Low Back Pain: Evaluation and Management in Emergency and Ambulatory Settings

AAPA Impact 2020

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Presentation Objectives

- Discuss the prevalence of low back pain and its societal costs
- Create a differential diagnosis of low back pain based on patient presentation and discuss how this may differ based on medical setting
- Describe the focused physical examination of a patient complaining of low back pain
- Discuss key elements to refining differential diagnoses for patients with low back pain based on historical data and physical examination findings
- Discuss appropriate evidence-based methods for determining diagnostic testing, treatment planning and referral patterns based on patient presentation

Societal Characteristics of LBP

84% of population will experience an activity limiting episode in their lifetime (Wheeler, et al., 2019)

149 million lost work days annually (Nguyen & Randolph, 2007)

Low back pain health care expenses = $90 billion annually (Borczuk, 2013)

Societal Characteristics of LBP

90% of patients initially seen in primary care do not seek treatment after 12 weeks (Chou, 2015)

5th most common reason for seeing a health care provider (Nguyen & Randolph, 2007)

Most common cause of disability in those < 45 years (Borczuk, 2013)

Where will PAs encounter patients with LBP?

Emergency Medicine

Primary Care

Surgical Specialties

Pain Management

Where does back pain come from?

- A cause cannot be determined in more than 85% of patients (Wheeler, et al., 2019)

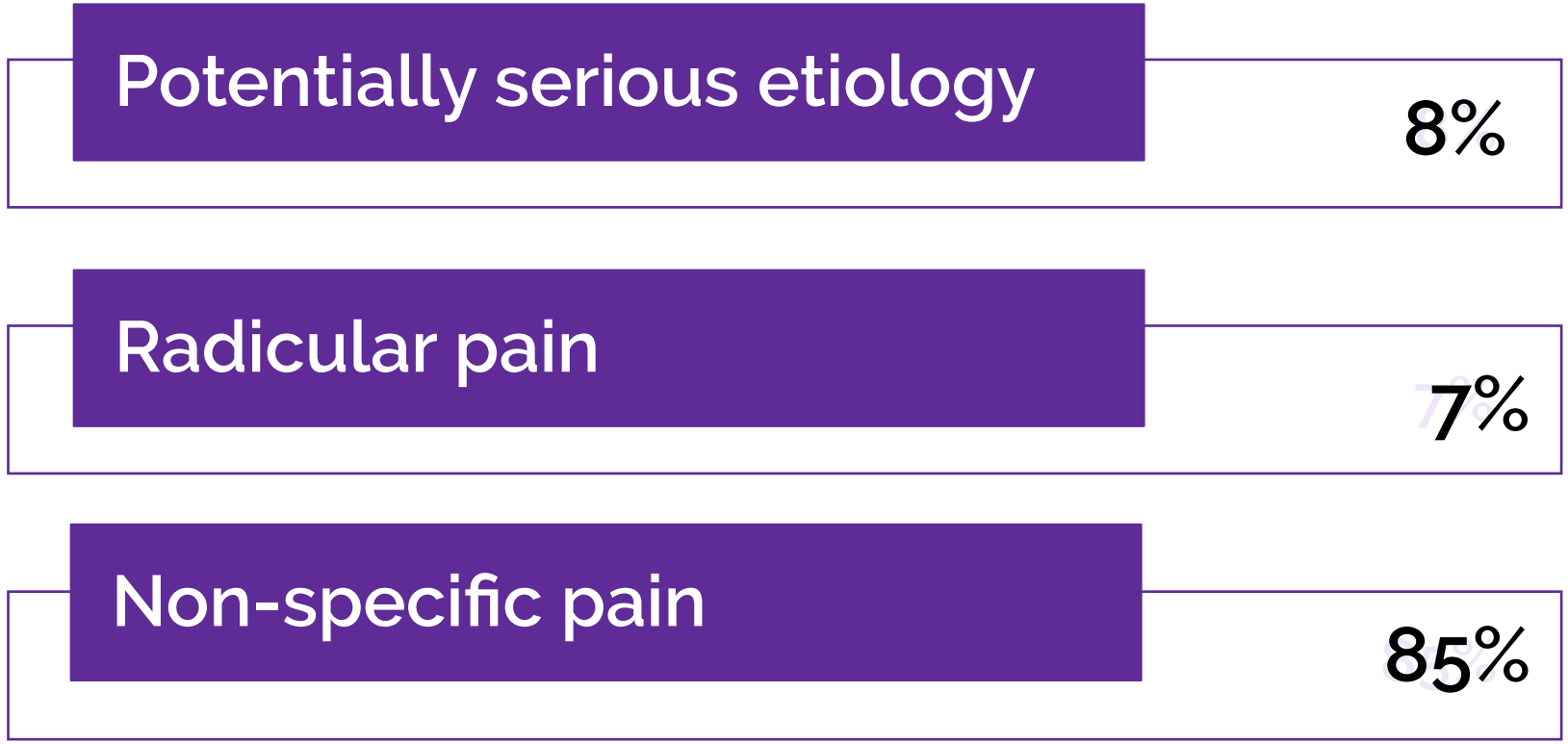
- Multiple anatomic structures may contribute to pain
  - Paraspinal muscles
  - Ligaments of the spinal column
  - Facet joints
  - Nerve roots
  - Intervertebral discs
  - Vertebrae

