PainWeek

"Doctor, I Have Pain Between My L4 and L5"
Dealing With False Positives and Google Dx

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Title & Affiliation

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Disclosures

- No financial relationships to disclose
- I work for the Department of Veterans Affairs and my presentation does not represent the views of the VA or the US Federal Government

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Learning Objectives

- Illustrate the importance of the history and physical examination in the evaluation of some common painful musculoskeletal disorders deemphasizing the use imaging studies
- Explain the pitfalls of establishing diagnoses of chronic painful conditions based on imaging studies
- Summarize the existing medical literature that demonstrate the abundance of false positive imaging findings in common chronic musculoskeletal conditions
- Discuss the importance of good communication and rapport with our patients in dealing with the epidemic of misinformation on the web

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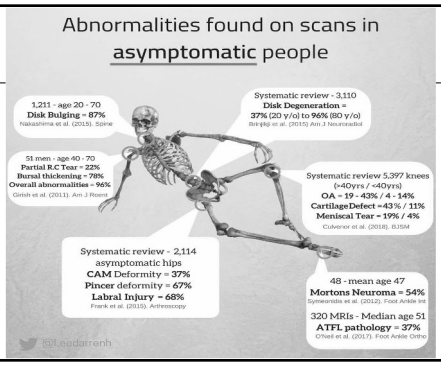

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Basics of the Evaluation

- Chief Complaint
  - Acute, chronic
  - Trauma (acute/cumulative)
- PMH
- PE – objective findings

- KEY: Clinical, not imaging diagnosis

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Medical Evaluation

Physical Examination
- Inspection
- ROM
- Reflexes
- Dermatomal sensation
- Weakness
- Tenderness

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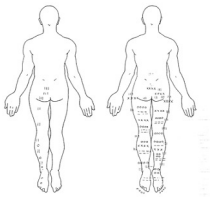
Medical Evaluation

Diagnosis, should generally

- Be supported by Hx and Exam
- Make medical sense based on known pathophysiology



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Testing

Ancillary Tests
- Plain films
- CT Scan
- MRI
- Electrodiagnostic Studies

all support clinical diagnosis; not diagnostic themselves in practical terms

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Ancillary Tests

Rarely needed before initial management

Exceptions

- "Significant" Trauma → plain films
- Progressive objective neurological deficit → MRI
- Suspected Fracture/Dislocation → plain films
- Hx of tumor (i.e. prostate, lung, breast, etc) → plain films
- Significant constitutional symptoms (fever, chills, unintended weight loss) → bloodwork, plain films

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Red Flags

Red Flag	Potential Underlying Condition as Cause of LBP
• History of cancer • Unexplained weight loss • Immunosuppression • Urinary infection • Intravenous drug use • Prolonged use of corticosteroids • Back pain not improved with conservative management	Cancer or infection
• History of significant trauma • Minor fall or heavy lift in a potentially osteoporotic or elderly individual • Prolonged use of steroids	Spinal fracture
• Acute onset of urinary retention or overflow incontinence • Loss of anal sphincter tone or fecal incontinence • Saddle anesthesia • Bilateral or progressive weakness in the lower limbs	Cauda equina syndrome or other severe neurologic condition

Bigos, et al. Acute Low Back Problems in Adults. Clinical Practice Guideline No. 14. AHCPR Publication No. 95-0642. Rockville, MD: Agency for Health Care Policy and Research, Public Health Service, U.S. DHHS. Dec 1994.

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ACR Low Back Pain Imaging Guidelines 2021

Acute, Subacute or Chronic LBP w/ or w/o radiculopathy, no red flags and no prior Tx

No imaging recommended

ACR Appropriateness Criteria – Low Back Pain; Rev 2021

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ACR Low Back Pain Imaging Guidelines 2021

- Subacute or CLBP w/ or w/o radiculopathy – surgery or intervention candidate with persistent or progressive symptoms during or following 6 wks of medical management:
  - Imaging including x-rays, MRI, CT or Bone Scan/SPECT – may be appropriate
- LBP with suspected Cauda Equina
  - MRI usually appropriate; also CT
- LBP w/ or w/o radiculopathy when there is prior surgery – with new or progressive symptoms/findings
  - X-rays or MRI usually appropriate; CT may be appropriate

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ACR Low Back Pain Imaging Guidelines 2021

- LBP w/ or w/o radiculopathy – low velocity trauma, elderly, osteoporosis, chronic steroid use
  - Plain films, MRI/CT w/ contrast
- LBP w/ or w/o radiculopathy – suspected CA, infection, immunosuppression
  - MRI usually appropriate; CT / plain films may be appropriate

