Acute & Chronic Low Back Pain: Primary Care Evaluation & Management

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Objectives

• Explain the natural history of low back pain
• Identify signs and symptoms of conditions associated with low back pain
• Demonstrate physical exam techniques to narrow the differential diagnosis
• Describe treatment strategies effective for common conditions

Speaker has no conflicts of interest to declare
Case 1

• 35 year old male with two week history of low back pain
• No trauma or history of overuse
• Pain radiates to buttocks and posterior right thigh
• Symptoms worse with activity and improve with sitting
• Good relief with his mothers pain medicine “it starts with a P... perca, perco.. something”
Low Back Pain

• 84% lifetime prevalence ($100 billion/yr)
  • Recurrence rate 50%

• 2\textsuperscript{nd} most common reason for PCP visit

• More than 50% improve regardless of Tx

• 50-80% improve within 2 weeks

• 85% improve within 2 months

• 5-15% develop chronic back pain
  • 75% of cost low back pain

• High expectations = better outcomes
  • Psychosocial variables predict outcome better than structural changes
Back Pain Risk Factors

• Smoking
• Obesity
• Older age
• Female gender
• Physically strenuous work
• Sedentary work
• Psychologically strenuous work
• Low educational level
• Workers comp claim
• Job dissatisfaction
• Anxiety, depression somatization disorder
Low back pain- an Overview

• Most “nonspecific”
  • LS strain, OA, Disc Dz, spinal stenosis
  • Muscle and ligamentous sources equally important

• Less than 1% serious systemic etiologies
  • RA, infection, tumor, cauda equina, referred pain
    • Most will have risk factors or other symptoms

• Consider patient history
  • Is there evidence of systemic disease
  • Is there neurologic compromise
  • Is there social or psychological distress
Low back pain- an Overview

• Consider systemic disease
  • History of cancer
  • Age over 50
  • Unexplained weight loss
  • Pain greater than one month
  • Night pain
  • Pain unresponsive to previous therapies
Low back pain- an Overview

• May be no identifiable precipitating event

• Symptoms
  • Low back pain that radiates into buttocks
  • May radiate into lower leg

• Age and posture suggest pathology
  • 20-40 LS strain- prefer to sit (⊗ stand/flex)
  • 30-50 disk Dz- prefer to stand (⊗ flex)
  • >50 OA- prefer to bend (⊗ stand/extend)
    • Spinal stenosis- prefer to stoop
Common pathoanatomical conditions of the lumbar spine

A. Normal anatomy

B. Abnormal anatomy

C. Spondylolysis (fracture in pars interarticularis)

Nonorganic Symptoms

- Response to symptoms inconsistent with known patterns of illness
- Not considered malingering
  - Individual communication pattern
  - Perception of illness or appropriateness of care
- Nonorganic findings do not indicate absence of pathology
- May be more commonly seen when litigation or workers’ compensation is involved
- Pain or symptoms may be global or travel in nonanatomic pattern
Nonorganic Symptoms

• Differential diagnosis
  • Diabetes mellitus
  • Multiple sclerosis
  • CVA

• Considerations
  • Rule out serious pathology
  • Discuss absence of specific disorders
  • Discuss psychological and social stressors and support systems
  • Inquire about contributing factors
    • Major life events
Nonorganic Symptoms

• Physical exam
  • Thorough neuro exam to provide perspective
  • Exaggerated response to stimuli
  • Axial load
    • Low back pain likely nonorganic origin
    • Neck pain could indicate radiculopathy
  • Flip sign
  • Distraction
  • Giving way
    • Lack of sustained effort and “gives way” in ratcheting, uneven pattern
  • Stocking-glove numbness

Chou, 2014
Case 1

• Exam
  • Inspection
    • No scoliosis or hyperkyphosis
  • Pain with low back ROM
    • Does not help distinguish cause
    • Documentation of ROM establishes baseline
  • Palpation/Percussion
    • Tender over low back paraspinal muscles
    • Bony tenderness sensitive but nonspecific (infection, mets, fracture)
  • Sensation, reflexes and motor strength intact
  • Negative Straight Leg Raise
    • Sensitive but nonspecific
 Appropriately exposed patient

Straight leg raise

- Elevate leg until pt complains of pain or knee bends (about 45°)
  - Dorsiflex ankle
    - ↑ Back pain?
    - Any radicular Sx?
  - Plantarflex ankle
    - Relieves sciatic tension
    - ↑ Pain may indicate nonorganic pathology
- Compare to sitting SLR
- Consider contralateral SLR
  - Less sensitive but 90% specific
Straight leg raise