Primary goals in evaluating a patient with low back pain

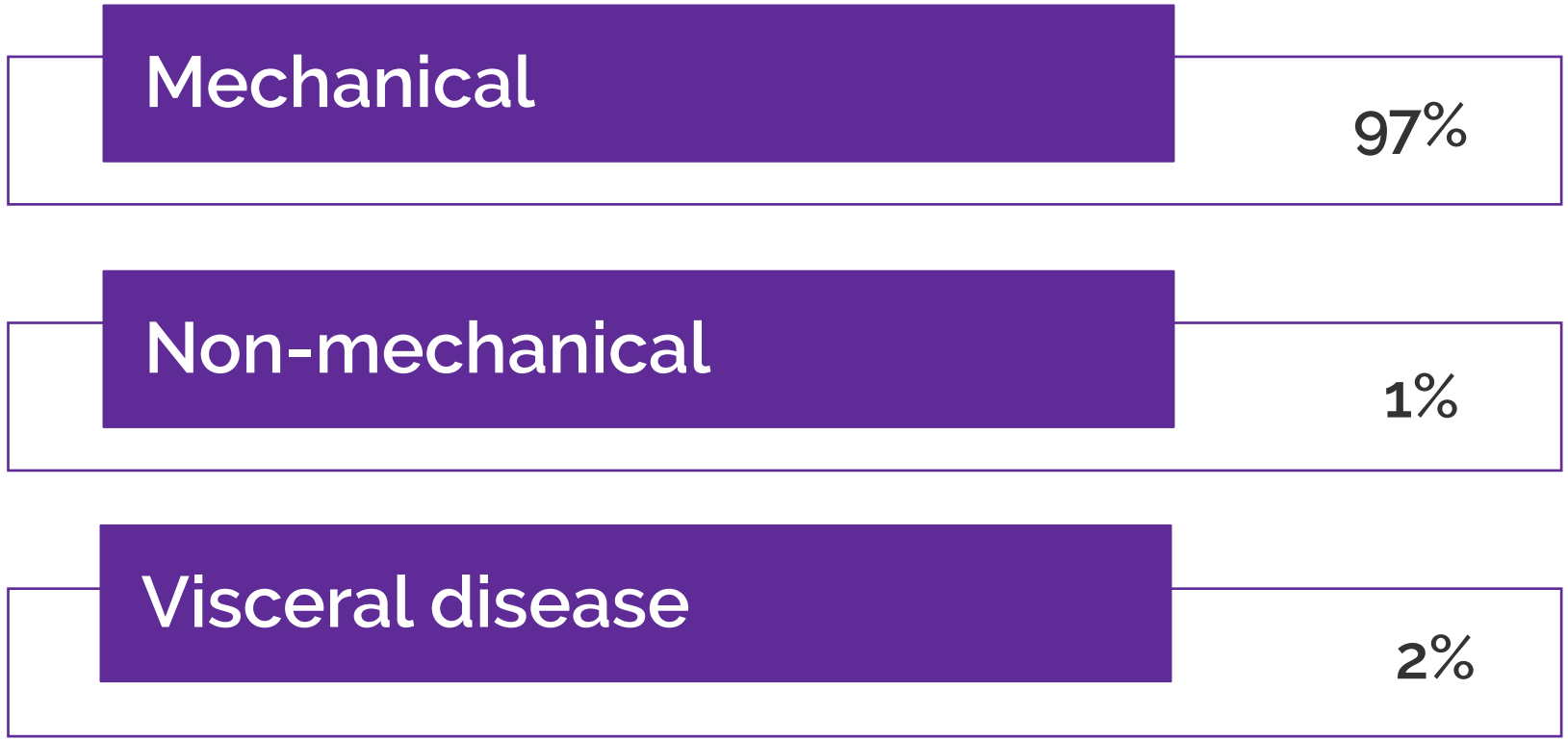
Step 1	Step 2	Step 3
Categorize the type of pain	Determine the cause, if possible through reasonable means	Choose a cost-effective and evidence based treatment