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Variant 7: **Low back pain with or without radiculopathy. One or more of the following: suspicion of cancer, infection, or immunosuppression. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI lumbar spine without and with IV contrast	Usually Appropriate	O
MRI lumbar spine without IV contrast	Usually Appropriate	O
Radiography lumbar spine	May Be Appropriate (Disagreement)	☢☢☢
CT lumbar spine with IV contrast	May Be Appropriate	☢☢☢
CT lumbar spine without IV contrast	May Be Appropriate	☢☢☢
CT myelography lumbar spine	May Be Appropriate	☢☢☢☢
MRI lumbar spine with IV contrast	Usually Not Appropriate	O
Bone scan whole body with SPECT or SPECT/CT complete spine	Usually Not Appropriate	☢☢☢
Discography and post-discography CT lumbar spine	Usually Not Appropriate	☢☢☢
CT lumbar spine without and with IV contrast	Usually Not Appropriate	☢☢☢☢
FDG-PET/CT whole body	Usually Not Appropriate	☢☢☢☢

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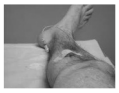
Ancillary Tests

Electrodiagnostic Tests

➢Yield when there is no objective weakness or numbness is nearly zero!!

Exceptions:
- ✓ Focal Neuropathies
- ✓ NMJ disorders



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Spine MRIs

- Abnormalities often correlate weakly with pain
- Very large # of false ++
- Significant # of individuals with back pain w/o identifiable pathology

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Which One Is Scariest?

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Imaging Reports

- Patients with copies of reports
  - Asking providers to address imaging, not the condition
  - Affects treatment outcomes
    - Provider starts from a disadvantaged position
      - Trust/credibility
    - Secondary gain
      - Claiming pain/disability

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Medical Wording in Reports Can Be Scary…

- Patients with copies of reports
  - Asking providers to address imaging, not the condition
  - Affects treatment outcomes
    - Provider starts from a disadvantaged position
      - Trust/credibility
      - Secondary gain
        - » Claiming pain/disability

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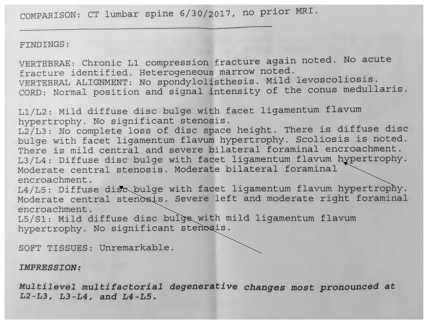

COMPARISON: CT lumbar spine 6/30/2017, no prior MRI.

FINDINGS:

VERTEBRAE: Chronic L1 compression fracture again noted. No acute fracture identified. Heterogeneous marrow noted.
VERTEBRAL ALIGNMENT: No spondylolisthesis. Mild levoscoliosis.
CORD: Normal position and signal intensity of the conus medullaris.

L1/L2: Mild diffuse disc bulge with facet ligamentum flavum hypertrophy. No significant stenosis.
L2/L3: No complete loss of disc space height. There is diffuse disc bulge with facet ligamentum flavum hypertrophy. Scoliosis is noted. There is mild central and severe bilateral foraminal encroachment.
L3/L4: Diffuse disc bulge with facet ligamentum flavum hypertrophy. Moderate central stenosis. Moderate bilateral foraminal encroachment.
L4/L5: Diffuse disc bulge with facet ligamentum flavum hypertrophy. Moderate central stenosis. Severe left and moderate right foraminal encroachment.
L5/S1: Mild diffuse disc bulge with mild ligamentum flavum hypertrophy. No significant stenosis.

SOFT TISSUES: Unremarkable.

IMPRESSION:

Multilevel multifactorial degenerative changes most pronounced at L2-L3, L3-L4, and L4-L5.

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What Should We Do?

- Correlate **symptoms and signs** with ancillary tests

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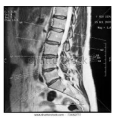
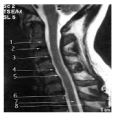
The Infamous Discs

Pitfalls

Abnormal MRI in asymptomatic subjects:

- –Lumbar- about 33% had abnormalities
  < 60 y/o: 21% >60 y/o: 57%
- –Cervical- about 20% had abnormalities narrow/degenerated discs
  < 40 y/o: 25% >40 y/o: 60%





S. Boden's articles: *J Bone & Joint Surg* 1990
Jensen MC, et al. *N Engl J Med* 1994

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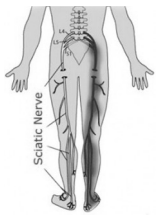
"I Have Pain Between L4 and L5"

Key
Is there neurological involvement?

