



2023 Napa Primary Care Conference

November 8-12, 2023
16 hours CME Credit™

Physicians, Nurses, Physical Therapists,
Athletic Trainers and other medical professionals

LUMBAR SPINE ASSESSMENT AND TREATMENT

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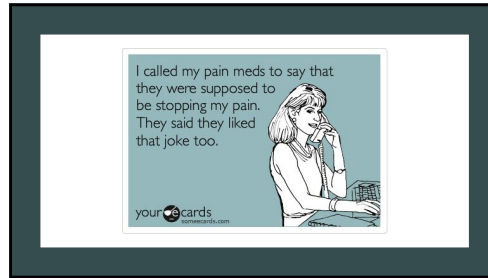
Conflict of Interest Disclosure

I, **Brandee Waite**, hereby declare that the content for this activity, including any presentation of therapeutic options, is well balanced, unbiased, and to the extent possible, evidence-based.

Level 42AI : Health Technology Consulting Advisor

OBJECTIVES

- Refresh knowledge on anatomy and physical exam of the spine
- Identify red-flags  which require quick action
- Arm yourself with resources to provide evidence-based treatment algorithms
- Smile or nod at least three times during the presentation
 - Good photos
 - Reminder of a patient you'll never forget



WHAT I WILL NOT BE DISCUSSING

- Opioid Prescribing
- Spinal Interventional Techniques
- Surgical Intervention
- Scoliosis & Adult Spinal Deformity
- Spondylolisthesis
- Neck Pain

Neck Pain

- Lifetime prevalence less than that of low back pain
- Estimated prevalence of a "significant" episode of neck pain is 40-70%
- Risk factors include: older age, rear-end automobile accidents, female
- Causes, diagnostic evaluation and treatment approach similar to LBP

COLD HARD FACTS

- LBP affects 80% of individuals over their life
- 2nd, 5th most common reason to visit a doctor (depends on source)
- 2nd leading cause of activity limitation and missed work in much of the world
- 1998: health costs related to LBP in US: \$26.3 BILLION
- 2% of the entire US workforce compensated for back injuries each year

[Med Clin North Am](#). 2016 Jan;100(1):149-81. doi: 10.1016/j.mcna.2015.08.015

WORKERS PREVALENCE & RISK

- 2010: self reported LBP in prior 3 months for US workers: 25.7%
- Significant associations with work-life imbalance, hostile work environment and job insecurity
- Increased risk if
 - Younger and working > 60 hrs or older with non-standard work arrangements
 - Male healthcare practitioners or female farming, fishing and forestry work
 - Female workers with 41-45 hour work week


J Manipulative Physiol Ther. 2016 September ; 39(7): 459-472.
doi:10.1016/j.jmpt.2016.07.004

GOOD NEWS / BAD NEWS

- Acute pain usually subsides spontaneously over time
- 50% of episodes resolve within 2 weeks, 80% by six weeks
- 30% of individuals will experience recurrent pain or develop persistent pain in the future
 - After 6 weeks, pain is considered "chronic"
 - Some define chronic as > 3 months


APPROACH TO LBP

- Identify any precipitating factors
 - Intrinsic
 - Poor flexibility
 - Obesity
 - Deconditioned/poor endurance
 - Anatomic
 - Medical disease



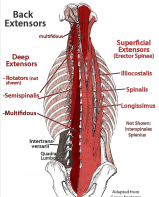
APPROACH TO LBP

- Identify any precipitating factors
 - Extrinsic
 - Posture
 - Work environment
 - Home environment
 - Hobbies
 - Sleep positions/surfaces



MUSCLES OF THE LUMBAR SPINE

Back Extensors



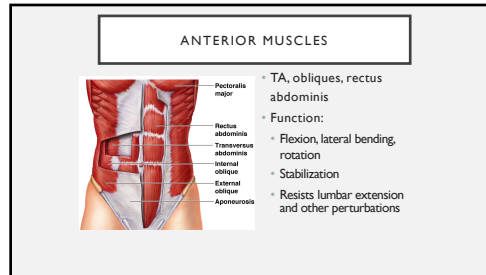
Deep Extensors

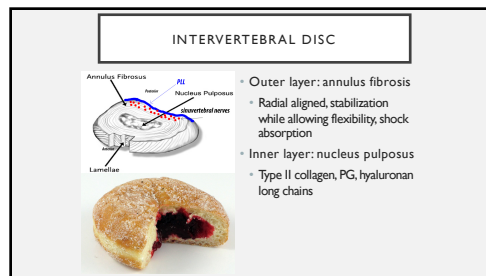
- Erectors (erector spinae)
- Semispinalis
- Multifidus

