Spinal Radiology
Report Interpretations
When is Surgical Referral Appropriate?

Abhay Sanan MD, FAANS
Center for Neurosciences
Disclosure

No financial disclosure
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Caveat Emptor

“Doctors With a Special Interest in Back Pain Have Poorer Knowledge About How to Treat Back Pain”

Back Pain
ACUTE (<4 weeks)
Back Pain is ONLY topic we tackle today

We won’t be covering:
Lumbar stenosis
Lumbar spondylolisthesis
Why talk about it ??
Common

80% of us will have an episode of temporarily disabling back pain at some point in time

- Bonica 1980
2nd most common reason for primary care office visit

5th most common reason for all medical office visits

Costs us a lot of Money

Medical costs (direct & indirect)

30 Billion paid to doctors in 2005 for back pain management visits.
Lost productivity

Lost time from work

#1 reason for filing a workman’s compensation claim
Other costs to society

Disability Claims

Litigation costs from workman’s compensation or disability claims
>100 Billion dollar problem
The patient with acute back pain evokes two types of reactions.
Easy visit?

Usually benign

Usually self-limiting

Benign neglect works
Frustrating visit?

Some patients can be demanding
The process often feels unsatisfying
Worry about “missing something”
• Be able to recognize the difference between routine back pain and “sinister” back pain.

• When to send the patient to a neurosurgeon
Routine or “Sinister” back pain?

Here is how I approach the patient
Routine or “Sinister” back pain?

Here is how I approach the patient

Step 1. Formulate a cognitive plan
Routine or “Sinister” back pain?

Here is how I approach the patient

Step 1. Formulate a cognitive plan

- Is there a systemic cause of the back pain?
- Is there neurological compromise?
Step 2. History/Exam

What don’t we want to miss?
Step 2. History/Exam

What don’t we want to miss?

1. Cancer
2. Infection
3. Cauda equina syndrome
The odds are in your favor

- Mechanical 89%
- Herniated disc 4%
- Osteoporotic Fracture 4%
- Cauda equina syndrome 0.2%
- Neoplasm 0.7%
- Infection 0.01%

Adapted from Deyo, Weinstein, Low Back Pain, NEJM 2001
Cauda Equina Syndrome

Bilateral leg pain
Bilateral leg weakness
Saddle anesthesia
Bowel/bladder incontinence

0.2 %
Cauda Equina Syndrome

Bilateral leg pain
Bilateral leg weakness
Saddle anesthesia
Bowel/bladder incontinence

Patients are distressed

0.2 %
Cauda Equina Syndrome

Bilateral leg pain
Bilateral leg weakness
Saddle anesthesia
Bowel/bladder incontinence

Patients are distressed
Send to ER or call your neurosurgeon. This is not the time to fill out a referral form.

0.2 %
Spinal Infection

- Fever
- Unrelenting pain
- Pain at rest
- IVDA
- Immunosuppression

Order an MRI

Referral to ER or Neurosurgeon

0.01 %
Spinal Metastatic Tumor

- Age >50
- History of Cancer
- Weight loss
- Night Pain

0.7%

MRI is indicated

Referral to neurosurgeon
My approach: Basic Questions

Young age (<55)?
Ambulatory?
Bowel/Bladder intact?
Sudden onset after minor trauma?
Fever/Chills?
Cancer history?
Long term steroid use?
Is all of the pain in the back?
Leg pain?
Red Flags

- Cancer history
- IVDA history
- Weight Loss
- Fevers
- Significant leg weakness
Red Flags

- Cancer history
- IVDA history
- Weight Loss
- Fevers
- Significant leg weakness

GET AN MRI FOR A PATIENT THAT HAS THESE FINDINGS
No Red Flags?
No Red Flags?

Relax.
No Red Flags?

Relax.

There are two other entities we want to look for:

Compression fracture

Herniated disc
Spotting the compression fracture

Older patient
Osteoporosis
Steroid use
Pain with percussion

A plain X-Ray will usually give the answer.
Recent controversy: NEJM published two RCTs in 2009


• These were negative studies
• Vertebroplasty criteria are now much more strict
Benign Compression fracture Management

Analgesics & Therapy

Referral to specialist if pain is severe/unrelenting.

Kyphoplasty/vertebroplasty still indicated in certain circumstances so referral to a specialist is appropriate if pain does not improve in 2 weeks.
Lumbar disc herniation

Approximately 4% of acute back pain patients will have a lumbar disc herniation as the cause.

Predominance of leg pain is the clue.

