

# Becker's Spine Review – October 11<sup>th</sup> Webinar, 12-1pm CT

## Weight-bearing MRIs - Beyond Gravity:

How Spine Specialists Leverage Clinical Innovation and Business Discoveries

# *Welcome!*

We will begin shortly....



Board-certified Spinal Neurosurgeon Fellowship-Trained Spinal  
Neurosurgeon  
CEO & President  
SpineNevada Minimally Invasive Spine Institute



Board-certified Orthopedic and Spine Teleradiologist  
Clinical Informatist, Inventor, Thought Leader  
& Serial Doctorpreneur  
CEO, Salubrio MRI Diagnostic Imaging

# Featured Guests...



**James J. Lynch, MD, FACS, FAANS**  
Board-certified Spinal Neurosurgeon  
Fellowship-Trained Spinal Neurosurgeon  
CEO & President  
SpineNevada Minimally Invasive Spine Institute

*Spine Nevada*  
Minimally Invasive Spine Institute

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**Douglas K Smith, MD, CPHIMS, CHCIO, CHPS**  
Board-certified Orthopedic & Spine Teleradiologist  
Clinical Informatist, Inventor, Thought Leader  
& Serial Doctorpreneur  
CEO, Salubrio MRI Diagnostic Imaging



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**Nancy Richardson, MS**  
President, VOC Company, LLC  
Voice of Customer, IT Vertical Market  
Commercialization & Positioning  
Strategies and Execution

# “Beyond Gravity” Agenda

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- Interactive Interview between the physician guest, and the audience (use “Chat”)
- Evolution to Weight-bearing MRI
  - Timeline
  - Diagnosing & Treating Cervical
  - Meeting Milliman Healthcare Guidelines Criteria
  - Diagnosing & Treating the Lumbar
- Outcomes & Lessons Learned
- Q & A

## Key Learnings

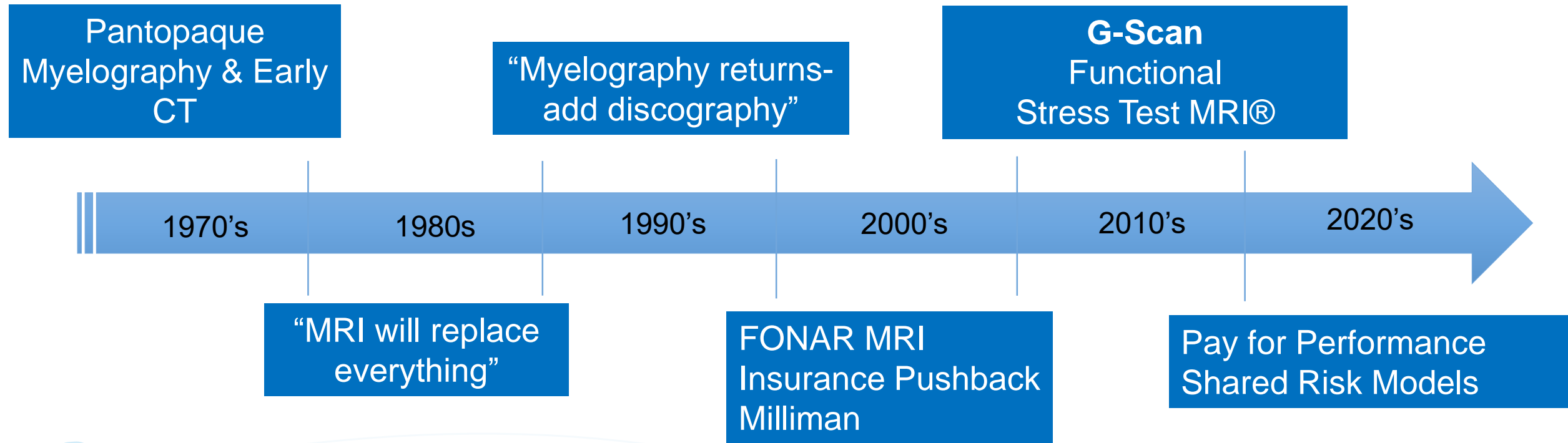
- Describe dynamic neural compression during weight-bearing (and flexion-extension in cervical spine)
- Discuss closing of Milliman Healthcare Guideline / Criteria gaps
- Review Weight-bearing MRI business considerations and implications
- Outline clinical experience
- Review lessons learned for future implementations