Some Pitfalls

- Buttock and trochanteric pain - often related to back (facets, SIJ, discs, etc.), not hip
- Nerve involvement generally causes pain referral to leg, radiating distal to the knee
- Many serious radiculopathies are painless
- Pure sensory radiculopathies generally not detected with EDX



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Back Pain Don'ts

- Don't order any test that will not change your management

So……

- Avoid ordering MRI's when clinical findings do not warrant
- Herniated/Bulging/Degenerated Discs
- Mean nothing w/o concordant symptoms and exam findings

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More Back Pain Don'ts

- No evidence that activity is harmful
- Prolonged rest leads to:
  - increased psychological distress and depression
  - loss of the work habit / progressive loss of job opportunity
  - decreasing probability of ever returning to work
  - increased difficulty in starting rehabilitation
- Increased activity:
  - promotes bone & muscle strength
  - improves disc and cartilage nutrition
  - increases systemic endorphins / reduce sensitivity to pain

Deyo RA, et al. How Many Days of Bed Rest For Acute LBP? *N Eng J Med* 1986

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Joint Pain

Is it really coming from the joint?

- Pain referral patterns
- Soft Tissue pathology

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Common Referral Patterns

- Visceral to shoulder
  - Chest – angina
  - Diaphragmatic irritation (liver, spleen, gallbladder)
- Neck to shoulder and vice-versa
  - Radiculopathy
  - CTS
  - Facets
- Knee to Hip and vice-versa
- Lumbosacral to leg

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A joint is not a joint… is not a joint….

- Shoulder Pain – several joints
  - GH
  - AC
  - ST
- Soft Tissues
  - Shoulder: Rotator Cuff, Biceps tendon, Glenoid labrum, capsule, bursae
  - Knee: cruciate ligaments, collateral ligaments, patellofemoral, menisci, several bursae

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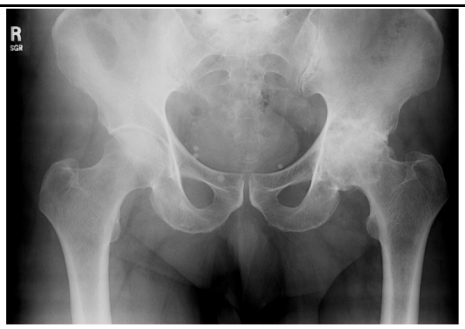

Where would you expect this person to have pain?

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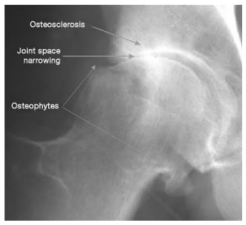
Hip Pain

Causes
- Hip Joint – Arthritis/AVN
- Low Back – referred pain due to facets/SI joint
- Trochanteric Bursitis
- Impingement
- Fracture – associated w/ a fall/pathologic condition



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Hip Pain

Symptoms

- Pain– key is Location
  - –Outer Groin - Hip joint, Knee (referred)
  - –Lateral thigh- Trochanter bursa/ back
  - –Posterior – SIJ / facets
- Quality
  - –Sharp, Achey, Throbbing → Arthritis
  - –Burning, Tingling → Neuropathic / Spine related
- Gait disturbance / Limp
- Loss of motion / Stiffness
- Leg length inequality

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www…..

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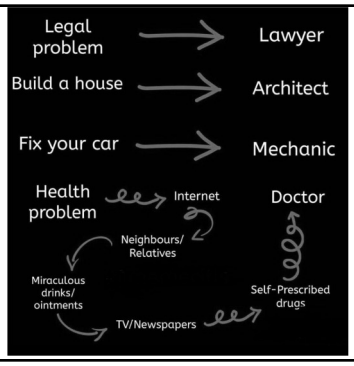

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"You can't list your iPhone as your primary-care physician."

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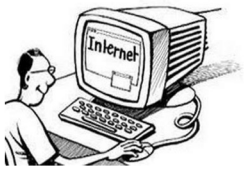
Here's Another Scary Creature…..



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Articles

Calling Dr. Internet: Analyzing News Coverage of Cyberchondria

Han Zheng & Edson C. Tandoc Jr.

Published online: 23 Sep 2020

Download citation https://doi.org/10.1080/17512786.2020.1824586 Check for updates

Full Article Figures & data References Citations Metrics Reprints & Permissions

ABSTRACT

Introduced and popularized by the news media, cyberchondria refers to excessive online health information searches associated with escalation of health anxiety. It has since received attention

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First the Good News….