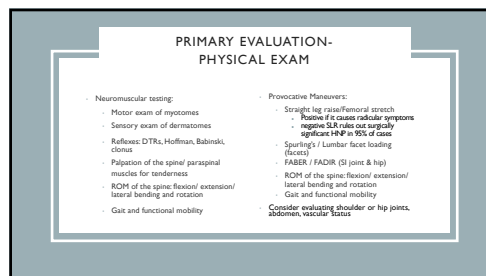
Superficial Extensors (Erector Spinae)

- Iliocostalis
- Spinalis
- Longissimus

- Psoas: hip flexors
- Quadratus lumborum and lateral intertransversarii: lateral flexors
- Interspinales, intertransversarii mediales, multifidi, erector spinae: extensors







QUIZ

55 yo LatinX male construction worker with a history of fluoxetine use for asthma reports insidious onset right sided low back and gluteal pain for the past 4 days, worse in the past 4 hours. He was able to walk to your office, is afebrile, denies numbness/tingling in the leg/groin, but has tenderness to palpation lateral to the spinous processes and pain is worsened with lumbar extension, though movement all directions is stiff.

What imaging does he need?

- A) No imaging needed
- B) Lumbar Spine X-ray
- C) Scoliosis X-ray study
- D) Lumbar MRI
- E) Lumbar CT scan

Box 2
Red-flag symptoms

The presence of any of these historical factors in a patient presenting with low back pain may indicate a serious underlying disorder and should prompt a more rapid and thorough evaluation of the patient.

Age >50 years

Systemic symptoms: fever, chills, night sweats, fatigue, decreased appetite, unintentional weight loss

History of malignancy

Nonmechanical pain (pain that gets worse with rest): night pain

Recent or current bacterial infection, especially skin infection or urinary tract infection

Immunosuppression

History of intravenous drug use

Failure of response to initial treatment/therapy

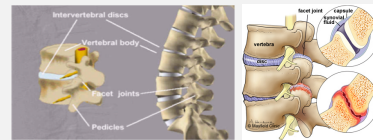
Prolonged corticosteroid use or diagnosis of osteoporosis

Trauma

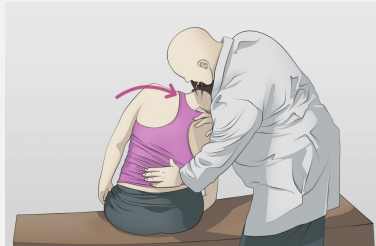
FACET ARTHROPATHY

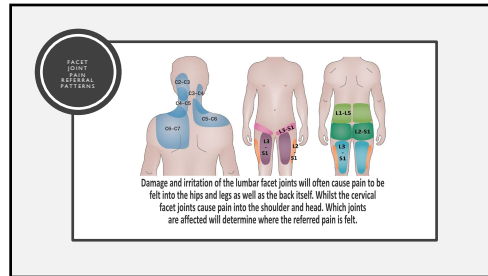
- Common axial low back pain
 - May refer to gluteal region
 - Acute flare of chronic issue
 - May have associated DDD on imaging
 - May have associated myofascial pain
 - Exam may be limited in acute setting
- Exam:
 - Rule out fracture (unlikely if no trauma)
 - Age / Osteoporosis
 - Steroid use
 - Rule out radicular pain
 - Rule out cauda equina symptoms
 - Lumbar facet loading maneuver

LUMBAR FACET ANATOMY



Kemp's Test- Lumbar facet loading





MEMORIZE THIS (JUST KIDDING)

Diagnosis and Treatment of Acute Low Back Pain
Cassazi B. Am Fam Physician. 2012 Feb 15;85(4):343-350.