The approach may differ depending upon clinical setting.

Categorizing LBP for the first point-of-care provider



Categorizing care for the secondary provider



Historical Red Flags

Past Medical History:

- Age > 50 or <20 years
- Immunocompromised state or indwelling catheter
- History of trauma, cancer, IVDA or glucocorticoid use

Symptoms:

- Pain worse at night or at rest
- Unexpected weight loss, unexplained or persistent fever, or night sweats
- Bowel or bladder changes or saddle area anesthesia

Approach to Physical Examination

Bilateral motor and sensory loss, bladder distention, and decreased rectal tone, saddle anesthesia	Cauda equina
Midline vertebral tenderness and weight loss	Osteomyelitis, epidural abscess or cancer
Pulsatile abdominal mass and diminished LE pulses	Abdominal aortic aneurysm

Approach to Physical Examination

CVA or flank tenderness	Pyelonephritis or Nephrolithiasis
Adnexal or cervical motion tenderness or palpation of a mass	Pelvic disease
Grouped vesicles on an erythematous base rash that does not cross midline	Shingles

Approach to Physical Examination

- When cause of pain appears musculoskeletal in origin focus on determining WHERE the problem is first

- Neurologic system
  - Strength, sensation, reflexes, straight-leg and crossed straight leg tests
  - Upper versus lower motor neuron signs
  - Gait analysis

Differentiating central from peripheral nervous system pathology

	Upper Motor Neuron Sign	Lower Motor Neuron Sign
Muscle tone	Increased	Decreased
Atropy	Disuse atrophy (generalized)	Specific
Fasiculation	None	Common
DTRs	Increased	Decreased
Babinski Sign	Present	Absent

L4 nerve root function

Motor	• Anterior tibialis strength by resisted ankle dorsiflexion
Sensory	• Medial malleolus sensation
Reflex	• Patellar

L5 nerve root function

Motor	• Extensor hallicus longus strength by resisted great toe extension
Sensory	• First dorsal web space sensation
Reflex	• NONE

S1 nerve root function

Motor	• Peroneus longus and brevis strength by resisted ankle eversion and heel raises in single leg stance
Sensory	• Lateral calf/heel sensation
Reflex	• Achilles

