



University of California  
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# Back & Neck Pain: Precision Spine Diagnosis Guides Therapy

## *Defining the Problem*

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# Topics to Cover

- The *Problem*: **Spine Related Pain**
- Current Clinical State
- Role of spine imaging & image-guided treatment
- Precision Spine: What the future holds?

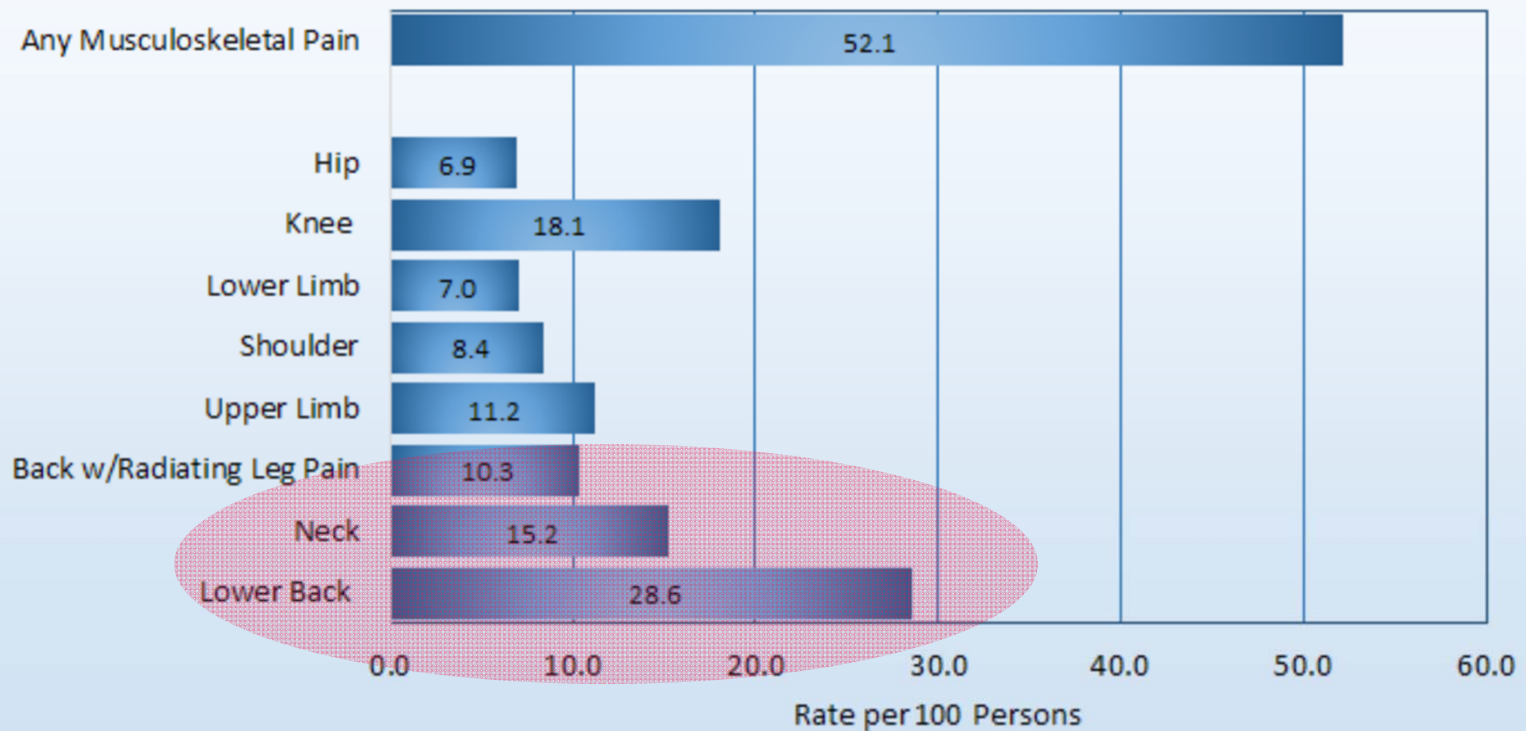


# Spine Related Pain: Prevalence

- Pain of spinal origin is extremely common
- Second most common reasons for physician office visits
- 75% lifetime prevalence of back pain in the US

# Spine Related Pain: Prevalence

**Self-Reported Prevalence of Musculoskeletal Pain in Past Three Months by Site of Pain, United States 2012**



Source: National Health Interview Survey (NHIS)\_Adult sample, 2012.  
[www.cdc.gov/nchs/nhis/nhis\\_2012\\_data\\_release.htm](http://www.cdc.gov/nchs/nhis/nhis_2012_data_release.htm) July 2, 2013.