# Weight-bearing MRI Innovation Beyond Gravity: The Evolution

# *What Drew You to Weight-bearing MRI Technology?*

## Life Cycle of Spinal Imaging

Evolution of Functional MRI Imaging





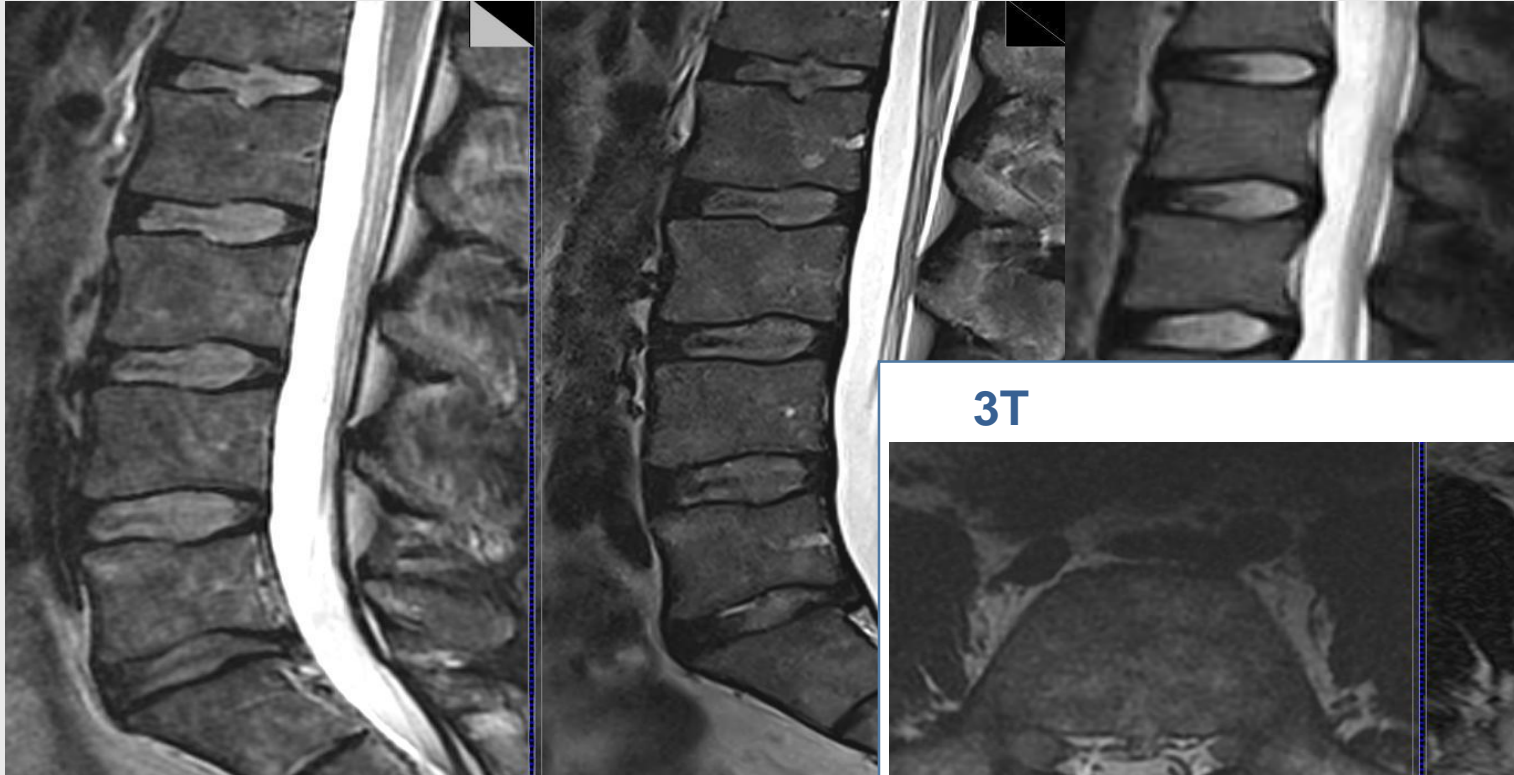
# Field Strength & Spine MRI

Which would you use?

3T

1.5T

.25T

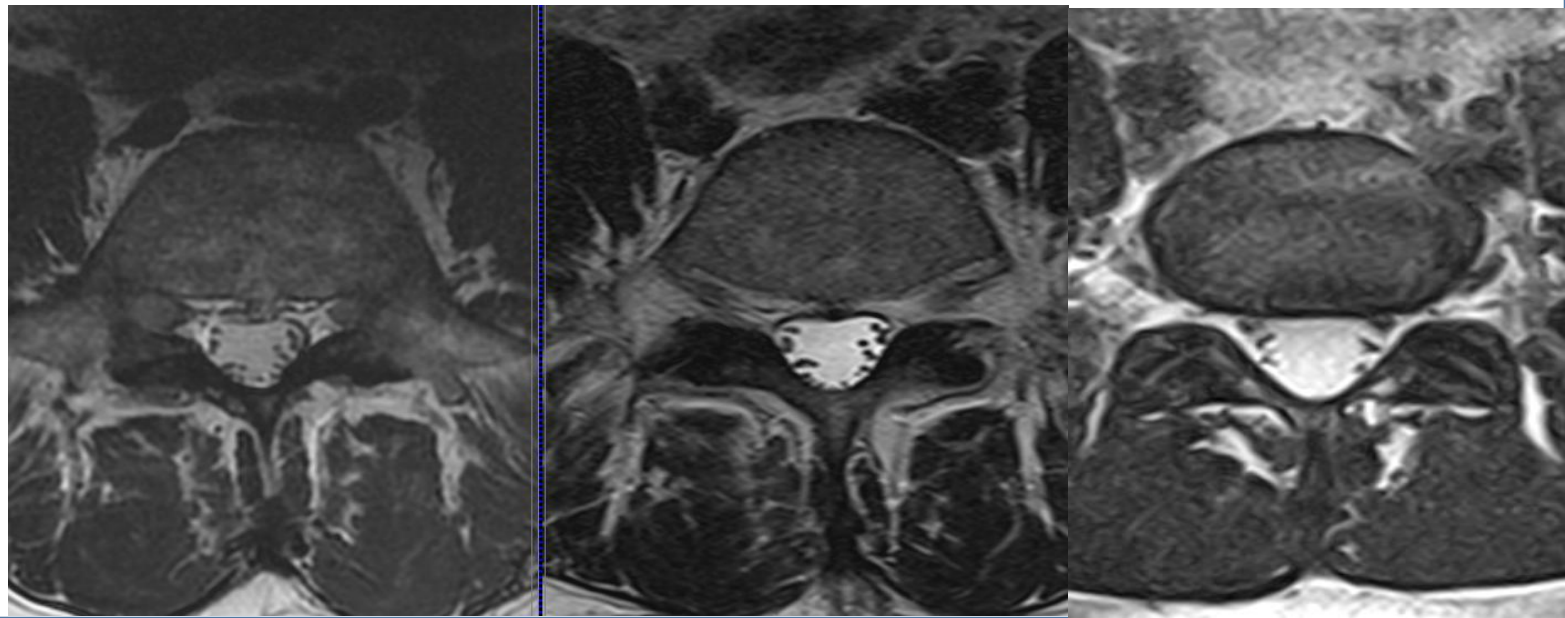


- MRI field strength is critical for imaging the brain (subtle signal changes) or vascular/cardiac studies where speed is important.
- In the spine, mechanics is more critical than signal.
- High resolution, false negative 3T exams are not added value.