History	Physical Exam	Imaging	Diagnosis	Treatment
History of low back pain (LBP) is the most common cause of disability in the United States. The prevalence of LBP is estimated to be 10% to 20% in the general population. The most common cause of LBP is muscle strain or sprain. Other causes include degenerative disc disease, herniated disc, spinal stenosis, and spondylolisthesis.	Physical exam findings include tenderness over the lower back, muscle spasm, and decreased range of motion. Neurological exam is usually normal.	Imaging studies (X-ray, CT, MRI) are not routinely indicated for acute LBP. Imaging is reserved for cases with red flags or persistent symptoms.	Diagnosis is based on history and physical exam findings. The most common diagnosis is muscle strain or sprain.	Treatment includes pain management (analgesics, NSAIDs), physical therapy, and patient education. Most cases resolve within 6 weeks.

MEMORIZE THIS TOO (STILL KIDDING)

Noninvasive Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians

Amir Qaseem, MD, PhD, RHA, Timothy J. Wilt, MD, MPH, Robert R. Colman, MD, PhD, Mary Ann Freston, MD, for the Clinical Guidelines Committee of the American College of Physicians

Ann Intern Med. 2017;166(5):330-339. doi:10.7326/M16-2367

ACCP

ACCP

LUMBAR FACET PEARLS

- Relative rest
- Not bedrest
- Acetaminophen or NSAIDs for symptom relief only (minimize)
- Short term muscle relaxant if local spasm only
- Bracing not recommend
- Prophylactic bracing may improve ergonomics
- Consider physical therapy if:
 - Patient fails to improve after 2 weeks of self-care
 - Patient presents with incapacitating, disabling back or leg pain
 - Functional or job activities are significantly limited
 - Recurrent issue
 - Advanced imaging if neurologic sx or sub-acute/chronic
 - Refer for consideration of interventional procedures

INDICATIONS FOR MRI

- Myelopathy
- Suspected metastasis, tumor, osteomyelitis, discitis or paraspinal abscess
- Suspected vascular malformation
- Compression fracture in elderly
- Congenital/traumatic spinal deformities
- LBP and radicular pain > 6 weeks
 - Severe pain
- Progressively severe symptoms or neurological dysfunction

SORT: KEY RECOMMENDATIONS FOR PRACTICE

Clinical recommendation	Evidence rating	References
Red flags are common in patients with acute low back pain and do not necessarily indicate serious pathology; therefore, physicians should rely on a comprehensive clinical approach to evaluating red flags in these patients.	C	5, 6, 8
Without findings suggestive of serious pathology, imaging is not indicated in patients with acute low back pain.	C	8-11
Nonsteroidal anti-inflammatory drugs, acetaminophen, and muscle relaxants are effective treatments for nonspecific acute low back pain.	A	16-20
Patient education that includes advice to stay active, avoid aggravating movements, and return to normal activity as soon as possible and a discussion of the often benign nature of acute low back pain is effective in patients with nonspecific pain.	B	23, 24
Although regular exercises may not be beneficial in the treatment of nonspecific acute low back pain, physical therapy (McKenzie method and spine stabilization) may lessen the risk of recurrence and need for health care services.	B	26-31, 37-39
Spinal manipulation and chiropractic techniques are no more beneficial than established treatments for nonspecific acute low back pain, and their addition to established treatments does not improve outcomes.	B	18, 20, 25, 42-44
Bed rest is not helpful for nonspecific acute low back pain.	A	46

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to <http://www.aafp.org/sort.pdf>.

QUIZ

A 34 yo Black/African American female health care worker reports acute onset of back pain after sneezing while twisting and scooping to reach for a file. Initially seemed to resolve with NSAIDs, but after an exercise class 3 days later she awoke with severe aching thigh and lower leg pain but min back pain. No bowel/bladder sx.

On exam, she is stiff all directions lumbar motion worse in flexion, has aversive gait and weakness in right great toe extension.

What is the most likely diagnosis?

- A) Myofascial strain
- B) Cauda equina syndrome
- C) Facet arthropathy
- D) Lumbar radiculitis
- E) Halingering

LUMBAR RADICULITIS

• AKA "Sciatica" or "Pinched Nerve"

• Mechanism typically foraminal narrowing due to disc irregularity +/- facet arthropathy abutting exiting nerve root

• +/- Back pain, but presence of thigh and lower leg pain/paresthesia/numbness (particularly in dermatomal distribution)

