Western Clinical Medicine

Week 1 MSK

Types of Pain

Acute pain usually in response to tissue injury resulting from activation of peripheral pain receptors and their sensory nerve fibers (nociceptors).

Nociceptive pain is linked to tissue damage to the skin, musculoskeletal system, or viscera. The sensory and nervous system are intact. It can be acute or chronic. The involved afferent nociceptors can be sensitized by inflammatory mediators and modulated by both psychological processes and neurotransmitters like endorphins, histamines, serotonin, norepinephrine and dopamine.

Types of Pain

Neuropathic pain is as a result of a lesion or disease affecting the somatosensory system. Over time this may become independent of the inciting injury becoming burning, lancinating, or shock like. This may persist even after healing from the initial injury has occured.

Chronic pain is defined as pain that persists or recurs for greater than 3 months, persists more than one month after the resolution of an acute tissue injury or accompanies a non healing lesion. Causes are multiple and can include many chronic conditions (cancer, arthritis, diabetes) injuries (herniated discs and torn ligaments).

Types of Pain

Central Sensitization alteration of central nervous system processing of sensation leading to amplification of pain signals. There is a lower pain threshold to non-painful stimuli and the response to pain maybe more severe than expected.

Resources for further reading

Conversations: Abdul-Ghaaliq Lalken, MD — the NOCTURNISTS

Central Sensitisation - Physiopedia

Central sensitisation in chronic pain conditions: latest discoveries and their potential for precision medicine - The Lancet Rheumatology

Frontiers in Pain Research | Pain Mechanisms

Walking the Tightrope: A Proposed Model of Chronic Pain and Stress

Pain Modulation and Mechanisms (Section 2, Chapter 8) Neuroscience Online

Therapeutic Basis of Clinical Pain Modulation - PMC

Surgical Sieve -Differential Diagnosis Tools

A surgical sieve is a tool that is useful when trying to answer questions about the cause of a sign or symptom. It helps to bring to mind a number of different conditions which are potential causes. It can also be used to formulate a differential diagnosis for patients where the diagnosis is unclear.

Surgical Sieves: MAGIC ADDITIVE

M- Metabolic

A- Autoimmune

G- Genetic

I- Infective

C- Cancer

McGov.co.uk - Surgical Sieves

A- Acquired

D- Degenerative

D- Drugs

I- Inflammatory

T- Trauma

I- Idiopathic

V- Vascular

E- Endocrine

Surgical Sieve: VITAMINS ABCDEK

V- Vascular

I- Infective

T- Trauma

A- Autoimmune

M- Metabolic

I- Idiopathic

N- Neoplasm

S- Social

A- Alcohol

B- Behavioral

C- Congenital

D- Degenerative

E- Endocrine or exocrine

K- Karyotype or (genetic)

Practical way of creating differential diagnoses through an expanded VITAMINSABCDEK mnemonic - PMC