Neurosurgeons want to see these patients. Why? Surgical results are often good.
Natural History of Sciatica

36% improve in 2 weeks
73% improve in 3 months
<20% require surgery

Predicting the outcome of sciatica at short term followup
Br J of General Practice, 2002
From: Surgical vs Nonoperative Treatment for Lumbar Disk Herniation: The Spine Patient Outcomes Research Trial (SPORT): A Randomized Trial

The Exam

Step onto a stepstool (L3L4)
Heel walking (L5)
Toe walking (S1)

Knee Reflex (L4)
Ankle reflex (S1)

Patrick’s maneuver (Hips)

Percussion of the spine (Cancer, fracture, Infection)

Should take <5 minutes
>90% of Lumbar disc herniations affect L4, L5 or S1
What about imaging?
Routine imaging is NOT required

  - 6 RCTs of 1804 patients with acute or subacute non-specific low back pain
  - NO difference in outcomes with routine imaging vs. usual care for pain, function, quality of life, anxiety, or patient-rated improvement

*Routine imaging = More cost w/o clinical benefit*
Routine Imaging may actually harm

- Relationship of Early MRI for Work-Related Acute LBP with Disability and Medical Utilizations Outcomes. JOEM 2010.

  * 8-fold increase in surgery *
  * 5-fold increase in total cost *
MRI abnormalities abound in the normal population

<table>
<thead>
<tr>
<th>Study</th>
<th>Subjects</th>
<th>Herniated Disk</th>
<th>Bulging Disk</th>
<th>Degenerative Disk</th>
<th>Stenosis</th>
<th>Annular Tear</th>
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<td>Boden et al.\textsuperscript{26}</td>
<td>Volunteers $&lt;$ 60 yr old</td>
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<td>Jensen et al.\textsuperscript{27}</td>
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<td>Volunteers (mean age, 35 yr)</td>
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<td>Stadnik et al.\textsuperscript{29}</td>
<td>Patients referred for head or neck imaging (median age, 42 yr)</td>
<td>33</td>
<td>81</td>
<td>72</td>
<td>NR</td>
<td>56</td>
</tr>
</tbody>
</table>
Several studies have shown that there is no correlation between MRI findings and patients’ low back symptoms.

1. Wittenberg et al., 1998
2. Smith et al., 1998
3. Savage et al., 1997
Why is routine imaging not beneficial?

- Abnormalities VERY common
- Acute LBP has a favorable history
- Imaging rarely affects treatment plans
- Potential benefits offset by harms
- May lead to unnecessary procedures

Diagnostic Imaging for LBP: Advice for High Value Health Care from the ACP. Ann Int Med 2011.
Imaging (Bottom Line)

If no red flag in history & No exam abnormality then

NO IMAGING REQUIRED
After the History/Exam, try to place the patient into one of three categories

Non specific low back pain (>90%)

Low back pain with radiculopathy (4%)

Back pain that sounds serious (1%)
Evidence based Treatment of
1. Nonspecific back pain
2. Radiculopathy (without deficit)

Tylenol
NSAIDS
Muscle Relaxants

Heat
Avoid Bed Rest
Poor evidence

- Poor Evidence / Unable to Estimate / I
  - Acupuncture
  - Back Schools
  - Ultrasound
  - Lumbar Supports
  - Massage
  - Modified Work
  - TENS
  - Superficial Cold
Reassurance

“I’m not sure I need an emergency room—is there a reassurance room?”
NSAIDS
Yellow flags

Negative mood
Poor job satisfaction
Litigation
Secondary gain
Yellow flags

- Negative mood
- Poor job satisfaction
- Litigation
- Secondary gain

- Psychosocial risk factors are stronger predictors of outcome than exam findings and severity of pain!!
Waddell’s Non-organic Signs

Inappropriate tenderness to slight touch

Pain with axial loading (e.g. pushing on top of head)

Non dermatomal disturbances in strength/sensation

Over-reaction during the exam
Bowel and Bladder

Hard to get bowel/bladder involvement in ambulatory patient with normal motor function around the ankle

Hard to get *isolated* bladder failure from disc disease

Urinary retention is seen from pain/narcotics

ISOLATED bladder dysfunction (no leg weakness, no saddle anesthesia) is NOT Cauda equina syndrome
Followup is always a good idea

You will want to verify that the pain went away.

You will want to verify that red flags did not appear.
When to refer

**Immediately**

Lumbar tumor
Lumbar infection
Cauda equina syndrome
When to refer

**Immediately**
- Lumbar tumor
- Lumbar infection
- Cauda equina syndrome

**Very soon**
- Radiculopathy with neurological deficit
When to refer

Immediately
Lumbar tumor
Lumbar infection
Cauda equina syndrome

If still in pain
Radiculopathy
Compression fracture

Very soon
Radiculopathy with neurological deficit
When to refer

**Immediately**
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- Cauda equina syndrome

**Very soon**
- Radiculopathy with neurological deficit

**If still in pain**
- Radiculopathy
- Compression fracture

**“It just does not feel right”**
- We’ll see them!
Some things to remember

Try not to miss cancer, infection, or cauda equina syndrome.

Harder to get into trouble if there is a follow-up visit

If the exam is normal and there are no “red flags,” take a deep breath. Even if something turns up later, you did nothing wrong.
Such a common disorder, yet....

“One would have thought by now that the problem of diagnosis and treatment would have been solved, but the issue remains mysterious and clouded with uncertainty.”