• Radiculitis = acute

• Radiculopathy = acute or chronic

• Exam

• Lumbar ROM

• Lumbar facet loading

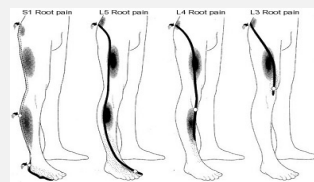
• Pin prick sensory evaluation

• Myotomal manual muscle testing

• Reflexes

• Neural tension tests

LUMBAR RADICULAR PAIN PATTERNS



LUMBAR RADICULITIS

- If pain, no red flags, may treat conservatively
- Consider steroid dose pack
- Physical therapy if no better in 2 weeks
- Xray +/- MRI if symptoms severe or persist > 6 weeks
- EMG/NCES to accompany MRI if considering interventional procedures
- Epidural Steroid Selective Nerve Root Block
- Caudal Epidural
- Asymptomatic adults lumbar MRI
 - 18% disc protrusion or herniation
 - 39% disc bulge from DDO
 - L5-S1 most common
- Radiculopathy = Root
- Myelopathy = Cord = bad
- Don't miss myelopathy



QUIZ

A 30 yo Asian male dock worker with axial right low back pain for 3 months after 1 week of unloading shipping containers with repeated torso rotation. What is the most likely diagnosis?

- A) Discogenic pain
- B) Arachnoiditis
- C) Myofascial Pain
- D) Sacroiliac Joint Pain
- E) Malingering

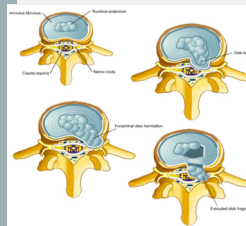


DISCOGENIC PAIN

- Chronic low back pain: 39% attributed to disc
- Innervated by segmental sinuvertebral nerves and gray rami communicantes
- Etiology: disc infection, torsion injury and internal disk disruption (IDD)
 - Torsion: rotational strain
 - IDD most common; disc degradation
 - Radial fissures, tears, endplate fracture
- Exam:
 - Axial pain predominates
 - may radiate to gluteal, occasional leg
 - Concern for infection if fever
 - Imaging only if pain > 6 weeks
 - X-ray limited use (r/o facet arthropathy)
 - MRI
 - Discogram

DISCOGENIC PAIN

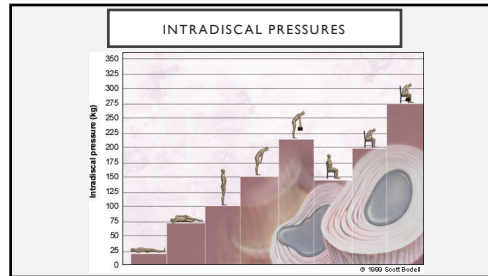
Annulus Fibrosis
Nucleus Pulposus



ANNULAR TEARS



- Common in asymptomatic individuals
- Not a predictor for accelerated disc degeneration
- May be symptomatic if it extends to the outer annulus
- May lead to a chemical radiculopathy



TREATMENT

- Acetaminophen & NSAIDs (good evidence)
- Short term muscle relaxants (good ev for acute pain)
- Tramadol reduces use of NSAID (good ev for chronic)
- Oral steroids (poor evidence)
- Opioids (controversy)
- Physical therapy (good ev)
- Cognitive behavior therapy (good ev but min, short term improvements)
- Manual medicine (good ev)
- Acupuncture (good ev for chronic- not acute)
- Yoga (good evidence)
- Tai Chi and meditation (inconclusive evidence)
- Epidural steroid for IDD has more evidence than intra-disk steroid
- Intradiskal procedures need more study

SPINAL STENOSIS

- Onset
 - Congenital – 2nd or 3rd decade
 - Degenerative – 6th or 7th decade
- Degenerative stenosis 5x more common in women
- Most common at L4-5

SPINAL STENOSIS


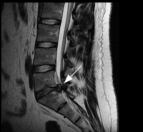
- History
 - Insidious onset chronic LBP that progresses to gluteal and leg pain
 - Exacerbated by activity and spinal extension
 - Relieved by rest and lumbar flexion
- Physical Examination
 - Loss of Achilles reflex
 - Lumbar ROM extremely restricted and may cause gluteal and leg symptoms
 - May have fixed neurologic deficits

CAUDA EQUINA SYNDROME

Compression of multiple nerve roots below the level of the conus

Sx: saddle anesthesia, bowel/bladder dysfunction, low back and leg pain, leg numbness/weakness

Surgical Emergency

Lumbar MRI reveals massive disc extrusion at L5/S1 causing severe compression of the cauda equina.