3T

1.5T

0.25T



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- Stress Test EKG reveals occult cardiac disease
- Stress Test MRI reveals occult spine disease & injury symptoms

# Weight-bearing: Cervical

Dr. Smith

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# Supine vs. Weight-bearing: Animated Illustration

Talking us through Dynamic Cervical Disc Herniation

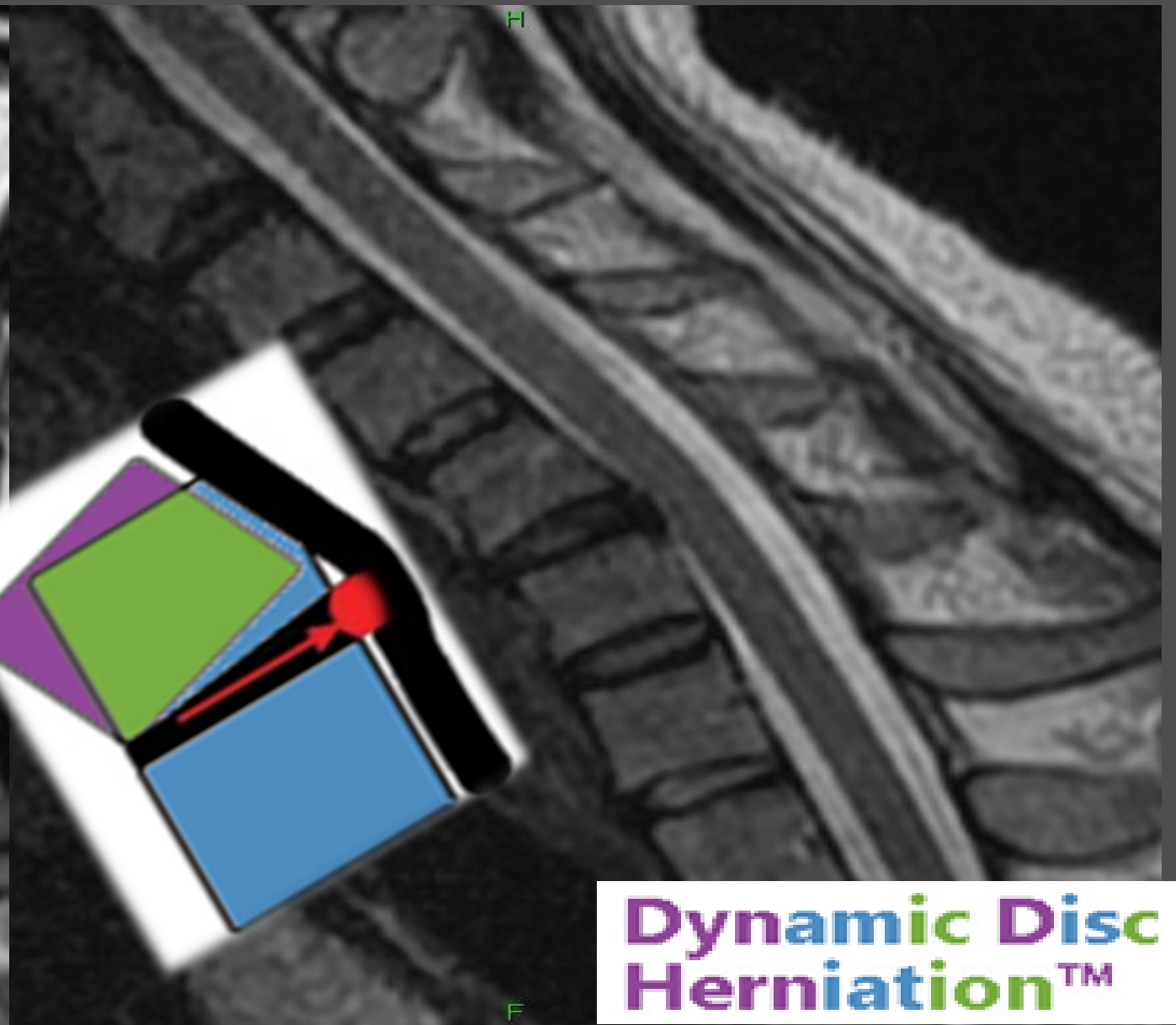


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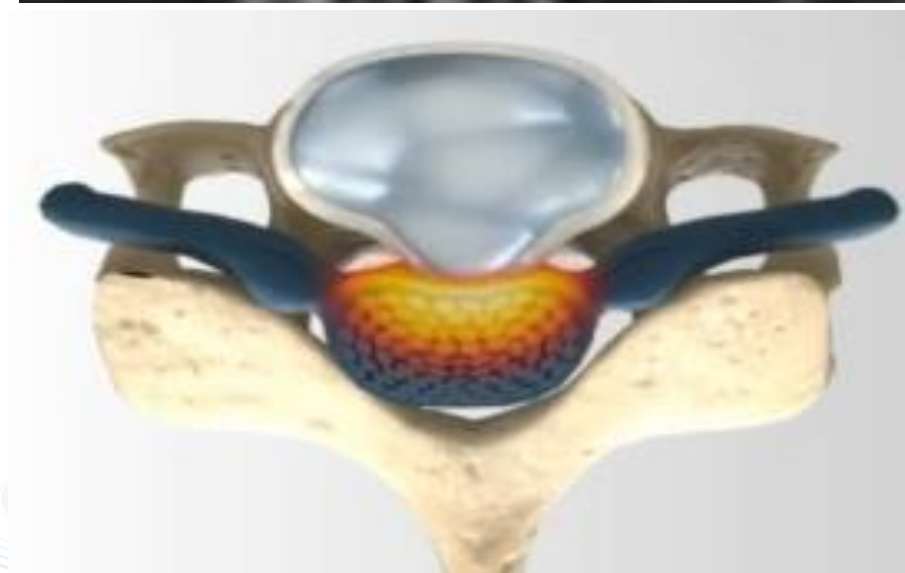
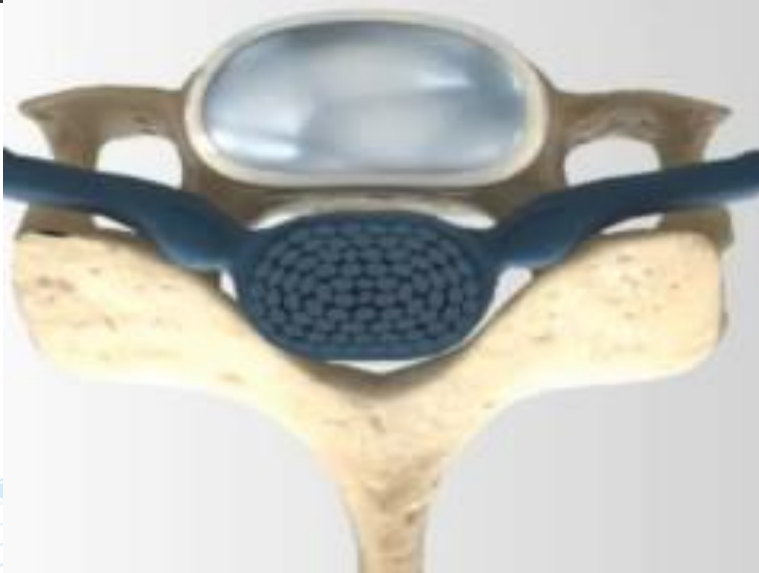
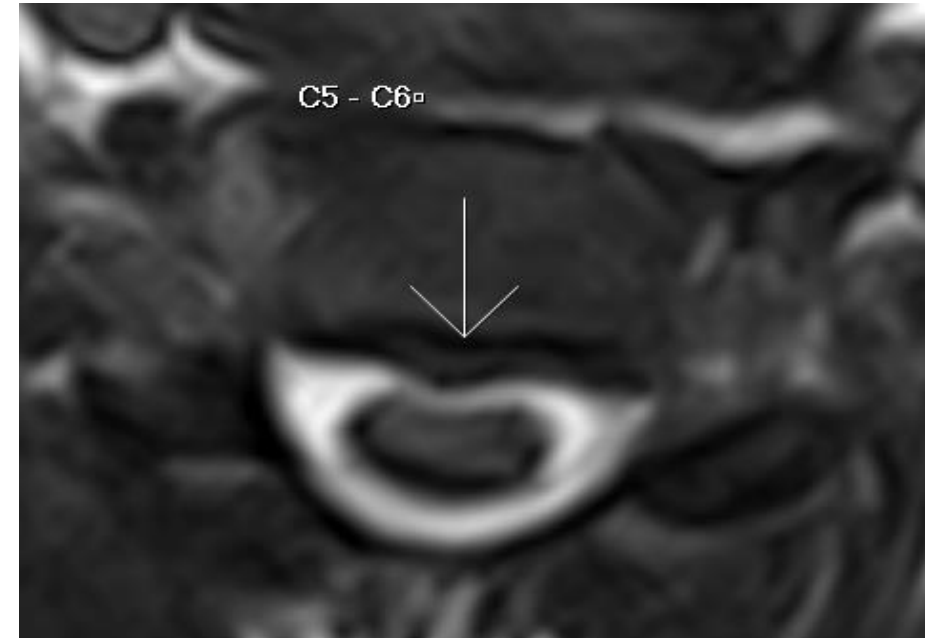
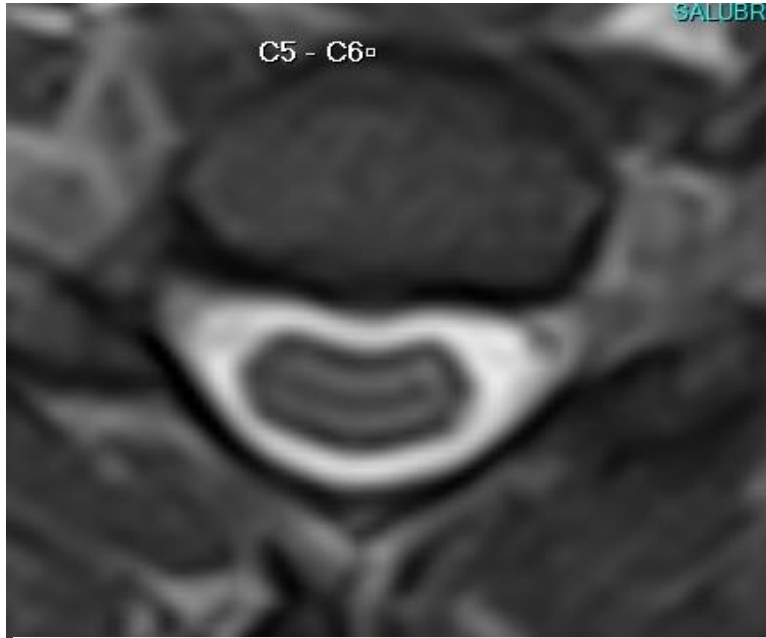




Dynamic Disc  
Herniation™



# Dynamic Cervical Disc Herniation Producing Dynamic Cord Compression



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# Dynamic Cervical Disc Herniation

Myelopathy: Positional Bilateral Upper Extremity Symptoms



*How has weight-bearing MRI technology changed the radiology services you provide today, versus traditional approaches?*

# Milliman Criteria.... joins two forces



*How did you two discover each other....?*

*What evolved....continuing to today?*

April 2013



Spine Nevada  
Minimally Invasive Spine Institute

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## BECKER'S SPINE REVIEW

### Spine Imaging: 5 Strategies for Meeting 'Milliman Criteria' Requirements Featured

Written by By Douglas Smith, MD, Founder of Musculoskeletal Imaging Consultants | Friday, 12 April 2013 13:58

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The Milliman accounting firm has proposed a series of clinical and imaging criteria to satisfy and document as best practice before a surgical procedure is performed. Many insurance companies have adopted the Milliman criteria as absolute requirements before approving surgical fusions and other procedures and will reject pre-authorization unless each of the Milliman criteria are specifically documented in the medical records submitted in the pre-authorization packet. Ideally, the entire pre-operative evaluation process would be designed to document the Milliman criteria. Technology and terminology best practices must be adopted and all members of the preoperative planning team must be sensitive to the importance of documenting how the Milliman criteria are satisfied in each patient's medical record. Here are some components of Milliman sensitive pre-operative evaluation process.

