Effects of force (intensity)
  - Jumping from chair to floor
  - Jumping from significant height
  - Acute overuse

- Effects of time (duration)
  - Walking around the block
  - Hiking the Continental Divide

- Chronic overuse
  - Cumulative trauma

The Cycle of Overuse

- Overloading
- Tissue injury
- Inflammation
- Continued activity
- Pain
- Rest - healing
Types of Overuse Injuries

Common Types of Overuse Injuries

- Tendons
  - Rotator cuff impingement
  - Lateral/medial epicondylitis
  - De Quervain’s tenosynovitis
  - Patellar tendinitis
- Nerves
  - Carpal tunnel syndrome
  - Cubital tunnel syndrome

Muscles
- Cervical strain
- Lumbar strain

Bone and joints
- Stress fractures
- Degenerative arthritis
Rotator Cuff
- Supraspinatus*, Infraspinatus, Teres Minor
- External rotation and abduction
- Subscapularis
- Internal Rotation
- Injuries may be from repetitive micro-trauma (overuse) or traumatic
- Pain over anterior & lateral aspects of the shoulder, radiates to deltoid
- Overhead activity then progresses to sx at rest
- ROM decreased
- Inability to abduct arm above shoulder level
- + Drop Arm (complete tear), + Empty Can, + Neer’s Impingement, + Hawkins

Elbow Epicondylitis
- Overuse syndromes
- Clinical Presentation:localized pain and swelling
- Reproducible pain with wrist flexion (medial) or wrist extension (lateral) against resistance
- Medial: Golfer’s Elbow
  - Wrist flexors, pronator muscle group
- Lateral: Tennis Elbow
  - Wrist extensors, supinator muscle group

Cubital Tunnel
- Compression of ulnar n.
  - Repetitive motion
  - Ulnar n. stretches around medial condyle
  - Constant pressure
  - Fluid accumulation
  - Trauma
- Clinical Presentation:
  - Ulnar neuropathy (RF/ULF tingling on numbness)
  - Decreased grip strength
  - Chronic: muscle wasting
Carpal Tunnel Syndrome (CTS)
- Pain, paresthesias, & weakness
  - Thumb, IF, LF, +/- medial ½ of RF
- Pathogenesis:
  - Repetitive activities result in swelling leading to compression
  - Typing/computer work is frequently associated
- Females 2:1
- Compare color, temperature, and texture BL
- Evaluate for thenar muscle atrophy
- Decreased sensory along median nerve distribution
- Decreased grip strength

De Quervain’s Tenosynovitis
- Inflammation of the 1st dorsal compartment involving the sheath of the abductor pollicis longus and extensor pollicis brevis
- Causes: overuse/repetitive gripping
- Increased risk with hormonal changes (postpartum)
- W>M, 30-50 yo
- Pain/swelling along dorsal radial wrist
- + Finkelstein Test: fist over thumb and ulnar deviation
- Pain aggravated by thumb and wrist motion (gripping)

Cervical Strain / Sprain
- Clinical presentation
  - Non-radicular, non-focal neck pain
    - From the base of the skull to the cervicothoracic junction
  - C/O neck stiffness and limited ROM
  - May have cervicogenic headache pattern
  - Tender to palpation (TTP) over involved muscle
When do you order an x-ray?

- Non-trauma related
  - Age >50 years with new symptoms
  - Constitutional symptoms (fevers, chills, unexplained weight loss)
  - Moderate to severe neck pain lasting more than six weeks
  - Progressive neurological findings
  - Infectious risk (e.g., injection drug use, immunosuppression)
  - History of malignancy

- Trauma related
  - Nexus low risk criteria (NLS) - no x-rays if patient satisfies all 5
    - Absence of posterior midline cervical tenderness
    - Normal level of alertness
    - No evidence of intoxication
    - No abnormal neurologic findings
    - No painful distracting injuries
Acute Low Back Pain