• **Flip sign**
  • Pt seated with hands on edge of table
  • Ask about knee pain
  • Extend knee
  • Assess for back pain
    • Sciatic tension will cause pt to “flip” back in acute pain
  • No pain makes sciatic radiculopathy unlikely
Low Back Sprain

• Diagnosis
  • Plain films usually not helpful
    • Most authorities do not recommend before 4-6 wks
    • Typically show age appropriate changes
    • May be loss of lumbar curve
    • Images do not improve prognosis
    • Consider if concern for tumor, infection, instability of if symptoms longstanding

• Differential diagnosis
  • Fx (osteoporosis), herniated disk (leg Sx = or > back Sx), infection (chills/fever/sweats), visceral pain, tumor (wt loss, fatigue), drug seeking
Acute Low Back Pain Treatment

• Focus on symptom relief and patient education
• 2-4 weeks of NSAIDS or acetaminophen
  • 500 mg of naproxen BID
  • Acetaminophen 3-4 grams daily (< 2 grams if heavy drinker or other risk of hepatotoxicity)
• Consider nonbenzodiazepine muscle relaxants for nocturnal symptoms
  • Cyclobenzaprine 10 mg QHS or 5mg TID for no more than 2-3 weeks
    • Sedating
• Tramadol 50-100 mg Q4-6 hours (maximum 400 mg daily)
  • Two weeks or less
  • Consider serotonin syndrome and seizure history
  • Precaution with cyclobenzaprine
Acute Low Back Pain Treatment

- **Other opioids**
  - Two weeks or less
  - Consider scheduled dosing or bedtime use
- **Return to ADLs and work ASAP**
  - Avoid bed rest and prolonged inactivity
- **Mobility exercises**
  - After acute phase has subsided
  - Formal PT for those at risk for chronic symptoms
- **Try ice and/or heat**
  - Heat wrap may reduce pain and disability for patients with pain of less than three months
  - No evidence for benefit of cold
Acute Low Back Pain Treatment

- Trigger point injection
  - Limited evidence for efficacy
- Yoga
  - No evidence to support yoga in acute back pain
- Spinal manipulation
  - No clear benefits over conventional medical therapy for acute low back pain
  - Integration depends on interest and access
- Acupuncture
  - Safe with few side effects
  - Evidence of benefit in acute low back pain is limited
    - More evidence to support acupuncture in chronic low back pain
- Massage
  - No evidence of clinical benefits
    - Increased patient satisfaction if chosen by patient
Patients Who Request Imaging

• Patients without concerning history or physical exam findings should be reassured
  • Unlikely to have serious condition
  • Incidental findings, unrelated to symptoms, are common and may lead to unnecessary tests and interventions
  • Imaging is appropriate if they do not improve as expected
• Advise that exam can identify signs of nerve injury
  • Point out exam features that are reassuring
• Consider plain films after 12 weeks of conservative treatment
  • Assuming no radiculopathy, progressive symptoms
Acute Low Back Pain/Chronic Low Back Pain

• Vast majority will improve within 2 months
• Recurrence is common
  • 50% in six months
  • 70% in 12 months
  • Recurrences have favorable prognosis
• 5-20% develop chronic back pain within 2 years of initial visit
• Predictors of chronic low back pain
  • Maladaptive coping behaviors (fear avoidance, catastrophizing)
  • Functional impairment
  • Poor general health
  • Psychiatric comorbidities
Chronic Low Back Pain/DJD

- Associated with degenerative disk disease
- LBP longer than 3 months
- Sx may be recurrent or unremitting
- Functional improvement is treatment goal
  - Move from cure to controlling pain and maintaining function

Symptoms
- LBP radiates to one or both buttocks
- Aggravated with ROM
- May be associated with intermittent “sciatica”
- Chronic pain associated mood disturbances
Chronic Low Back Pain/DJD

• Exam
  • May be tender over the lumbar and SI regions
  • May be radicular Sx without focal deficit

• Diagnosis
  • AP/lateral radiographs show anterior osteophytes and reduced intervertebral height

• Differential
  • Depression, Infla Dz (AM stiffness, abn labs), visceral pain, drug seeking, infection (fever etc)
Chronic Low Back Pain Treatment