**Use weight-bearing imaging techniques to demonstrate maximal compression of neural structures and spinal instability.**

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## Milliman Care Guidelines®

- Milliman Care Guidelines are evidence-based clinical guidelines including care pathways that help providers and payors in effective decision making for the patient care. Milliman Care Guidelines® are annually updated, evidence-based clinical guidelines that span the continuum of care, including chronic care and behavioral health management.
- They are either client-hosted or web-based software that readily interfaces with many medical management and clinical information systems. Interactive version CareWebQI® enables quality improvement and cost efficiency through targeting and reducing inappropriate care. It helps in identifying gaps in care and cause of variation thus reducing their occurrences.
- Indicia® for Utilization Review helps clinical teams make admissions decisions and utilization managers justify admissions, level-of-care assignments, and procedures to safeguard reimbursements and meet the challenges of RAC audits.

Source: Milliman website

**Talent** — A qualified spine radiologist should conduct the scan

**Terminology** — Use the correct wording as dictated by the payer

**Timing** — Submit all information with the application, as opposed to waiting for the appeal

**Technology** — Optimal use of technology

Medical Claim Form

Milliman

6679 Random Street



Medical Appeals Form

Diagnosis/Condition



- Appeals process is expensive & timing-consuming with no ROI
- G-Scan helps capture, document and meet Milliman Healthcare Guidelines

- ✓ Decreasing Pre-Authorization Rejections
- ✓ Enables more time in the OR
- ✓ *Right Procedure for the Right Patient*
- ✓ Increases Patient Satisfaction
- ✓ Improves Patient Experience Lifecycle

# Weight-bearing: Lumbar

*Dr. Lynch*

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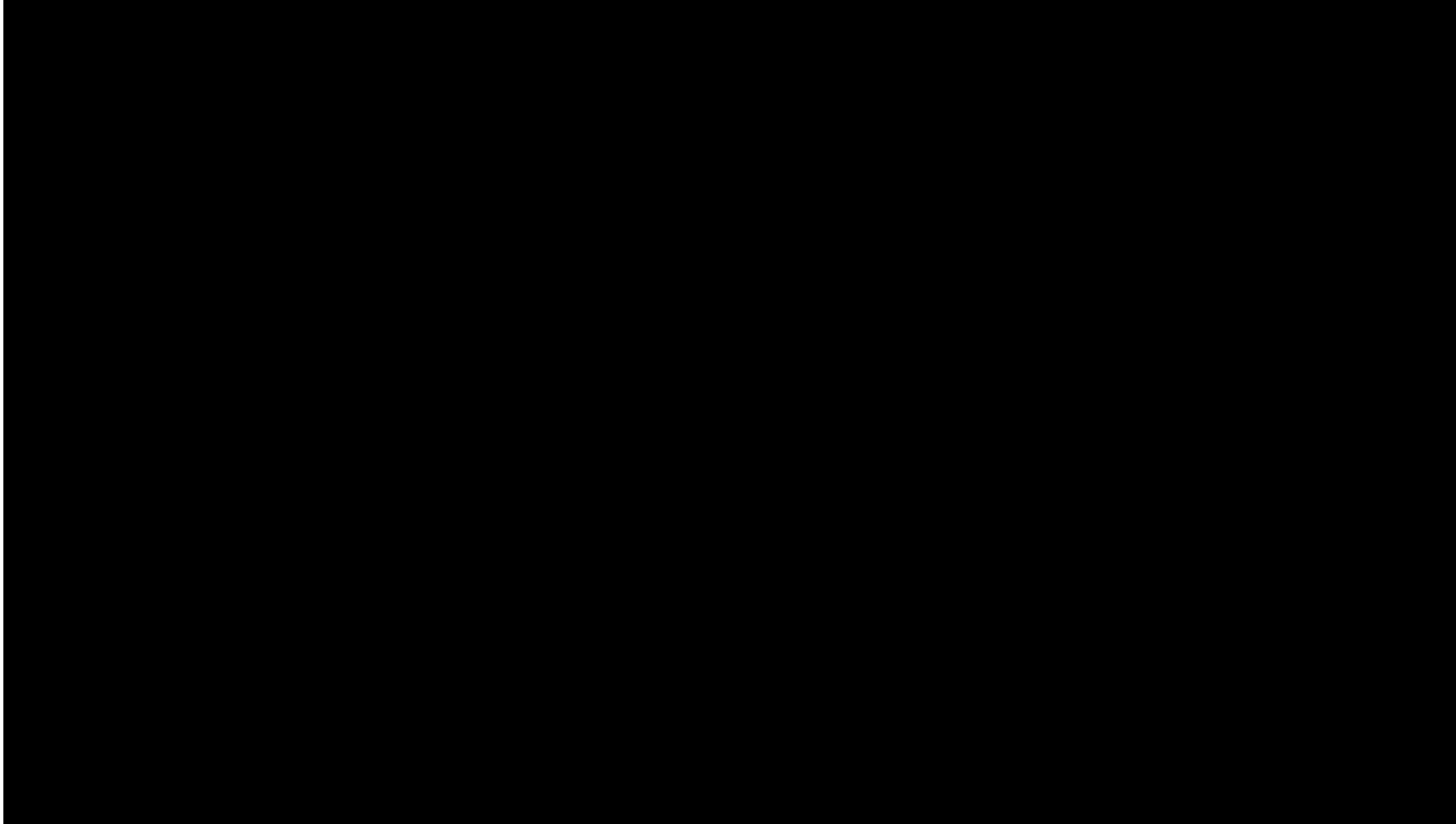
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# Supine vs. Weight-bearing: Animated Illustration