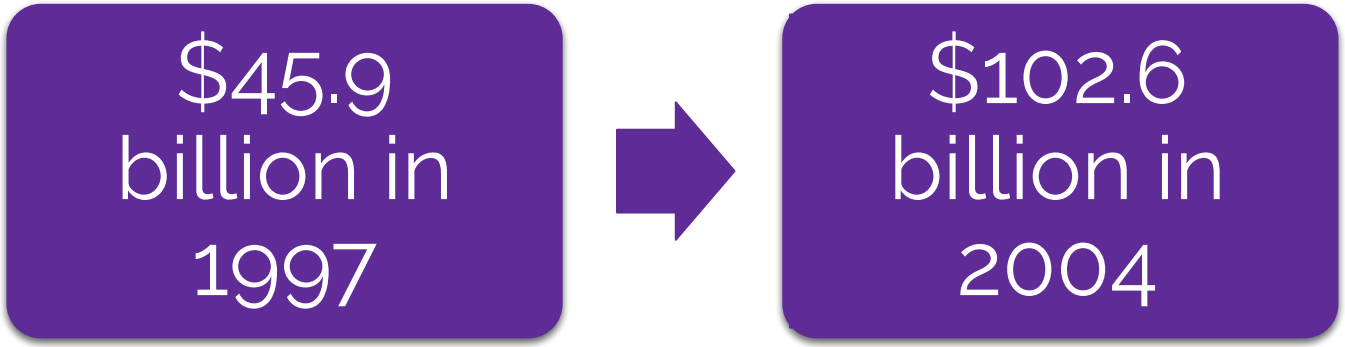
Diagnostic Imaging

- Indications for imaging include:
  - Progressive or severe neurologic deficits
  - Red flag signs and symptoms
  - Pain that is persistent after 4-6 weeks with little to no improvement despite conservative treatment

- In the absence of red flag symptoms, lumbar imaging is NOT recommended in the first month of acute LBP (Chou, Fu, Carrino & Deyo, 2009)

Cost of Diagnostic Imaging for LBP

- Costs associated with health care services for spinal pain in the US (Dagenais, Galloway & Roffey, 2014)



- Use of lumbar MRI increased by 300% from 1994 to 2006 (Dagenais, Galloway & Roffey, 2014)

What are outcomes of increased diagnostic imaging in acute LBP?

Patients with LBP and no evidence of serious underlying pathology treated with usual clinical care without immediate imaging

Compared with

Patients with LBP and no evidence of serious underlying pathology evaluated with routine lumbar spine imaging and treated with usual clinical care

No improvement in clinical outcomes

Potential Harm of Diagnostic Imaging

Increased health care spending

Repeated exposure to ionizing radiation

Detection of anatomic abnormalities that are asymptomatic

40–80% of pts have bulging discs on MRI

Up to 20% of patients >50 years have spinal stenosis

Many *asymptomatic* patients will have anatomic abnormalities on imaging studies

20% of pts aged 14-25 have DDD on Xrays

>90% of pts older than age 50 have DDD on MRI

Even in symptomatic patients, anatomic abnormalities are not necessarily causative, and identifying them does not influence initial treatment decisions.

Care of LBP by Provider Perspective

Emergency Medicine	•Identify and stabilize emergent conditions •Provide pain control and education •Provide appropriate follow up resources
Primary Care	•Identify and triage emergent conditions •Provide pain control, education and adjunctive care •Refer appropriate patients for diagnostic imaging and specialist
Surgical Specialist	•Provide pain control, education and refer for adjuncts of care •Evaluate to determine surgical candidacy

43 year-old female with radicular pain

No PMH. She presents to PCP with complaint of a mild ache in her low back along with pain from her posterior thigh to right lateral calf after picking up a watering can while gardening two days ago. She denies fever, unexpected weight loss, bowel/bladder dysfunction

HNP | Spinal stenosis | Cauda equina

Physical exam reveals non-tender spine/paraspinal muscles, full range of motion of spine except for mildly limited forward flexion with reproducible pain down her right leg to the calf. Full and pain free ROM of the hips bilaterally, diminished sensation in right L5 dermatome, normal DTRs, 5/5 strength all major muscle groups (including EHL), positive SLR on the right at 45 degrees

Approach to this patient

- Patient education
- Activity modification
- Pain management
  - NSAIDs +/- skeletal muscle relaxant first line

Two days later the patient presents to PCP with worsening neurologic deficits: **Severe weakness in EHL, numbness in L5 dermatome, increasing pain**

What diagnostic test would you order for this patient?

