Avoidable Imaging Learning Collaborative:
Low Back Pain
Kevin M. Klauer, DO, EJD, FACEP
CMO, EM-TeamHealth
Co-Chair of the Avoidable Imaging Initiative for the E-QUAL Network
Medical Editor-in-Chief, ACEP Now
Asst. Clinical Professor, MSU-College of Osteopathic Medicine
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.
“In actual ED practice, more than 30% of patients with nontraumatic back pain are imaged.”

“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.”
Algorithm for Management of Nontraumatic Back Pain

* Red Flags (for cord/cauda equina compression)

**History**
- Epidural abscess: fever, immunocompromised, intravenous drug abuse, h/o bacteremia
- Epidural tumor: history of systemic cancer or weight loss
- Epidural hematoma: anticoagulation or recent spinal anesthesia
- General: new frequent falls or ataxia, ≥3 weeks of midline pain, nocturnal pain, sphincter incontinence or urinary urgency, bilateral leg symptoms

**Physical examination**
- Motor - weakness in legs (or arms)
- Sensory - sensory level or saddle anesthesia
- Reflexes - diminished or abnormal reflexes including positive Babinski sign
- Sphincter dysfunction - lax rectal tone (rectal optional but perform in intermediate or high risk patients) or post-void residual >100 cc’s

**Caution:**
- Communicate clearly with the patient
- The plan, the concerns & the follow-up
- Symptoms for which to return to the emergency department
- Coordinate with primary care physician or admitting physician
- Treat symptoms with analgesics

**Negative magnetic resonance imaging**
1. Review with radiologist
   - Is the scan truly negative?
   - Is the scan technically adequate?
   - Have the correct levels been imaged?
2. Repeat the neurological exam
   - Is it truly abnormal?
   - Has it evolved?
3. Consider lumbar puncture
4. Admission for further evaluation

**Positive magnetic resonance imaging**
1. Consult spine surgeon for definitive care
2. Start emergency department-based treatments and/or consults based on the diagnosis

**EMERGENCY MAGNETIC RESONANCE IMAGING**
Facilitate rapid imaging of the correct portion of spine (Figure 5)

**HIGH RISK**
New abnormality on neurological exam (except for isolated single root finding consistent with sciatica)

**Caution:** consider non-spine causes of back pain (not covered in this algorithm)

* 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.**


KNOWLEDGE TRANSLATION
TAKING IT TO THE BEDSIDE!
Presenters

Dr. Thomas Wetjen, DO

Shawna Laursen, MD
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
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.
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 medical 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.
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.
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.
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.
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.
Results:

*Codes: Spine Lumbo Sacral Ant/Lat and Lumb A/P and Lat
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
Skagit Valley Emergency Department
Mt Vernon, WA
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 paraesthesia), 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/_assset/bjvqrj/LBP.pdf


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): ntarrant@acep.org