• Self-care education

• Medium firm mattress
  • Better than firm

• Lumbar support
  • No evidence of effectiveness

• Exercise therapy
  • Core strengthening, hamstrings stretching and low back mobility
    • Safe, available and promotes functionality
  • All patients with subacute or chronic low back pain should be encouraged to remain as active as possible
Chronic Low Back Pain

• Individualized, supervised physical modalities that focus on stretching/strengthening
  • Physical therapy
  • Short course of manipulation
    • Chiropractic, osteopathic providers and physical therapists
    • Spinal manipulation had small short-term effects on reducing pain and improving functional status
      • Serious adverse events following lumbar spinal manipulation are rare
  • Acupuncture
    • Moderately more effective than no treatment for short term pain relief
      • No functional improvement
  • Yoga/massage
    • Limited evidence in hard to control studies
Chronic Low Back Pain Treatment

• NSAIDS and/or acetaminophen
  • Assess gastrointestinal and cardiovascular risk factors

• Opioids
  • Little evidence for efficacy greater than nonopioid analgesics
  • Tramadol

• Antidepressants
  • Conflicting studies in nonspecific low back pain
    • Tricyclics (not SSRIs) or trazadone associated with slightly improved pain relief
    • Duloxetine slightly more effective than placebo in manufacturer funded study
      • FDA approved for low back pain
  • Treat depression appropriately
Chronic Low Back Pain Treatment

• Benzodiazepines show limited efficacy
  • Potential for addiction and abuse

• Antiepileptic medication
  • Limited evidence in small studies
    • Gabapentin, pregabalin and topiramate small and unclear effects
    • For spinal stenosis
      • Gabapentin titrated to 2400 mg/day moderately improved pain scores at 4 months
      • Weight reduction

• Smoking cessation

• Weight reduction
Case 2

- 47 year old female with recent onset of low back pain that radiates to left foot
- Pain interferes with ADLs
- NSAIDs not helping any more
- Worried because foot is weak and getting numb
- No change in bowel/bladder control
Case 2

• Exam
• Trunk lists to one side
• Limited forward flexion
• Positive Straight Leg Raise on left
• Sensation reduced over dorsum of foot
• Weak great toe dorsiflexion (4/5)
• DTRs intact
Case 2

• Lateral protrusion at disc level L4-5 usually affects L5 nerve root (not L4)

• Disc protrusion at L5-S1 usually affects S1 nerve root (not L5)
Common pathoanatomical conditions of the lumbar spine

A. Normal anatomy

B. Abnormal anatomy

L3, L4, L5

Spondylolysis (fracture in pars interarticularis)

Intervertebral foramen

Thickened ligamentum flavum

Herniated disc

Spondylolisthesis

Hypertrophied facet

Nerve root canal

Lamina

Cauda equina

Facet

Spinal canal

Intervertebral disc

Anulus fibrosus

Nucleus pulposus

Sacrum

Sacroiliac joint

L3, L4, L5
Lumbar Radiculopathy

• Disk herniation causes nerve root irritation
  • Most often 5th lumbar or 1st sacral
  • Usually herniation of nucleus pulposus
  • Mechanical and chemical irritation

• Signs/Symptoms
  • Often abrupt and associated with LBP
    • Aggravated by sitting, walking, standing, coughing
  • L1 to L3 radiates to anterior thigh
  • L3-4 weak ADF, asymmetric knee reflex
  • L4-5 weak EHL, numb 1st web space
  • L5-S1 weak gastroc, numb side of foot weak ankle reflex

Lumbar Radiculopathy

• Severity
  • Pure sensory with painful dermatomal pattern
    • Radicular pain and sensory dysfunction without weakness
  • Mild motor deficits
    • Radicular pain, sensory dysfunction and nonprogressive motor weakness
  • Marked motor deficits
    • Radicular pain, sensory dysfunction and severe/progressive motor deficits
Lumbar Radiculopathy

• Diagnosis
  • Plain films show age appropriate changes
  • MRI
    • Diagnostic dilemma or as part of preop planning
    • May identify inflammatory, malignant and vascular disorders
  • EMG
    • May not detect clinically significant radiculopathy in the first few weeks
    • Useful in persistent disabling symptoms when neuroimaging is inconsistent with presentation
    • Most useful in the setting of neuromuscular weakness

• Differential diagnosis
  • Cauda equina (perianal numbness/bladder changes), trochanteric bursitis (neuro intact/tenderness), spinal stenosis (elderly)
Lumbar Radiculopathy

