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CME/CE Information

CME/CE Released: 09/02/2010; Valid for credit through 09/02/2011

Target Audience

This activity is designed for physicians, psychologists, nurses, pharmacists, and other healthcare professionals and research scientists interested in the evaluation and management of chronic low back pain, including those specializing in pain management, anesthesiology, rheumatology, psychiatry, neurology, and internal medicine.

Goal

This activity will bring together clinical and research experts to review and discuss the evaluation, treatment, and prognosis of patients presenting with low back pain. The activity will consist of 3 lectures and a question and answer session to provide an in-depth and comprehensive discussion of the epidemiology, disparate etiologies, and clinical assessment of both acute and chronic low back pain. Evidence-based treatment strategies, including pharmacologic and nonpharmacologic therapies, and the evolving research into early interventions for patients at high risk for transitioning from acute low back pain to chronic low back pain will also be presented.

Learning Objectives

Upon completion of this activity, participants will be able to:

1. Discuss the differential diagnosis for low back pain and the importance of clinical red and yellow flags in evaluation of low back pain.
2. Integrate evidence-based pharmacologic and nonpharmacologic therapies into a comprehensive treatment plan for chronic low back pain.
3. Evaluate early interventions for acute back pain in patients considered at high risk for transition to chronic low back pain.

Credits Available

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Pharmacists - 1.50 *ACPE Contact Hour(s)* (0.150 CEUs)

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Authors and Disclosures

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Dr. Cole's presentation will not include discussion of off-label, experimental, and/or investigational uses of drugs or devices.

Evidence-Based Evaluation of Patients With Low Back Pain **CME/CE**

B. Eliot Cole, MD, MPA, Chair

Posted: 09/02/2010



Slide 1.

I'm going to go ahead and get started on the evidence-based evaluation of patients with lower back pain (LBP).



Slide 2.

And we've got our usual disclosures to show you. There they are for me: whom I speak for, whom I'm a consultant to, whom I've been employed by, and what stock I might actually own in my retirement account. I don't plan to talk about any medications, as far as I know. Nothing could be off-label or experimental because I'm basically going through the American College of Physicians (ACP)/APS guidelines for you.

Learning Objective

- ▶ Discuss the differential diagnosis for low back pain (LBP) and the importance of clinical red and yellow flags in evaluation of LBP



Slide 3.

Learning objectives for this hour will be to help you better acquaint yourself with the differential diagnosis of LBP and the importance of both red and yellow flags in the evaluation of LBP. I don't think I'm the only person who's on a crusade, basically, to get us to think more specifically about the diagnosis of LBP. When I'm often faced with someone where I get the diagnosis, I wonder beyond knowing where they hurt. I don't really think I have much of an idea why they hurt, and we want to talk more about that.

Low Back Pain Guidelines



Slide 4.

The LBP guidelines from the ACP and the APS came out in 2007. Dr Chou was obviously a critical player in the development of those guidelines, and so I'm going to be paraphrasing most of the work that he's actually developed.

Guideline #1



Slide 5.

The first principle of the guidelines was that clinicians should really conduct a focused history and physical examination to help place patients with LBP into 1 of 3 categories, so at least we are getting this some diagnostic specificity. It's either nonspecific LBP, probably something more muscular in origin. It could be LBP potentially associated with a radiculopathy or maybe spinal stenosis. Worse, it could be back pain that is coming from some other very specific but very serious spinal cause. And, it's important though to think biopsychosocially; it's not just doing a history and performing a physical, but thinking in the context of the whole patient that we've always been told since our early days in training biopsychosocial.

Focused History and Physical Examination

- ▶ Determine presence and level of neurological involvement^{1,2}
- ▶ Classify patients into 3 broad categories
 - ▷ Nonspecific
 - ▷ Potentially associated with radiculopathy, spinal stenosis
 - ▷ Potentially associated with another specific spinal cause
 - ▶ Patients with serious or progressive neurologic deficits or underlying conditions requiring prompt evaluation
 - ▷ Tumor
 - ▷ Infection
 - ▷ Cauda equina syndrome
 - ▶ Patients with other conditions that may respond to specific treatments
 - ▷ Ankylosing spondylitis
 - ▷ Vertebral compression fracture

1. Deyo RA, et al. JAMA. 1992;268(6):760-765.

2. Bigos SJ, et al. Acute Low Back Problems in Adults. Clinical Practice Guideline, No. 14, 1994.



Slide 6.

In that focused evaluation, with our goal to be able to pigeonhole the patients into 1 of the 3 bigger buckets, we really want to look at probably the evidence for neurologic involvement. If there's a litmus test, to what extent can we determine the presence and level of something neurologic that is going to give us quite a specific marker? When we think about this third bucket—things that are associated with other causes for spinal-related pain—we've got to be able to differentiate people with very progressive, serious neurologic conditions like tumors, infections, or cauda equina syndrome, or people that would have actually a specific treatable pathology like ankylosing spondylitis or vertebral compression fractures.

Evaluation of Back Pain

- | | |
|---------------------|-------------------------|
| ▶ Site | ▶ Duration |
| ▶ Length of illness | ▶ Time of onset |
| ▶ Spread | ▶ Mode of onset |
| ▶ Quality | ▶ Precipitating factors |
| ▶ Intensity | ▶ Aggravating factors |
| ▶ Frequency | ▶ Relieving factors |
| | ▶ Associated features |

McGuirk BE, et al. In: Ballantyne J, Fishman S and Bonica JJ, eds. Bonica's Management of Pain. 2010:1094-1105.




Slide 7.

I won't begin to try and describe how you should do the physical examination for someone with LBP, but certainly the kinds of things we've been all talking about through all of the years who do pain management, is getting more than just the physical location—LBP—but understanding how long has it been going on, where does it spread to, what is the quality of the pain, what makes it worse, what makes it better, how did it begin, where did it go after there, what have been the treatments provided to date, and were those treatments actually effective at any point in time?