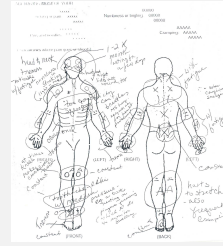
WHEN THE STORY DOESN'T ADD UP



WADDELL'S SIGNS

- Tenderness: superficial and/or non-anatomic
- Distraction tests: straight leg raising in seated position
- Simulation:
 - Axial loading causing low back pain
 - Passive rotation of the trunk as a block causing low back pain
- Regional disturbances:
 - Non-anatomic weakness or giving way
 - Sensory changes in stocking distribution
- Overreaction: facial grimacing, jumping, crying

3 or more positive signs may indicate pathologic factors.



AFP 2012





Table 2. Red Flags for Serious Etiologies of Acute Low Back Pain

Possible etiology	History findings	Physical examination findings
Cancer	Strong: Cancer metastatic to bone Intermediate: Unexplained weight loss Weak: Cancer pain increased or unrelieved by rest	Weak: Vertebral tenderness, limited spine range of motion
Cauda equina syndrome	Strong: Bladder or bowel incontinence, urinary retention, progressive motor or sensory loss	Strong: Major motor weakness or sensory deficit, loss of anal sphincter tone, saddle anesthesia Weak: Limited spine range of motion
Fracture	Strong: Significant trauma related to age* Intermediate: Prolonged use of steroids Weak: Age older than 70 years, history of osteoporosis	Weak: Vertebral tenderness, limited spine range of motion
Infection	Strong: Severe pain and lumbar spine surgery within the past year Intermediate: Intravenous drug use, immunosuppression, severe pain and distant lumbar spine surgery Weak: Pain increased or unrelieved by rest	Strong: Fever, urinary tract infection, wound in spine region Weak: Vertebral tenderness, limited spine range of motion

AFP: Presence of one or two weak or intermediate red flags may warrant observation because few patients will be significantly harmed if diagnosis of a serious cause is delayed for four to six weeks. Presence of any strong red flag warrants more urgent workup and probable referral to a spine subspecialist.
* Fall from a height or motor vehicle crash in a young patient, minor fall or heavy lifting in a patient with osteoporosis or possible osteoporosis.
Information from references 5, 6, and 8.

OBJECTIVES IN REVIEW

- ✓ Refresh knowledge on anatomy and physical exam of the spine
- ✓ Identify red flags  which requires quick action
- ✓ Arm yourself with resources to provide evidence-based treatment algorithms
 - AAPP monograph: Differential diagnosis of Acute low back pain
 - <https://doi.org/10.1016/j.jam.2016.01.001> *Med Clin North Am*. 2016 Jan;100(1):169-81. doi: 10.1016/j.jam.2016.01.001.
- ✓ Nonsurgical Treatments for Acute, Subacute, and Chronic Low Back Pain: A Clinical Practice Guideline From the American College of Physicians 2017
 - Good photos
 - Reminder of a patient you'll never forget

QUESTIONS?



REFERENCES

- Yang H et al. Low Back Pain Prevalence and Related Workplace Psychological Risk Factors: A Study Using Data From the 2010 National Health Interview Survey. *J Manipulative Physiol Ther.* 2016 September; 39(7):459-472. doi:10.1016/j.jmpt.2016.07.004.
- Casazza B. Diagnosis and Treatment of Acute Low Back Pain. *Am Fam Physician.* 2012 Feb 15;85(4):343-350.
- Simon J et al. Disogenic low back pain. *Phys Med Rehabil Clin N Am.* 2014 May;25(2):305-17. doi: 10.1016/j.pmr.2014.01.006. Epub 2014 Feb 28.
- Patrick N et al. Acute and Chronic Low Back Pain. *Med Clin North Am.* 2016 Jan;100(1):149-81. doi: 10.1016/j.mcna.2015.08.015.
- Imaging for Low Back Pain: AAFP Choosing Wisely project
- Christopher E. Alexander et al. Lumbosacral Facet Syndrome. StatPearls.

BONUS SLIDE: WHAT IS MECHANICAL LBP?

- Implies the source of pain is in the spine and/or its supporting structures
 - Disc, joints, vertebrae, or soft tissues
- The surrounding muscles and ligaments may develop reactive spasm and pain