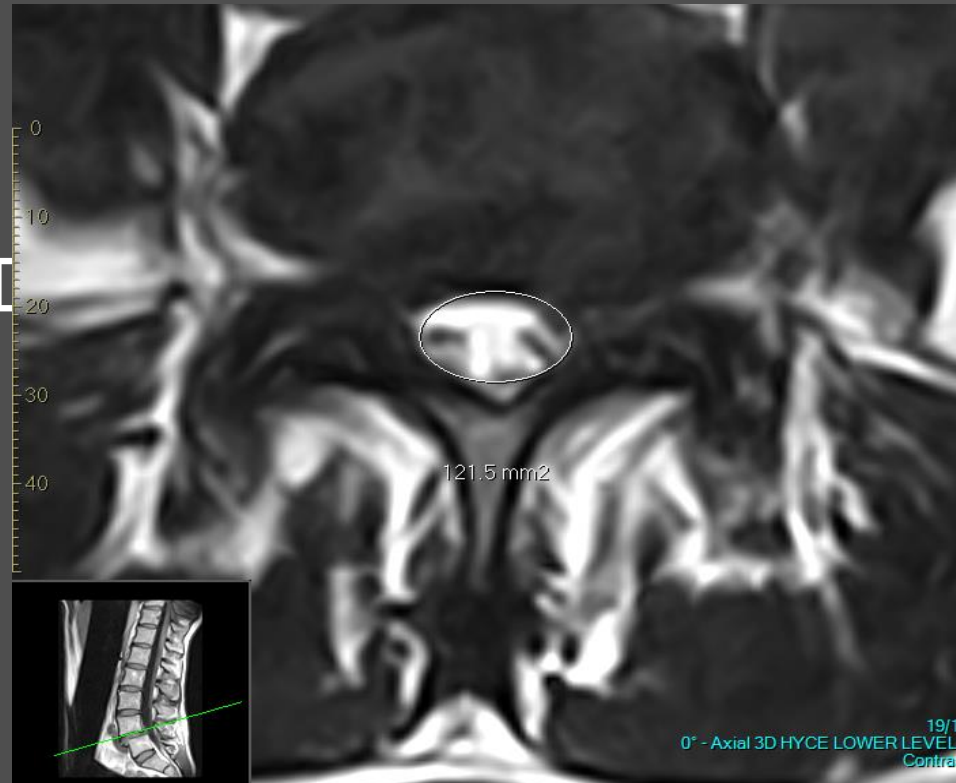
Talking us through Stenosis



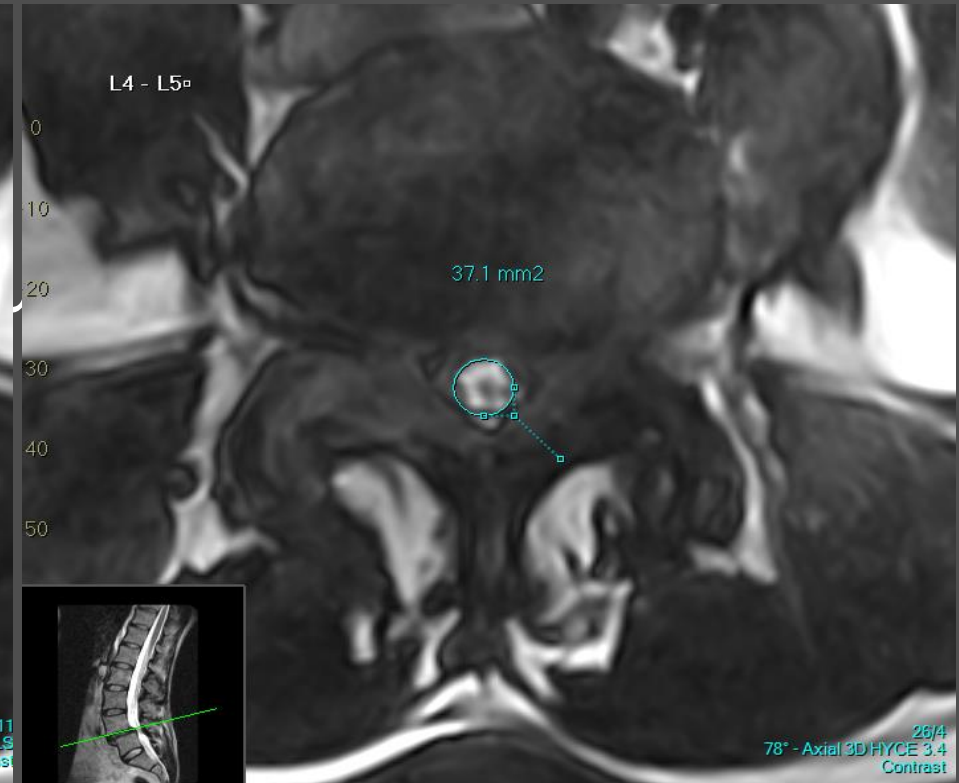
## CASE: Dynamic Positional Central Lumbar Spinal Stenosis

- Supine: Minimal Stenosis 121mm(2)
- Weight-bearing critical central stenosis 37mm(2)

### Supine



### Weight-bearing



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## CASE: Dynamic L4-5 degenerative listhesis

- Supine image: 5mm listhesis without stenosis
- Weight-bearing 10mm listhesis and dynamic stenosis

### Supine



### Weight-bearing



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# Supine vs. Weight-bearing: Animated Illustration