Epidemiology of Low Back Pain

- ▶ 90% of American adults experience an episode of back pain during their lifetime
- ▶ Of patients who have acute back pain
 - ▷ 90% to 95% have a non-life-threatening condition
 - ▶ Although up to 85% cannot be given an exact diagnosis, nearly all recover within 4 to 6 weeks
 - ▷ For 5% to 10% of patients, acute back pain is a manifestation of more serious pathology
 - ▶ Vascular catastrophes, malignancy, spinal cord compressive syndromes, and infectious disease processes

Winters ME, et al. *Med Clin North Am.* 2006;90(3):505-523.



Slide 8.

In terms of epidemiology, if you want to depict the number 1 health problem in the United States, I guess you could probably throw LBP into that bucket, since 90% of us at some point have had LBP during our lives or will have it before we complete our lives. So, virtually everybody winds up with LBP. I guess you'd say that's the bad news. The good news is, for about 90% to 95% of us, it won't be a serious, life-damaging event. For maybe 5% to 10%, that LBP is really part of something far more serious, some kind of a vascular catastrophe, a malignancy spinal cord compressive syndrome, or an infectious disease process, so it's like a good news/bad news story to some extent.



Slide 9.

In terms of those of you who are primary care practitioners, you are seeing all comers showing up in your emergency room in your private office just because you're working in an ambulatory treatment center. If you look at the probability of seeing cancer, compression, spinal cord infections, these are low probability events. It's even unlikely you'll be seeing cauda equina syndrome for that matter, but 3%, 4%, or 5% might be somebody with spinal stenosis or a symptomatic herniated disc, so these are the kinds of things that walk into our office.



Slide 10.


The economy and the economics of LBP are fascinating. I know someone working on a PhD right now trying to understand the cost of LBP, and apparently the problem is that there are really no good data sources. Back in 1991, \$25 billion a year was thrown around. By 1998, it might have been \$90 billion. Dr Chou was saying this morning when we were getting ready, it might be well over \$100 billion by now. You know, it's sort of that old joke,

it is millions of people costing billions of dollars, to paraphrase Carl Sagan. But, people go to see primary care physicians and primary care providers in general because of LBP. It's in the top 10 list of why people go seeking medical care, and if 90% of us have LBP during our lifetimes, how interesting that 80% of adults will eventually seek medical care in some way to do something about this. So, virtually everybody who hurts will be going out and seeking some kind of medical attention.

Etiology of Low Back Pain

- ▶ Nonspecific LBP
- ▶ Back pain potentially associated with radiculopathy or spinal stenosis
- ▶ Back pain potentially associated with another specific spinal cause

Chou R, et al. *Ann Intern Med.* 2007;147(7):478-491.



Slide 11.

Well, as I said before, the etiology boils down into these 3 larger buckets: nonspecific, specific to radiculopathy or spinal stenosis, or maybe it's associated with some other specific spinal cause.



Slide 12.

We probably understand better the structural sources of LBP than we actually do the causes. We know that muscles can give rise to pain. We know ligaments give rise to pain. Joints of various types give rise to pain. The discs, apparently, have a pain-generating potential, and there could be mechanical or chemical irritations that lead to pain.

Causes of Low Back Pain

- ▶ Possible sources of back pain have been demonstrated; causes have been more elusive
 - ▷ Refuted: conditions traditionally considered to be possible causes are actually not causes
 - ▶ Eg, spondylolysis, spondylolisthesis, degenerative changes (spondylosis)
 - ▷ Accepted: tumors and infections
 - ▷ Untested: muscle sprain, ligament sprain, segmental dysfunction, and trigger points
 - ▷ Known source, unknown cause: sacroiliac joints, zygapophyseal joints, internal disc disruption

McGuirk BE, et al. In: Ballantyne J, Fishman S and Bonica JJ, eds. *Bonica's Management of Pain*. 2010:1105-1122.



Slide 13.

But, when we get into the more specifics of trying to understand how the structures cause the pain, it gets more enigmatic, and certainly there's been some dispute about the traditional sort of bony problems being the cause of LBP. It's probably much easier to make the compelling argument that tumors and infections around the spinal cord are causing problems, but then there's a lot of untested things like muscle sprain, ligamentous sprain, segmental dysfunction, and some might argue even trigger points, so lots of things still to sort out.

Diagnostic Triage Guides Subsequent Decision-Making

- ▶ Inquire about
 - ▷ Location of pain
 - ▷ Frequency of symptoms
 - ▷ Duration of pain
 - ▷ History of previous symptoms, treatment, and response to treatment
- ▶ Consider possibility of LBP due to problems outside the back
 - ▷ Pancreatitis
 - ▷ Nephrolithiasis
 - ▷ Aortic aneurysm
 - ▷ Systemic illnesses (eg, endocarditis or viral syndromes)



Slide 14.

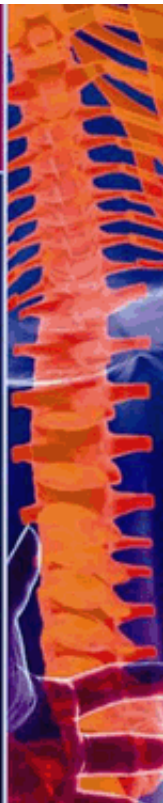
We continue to look for the final answer, as if the final answer is out there, but you know maybe it is. Considering the possibility of LBP from something other than the back is very important. Think about a patient with

pancreatitis, or a patient with pancreatic cancer. It looks like LBP, but it's not. In reality, it's something much more serious. Passing a kidney stone, having a dissecting aortic aneurysm—it would be real important to sort that one out, so we need to move from the back to the front of the patient sometimes. And, there could be a variety of systemic illnesses that we need to be on guard about.