- Computerized Diagnostic Decision Support (CDDS) programs
- Computer algorithms called **"Symptom Checkers"**

- Demand for this is high and growing; in the US, 1 in 3 people reported resorting to the internet for self-diagnosis….
- 2019 study – nearly 50% of the patients had investigated their symptoms with an online search engine before going to the ED

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Online Symptom Checkers

There are a number of SCs out there

- Serve 2 main functions:
  - facilitate self diagnosis (list of diagnoses, usually rank ordered by likelihood)
  - assist with triage
- Potential benefits:
  - can encourage patients with life threatening problems (stroke or MI) to seek emergency care
  - can reassure and recommend staying home regarding non-emergent problem that does not require a medical visit
- Some have been systematically tested
- Testing generally involves standardized cases, but……

Operators are generally medical providers, not lay persons

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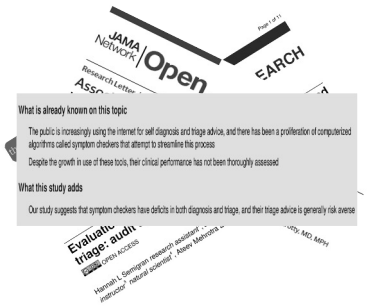

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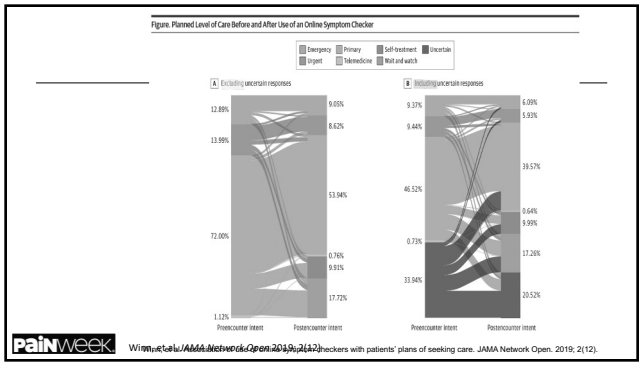

Wiler et al. Association Between an Online Symptom Checker with patients' plans of seeking care. JAMA Network Open. 2019; 2(12).

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Now: The Not So Good….

- Misdiagnosis by physicians occurs in approximately 5-20% of outpatients
- Interest in this area has increased alongside advances in AI and wider availability of clinical data
- Originally designed for doctors, symptom checkers are designed to directly assist patients by creating differential diagnoses and advising on the need for further care
- Great potential to improve diagnosis, quality of care, and health system performance However, if poorly designed or lacking rigorous clinical evaluation can put patients at risk and likely increase the load on health systems

Fraser et al. Safety of patient-facing digital symptom checkers. *The Lancet* 2018

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Human vs Machine

- Human Dx is a web- and app-based platform on which physicians generate differential diagnoses for clinical vignettes
- First direct comparison of diagnostic accuracy, physicians vastly outperformed computer algorithms in diagnostic accuracy (84.3% vs 51.2% correct diagnosis in the top 3 listed)
- Despite physicians' superior performance, they provided the incorrect diagnosis in about 15% of cases

Semigran et al. Comparison of Physician and Computer Diagnostic Accuracy. *JAMA Internal Medicine* 2016

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Current State of Symptom Checkers

- Most SCs – no greater triage capability than average layperson
- Might improve early detection of emergencies but might also needlessly increase resource utilization in healthcare
- Laypersons sometimes require support in deciding when to rely on self-care but it is in that very situation where SCs perform the worst

Schmieding ML, et al. Benchmarking Triage Capability of Symptom Checkers Against that of Medical Laypersons: Survey study. *J Med Internet Res* 2021

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BASIC RESEARCH

Most YouTube Videos About Carpal Tunnel Syndrome Have the Potential to Reinforce Misconceptions

Goyal, Ria; Mercado, Amelia E.; Ring, David MD, PhD; Crijns, Tom J. MD **Author Information**

Clinical Orthopaedics and Related Research: April 11, 2021 - Volume Latest Articles - Issue - 10.1097/CORR.0000000000001773
doi: 10.1097/CORR.0000000000001773

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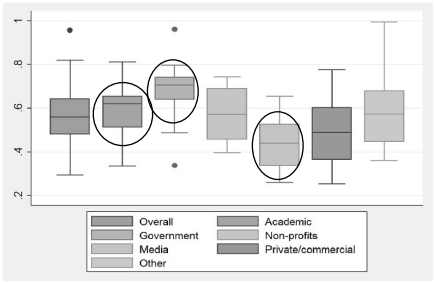

Level of Quality by Type of Organization

Daraz, et al. Can patients trust online information? *J Gen Int Med* 2019; 34(9):1884-91

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www….. Not Always Useful

- Many times: operator dependent
  - Specific terms/words
  - Not putting 2+2 together
- Search terms use algorithms
  - Biased in various ways
    - Technically / Intellectually
    - Politically
    - Commercially - $$

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Take Home Points…….

- *Don't order any test that will not change your management*
- *Avoid ordering imaging studies when clinical findings do not warrant*
- *Counsel patients about using online tools – these can be useful but may also be quite misleading*
- *Be available and be a resource - otherwise Dr. Google will replace you …….and that's NOT good*

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"The usual stuff — a new virus from the Joker, spyware from the Penguin, malicious code from Cat Woman, another phishing scheme from the Riddler."

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Thanks!

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