Differential Diagnosis of Acute Low Back Pain
The Primary Care Physician Approach

David Kuo, DO
Associate Professor of Family Medicine
Philadelphia College of Osteopathic Medicine

Goals of treatment
• Review the “Red Flags” about causes of low back pain
• When to order imaging
• Review treatment modalities
• When to refer for interventional treatment

Disclosures
• No conflicts of interest to report
Definitions

- Acute low back pain – 6 to 12 weeks of symptoms (some say acute is less than 4 weeks and sub-acute is 4 to 12 weeks)
- Chronic low back pain – symptoms lasting longer than 12 weeks

Epidemiology

- Fifth most common cause for all physician visits in the U.S.
- A 2012 study by the National Center for Health Statistics showed that 28.6% of American adults reported having low back pain lasting 1 whole day in the past 3 months

[Graph showing self-reported prevalence of musculoskeletal pain in the United States in 2012]
Office visits for back pain continue to increase:
- 1998 ~ 32 million visits
- 2004 ~ 45 million visits
- 2010 ~ 50 million visits

Many cases of low back pain are self-limited and resolve with little intervention
However, up to one third of those patients will still have persistent pain of at least moderate intensity 1 year after an acute episode
So how do we achieve our goal of relieving pain, improving function, reducing time away from work and developing coping strategies to manage their pain?

Differential Diagnosis

Focused History

Physical Exam

Diagnostic Workup

Treatment Plan

Differential Diagnosis

Formulate a differential as the patient is telling you their symptoms

• Intrinsic spine
• Systemic
• Referred
Mechanism of injury
- First or recurrent episode – recurrent episodes are usually more painful
- Pain from spinal structures like musculature, ligaments, facet joints and disks can refer to the thigh, but rarely below the knee
- SI joint pain often refers to the thigh, but can also refer to below the knee
- Lumbar root involvement results in more leg than back pain
- Red flags
### Physical Exam

- Tissue texture change
- Asymmetry
- Restriction
- Tenderness
- Spinous process tenderness
- Motor strength, sensation and reflexes of the lower extremities

### Diagnosis and Treatment of Acute Low Back Pain

<table>
<thead>
<tr>
<th>Table 1: Neurologic Examination Findings in Patients with Acute Low Back Pain</th>
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<tbody>
<tr>
<td><strong>AFFECTED NERVE ROOT</strong></td>
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L1-3 nerve roots – pain radiates to the hip and/or thigh
L4-S1 nerve roots – pain radiates below the knee
Straight leg raise test – positive for L4-S1 nerve root pain if it radiates below the knee
Reverse straight leg raise test – positive for L3 nerve root pain if it radiates into the anterior thigh

Distribution of dermatomes (Hancock, 2011)

About 80% of pts. that present in the primary care setting tend to have one or more red flags, but rarely have a serious condition
Cauda equina syndrome and infections are medical emergencies that require immediate referral
Major intra-abdominal pathology, malignancy and fractures should also be evaluated with more urgency
In a patient with nonspecific low back pain, routine imaging and other diagnostics are not recommended. Even with a few weaker red flags, conservative treatment for 4-6 weeks is recommended before ordering imaging studies. Cons to imaging: it doesn’t improve outcomes, exposure to radiation (especially gonadal exposure in women) and cost.

Plain radiography – recommended for higher risk groups in whom a vertebral compression fracture is suspected (osteoporosis, chronic steroid use)

MRI or CT – MRI is preferred because of better visualization of soft tissue, vertebral marrow, and the spinal canal. Also no radiation exposure.

Laboratory testing
- CBC with differential
- ESR
- C-reactive Protein
Lack of a fever and a normal CBC are common in patients with spinal infection.
Pt Education
Exercise/PT
Manipulation
Meds
Referral for interventional treatment – injections; surgery

Pt. Education
Exercise/PT
Manipulation
Meds
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Patient Education
- Reassurance that the prognosis is good and the symptoms will resolve without much intervention
- Advise pt. to stay active, avoid bed rest, and return to normal activities as soon as possible
- Application of ice or heat
- Self-care education books (e.g. The Back Book, Treat Your Own Back)
Treatment Plan

- Pt Education
- Exercise/PT
- Manipulation
- Meds
- Referral for interventional treatment – injections; surgery

Exercise
- Strengthening, flexibility, aerobic conditioning or a combination of these exercises is no more effective than other treatments in acute low back pain

Physical Therapy
- Moderate quality evidence that physical therapist-directed home exercise programs can reduce rate of recurrence, increase time between recurrences, and decrease the need for health care services
- McKenzie Method
- Spine stabilization exercises
Pt Education
Exercise/PT
Manipulation
Meds
Referral for interventional treatment – injections; surgery

Manipulation improved symptoms more effectively than placebo and was as effective as nonsteroidal anti-inflammatory drugs, home exercises, physical therapy, and back school.