• Treatment
  • NSAIDS and/or acetaminophen
  • Limited course of opioids on fixed schedule
  • PO steroids (with caution)
    • Limited evidence
  • Epidural steroids
    • Not recommended during acute phase
  • Activity as tolerated
  • Physical therapy
    • Reasonable to delay physical therapy until symptoms have persisted for three weeks
  • Reassure pt that most disk herniation resolves without residual problems
Lumbar Spinal Stenosis

- Narrowing of one or more levels of spinal canal with subsequent nerve root compression
- Thirty percent of those 60 or older
  - Small percentage symptomatic
- Usually degenerative
  - L2-3
  - L3-4
  - L4-5
  - Uncommon at L5-S1 but can affect L5 root

Lumbar Spinal Stenosis

• Symptoms
  • May be sudden or gradual
  • Fatigue and weakness progress proximal to distal
  • Aggravated by walking and standing
  • Relieved by sitting or lying
  • Vascular insufficiency may have similar symptoms
Vascular vs. Neurogenic

• Vascular
  • Fixed distance
  • Relief with standing
  • Pain with walking uphill
  • Pain with biking
  • Absent pulses
  • Skin changes

• Neurogenic
  • Variable distance
  • Relief with sit/stoop
  • Pain relieved with walking uphill
  • No pain with biking
  • Pulses present
  • No skin changes

Conditions may coexist in elderly patients
Lumbar Spinal Stenosis

• Physical exam
  • Weakness less common
  • Poor proprioception/Romberg
  • Assess peripheral pulses
  • Sensory changes may be multilevel
    • DTRs may be diminished
  • Assess bowel and bladder symptoms
    • Consider stress incontinence and prostate sx
    • Loss of sphincter tone rare

• Diagnostic testing
  • Radiographs may show spondylolisthesis or significant narrowing of intervertebral disk
Lumbar Spinal Stenosis

• Differential diagnosis
  • AAA (palpable pulsatile mass)
  • Arterial insufficiency (fixed distance, poor pulses, recovery after rest)
  • Diabetes mellitus (abnormal labs, stocking distribution of symptoms, skin changes)
  • Folate/Vit B12 deficiency (abnormal labs)
  • Infection (fever, ESR, CRP)
  • Tumor (bone destruction, night pain)
Lumbar Spinal Stenosis Treatment

• Comorbidity is common
  • Consider when weighing options
• Analgesia
  • Caution with NSAIDs in elderly population
  • Narcotics seldom required
• Physical therapy
  • Stretching, strengthening, and aerobic fitness
  • Biking and weight loss
• Epidural steroid injection
  • Not supported by evidence
• Surgical management
  • Nonambulatory or poor quality of life
  • Age less important than comorbidity
Back Pain - Consider Imaging/Labs

- Progressive neuro findings
- Constitutional symptoms
- History of trauma
- History of malignancy
- Age <18 or >50
- Risk for infection
  - IV drugs, immunocompromise, steroids, active infection
    - CBC, ESR, CRP
- Osteoporosis
Back Pain - Consider Imaging

- Plain films - AP/lateral of LS spine
  - No improvement after 6 weeks
  - Rule out bad stuff

- MRI
  - Infection or tumor
  - Disc disease and spinal stenosis

- Guidelines from the American College of Physicians and the American Pain Society
  - Do not routinely obtain imaging or other diagnostic tests in patients with nonspecific low back pain
  - Reserve imaging for when severe or progressive neurologic deficits or serious underlying conditions are suspected on the basis of history and physical examination
Indications for Imaging & Referral “Red Flags”

• Cauda equina syndrome
  • Bowel/Bladder incontinence, saddle anesthesia, significant motor deficits not localized to a single unilateral nerve root

• Suspected cord compression

• Progressive or severe neuro deficit
  • Radiculopathy at one level or spinal stenosis with stable symptoms do not need immediate imaging unless history of cancer or suspicions of infection

• Persistent neuromotor deficit after 4-6 weeks of conservative treatment
Infection = Imaging

- High suspicion for either vertebral osteomyelitis or epidural abscess
  - MRI most sensitive
  - CT (abscess) or bone scan (osteomyelitis) if can’t use MRI

- Infection a concern but not high
  - ESR/CRP
  - Plain films
  - Patients with a positive ESR but negative plain radiograph should be evaluated with MRI.
Cancer

• Cancer or risk factors for cancer and neurologic deficits
  • Immediate imaging