- New onset low back pain of < 12 weeks duration
- 5th most common reason for medical office visits in the U.S.
- Leading cause of work-related disability
  - 80% of the population will experience at least one episode of disabling LBP during their lifetime
- 90% have “mechanical” LBP and the prognosis is good
  - Acute:
    - 50% are improved in 1 week
    - 80% return to full work within 1 month
    - 90% have resolution within 8 weeks

Acute Low Back Pain

- Risk factors
  - Age
  - Obesity
  - Physically strenuous work
  - Repeated twisting or bending
  - Job dissatisfaction
  - Prolong static posture (sedentary work)
  - Anxiety / depression

Prepatellar Bursitis

- From direct contact/trauma
- Common in carpet/tile layers
Patella Tendonitis

- Overuse / repetitive stress forces (e.g., jumping activities)
- Signs and Symptoms
  - Localized pain / tenderness on palpation
  - Persistent aching after activity
  - Palpable crepitus during active knee flexion / extension.

Stress Reactions

Etiology

- Repetitive mechanical stress (e.g., distance running)
- Purely overuse

Important historical components

- Previous history
- Family history
- Recent changes (e.g., footwear, activity)
- Changes in menstrual cycle
- Dietary changes &/or restrictions

Signs & symptoms

- Pain, aggravated by weight bearing activities (running)
- Point tenderness
- Diffuse around area of injury
- Exquisite over area of injury
- Swelling / pitting edema
Grading of Overuse Injuries

Grade I (most mild)

- Symptoms occur generally only after activity or at night

Grade II

- Symptoms occur during activity, but do not interfere with performance of tasks
### Grade III

- Symptoms occur during activity and do interfere with performance

### Grade IV

- Symptoms so bad unable to use the affected part

### Treatment of overuse injuries

- General principles
  - Flexibility
  - Strength
  - Endurance
Treatment of overuse injuries

- Acute phase
  - PRICES
    - Protection
    - Rest
    - Ice
    - Compression
    - Elevation
    - Support

Treatment of Grade I

- Reduce intensity or duration of activity by 25%
- More diligent stretching
- Ice following activity
- Follow the 10% per week rule
  - *Sudden, excessive overtime is a recipe for overuse complaints*

Treatment of Grade II

- *Reduce intensity or duration of the activity by 50%*
- NSAID’s
- Counterforce bracing
- Consider physical therapy
  - *Flexibility, endurance, strengthening*
Treatment of Grade III

- "Active" rest: the worker should stop performing the offending tasks, but is allowed to move the affected part for his daily activities
- NSAIDs
- Physical therapy
- Consider steroid injection depending on site

Treatment of Grade IV

- Complete rest of the affected part, usually involving the use of some sort of sling or splint
- NSAIDs or other non-opioid pain medication
- If all else fails, consider surgical options

Medications for Pain Control

- Over-the-counter analgesics
  - Acetaminophen
  - NSAIDs
  - Aspirin
- Anticonvulsants
  - Gabapentin
  - Pregabalin
  - Sodium valproate
- Antidepressants
  - Venlafaxine (SNRI)
  - Duloxetine (SNRI)
  - Amitriptyline (TCA)
- Other
  - Capsaicin (Substance P)
  - Tramadol (Centrally acting analgesic)
  - Alpha-lipoic acid (Anti-oxidant)
  - Opioid analgesics
  - Muscle relaxants (cyclobenzaprine)
Sports Medicine Pearls

- Healthy people perform better than sick people
- Difficult to win Super Bowl with team of injured athletes
- Athletes perform better when using the right equipment
- Difficult to run marathon if shoes too big or too small

Sports Medicine Pearls

- Work smartly with proper ergonomics
- Concept of neutrality

Sports Medicine Pearls

- Decrease unnecessary forces to body
- Footwear
  - Vibram rubber soles
  - Shock mats
Sports Medicine Pearls

- Training/conditioning
  - Should progress gradually
  - Increase duration of a specific task gradually, e.g. an hour/day/week
    - Alternating tasks/departments every few hours

Sports Medicine Pearls

- Maintain flexibility
  - Stretches every 2 hours (approximately)
  - Slow and controlled movements

Questions?