MUSCULOSKELETAL CONDITIONS

Neck Pain

Back Pain

TMD

Emergencies

Trauma/ Injuries

Bursitis

Tendinitis

Sprains

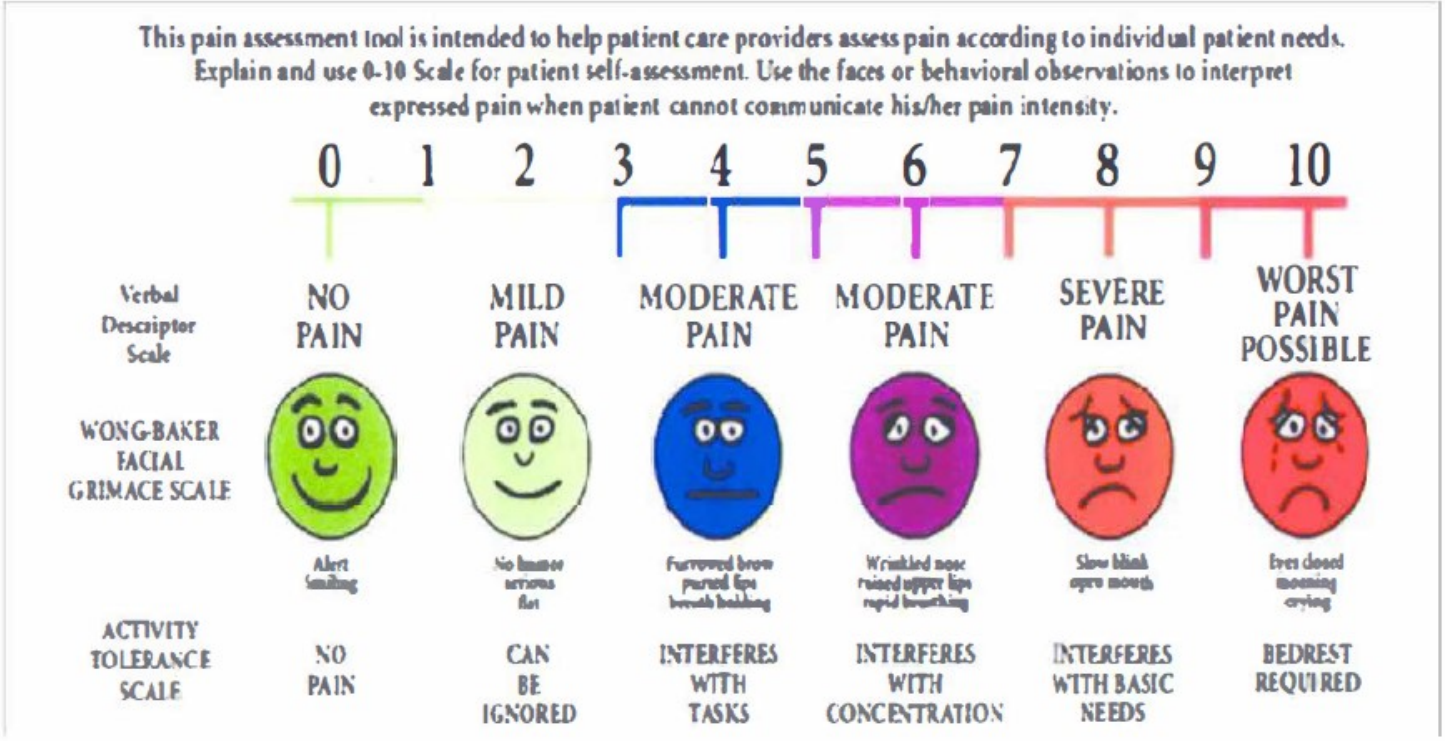
Strains

Shoulder Pain

History

1. Pain -O,P,Q,R,S,T
2. Stiffness
3. Swelling
4. Erythema
5. Temperature
6. Skin lesion
7. Concurrent infection
8. Inflammatory bowel disease
9. Multi-system involvement
10. Deformity
11. Motion -Body mechanics and ROM

Pain scale assessment tool



Physical Exam

Vitals (BP, HR, Temp, Resp, Pain)

1. Observation of whole body
2. Begin with unaffected side if possible
3. Inspection
4. Palpation -tenderness, temp, swelling
5. ROM

Measured in degrees of a circle

Abnormal limitations

Passive, active, resisted

6. Joint position -comfort vs. function
7. Measurement -atrophy vs. hypertrophy
8. Neurological exam

Muscle strength

Cutaneous sensation

Dermatomes

DTR's (deep tendon reflexes)

Imaging

1. X-rays -first imaging in evaluating musculoskeletal disorders
2. CT scans
3. MRI
4. Ultrasound -soft tissue masses
5. Arthrography -joint
6. Bone and marrow scans -bony disorders

Lab Studies

1. ESR **(erythrocyte sedimentation rate)**, C-reactive protein - inflammation
2. RF **(rheumatoid factor)**, ANA **(antinuclear antibodies)** -autoimmune connective tissue disorders
3. CK **(creatinine kinase)**, AST **(aspartate aminotransferase)** -peripheral muscle disorders

Other

1. Joint aspiration -synovial fluid evaluations
2. Arthroscopy
3. Thermography
4. Electromyography -electrical changes associated with muscle contraction
5. Nerve conduction velocity -conduction of impulse along a nerve
6. Muscle and bone biopsy