## Lumbar Herniation

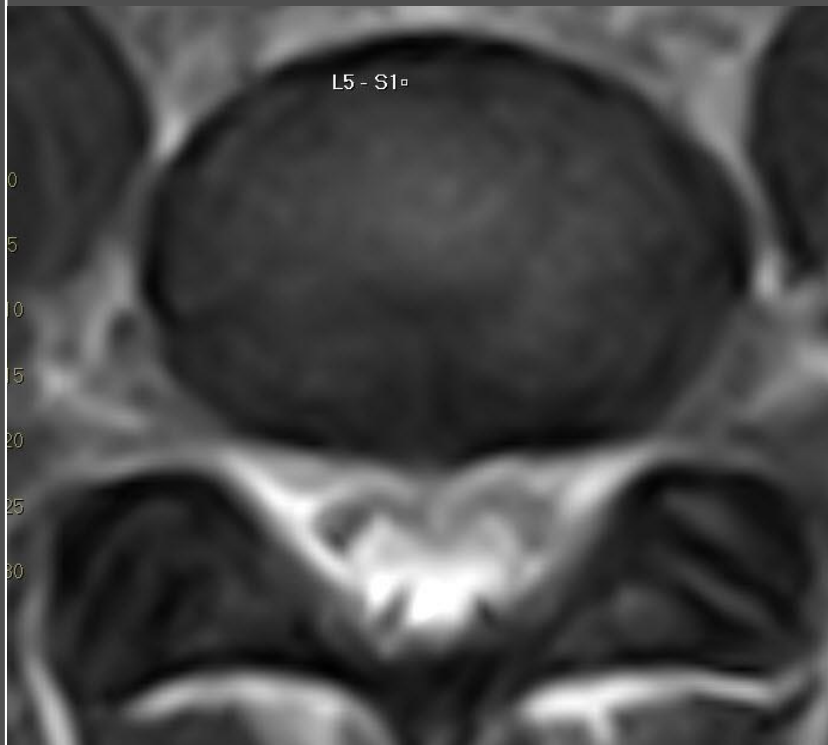




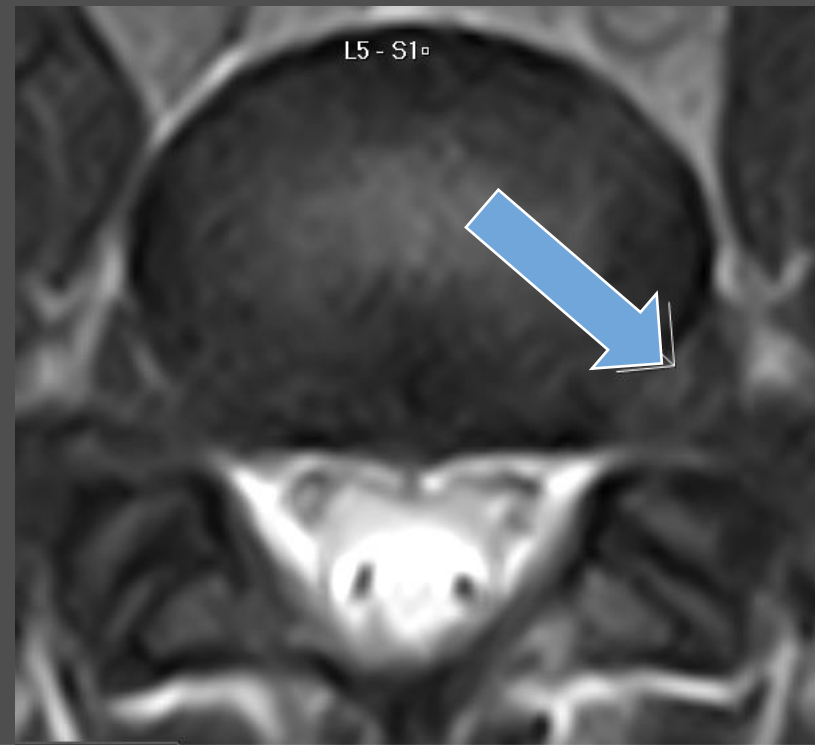
## CASE: Dynamic Lateral L5 S1 Disc Herniation with Dynamic L5 Radiculopathy

- Post-traumatic Lumbar injury with Left Lateral thigh pain
- Supine image – Negative
- Weight-bearing image **reveals** dynamic lateral disc herniation, compressing L5 nerve root – explaining Left L5 Radicular symptoms