A. Plain radiographs
B. CT scan
C. MRI
D. None

Approach to this patient

- Obtain MRI
- Refer to specialist for further evaluation evaluate

Indications for Surgery

- Progressive or severe motor weakness
- Signs of spinal cord or cauda equina compression
- Incapacitating pain despite conservative treatment for four weeks at a minimum that interferes with ADLs

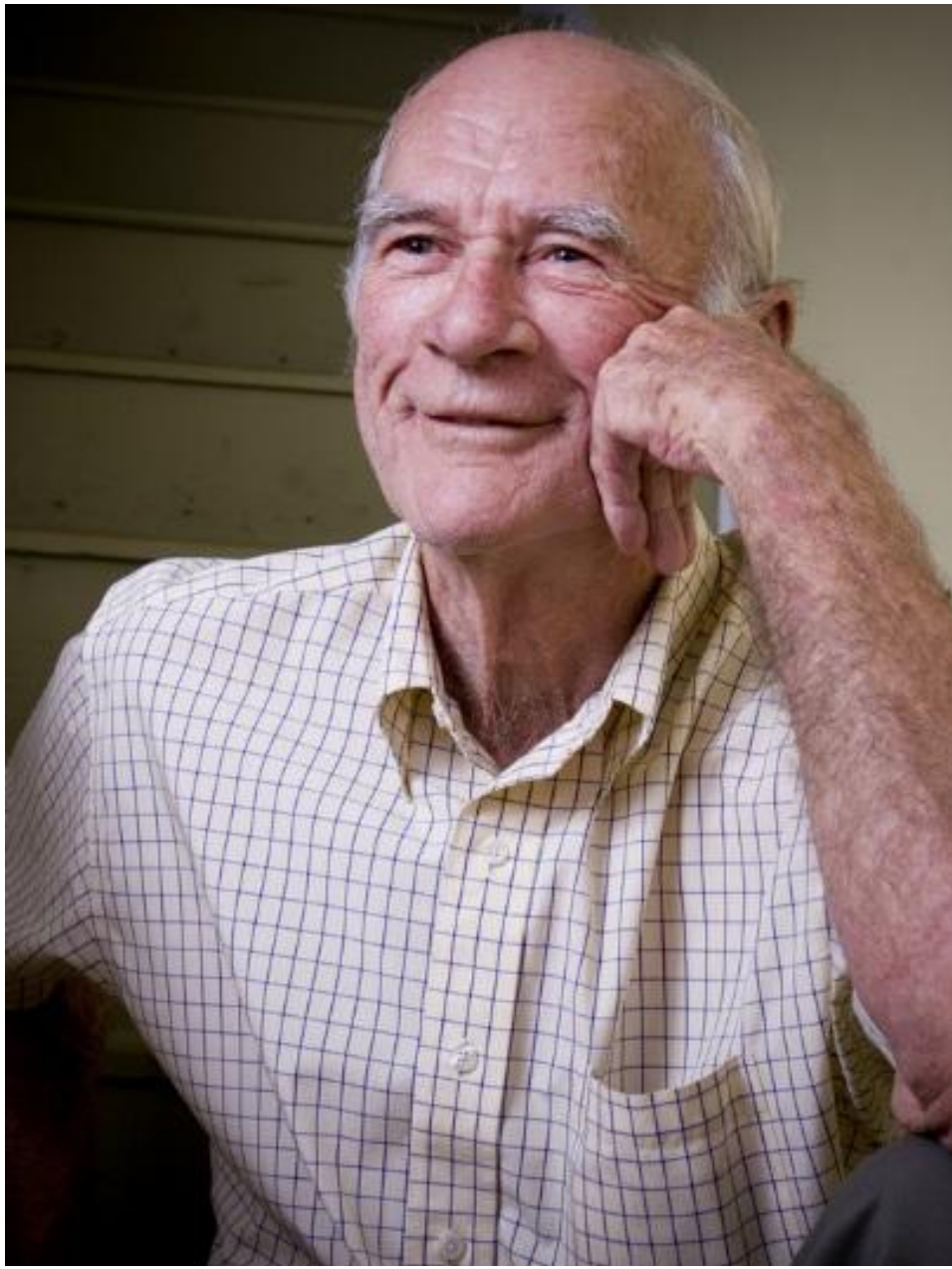
65 year-old male with LBP