Spinal manipulation was no better statistically or clinically than general care, analgesics, physical therapy, exercises, or back school.
Lumbar Support
- Unclear if it is more effective than no intervention or other treatments

Massage Therapy
- Insufficient evidence to recommend for or against its use

Acupuncture
- Minimal or no benefit over sham treatment or naproxen
- May be cost effective in patients with pain lasting longer than 4 weeks

Traction
- No evidence of benefit as a single modality or in combination with other therapies in acute back pain

Bed Rest
- Not recommended for pts. with nonspecific acute low back pain
- Moderate-quality evidence shows that bed rest is less effective at reducing pain and improving function than staying active
- Prolonged bed rest can also cause muscle wasting, joint stiffness, loss of bone mineral density, pressure ulcers and venous thromboembolism

Treatment Plan
- Pt Education
- Exercise/PT
- Manipulation
- Meds
- Referral for interventional treatment – injections; surgery
**NSAIDs**
- Effective for short term symptom relief compared with placebo
- Moderate evidence shows that no one NSAID is superior to another and therefore switching to a different NSAID may be helpful if the first was ineffective
- Cox-2 drugs are equal in effectiveness to the non-selective NSAIDs

**Acetaminophen**
- Equally effective as NSAIDs for acute back pain
- Favorable safety profile compared with NSAIDs
- Adding an NSAID to acetaminophen therapy is not any more beneficial than acetaminophen alone

**Muscle Relaxants**
- Non benzodiazepine muscle relaxants [e.g. cyclobenzaprine (Flexeril), tizanidine (Zanaflex), metaxalone (Skelaxin)] have been shown to be beneficial in acute low back pain
- Most pain reduction occurs in the first 7-14 days, but may last up to 4 weeks
- No compelling evidence that they differ in efficacy
- Adding an NSAID to muscle relaxant therapy does not provide further relief of acute low back pain (?)
• Opioids
  • Reserve for use when pain is not controlled with acetaminophen or NSAIDs
  • Combination therapy of an opioid with an NSAID or acetaminophen is more effective than opioid therapy alone
  • Insufficient evidence to recommend one opioid over another, except for codeine, which is less effective due to its low affinity for opioid receptors

• Tramadol (Ultram)
  • weak mu-opioid receptor agonist and a weak inhibitor of norepinephrine and serotonin reuptake in the central nervous system
  • Effective in clinical trials for acute pain, but the benefits were small, and therefore is considered a 2nd tier medication

• Oral steroids
  • Questionable benefit for acute radicular leg pain
  • No evidence for use in isolated acute low back pain
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**Treatment Plan**
- Pt Education
- Exercise/PT
- Manipulation
- Meds
- Referral for interventional treatment – injections or surgery

**Interventional Treatments**
- Epidural steroid injections – not beneficial for isolated acute low back pain
- May be helpful for radicular pain that does not respond to 2-6 weeks of noninvasive treatment

**Treatment of Nonspecific, Acute, Low Back Pain**
- Patient education
  - Reassurance that the prognosis is good and the symptoms will resolve without much intervention
  - Advise pt. to stay active, avoid bed rest, and return to normal activities as soon as possible
  - Application of ice or heat
  - Self-care education books (e.g. *The Back Book*, *Treat Your Own Back*)
- Start NSAID or acetaminophen
- Consider a muscle relaxant based on severity of pain or short course of opioid therapy if pain is severe
- Consider OMT or PT (McKenzie Method)
Treatment of Nonspecific, Acute, Low Back Pain

- Follow up visit – 2–4 weeks later
  - Consider change to another NSAID
  - Consider adding opioid
  - Consider PT referral if not done at first visit
  - Consider referral for interventional treatment (i.e. injections, surgery)

References