Differential Diagnosis for Acute Low Back Pain

Disease or Condition	Patient Age (Years)	Location of Pain	Quality of Pain	Aggravating or Relieving Factors	Signs
Back strain	20-40	Low back, buttock, posterior thigh	Ache, spasm	Increased with activity or bending	Local tenderness, limited spinal motion
Acute disc herniation	30-50	Low back to lower leg	Sharp, shooting, or burning pain; paresthesia in leg	Decreased with standing; increased with bending or sitting	Positive straight leg raise test, weakness, asymmetric reflexes
Osteoarthritis or spinal stenosis	30-50	Low back to lower leg; often bilateral	Ache, shooting pain, "pins and needles" sensation	Increased with walking, especially up an incline; decreased with sitting	Mild decrease in extension of spine; may have weakness or asymmetric reflexes
Spondylolisthesis	Any age	Back, posterior thigh	Ache	Increased with activity or bending	Exaggeration of the lumbar curve, palpable "step off" (defect between spinous processes), tight hamstrings
Ankylosing spondylitis	15-40	Sacroiliac joints, lumbar spine	Ache	Morning stiffness	Decreased back motion, tenderness over sacroiliac joints
Infection	Any age	Lumbar spine, sacrum	Sharp pain, ache	Varies	Fever, pervasive tenderness, may have neurologic abnormalities or decreased motion
Malignancy	>50	Affected bone(s)	Dull ache, throbbing pain; slowly progressive	Increased with recombination or cough	May have localized tenderness, neurologic signs, or fever

Adapted from: Patel AT, et al. *Am Fam Physician*. 2000;61(6):1779-1786.



Slide 15.

The differential diagnosis gets a little bit puzzling. My takeaway from this is, even when you know what the differential diagnosis list is, it's often very difficult to puzzle between the various diagnoses. We can say some things stratify more toward youth, others toward an older population. We can try and look at location of pain, or quality of pain, or even what aggravates it. But, they start to overlap so much, that obviously we do not really know after getting a history and doing the best physical we can, exactly what might be the cause of an acute LBP problem.

Guideline #2

Guideline #2

- ▶ Clinicians should not routinely obtain imaging or other diagnostic tests in patients with nonspecific LBP
 - ▷ Strong recommendation
 - ▷ Moderate-quality evidence

Chou R, et al. *Ann Intern Med.* 2007;147(7):478-491.



Slide 16.

This usually says we're heading potentially toward something like imaging where we're hoping that a test will help us out. The problem is, according to guideline number 2, clinicians should not routinely obtain imaging or other diagnostic studies for people with LBP, and the reason for that, especially when it's nonspecific LBP, you have no neurologic findings; they just say their back hurts.

Plain X-Rays for Low Back Pain

- ▶ There is no evidence that routine plain radiography in patients with nonspecific LBP is associated with a greater improvement in patient outcomes than selective imaging¹⁻³
- ▶ Exposure to unnecessary ionizing radiation should be avoided, particularly in young women (amount of gonadal radiation from obtaining a single plain radiograph [2 views] of the lumbar spine is equivalent to daily chest radiograph for more than 1 year)⁴
- ▶ Routine advanced imaging (computed tomography [CT] or magnetic resonance imaging [MRI]) is not associated with improved patient outcomes,⁵ identifies radiographic abnormalities poorly correlated with symptoms,⁶ and could lead to additional, possibly unnecessary interventions^{7,8}

1. Deyo RA, et al. *Arch Intern Med.* 1987;147(1):141-145.
 2. Kendrick D, et al. *BMJ.* 2001;322(7283):400-405.
 3. Kerry S, et al. *Br J Gen Pract.* 2002;52(479):469-474.
 4. Jarvik JG. *Neuroimaging Clin N Am.* 2003;13(2):293-306.

5. Gilbert FJ, et al. *Radiology.* 2004;231(2):343-351.
 6. Jarvik JG, et al. *Ann Intern Med.* 2002;137(7):586-597.
 7. Jarvik JG, et al. *JAMA.* 2003;289(21):2810-2818.
 8. Lurie JD, et al. *Spine (Phila Pa 1976).* 2003;28(6):616-620.



Slide 17.


The reason for that is there may not be any spectacular evidence that can make the case that plain films really change outcome or really make any difference in improvement for a patient, other than we got a nice set of plain films. And, the worst part is that a set of plain films of the lower back can virtually expose people to ionizing

radiation levels on par with having a daily chest X-ray for a year, so that's not an insignificant amount of radiation that we probably ought to think about. Whether or not you need to jump to more sophisticated imaging techniques we'll get to in just a second.

Plain X-Rays for Low Back Pain (cont.)

- ▶ Plain radiography is recommended for initial evaluation of possible vertebral compression fracture in select high-risk patients, such as those with a history of osteoporosis or steroid use¹
- ▶ Evidence to guide optimal imaging strategies is not available for LBP that persists for more than 1 to 2 months if there are no symptoms suggesting radiculopathy or spinal stenosis, although plain radiography may be a reasonable initial option (see recommendation 4 for imaging recommendations in patients with symptoms suggesting radiculopathy or spinal stenosis)²
- ▶ Thermography and electrophysiologic testing are not recommended for evaluation of nonspecific LBP

1. Jarvik JG, et al. *Ann Intern Med.* 2002;137(7):586-597.
2. Chou R, et al. *Ann Intern Med.* 2007;147(7):478-491.



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Now, in terms of plain radiography being recommended as a screening, it would make sense if you thought about vertebral compression fracture in a high-risk patient. So, for somebody who is older, somebody with known osteoporosis, somebody who is on steroids, you are thinking, well, compression fracture could be part of the real differential, and you want to be able to see that. Well, maybe plain films would make good sense. Whether they need to go immediately for thermography and electromyography (EMG)/nerve conduction velocity (NCV), it's probably not of any utility if it's a nonspecific LBP problem.

Guideline #3

Guideline #3

- ▶ Clinicians should perform diagnostic imaging and testing for patients with LBP when severe or progressive neurologic deficits are present or when serious underlying conditions are suspected on the basis of history and physical examination

- ▷ Strong recommendation
- ▷ Moderate-quality evidence

Chou R, et al. *Ann Intern Med.* 2007;147(7):478-491.



Slide 19.

Then finally, clinicians should perform diagnostic imaging and testing for their patients with LBP, more precisely when there is severe or progressive neurologic deficit, or when there's some serious underlying medical condition that is going to lead you to some need for a corrective action. So, hopefully your imaging isn't just like surveying the field, but it's actually taking you to better medical decision-making.

CT or MRI Diagnostic Imaging

- ▶ Prompt work-up with MRI or CT is recommended if severe or progressive neurologic deficits or suspected serious underlying condition; delayed diagnosis and treatment associated with poorer outcomes¹⁻³
- ▶ MRI is generally preferred over CT if available; does not use ionizing radiation, provides better visualization of soft tissue, vertebral marrow, and the spinal canal⁴

1. Loblaw DA, et al. *J Clin Oncol.* 2005;23(9):2028-2037.
2. Todd NV. *Br J Neurosurg.* 2005;19(4):301-306.
3. Tsioltras S, et al. *Clin Orthop Relat Res.* 2006;444:38-50.
4. Jarvik JG, et al. *Ann Intern Med.* 2002;137(7):586-597.



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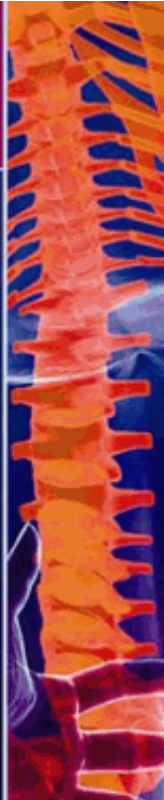
We would say that prompt workup with magnetic resonance imaging (MRI) or computed tomography (CT) is recommended if there are severe or progressive neurologic deficits or suspected serious underlying medical conditions where the delay of recognition in making the appropriate diagnosis will delay the treatment that is

necessary for the condition, and therefore result in a poorer outcome. An MRI is probably preferred over CT, not just because it avoids the ionizing radiation, but it really lets us see the neural structures we want to know the most about. CT really is more for bony architecture, I would argue.

CT or MRI Diagnostic Imaging (cont.)

- ▶ There is insufficient evidence to guide diagnostic strategies in patients who have risk factors for cancer but no signs of spinal cord compression
- ▶ Proposed strategies generally recommend plain radiography or measurement of erythrocyte sedimentation rate³, with MRI reserved for patients with abnormalities on initial testing^{1,2}
- ▶ Alternative strategy is to directly perform MRI in patients with a history of cancer, the strongest predictor of vertebral cancer;² for patients older than 50 without other risk factors for cancer, delaying imaging while offering standard treatments and reevaluating within 1 month may also be a reasonable option⁴

1. Jarvik JG, et al. *Ann Intern Med*. 2002;137(7):586-597.
2. Joines JD, et al. *J Gen Intern Med*. 2001;16(1):14-23.
3. van den Hoogen HM, et al. *Spine (Phila Pa 1976)*. 1995;20(3):318-327.
4. Suarez-Almazor ME, et al. *JAMA*. 1997;277(22):1782-1786.



Slide 21.

And, there's insufficient evidence to guide diagnostic strategies in patients who have risk factors for cancer but no signs of spinal cord compression. So, just a history of cancer of and by itself does not necessarily warrant CT and MRI on a routine basis unless there is some reason to think that there is pathology in that area and that the proposed strategies generally are seeming to recommend plain radiography or measurement of something like erythrocyte sedimentation rate, with MRI being reserved for patients who have some kind of an abnormality on an initial screening. Alternatively, some people might just go directly to an MRI because they just want to see the nervous system structures right away. It's a bit equivocal.

Guideline #4

Guideline #4

- ▶ Clinicians should evaluate patients with persistent LBP and signs or symptoms or radiculopathy or spinal stenosis with MRI (preferred) or CT only if they are potential candidates for surgery or epidural steroid injection (for suspected radiculopathy)
 - ▷ Strong recommendation
 - ▷ Moderate-quality evidence

Chou R, et al. *Ann Intern Med.* 2007;147(7):478-491.



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Guideline 4: clinicians should evaluate patients with persistent LBP and signs or symptoms of radiculopathy or spinal stenosis with MRI or CT only if they are potential candidates for procedures like epidural injections or surgery. So, if we're not ever going to do anything, what's the point of the imaging modality? Does the imaging modality change anything we're doing? Theoretically, there's a linkage between what we're thinking, what we're ordering, and then what we're going to do—the plan of action. So, there ought to be some connection there.

Imaging for Low Back Pain

- ▶ The natural history of lumbar disc herniation with radiculopathy in most patients is for improvement within the first 4 weeks with noninvasive management^{1,2}
- ▶ There is no compelling evidence that routine imaging effects treatment decisions or improves outcomes³
- ▶ For prolapsed lumbar disc with persistent radicular symptoms despite noninvasive therapy, discectomy or epidural steroids are potential treatment options⁴⁻⁸
- ▶ Surgery is also a treatment option for persistent symptoms associated with spinal stenosis⁹⁻¹²

1. Vroomen PC, et al. *Br J Gen Pract.* 2002;52(475):119-123.

2. Weber H. *Spine (Phila Pa 1976).* 1983;8(2):131-140.

3. Modic MT, et al. *Radiology.* 2005;237(2):597-604.

4. Gibson JN, et al. *Cochrane Database Syst Rev.* 2000(3):CD001350.

5. Gibson JN, et al. *Cochrane Database Syst Rev.* 2005(4):CD001352.

6. Nelemans PJ, et al. *Spine (Phila Pa 1976).* 2001;26(5):501-515.

7. Peul WC, et al. *N Engl J Med.* 2007;356(22):2245-2256.

8. Weinstein JN, et al. *JAMA.* 2006;296(20):2451-2459.

9. Amundsen T, et al. *Spine (Phila Pa 1976).* 2000;25(11):1424-1435.

10. Atlas SJ, et al. *Spine (Phila Pa 1976).* 2005;30(8):936-943.

11. Weinstein JN, et al. *N Engl J Med.* 2007;356(22):2257-2270.

12. Malmivaara A, et al. *Spine (Phila Pa 1976).* 2007;32(1):1-8.



Slide 23.

In terms of imaging for LBP, you know what are the take away messages? Well, the good news is, if you wait 4 weeks, most people even with herniated discs are doing better, so after a couple million years of evolution, we

actually can fix ourselves on the fly when that's necessary. Not everybody needs, you know, the "feel of steel" to be recovered. There's no compelling evidence that routine imaging necessarily affects treatment decisions or absolutely improves the outcomes. And, surgery is probably an option more when there's persistence of symptoms, and especially when it's associated with things like spinal stenosis.

MRI for Low Back Pain

- ▶ MRI (preferred if available) or CT is recommended for evaluating patients with persistent back and leg pain who are potential candidates for invasive interventions
 - ▶ Plain radiography cannot visualize discs or accurately evaluate the degree of spinal stenosis¹
- ▶ However, clinicians should be aware that findings on MRI or CT (such as bulging disc without nerve root impingement) are often nonspecific
- ▶ Recommendations for specific invasive interventions, interpretation of radiographic findings, and additional work-up beyond scope of guideline, but decisions should be based on clinical correlation between symptoms and radiographic findings, severity of symptoms, patient preferences, surgical risks, and costs and will generally require specialist input²

1. Jarvik JG, et al. *Ann Intern Med.* 2002;137(7):588-597.
2. Chou R, et al. *Ann Intern Med.* 2007;147(7):478-491.



Slide 24.

MRI for LBP: just a couple of last points before we move on to something else. MRI is preferred over CT and recommended for evaluating patients with persistent back pain and leg pain who, again, are potential candidates for an interventional procedure. Plain X-rays just won't be able to show what we need to see accurately: the discs, and the neural structures as well, as one of the more sophisticated measures.

Critical Clinical Indicators of Pathology

- ▶ In patients with back and leg pain, a typical history for sciatica (back and leg pain in a typical lumbar nerve root distribution) has a fairly high sensitivity, but uncertain specificity for herniated disc^{1,2}
- ▶ >90% of symptomatic lumbar disc herniations (back and leg pain due to a prolapsed lumbar disc compressing a nerve root) occur at L4/L5 and L5/S1 levels³

1. van den Hoogen HM, et al. *Spine (Phila Pa 1976).* 1995;20(3):318-327.
2. Vroomen PC, et al. *J Neurol.* 1999;246(10):899-906.
3. Chou R, et al. *Ann Intern Med.* 2007;147(7):478-491.



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There are critical clinical indicators of pathology we need to keep our eyes open and really be looking for. In patients with back and leg pain, a typical history of sciatica has a fairly high sensitivity, but it's not necessarily that specific for herniated disc. And, how interesting that 90% of symptomatic lumbar disc herniations will be occurring at really just 2 contiguous levels—L4/5 and L5/S1—so it's like we only have to really zone in, think about 2 inches of the lower back, and that may be a 90% probability of where all the problems are going to be.

Critical Clinical Indicators of Pathology (cont.)

- ▶ A focused examination that includes straight-leg-raise testing and a neurologic examination that includes evaluation of knee strength and reflexes (L4 nerve root), great toe and foot dorsiflexion strength (L5 nerve root), foot plantarflexion and ankle reflexes (S1 nerve root), and distribution of sensory symptoms should be done to assess the presence and severity of nerve root dysfunction

Chou R, et al. *Ann Intern Med*. 2007;147(7):478-491.

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This means when we do that focused evaluation, we really need to look critically for people with LBP to the 90% probability level—what's the function of L4, the function of L5, and the function of S1 nerve roots? So, be sure to look at the specific assessment methods needed for those, and then think about the sensory examination that's appropriate for L4, L5, or S1.

Critical Clinical Indicators of Pathology (cont.)

- ▶ A positive result on straight-leg-raise test (defined as reproduction of the patient's sciatica between 30 and 70 degrees of leg elevation) has a relatively high sensitivity (91% [95% CI, .82 to .94]), but modest specificity (26% [95% CI, .16 to .38]) for diagnosing herniated disc
- ▶ Crossed straight-leg-raise test is more specific (88% [95% CI, .86 to .90]), but less sensitive (29% [95% CI, .24 to .34])

Dewille WL, et al. *Spine (Phila Pa 1976)*. 2000;25(9):1140-1147.



Slide 27.

A positive result on a straight-leg-raise test of and by itself may be of some importance, but it's not the absolute marker. And, it's interesting that we can say that a straight leg raise occurring with pain at 30 to 70 degrees has a fairly high sensitivity, but again, not absolutely specific in all cases. The cross straight-leg-raise test is probably more specific, but it may unfortunately be a little less sensitive—so again, no absolutes.

Critical Clinical Indicators of Pathology (cont.)

- ▶ All patients should be evaluated for
 - ▷ Presence of rapidly progressive or severe neurologic deficits
 - ▶ Motor deficits at more than 1 level, fecal incontinence, and bladder dysfunction
- ▶ Most frequent finding in cauda equina syndrome is urinary retention (90% sensitivity)
 - ▷ Without urinary retention, probability is approximately 1 in 10,000

Chou R, et al. *Ann Intern Med*. 2007;147(7):478-491.
Deyo RA, et al. *JAMA*. 1992;268(6):760-765.



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All patients should be evaluated for the presence of rapidly changing neurologic status—especially severe neurologic deficits—especially if you start seeing loss of function, 1 side vs the other. We see fecal incontinence, we see bladder dysfunction. It is said that probably the most critical thing is bladder dysfunction because without

urinary retention, the probability of cauda equina syndrome drops to < 1 in 10,000. So, if we see retention of urine, fecal incontinence, we're talking about something that is severely compromising the spinal cord.

Yellow Flags

- ▶ Identify psychosocial problems in acute phase
- ▶ Slow progress to recovery may be due to undetected, or unrevealed psychosocial factors
 - ▷ Pertain to patient's beliefs and behaviors concerning physical activity and domestic, social, and vocational responsibilities
 - ▶ Example: patient believes physical activity might harm back, make pain worse, so avoids activities
 - ▷ Most destructive is aversion to work
 - ▶ Belief that work caused pain, work aggravates pain, work is too heavy, and work should not be done

McGuirk BE, et al. In: Ballantyne J, Fishman S and Bonica JJ, eds. *Bonica's Management of Pain*. 2010:1094-1105.



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Yellow flags are important. There are red flags, yellow flags, blue flags, black flags, and I guess the white flag of surrender when we have to just give up sometimes. We need to identify the psychosocial problems—the yellow flags—and understand that slow progress to recovery. They're just not getting where we need to see them getting as quickly as we expected them to do. That may be indication of a psychosocial issue. And, it's interesting when we give the advice that we often give, like take it easy, go to bed, do not push things too much, give up painful activities. You know, that may start them on this downward trajectory. We'd be better off saying, "Hey look, everything's neurologically fine, get back to whatever you're doing in 2 days," not to give people advice to throw in the towel, the white flag of surrender, because they probably will never get back to work if they're not told to go back to work. They may not even get back to walking around in their house if somebody doesn't specifically say to do that.

Psychosocial Factors of Low Back Pain

- ▶ Stronger predictors of LBP outcomes than either physical findings or severity/duration of pain¹⁻³
- ▶ Assessment of psychosocial factors identifies patients who may have delayed recovery and could help target interventions
 - ▶ 1 trial in referral setting found intensive multidisciplinary rehabilitation more effective than usual care in patients with acute or subacute LBP identified as having risk factors for chronic back pain disability⁴
- ▶ Direct evidence on effective primary care interventions for identifying and treating such factors in patients with acute LBP is lacking^{5,6}
- ▶ Evidence is currently insufficient to recommend optimal methods for assessing psychosocial factors and emotional distress⁷
- ▶ However, psychosocial factors that may predict poorer LBP outcomes include presence of depression, passive coping strategies, job dissatisfaction, higher disability levels, disputed compensation claims, or somatization⁸⁻¹⁰

1. Pengel LH, et al. *BMJ* 2003;327(7410):323.

2. Fayad F, et al. *Ann Readapt Med Phys*. 2004;47(4):179-189.

3. Pincus L, et al. *Spine (Phila Pa 1976)*. 2002;27(5):E109-120.

4. Gatchel RJ, et al. *J Occup Rehabil* 2001;13(1):1-9.

5. Hay EM, et al. *Lancet* 2005;365(9476):2024-2030.

6. Jellema P, et al. *BMJ* 2005;331(7508):84.

7. Chou R, et al. *Ann Intern Med* 2007;147(7):478-495.

8. Steenstra JA, et al. *Occup Environ Med* 2005;62(12):851-860.

9. Deyo RA, et al. *Spine (Phila Pa 1976)*. 2006;31(23):2724-2727.

10. Carey TS, et al. *Spine (Phila Pa 1976)*. 1996;21(3):339-344.



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There are some psychosocial factors that will be important for lower back pain, and certainly it is thought that the psychosocial factors may be so significant and maybe more significant, in fact, than some of the physical findings for the severity and duration of pain. Currently, we don't have spectacular recommendations to offer in terms of optimal measures for psychosocial assessment or emotional distress assessment, but we can't be remiss about it because we know that psychosocial factors may predict a poorer outcome in LBP when you're looking for things like depression. Well, that's 50% of people, I think, in chronic pain according to Dave Fishbain.

What about passive coping strategies opposed to active coping strategies—searching for the elusive disability label, disputed compensation claims, having somatization as an underlying problem—if we're not attentive to those issues, I think we're going to be thwarted in our best clinical efforts.

Red Flags of Lower Back Pain

History

- ▶ Gradual onset of back pain
- ▶ Age <20 years or >50 years
- ▶ Thoracic back pain
- ▶ Pain lasting longer than 6 weeks
- ▶ History of trauma
- ▶ Fever/chills/night sweats
- ▶ Unintentional weight loss
- ▶ Pain worse with recumbency
- ▶ Pain worse at night
- ▶ Unrelenting pain despite supratherapeutic doses of analgesics
- ▶ History of malignancy
- ▶ History of immunosuppression
- ▶ Recent procedure causing bacteremia
- ▶ History of intravenous drug use

Physical Examination

- ▶ Fever
- ▶ Hypotension
- ▶ Extreme hypertension
- ▶ Pale, ashen appearance
- ▶ Pulsatile abdominal mass
- ▶ Pulse amplitude differentials
- ▶ Spinous process tenderness
- ▶ Focal neurologic signs
- ▶ Acute urinary retention

Winters ME, et al. *Med Clin North Am*. 2006;90(3):505-523.




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What are the red flags? Well, let me start on the physical exam side. The red flag would be a febrile patient, hypotensive or extreme hypertension, ashen and pale—ooh, that doesn't sound like a normal back patient—having a pulsatile abdominal mass—again, that's not usually in the back—spinous process tenderness, focal neurologic signs, acute urinary retention, or bowel and bladder incontinence. I mean, these are now serious markers that require us to get moving quickly.

The historical phenomena are more on the left side. I think what's important, if you're thinking about infections—history of IV drug use, history of a procedure that would have induced bacteremia, history of being immunocompromised—or if you are thinking malignancy and tumor involving the spine, they have to have a kind of an underlying history usually of having a malignancy. But, lots of things to think about historically, more importantly I think is to observe these serious physiologic markers.

Risk for Chronicity

- ▶ **Vertebral infection**
 - ▷ Intravenous drug use, recent infection
- ▶ **Vertebral compression fracture**
 - ▷ Older age, history of osteoporosis, and steroid use
- ▶ **Musculoskeletal**
 - ▷ Inactivity
- ▶ **In general**
 - ▷ Emotional distress

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The risk for chronicity we believe goes up with things like intravenous drug use and having a recent infection. Obviously, that's how you see the blood and you could get, therefore, a vertebral infection. Having recently had an epidural or having an abscess has an unfortunate consequence, as does vertebral fractures occurring because of older age, osteoporotic status, recent steroid use, having musculoskeletal pain perhaps because of inactivity, certain kinds of abnormalities and body mechanics and posture, and, in general, maybe having a risk for chronicity by way of severe emotional distress that's not very well attended to.

Cancer-Related Risk Factors

- ▶ Large, prospective study from a primary care setting
 - ▷ History of cancer (positive likelihood ratio, 14.7)
 - ▷ Unexplained weight loss (positive likelihood ratio, 2.7)
 - ▷ Failure to improve after 1 month (positive likelihood ratio, 3.0)
 - ▷ Age >50 years (positive likelihood ratio, 2.7)
 - ▷ Posttest probability of cancer increases from approximately 0.7% to 9% in patients with a history of cancer (not including nonmelanoma skin cancer)
 - ▷ In patients with any 1 of the other 3 risk factors, the likelihood of cancer only increases to approximately 1.2%

Deyo RA, et al. *J Gen Intern Med.* 1988;3(3):230-238.



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If we think about cancer-related risk factors, I think maybe the most overt thing we need to pick up is the history of cancer, because notice that the positive likelihood ratio is about 15 when we just know that the patient already has cancer and we're evaluating them with, say, an acute back pain situation. The next 3—unexplained weight loss, failure to improve after a single month, and being over the age of 50—those collectively each are coming in at about a ratio of 3. And then, everything else is lower, so that when we're thinking about someone with a cancer-related cause for back pain, just knowing that they have cancer is already a problem, knowing that they have risks for cancer may be a problem, the man with a 40-year pack risk of smoking.

Non-Cancer-Related Risk Factors

- ▶ Features predicting vertebral infection not well studied, but may include fever, intravenous drug use, or recent infection¹
- ▶ Consider risk factors for vertebral compression fracture, such as older age, history of osteoporosis, and steroid use; and for ankylosing spondylitis, such as younger age, morning stiffness, improvement with exercise, alternating buttock pain, and awakening due to back pain during the second part of the night only²
- ▶ Clinicians should be aware that criteria for diagnosing early ankylosing spondylitis (before the development of radiographic abnormalities) are evolving³

1. Jarvik JG, et al. *Ann Intern Med.* 2002;137(7):586-597.
 2. Rudwaleit M, et al. *Arthritis Rheum.* 2006;54(2):569-578.
 3. Rudwaleit M, et al. *Arthritis Rheum.* 2005;52(4):1000-1008.



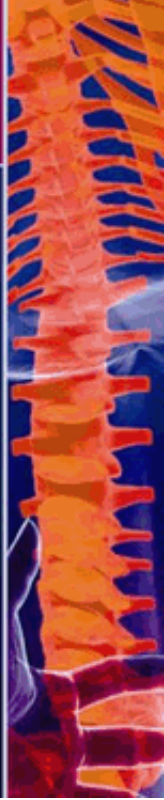
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Non-cancer-related risk factors that we think raise the risk of having long-term back pain problems are things like the IV drug use I've already spoken about or recent infections giving rise to vertebral infections. Also, consider fracture likelihoods, older patients, steroids, osteoporotic status, and then understand that sometimes with things like ankylosing spondylitis, there can actually be the disease beginning before there's radiologic manifestation, so now the history becomes important. You know, somebody who's talking to you at a younger age about morning stiffness, improvement with exercise, alternating buttocks pain, awakening at night because of pain, especially during the latter part of the night.

Racial/Cultural Aspects of Assessment

- ▶ To communicate effectively with all patients
 - ▷ Always use simple words, not medical jargon
 - ▷ Determine what the patient/caregiver already knows or believes about his/her health situation
 - ▷ Encourage questions by asking, "What questions do you have?" (allows for an open-ended response), instead of "Do you have any questions?" (allows for a "no" response, ending the conversation)
 - ▷ Use the "teach-back" method to confirm the level of understanding: Ask patients/family members to restate what was just communicated in the appointment or meeting

Zacharoff KL. Cross-Cultural Pain Management: Effective Treatment of Pain in the Hispanic Population; 2009.



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We're asked to give a brief statement about the racial and cultural aspects. Let me just say that this California Assembly Bill 1195 has mandated this because we're talking about clinical care, and it's important when we do clinical care to do the best job we can. It is important that throughout our assessment of any patient, we communicate effectively—the notion that we shouldn't use medical jargon but actually speak in real English words, I would argue maybe smallest words possible in some situations. Aligning ourselves with our patients and their caregivers by finding out, "What do you actually know, now?" You know, "Why are you coming now to see me? What would you like me to be able to provide information about?" This is the aligning with the patient and their family and giving the opportunity to answer questions by asking open-ended, inviting questions, like "What questions do you have for me?" as opposed to, "Do you have any questions for me?" where the answer can only be yes or no and isn't really a conversation encouraging sort of question. It's really more intended to shut the conversation off.

And then, I love this notion of the "teach-back" technique. I've explained something to the patient; I want to know if they actually understood it, so I'll ask them to explain it back to me. And, I think it's always interesting when I ask patients, "Do you do your physical therapy exercises?" You always get an affirmative, "Yes doctor, I always do them. I do them 4 times a day just like you told me to." It would be better to say, "Would you please demonstrate how you do your exercises?" Then, you realize they have no idea how to do the exercises, they've been to PT 3 or 4 times. So, that "teach-back" method really is a great reality check.

Culturally Competent Care

- ▶ Ensure that patients/consumers receive effective, understandable, and respectful care that is provided in a manner compatible with their cultural health beliefs and practices and preferred language
- ▶ Implement strategies to recruit, retain, and promote at all levels of the organization a diverse staff and leadership that are representative of the demographic characteristics of the service area
- ▶ Ensure that staff, at all levels and across all disciplines, receives ongoing education and training in CLAS delivery

USDHHS OMH. National Standards for Culturally and Linguistically Appropriate Services (CLAS) in Health Care; 2001.



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We need to ensure that people get effective care, that they understand what's happening, that the care provided is done in a respectful way, and it's provided in a manner that's compatible with their cultural background, and hopefully in a language that they speak. I don't know about you, but I've actually had the interesting occurrence of having to work with 2 translators to communicate with the patient because there was no translator where I practiced who spoke that language and English. So, it went from English to another language—I think it was Cambodian—to some dialect of Laotian, to the patient, and then back to me. It was quite interesting to watch this thing, and I was thinking it's like the game telephone where you start whispering in 1 person's ear, it goes around the table, do you even get the same message back that you sent out? So, after a couple of translators walked all over the conversation in both directions, I wasn't sure what was being translated.


Also, I get concerned whenever there's translation, and I say something, the translator says something, the patient starts talking animatedly for several minutes, it seems, and the translator says, "No." Okay, I don't think he said "No," but I don't know what he said.

Implement strategies as best you can to get diversity in your institution so the kind of care you provide for a diverse population is being provided by a diverse care team. Wouldn't that be fantastic? And then, ensuring that staff at all levels across the disciplines receives training about, and education in, what is called CLAS delivery, which is Culturally and Linguistically Appropriate Services. There's actually a federal Web site you can go to get more information about that.

Avoiding Racial and Cultural Bias per Knox H. Todd, MD, MPH

- ▶ Make pain assessment mandatory
- ▶ Give a nonopioid analgesic at triage
- ▶ Track reasons for unscheduled returns
- ▶ Audit for ethnic bias
- ▶ Consider which pain scales should be used
- ▶ Use multilingual laminated cards

Todd KH. Medical Ethics Advisor. 1999.



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Dr Knox Todd, someone who's quite familiar to many of us, really talks to us about the importance of avoiding racial and cultural bias, obviously within the context of emergency rooms, make good pain assessments mandatory. It's not thinking about pain assessments for some people but not necessarily others. You just do it the same way every time for every person, and that doesn't matter who or what they are. They are getting the same kind of care. Perhaps immediately get some nonopioid analgesics at the level of triage and then start deciding what needs to be added to that. Start looking at why people have unscheduled returns—is it just bad Karma, phases of the moon, or is there a reason why people are coming back? Try to do audits as best as possible, looking for ethnic biases or a way that maybe we could detect that.

Consider which pain scale you are using, because some are just not appropriate for some populations. I mean, you've looked at the adult—especially the geriatric—pain assessment literature. You'll see that some pain techniques like the Visual Analog Scale (VAS) just are challenging to work with in an older person immediately postsurgery. Maybe that old numeric rating scale would be more appropriate. Look at the development of multilanguage laminated cards; these are downloadable from the Internet and then you can get some laminating paper.

Summary

Pearls for Practice

- ▶ Categorize patients into 1 of 3 broad groups: nonspecific low back pain, back pain potentially associated with radiculopathy or spinal stenosis, or back pain potentially associated with another specific spinal cause
- ▶ Evaluate psychosocial risk factors to predict the risk for chronic, disabling low back pain
- ▶ Provide patients with evidence-based information on expected course of low back pain, effective self-care options, and recommend that they be physically active

Chou R, et al. *Ann Intern Med.* 2007;147(7):478-491.



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So, our final tips, some pearls for practice, again, go back to the 3 buckets. Theoretically, we can get past LBP, a place that they hurt, to LBP of a nonspecific origin, LBP because of radiculopathy or spinal stenosis, or LBP because of another spinal problem and/or a serious underlying medical problem. Evaluate everyone psychosocially to predict the risk for chronicity as well as the disability associated with LBP. And then, certainly always try to provide patients with evidence-based information about the expected course of their LBP, effective self-care options, and recommend that they remain physically active—don't let them go to bed, don't let them sit in the rocker, keep them up and about as best we can.

And now, Dr Chou is going to come up and give us the next presentation, which will be on the subject of treatment of LBP: pharmacologic and nonpharmacologic actions or options.

This article is part of a CME/CE certified activity. The complete activity is available at:
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4. Current Understanding of the Prevention of Chronicity of Low Back Pain
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