History of lung cancer 10 years ago, presents to the ED with complaints of unexplained weight loss and low back pain x 1 week. He denies radicular symptoms, fever, bowel/bladder dysfunction

Cancer	AAA/Aortic dissection
Osteomyelitis	Compression fracture
Degenerative disc disease	Prostatitis

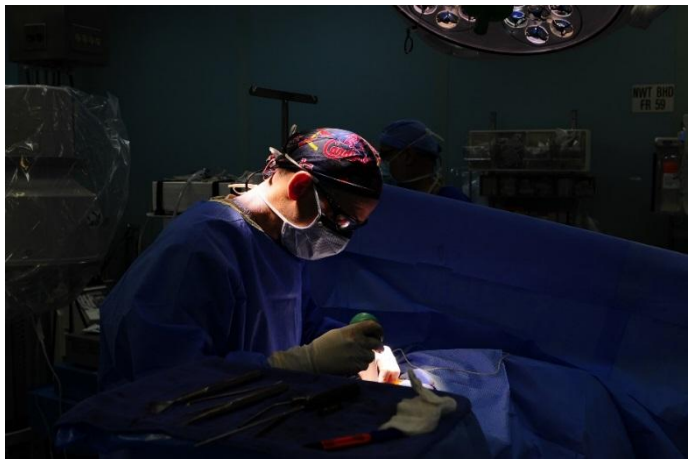
On physical exam:

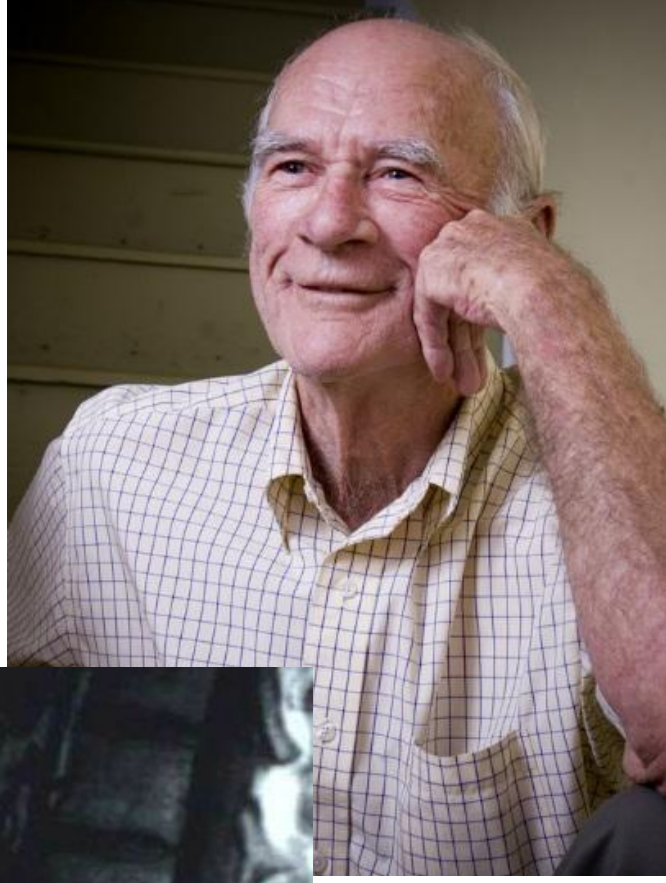
Midline tenderness at L4 and diminished sensation on the right in the L4 dermatome, 4/5 strength of the right dorsiflexors , +1/4 patellar reflex on right