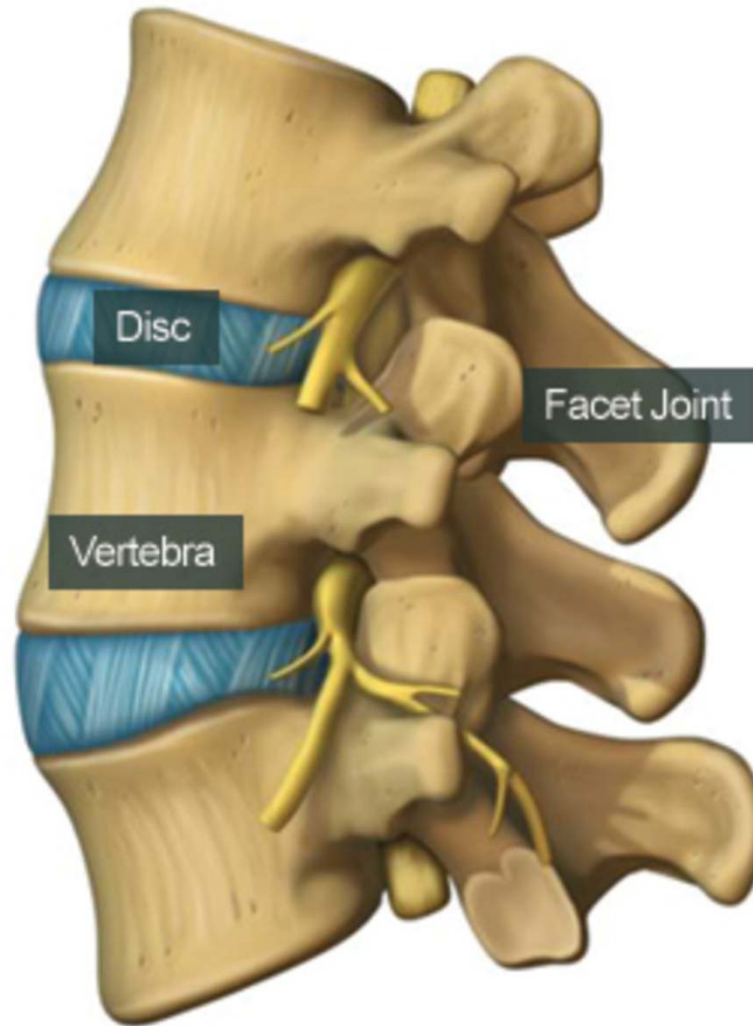
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# Spine Related Pain: Cost to Society

- Tremendous impact on society
  - Direct costs
  - Indirect: Lost productivity
- Health care expenditures > \$100 billion annually
- Back pain is single greatest cause of work disability in the US



# Spine Pain Generators



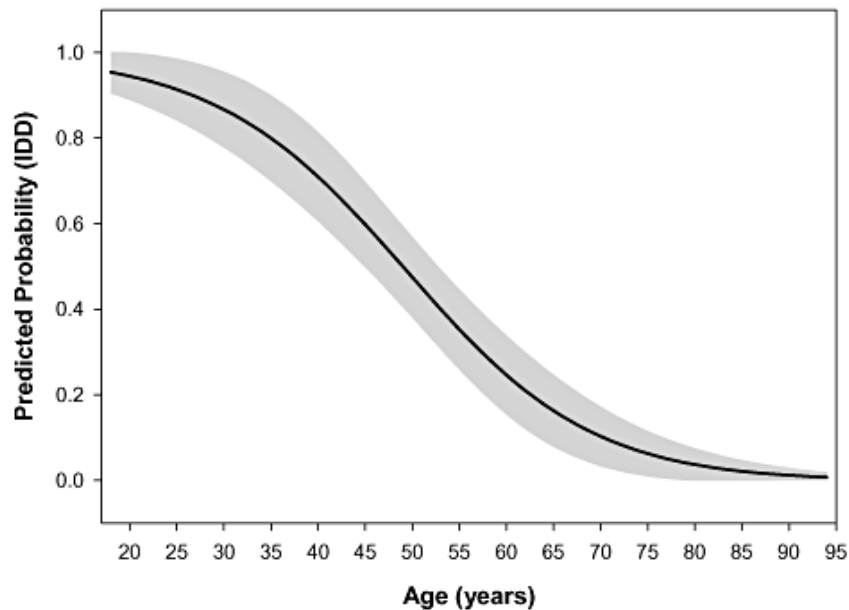
# Spine Related Pain: What do patients feel?