### Supine



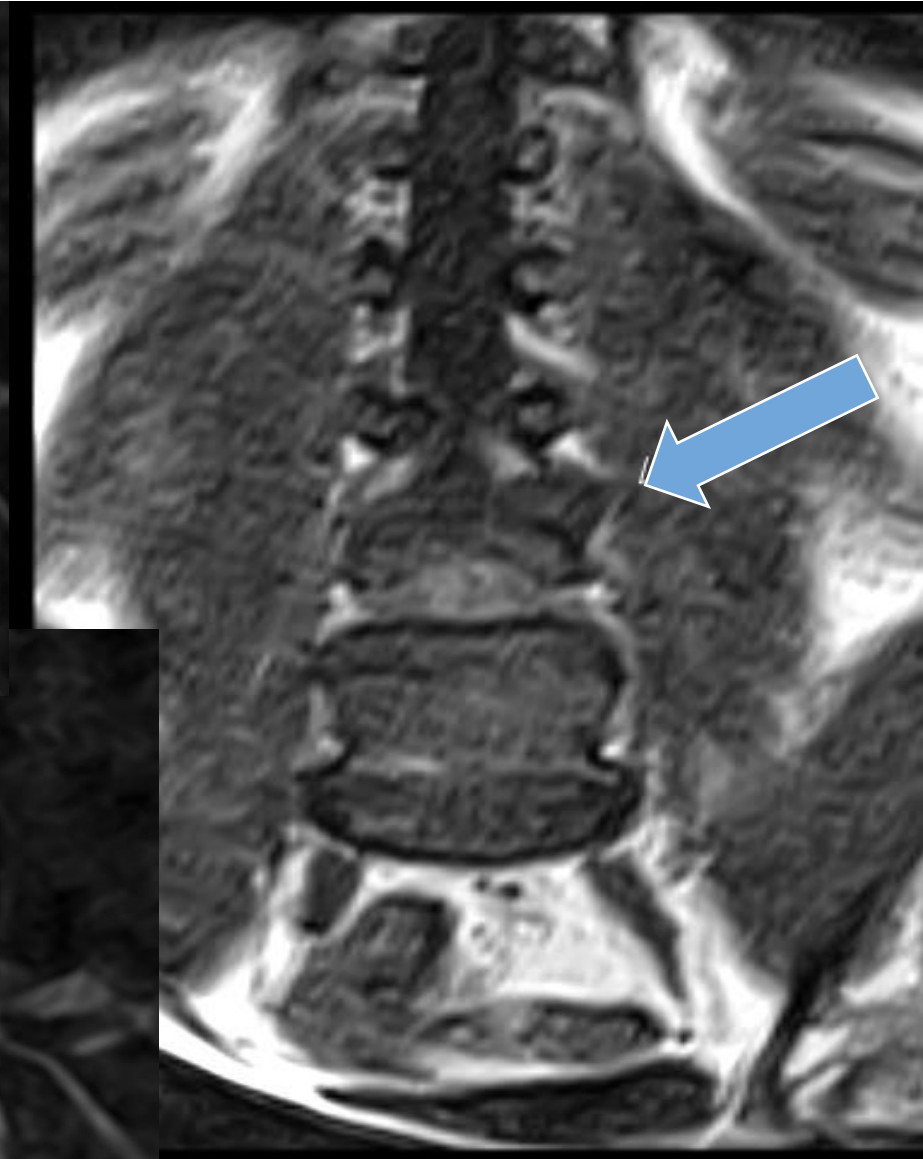
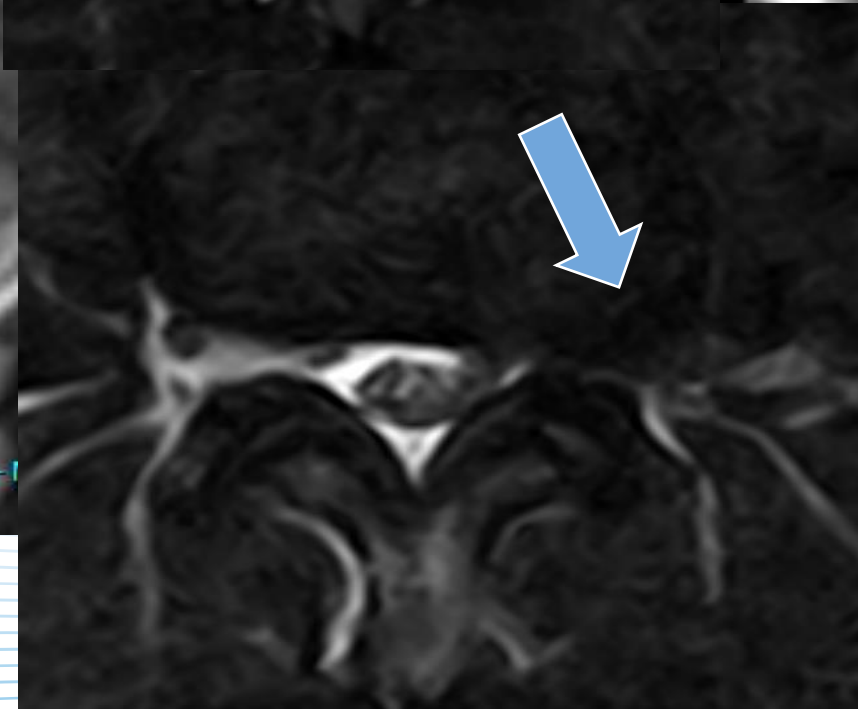
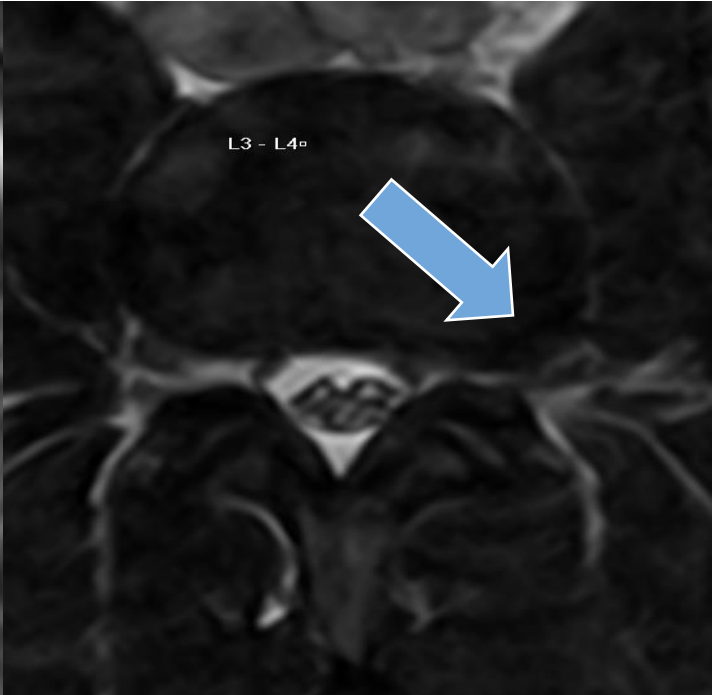
### Weight-bearing



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# Outcomes

# *What are both the patient and procedure impacts in meeting Milliman Criteria / Guidelines?*

- Guidelines for determination most
  - Appropriate level of care
  - Medical necessity
- Know guidelines and apply them to ensure optimal high level of care delivery
- G-scan assists with how we understand spinal motion and accurately document it.
- G-scan essentially makes myelogram and discogram studies obsolete in our practice

## **Patient Impact**

- ✓ Timeliness of patient care
- ✓ Non-invasive exam minimizes patient fears
- ✓ Increases potential of patient symptom validation
- ✓ Key to minimally invasive procedure potential
- ✓ Increases potential speed to recovery



## *How has this approach changed patients' experience compared to past MRI approaches?*

- The anterior aspect of cervical spinal cord was frequently concave adjacent to a disc bulge but there was CSF in front of the cord.
- Many patients' symptoms are reproduced during weight-bearing and relived when lying down.
- Experienced the Stress Test MRI® using the G-scan in the both the position of symptoms vis a vis WB with flexion compared to supine imaging shows approximately 30% more significant abnormalities on the WB images.
- Patients and medical doctors are relieved to better understand the etiology of the patient's dynamic symptoms
- