



Avoidable Imaging Learning Collaborative:
Low Back Pain

E·QUAL

EMERGENCY
QUALITY
NETWORK



 American College of
Emergency Physicians®
ADVANCING EMERGENCY CARE 

 **Choosing
Wisely**®

An initiative of the ABIM Foundation



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Avoid lumbar spine imaging in the emergency department for adults with non-traumatic back pain unless the patient has severe or progressive neurologic deficits or is suspected of having a serious underlying condition (such as vertebral infection, cauda equina syndrome, or cancer with bony metastasis).

Low back pain without trauma is a common presenting complaint in the emergency department (ED). Most of the time, such pain is caused by conditions such as a muscle strain or a bulging disc that cannot be identified on an X-ray or CT scan. When a patient has symptoms or physical findings of a serious or progressive neurological condition, or is suspected of having a serious underlying condition such as cancer or a spinal infection, imaging may be appropriate and may include plain X-rays or advanced imaging (e.g., MRI or CT scan). Diagnostic imaging does not accurately identify the cause of most low back pain and does not improve the time to recovery. The vast majority of cases of back pain in the ED are related to muscle strain or inflammation. As a result, routine imaging of the low back should be avoided in order to reduce ionizing radiation exposure and unnecessary cost.



Managing Nontraumatic Acute Back Pain

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A **podcast** for this article is available at www.annemergmed.com.
Continuing Medical Education exam for this article is available at <http://www.acep.org/ACEPeCME/>.

[Ann Emerg Med. 2015;66:148-153.]

Editor's Note: *The Expert Clinical Management series consists of shorter, practical review articles focused on the optimal approach to a specific sign, symptom, disease, procedure, technology, or other emergency department challenge. These articles are typically solicited from*

equina damage; and other abdominal or retroperitoneal processes that can present with back pain. For simplicity, I will refer to these groups as simple, serious, and nonspine causes of back pain, respectively.

Simple musculoskeletal causes include degenerative spine disease, muscular or ligamentous injury, and most acute disc herniations. These patients may have severe pain but have normal neurologic examination results, except for

“In actual ED practice, more than 30% of patients with nontraumatic back pain are imaged.”

INTRODUCTION

Scope of the Problem

Back pain is common and costly.¹ Adults with acute nontraumatic back pain account for 2% to 3% of emergency department (ED) visits.^{2,3} Although most patients' pain has a benign course, a small percentage has serious causes. These causes, if not identified, can result in significant morbidity. Emergency physicians must develop a systematic approach to the care of patients who request imaging. This approach should be based on physical examination and history, and should aim to identify serious causes while minimizing unnecessary imaging and using resources. Overall, the approach should be specifically related to the ED setting. Recommendations in the literature are mostly based on clinical guidelines, expert opinion, and the author's 33 years of clinical experience. This article will exclude interventions not typically related to the ED phase of care such as epidural steroid injections, chiropractic treatment, and acupuncture therapy.

Differential Diagnosis and Misdiagnosis

Acute, nontraumatic low back pain can be broadly divided into 3 categories: benign, self-limited musculoskeletal causes; spinal pathologies that can cause severe neurologic disability because of spinal cord or cauda

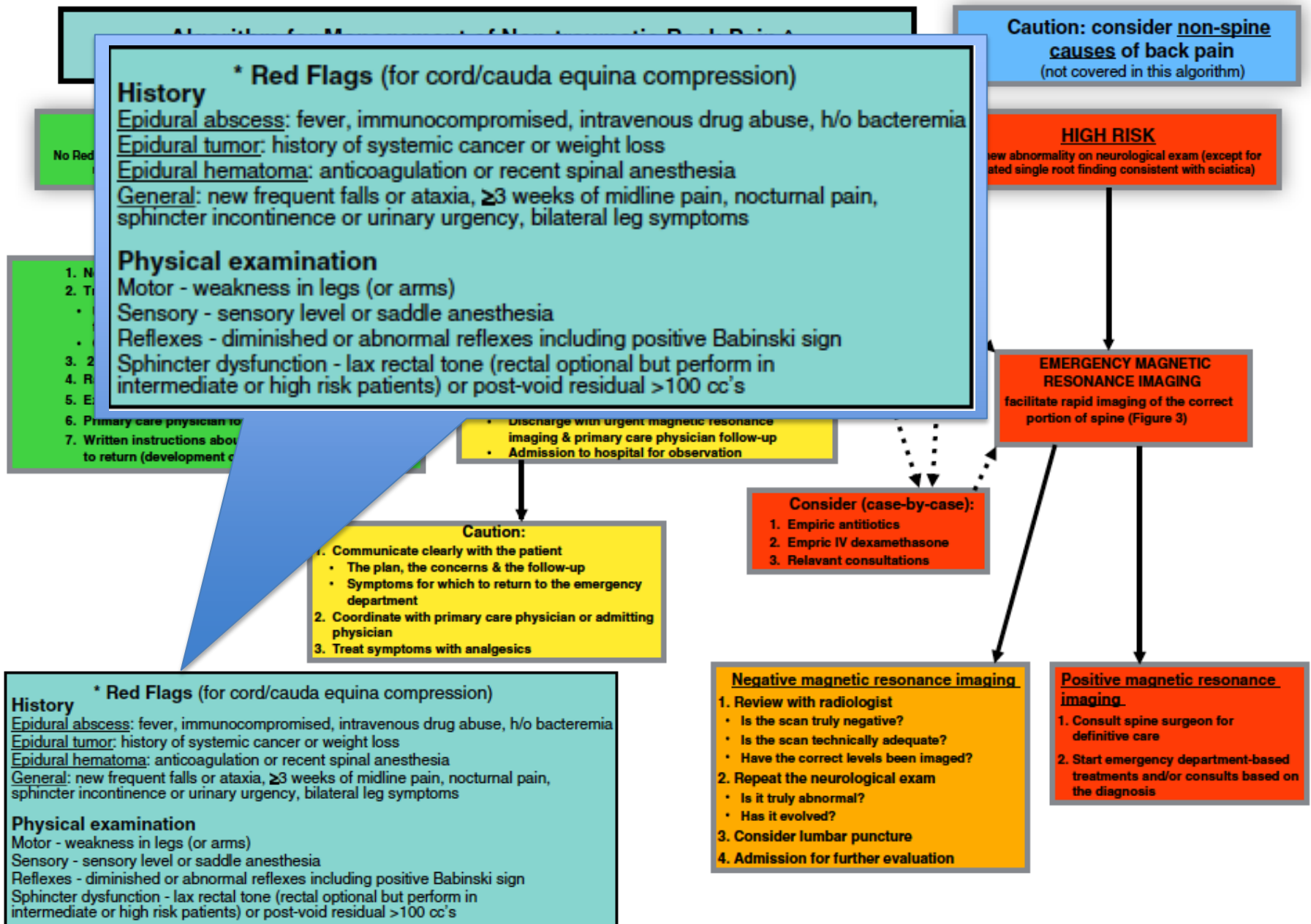
Given a surprising paucity of ED-specific data, emergency physicians must look to national guidelines based on primary care data. Given the acuity-skewed ED population, however, they will likely encounter a larger (not precisely defined) proportion of patients with serious causes. The more common ones include metastatic epidural

“A meta-analysis of 1,804 patients from 6 studies who received no imaging versus those with any imaging (spine radiographs or MRI) found no difference in outcomes.”

Emergency physicians must think broadly and carefully consider nonspine causes of back pain (eg, aortic aneurysm, cholangitis) (Figure 1), which will not be discussed further in this article.

RISK STRATIFICATION

After history and physical examination, patients with simple back pain can be discharged from the ED, whereas those with serious back pain require advanced imaging, usually magnetic resonance imaging (MRI). Distinguishing between these 2 groups is therefore critical. The clinical examination (history and physical examination) helps make



^ Solid lines indicate usual care; dotted lines indicate options based on case-by-case clinical judgment.

Figure 2. Algorithm for management of nontraumatic back pain.

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Additional Resources

**KNOWLEDGE TRANSLATION
TAKING IT TO THE BEDSIDE!**

Presenters



Dr. Thomas Wetjen, DO



Shawna Laursen, MD

EMERGENCY DEPARTMENT MEDICAL IMAGING: LOW BACK PAIN

Utilization of Medical Imaging

July 21, 2016

Thomas Wetjen, DO

Medical Imaging and Low Back Pain

- ▣ Kennedy Health System – located in Southern New Jersey
 - Three hospital health system with an ED Volume of approximately 140,000 visits annually
 - Community based health system with a residency program in Emergency Medicine
 - The ED's are constantly challenged by our Utilization Management Committee to reduce usage of medical imaging
 - ▣ Department of Radiology and the Emergency Department decided to approach the problem via a systems approach
 - The first performance improvement project was low back pain and medical imaging

Medical Imaging and Low Back Pain

- ▣ The Emergency and Radiology Departments agreed that reducing medical imaging of the lumbar spine for our population would result in reduced healthcare costs and would benefit patients by reduced radiation exposure

Medical Imaging and Low Back Pain

- ▣ Objective: To reduce the usage of medical imaging for atraumatic low back pain in the ED
- ▣ Methods: To provide education to our team of medical providers (attending physicians, resident physicians, and APC's) in regards to their approach to medial imaging and back pain. The education was disseminated via a computer based learning module. All emergency providers had to attest to studying the materials via a post test.

Medical Imaging and Low Back Pain

- ▣ Methods Continued: The Emergency Department Directors collaborated with the Department Head of Radiology and approved the materials and criteria for medical imaging
- ▣ The next few slides are highlights of the educational materials which were introduced at the end of April 2016

Back Pain

(<http://emedicine.medscape.com/article/310353-workup#c5>)

- ▣ The association between symptoms of mechanical low back pain (LBP) and imaging results is weak. Ordering of imaging studies should be limited to patients with clinical findings suggestive of systemic disease (eg, fever, weight loss without explanation, patients older than 50 y, alcohol use, or intravenous drug abuse) or trauma.

From Choosing Wisely Campaign

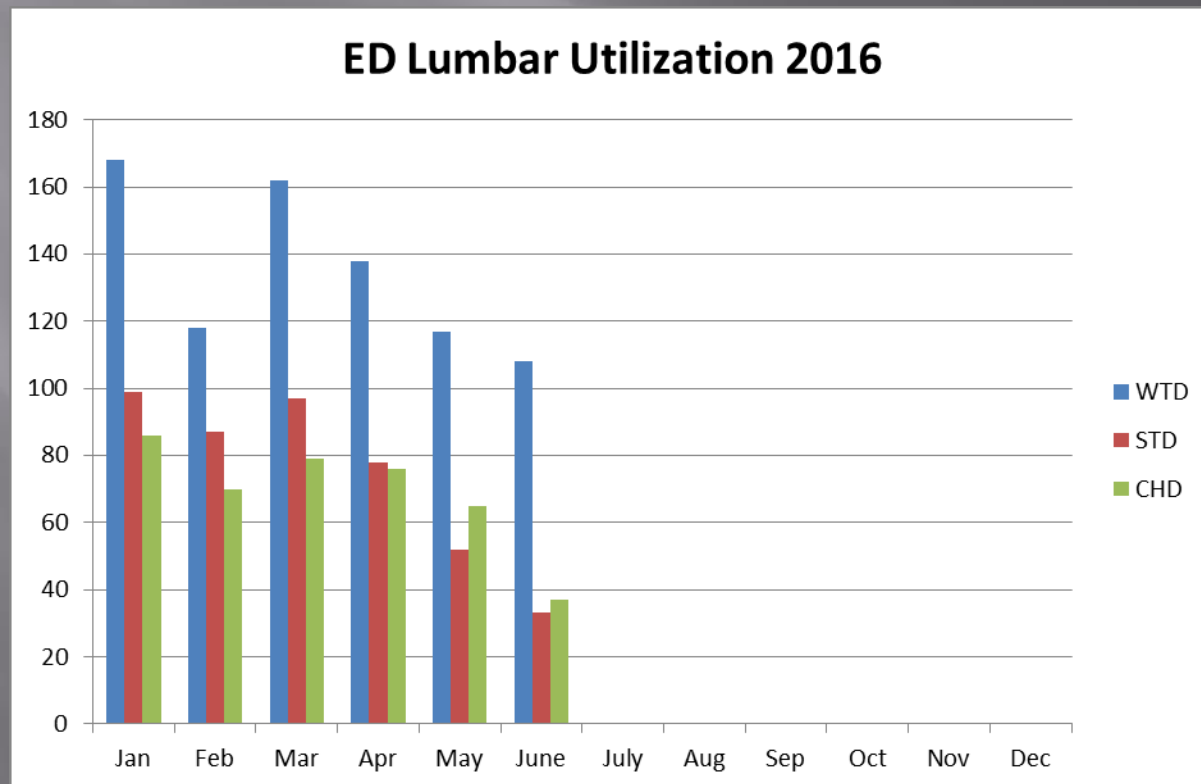
- ▣ Avoid lumbar spine imaging in the emergency department for adults with atraumatic back pain unless the patients have severe or progressive neurologic deficits or are suspected of having a serious underlying condition, such as vertebral infection or cancer with bony metastasis. Low back pain without trauma is a common presenting complaint in the emergency department. Most of the time, such pain is caused by conditions such as a muscle strain or a bulging disc that cannot be identified on an X-ray or CT scan.

Summary

- Too many diagnostic x-rays are ordered in the evaluation of low back pain at all three Kennedy Emergency Departments
- ↳ Uncomplicated acute low back pain and/or radiculopathy are benign, self-limited conditions that **do not warrant any imaging studies.**
 - Significant (major) trauma - CT is the modality of choice. If a CT of the chest, abdomen and pelvis have been performed - 2D reconstructions are sufficient, and dedicated thoracic and lumbar CT's are not necessary.
 - CT can be performed in conjunction with MRI and MRI may be preferred in suspected ligamentous and or cord injury.
 - MRI of the lumbar spine should be considered for those patients presenting with red flags raising suspicion for a serious underlying condition, such as cauda equina syndrome, malignancy, or infection.

Medical Imaging and Low Back Pain

- ▣ Results:
 - ▣ *Codes: Spine Lumbo Sacral Ant/Lat and Lumb A/P and Lat



Medical Imaging and Low Back Pain

- ▣ Results:
 - Pre-Intervention (January – April 2016)
 - ▣ 1258/49254 or 25.5 patients per 1000 visits received a diagnostic x-ray of their lumbar spine
 - Post-Intervention (May – June 2016)
 - ▣ 412/24821 or 16.6 patients per 1000 visits received a diagnostic x-ray of their lumbar spine
 - ▣ Represents a 35% reduction of diagnostic x-rays performed for the evaluation of low back pain

Reducing Imaging in Low Back Pain

Shawna Laursen, MD
Medical Director
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Choosing Wisely

- ❖ The Choosing Wisely (www.choosingwisely.org) campaign was created as an initiative of the American Board of Internal Medicine (ABIM) foundation to improve health care quality.
- ❖ More than 50 specialty societies have identified commonly used tests or procedures within their specialties that are possibly overused.
- ❖ One such test is Imaging for Low Back Pain

Low back pain is the presenting complaint for almost 3 million annual ED visits and 2.5% of all outpatient clinic visit in the US

- ❖ Over 30% of these visits have x-rays ordered
- ❖ Multiple guideline and consensus recommendations recommend: Don't do imaging for low back pain within the first 6 weeks unless red flags are present
- ❖ Red Flags include but not limited to: Severe or progressive neurologic deficits (e.g., bowel or bladder function, saddle parasthesia), Fever, Sudden back pain with spinal tenderness (especially with history of osteoporosis, cancer, steroid use), Trauma, Serious underlying medical condition (e.g., cancer)

- ❖ Choosing Wisely www.choosingwisely.org
- ❖ US Department of Health and Human Services
AHCPR Clinical Practice guideline: Acute Low Back Problems in Adults <http://d4c2.com/d4c2-00038.htm>
- ❖ Institute for clinical Systems Improvement. Adult Acute and subacute Low Back Pain
www.icsi.org/_asset/bjvqrj/LBP.pdf
- ❖ Clinical Efficacy Assessment Subcommittee of the American college of Physician and the American College of Physicians/American Pain Society Low Back Pain Guidelines Panel *Ann Intern Med.* 2007;147: 478-491
- ❖ AAFP Clinical Practice Guideline: Low Back Pain
AAFP, endorsed February 2011

What did we do and how did we do it?

- ❖ Medium size community hospital, 33K/yr ED visits, level 3 trauma center
- ❖ Started with provider education, group discussion at staff meeting, distribution of guidelines
- ❖ Provider participation in chart review to establish baseline rates of imaging.

Provider participation key

- ❖ Having providers do chart review means they know the review is happening (more than just another email)
- ❖ They have to be aware of the guidelines to complete review
- ❖ They see how their partners are charting which tends to standardize practices
- ❖ They tend to adhere to guidelines knowing their partners will be reviewing them in the near future
- ❖ Forces engagement rather than just acknowledgement

How to get provider buy-in

- ❖ Pay them for doing the review (we include chart reviews in quarterly bonus structure)
- ❖ Make the review itself easy (each provider was given 20 records that were coded as low back pain, asked if red flags present, if no red flags, was imaging done)
- ❖ Give provider specific feedback and name names (no one wants to be the outlier)

The Hawthorn Effect

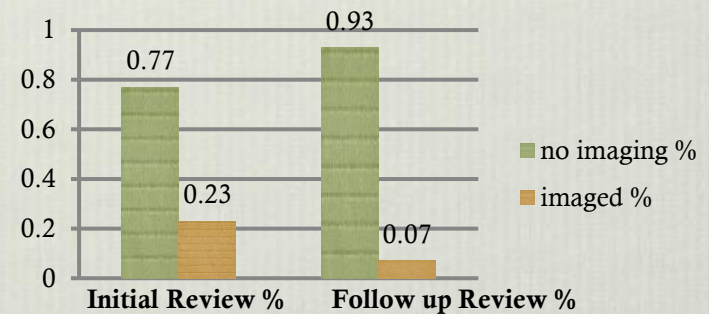
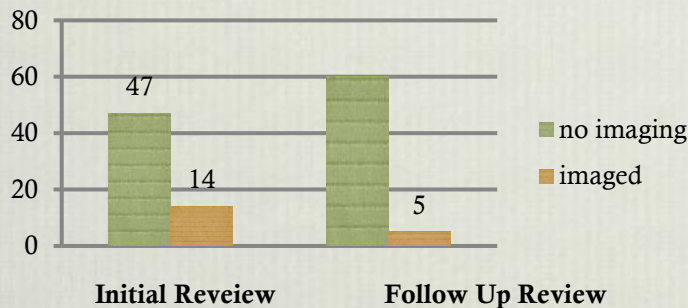
- ❖ **The Hawthorne effect** (also referred to as the **observer effect**) is a type of reactivity in which individuals modify or improve an aspect of their behavior in response to their awareness of being observed.
- ❖ Let psychology work for you
- ❖ Repeat the chart review after period specified
- ❖ Summarize and report back results to providers

Our Method

- ❖ Initial Chart review done in November 2015. Education and discussion regarding evidence based guidelines for use of imaging in low risk low back pain followed. Follow up chart review was done in May 2016
- ❖ *“We will be reviewing Low Risk Low Back Pain seen in the ER to determine our initial rate of imaging. We will be discussing this at our ED Department meeting and asking all providers to review guideline recommendations. A review will be repeated in 6 months to see if our imaging rate is altered as awareness of and compliance with national guidelines is encouraged.”*

Our Findings

Bottom line: We had a 70% reduction in overall imaging for low risk low back pain with education, use of evidence based guidelines and provider involvement in chart review



Questions?

Avoidable Imaging Initiative Webinar:

Thursday August 18

1:00pm-2:00pm EST

E-QUAL Network Resources and More Information:

www.acep.org/equal

Contact Nalani Tarrant (Project Manager):

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