- Low back pain
- Low back pain + Radicular pain
- Radicular pain

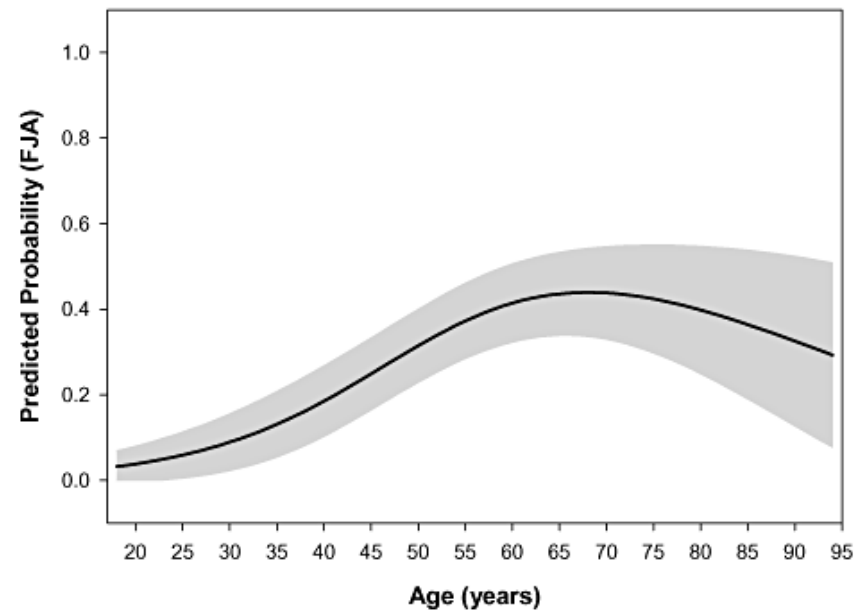
# Source of Chronic Low Back Pain

## DePalma *Pain Medicine* 2011

Discogenic Pain, IDD



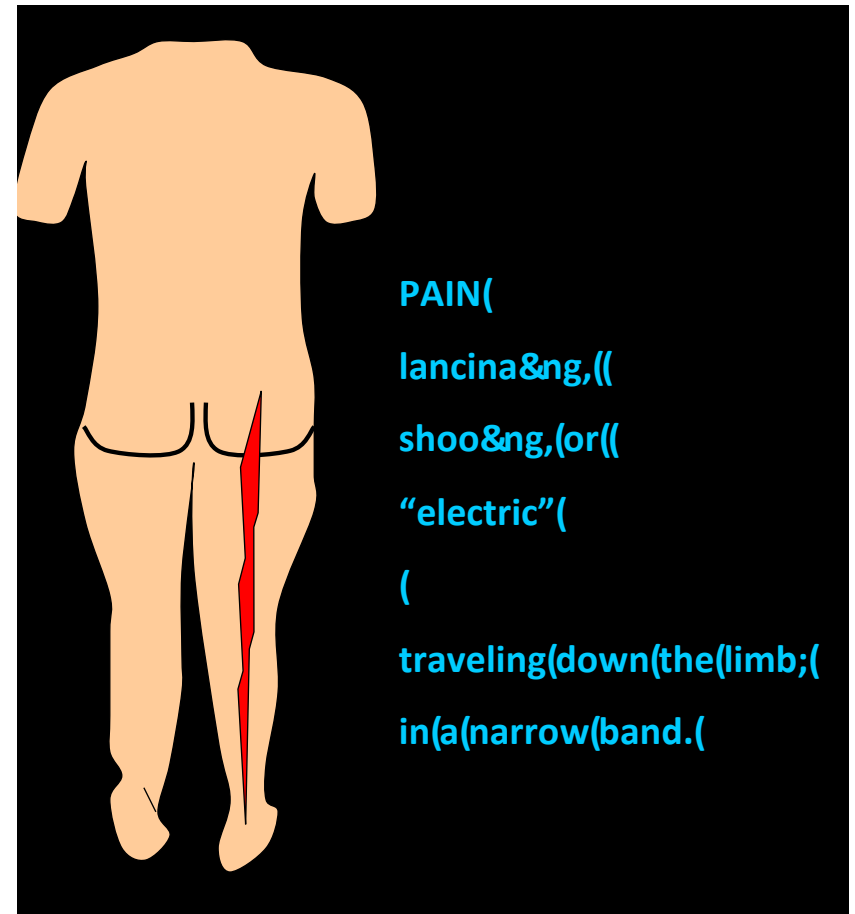
Facet Mediated Pain





# Radicular Pain

- Pain that radiates into the arms or legs along the course of a spinal nerve root
- Young patients, usually from a disc herniation
- Older patients, disc herniation or spinal stenosis



# Spine Related Pain: Role of Imaging

- Used increasingly frequently
- Remarkable advances in recent decades
- Multi-detector CT, high field strength MRI, PET/MRI, SPECT/CT
- Exquisite depiction of anatomy & pathology