• Cancer or risk factors for cancer without neurologic deficits
  • Decision to image is based on risk
    • Current or recent cancer and recent imaging studies
      • Consult with oncologist
  • High cancer risk
    • ESR/CRP and plain films
    • Positive ESR/CRP but negative plain radiograph should be further evaluated with MRI
Compression Fracture

• Risk factors
  • Prolonged glucocorticoid use
  • Age > 70
  • Trauma
    • May be minor
      • May be no trauma history in osteoporosis
    • Contusion or abrasion

• Suspected vertebral compression fracture should have plain films
Trochanteric Bursitis

• Inflammation between greater trochanter and gluteus medius tendon/iliotibial band

• Symptoms
  • Lateral thigh pain radiates to knee or ankle
  • Pain worse when first rising from seated position
    • Improves after a few steps
  • Nocturnal pain and unable to lie on affected side
  • May occur with:
    • Intra-articular hip Dz
    • Lumbar spine Dz
    • RA
    • Leg length inequality
Trochanteric Bursitis

• **Exam**
  • Point tenderness over greater trochanter
  • May have pain with adduction/resisted abduction

• **Diagnosis is primarily clinical**
  • AP pelvis and lateral hip films
  • May see calcific deposits above the trochanter at the attachment of gluteus medius
  • Consider hip films to rule out joint pathology
Trochanteric Bursitis

• Differential diagnosis
  • OA of hip
    • Painful ROM
    • Radiographs
  • Sciatica
    • Neuro changes
  • Metastatic tumor
    • Constitutional Sx

• Treatment
  • NSAIDS
  • Iliotibial band stretching
  • Injection of local anesthetic and corticosteroid
    • Relieves symptoms in more than 90% of patients
Imaging evaluation for acute low back pain

This algorithm is intended to identify the small minority of patients with acute (≤4 to 6 weeks) low back pain who present to the office and need immediate imaging. Most patients (55%) will not require immediate imaging.

**Exclusion:** History of significant trauma

- Signs or symptoms of cauda equina syndrome (new urinary retention, fecal or urinary incontinence, or saddle anesthesia)
- OR
- Significant neurologic deficits (progressive motor weakness or motor weakness at multiple neurologic levels)
  (Cauda equina accounts for approximately 0.04% of patients in primary care who present with low back pain)

  **Yes** → Emergent MRI* and consultation

  **No** → Discuss choice of imaging study with patient’s oncologist

- Current or recent cancer history other than nonmelanoma skin cancer (particulalry breast, prostate, lung, thyroid, kidney, and NHL)
  **Yes** → Evaluate for malignancy
  **No** → Radiograph suggests possible cancer

- High risk for cancer (multiple risk factors/symptoms, remote history of cancer, strong clinical suspicion)
  (Metastatic cancer accounts for approximately 0.7% of patients in primary care who present with low back pain. A history of cancer at the strongest risk factor)
  **Yes** → Radiograph normal, but ESR high
  **No** → Evaluate for infection

- Signs, symptoms, risk factors for spinal infection (e.g., epidural abscess or osteomyelitis): Fever, history of IVDD, recent infection, NDI, immunosuppression
  (Spinal infection accounts for approximately 0.03% of patients in primary care who present with low back pain)
  **Yes** → Radiograph abnormal
  **No** → Evaluate for infection

- Risk for vertebral compression fracture (age 70 years or older, history of prolonged systemic glucocorticoid use, significant trauma, mild trauma with history or risk factors for osteoporosis)
  (Vertebral compression fracture accounts for approximately 4% of patients in primary care who present with acute low back pain)
  **Yes** → Plain film
  **No** → Radiograph normal, but ESR high

- Other patients (low back pain without other features and low risk for cancer, spinal infection, or progressive neurologic impairment)
  (Approximately 96% of patients who present with acute low back pain)

  **Yes** → Radiograph normal, but ESR high
  **No** → Evaluate for infection

- Conservative therapy for four to six weeks
  **If no improvement in symptoms after four to six weeks, assess for subacute low back pain

MRI: magnetic resonance imaging; MM: multiple myeloma; ESR: erythrocyte sedimentation rate; IVDD: intravenous drug use; HD: hemodialysis; CT: computed tomography.

* MRI generally preferred; CT is an alternative if patient cannot get an MRI.
Back Pain Summary

- Thorough history and physical exam is critical
- Etiology is unknown in most cases
- Consider neuro vs vascular etiology
- Imaging studies usually not needed in first 4-6 weeks
- Urgent surgical referral if progressive or severe neuro deficits
- Cauda equina is surgical emergency
References


