Acute Low Back Pain

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Outline

- Introduction / Epidemiology.
  - Most Important lecture!!

- Anatomy / Pain generators

- Diagnosis

- Treatment
Course Objectives

- Know the RED FLAGS in history taking.
- Know the Pain Generators of the Lumbar spine
- Know the Guidelines for Imaging of the spine with acute low back pain.
- Know the general guidelines to rehabilitation.
Epidemiology of Back Pain

- Who gets it?
  - 60-90% lifetime prevalence.
  - 80-90% have recurrent episode.

- What is the Natural history?
  - 80-90% resolves in 1 month.
  - 20-30% remains “chronic”
  - 5-10% “disabling”
Anatomy

- 5 lumbar vertebra
  - Transitional segments
- Components
  - Body
  - Pedicles
  - Facets
  - Lamina
  - Spinous and transverse processes
Typical Vertebra
Vertebral Body

- End-plate attachment
- Tall (L1). Wide (L5)
- L3 Square
Posterior Elements

- Spinous Process
- Lamina
- Pedicle
- Transverse process
Lumbar Intervertebral Disc

- **Annulus Fibrosis**
  - Dense connective tissue, interwoven matrix
  - Outer 1/3 innervated from sinuvertebral nerve and gray rami communicans.
  - Concentric layers attaching to end plates

- **Nucleus pulposus**
  - 80-90% water, mucopolysaccharide, collagen.
Figure 1–14. Components of the functional unit.

*From Calcat, *Low Back Pain Syndrome*, 4th Ed.*
Zygopophyseal Joints

- Joint Capsule
- Meniscoid
- 10% wt bearing
- Sagittal plane L1
  45° orientation L5.
Lumbar ligaments

- ALL
- PLL
- Ligamentum flavum
- Facet capsules
- Interspinous ligaments
- Supraspinous ligaments
Muscle Layers

- Deep
  - Multifidus, Quadratus lumborum
  - Iliocostalis, longissimus, (Erector s.)

- Superficial
  - Thoracolumbar fascia
  - Lattisimus dorsi
Nerves and Vessels

- Neural Foramen
- Spinal Nerve
- Dorsal Root ganglion
- Relationships
Pain Generators

- Annulus Fibrosis (outer 1/3 only?)
- Periosteum
- Neural Membranes (Anterior Dura)
- Ligaments/ Z-joint capsules
- Muscles.
Diagnostic

- **Pain**: location (radiation), qualitative, what makes pain better / worse.

- **Neurologic Symptoms**
  - Paresthesias.
  - Bladder / Bowel retention or incontinence.
  - Weakness.
Diagnostic

- **History:**
  - **RED FLAGS**
    - Trauma,
    - Age >50,
    - Hx of CA,
    - Unexplained wt loss,
    - fever or immunosupression,
    - IV Drug use,
    - Neurologic deficit.
Examination

- Range of Motion (document range and pain)
  - Flexion- 40°
  - Extension- 15°
  - Lateral bending- 30°
  - Rotation- 45°
Neurologic Examination I

- Strength tests
  - L1, L2- Hip flexion (Psoas, rectus femoris)
  - L2,3,4 – Knee extension (Quads)
  - L2,3,4 -- Hip adductors (adductors and gracilis)
  - L5 – ankle/ toe dorsiflexion (ant. Tibialis, EHL)
  - L5– Hip abductors (gluteus medius, TFL)
  - S1- ankle plantarflexion (gastroc/ soleus)
  - S1– Hip extensors (Gluteus max., Hamstrings)
Neurological examination II

- **Reflexes**
  - L2,3,4- Quads
  - L5- Medial hamstring
  - S1- Achilles

- **Sensation**
  - Pin prick- primarily spinothalamic tract
  - Vibration/ position sense- dorsal columns
    - Vibration tested with 256cps fork!
    - Position on 3-4\textsuperscript{th} digit
Provocative Maneuvers

- Straight Leg Raise (supine or seated)
  - For L5-S2 radicular symptoms
- Femoral Stretch
  - For L2-4 radicular symptoms
- FABER’s test
  - For SI joint, hip joint, lumbar z-joint symptoms
Provocative Manuvers

Seated SLR (Slump Test)

Standing Femoral Stretch
Imaging or Not?

- Low yield without RED FLAGS present.

- “Abnormal” findings in Asymptomatic.
  - Jarvik- LAIDback study.

- Psychological.
  - Anxiety, fear-avoidance- possibly help?
  - Depression- “there must be something wrong”
Guidelines for Imaging

- **NO RED FLAGS!**

- Acute pain- symptomatic treatment for 4 weeks, re-evaluate. Image if pain continues.
  - AHCPR Guidelines for Acute LBP.


- Chronic pain- none, unless changes in sx’s

- Chronic intermittent- TX as acute patients
Treatments
Medications

- NSAID’s- anti-inflammatory, mild pain relief.
- Tylenol- mild- moderate pain relief.
- Narcotics- moderate to severe pain. (fail above).
- Anticonvulsants- neurogenic pain.
- TCA’s- neurogenic symptoms, paresthesias.
- Muscle relaxants- acute spasm.
General Therapy Guidelines

- Pain Control (symptomatic TX.).
- Tissue injury (physiologic TX.)
- Motion in Pain-free range.
- Restore Full pain free range of motion.
- Core CONTROL for Neutral spine.
- Restore Muscle ENDURANCE.
- Restore Functional movements.
Therapies

- Bed Rest.
  - Less than 2 days.
- ROM.
  - Lower extremity, multifidus, lats.
- Core strengthening.
  - Transversus Ab., quadratus, multifidus, glutes.
- Multiplanar exercises.
Modalities

- Thermal (hot/cold)
- Ultrasound
- Electrical Stimulation (NMES)
- TENS (transcutaneous electrical neurostim.)
- Bracing
Injections

- Epidural procedures
  - Helpful in radicular pain and stenosis

- Z-joint Blocks
  - Short-term relief for furthering therapy.

- Medial branch blocks
  - Radiofrequency lesions.
Who needs Surgery?

- Unstable Spine
  - Acute fractures with Neurologic deficit.
- Severe Stenosis
  - After failure of aggressive non-operative tx.
- Tumor?
- Progressive Neurologic deficit