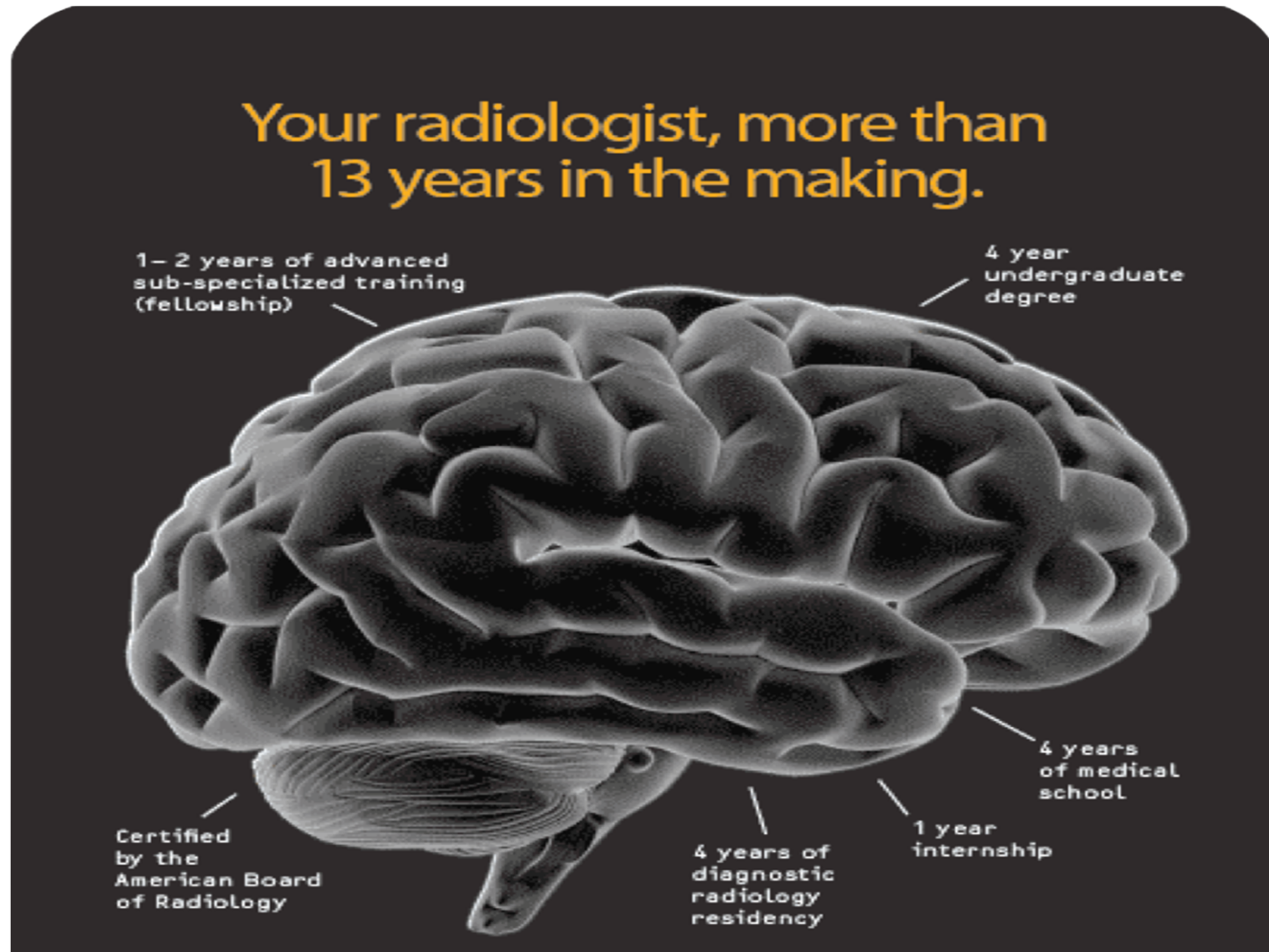


# Spine Related Pain: Role of Imaging

- Emerging role of advanced “precision” imaging modalities to
  - Identify source of pain
  - Assist in selection of treatment strategies
  - Result in improved patient outcomes

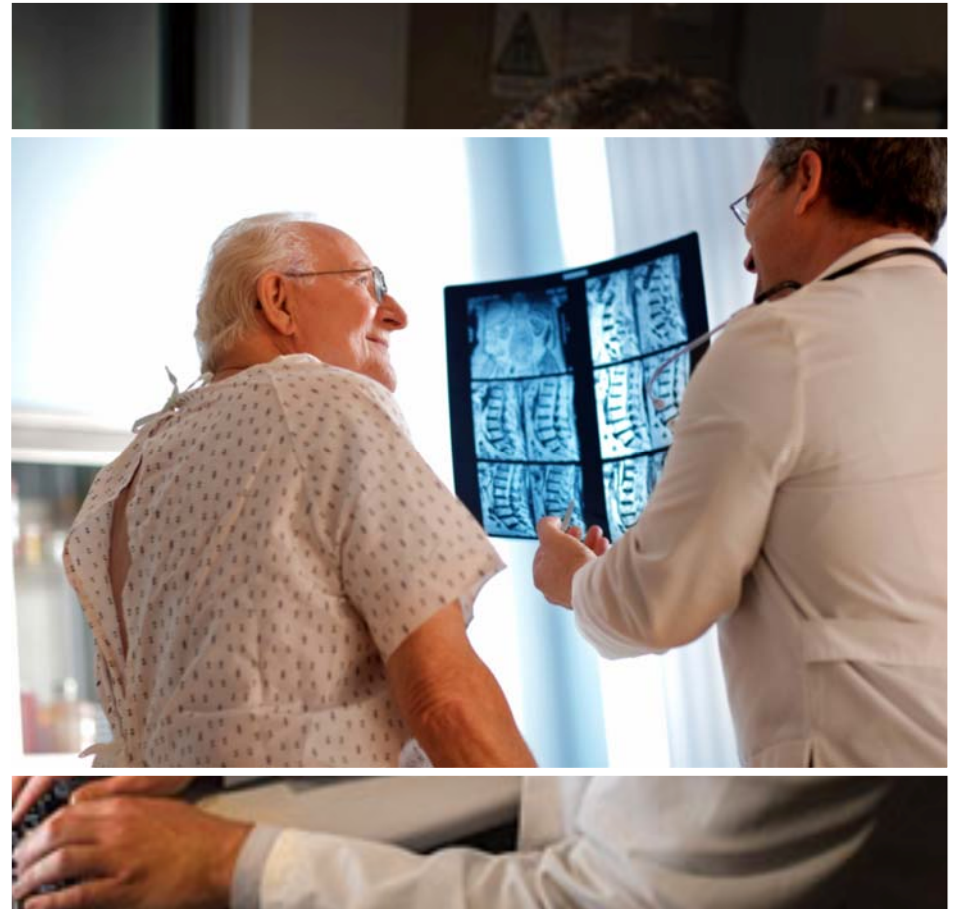


# Spine Related Pain: Role of the Radiologist



# Spine Related Pain: Role of the Radiologist

- Experts in image interpretation and image-guided intervention
- Central role in coordinating care for the patient
- Ability to substantially impact and change the course of treatment





# Spine Related Pain: Image-Guided Therapy



# Spine Related Pain: Image-Guided Therapy

- Spinal injections of steroids used in management of back pain for more than 50 years
- Image-guidance (X-ray, US, MRI) provides precision & allows for safe performance of these procedures

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