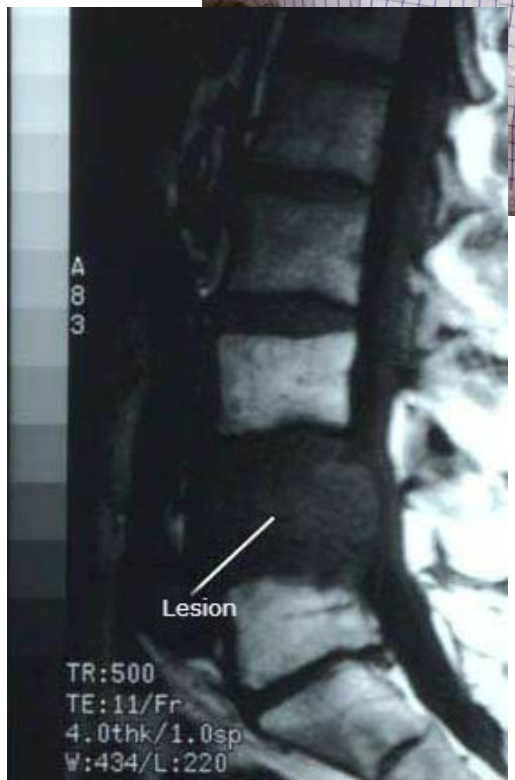


Management of this patient

- X-ray and MRI
- Steroids
- Pain management
- Serial neurologic exams to detect worsening deficits
- Emergent surgical consult







45 year-old male with LBP

History of depression presents to PCP complaining of LBP after lifting his daughter over the weekend at a picnic. He denies radicular symptoms, fever, unexpected weight loss, bowel/bladder dysfunction

Degenerative disc disease
Lumbar muscle strain/sprain
Spondylolisthesis

Physical exam reveals tenderness at paraspinal muscles bilaterally, ROM limited in all directions secondary to pain, no neurologic deficits

Approach to the patient

- Patient education
- Initial activity modification based on symptoms
- Pain management

Medication Options to Treat Acute LBP

- **NSAIDS** – first line treatment
- **Muscle relaxants (cyclobenzaprine)** – best outcome when used in conjunction with NSAIDs for acute LBP
- **Opioids** – short-term use only; indicated for severe pain that disrupts ADLs and is not controlled with NSAIDS
- **Tramadol** – alternative to opioids for chronic LBP

Systemic Glucocorticoids have shown NO benefit in treating LBP

At his follow up appointment 2 weeks later

- Pain is mildly improved without disruption of sleep but does limit his activities during the day

- Modified Treatment Plan:
  - Addition of physical therapy or spinal manipulation
  - Continue NSAIDs

Potential outcomes for this patient

- May resolve in 4-6 weeks like the majority of patients with LBP
- This patient is at risk for developing chronic LBP given his history of depression (known as a “yellow flag”)
- Other Yellow Flags include
  - Anxiety
  - Passive attitude about treatment
  - Adverse coping strategies
  - Job dissatisfaction
  - Pending litigation
  - Workers compensation claims
  - History of sexual or physical abuse
  - Substance abuse

Treatment of chronic LBP

- Pharmacotherapy
  - NSAIDs - first line
  - Duloxetine, Tramadol or a tricyclic antidepressant- second line
- Physical therapy
- Acupuncture
- Spinal manipulation
- Massage therapy
- Cognitive behavioral therapy
- Surgery

Take Home Points

- Evaluate for “red flag” signs and symptoms in all patients with LBP
- Thorough evaluation and documentation is essential
- Diagnostic testing is not indicated in acute back pain (<4 weeks) in the absence of red flag signs/symptoms, progressive neurologic deficits or intractable pain
- Prescribe analgesia as necessary, but be cautious of addiction and side effects
- Keep a holistic view of the patient…what is getting in the way of improvement?

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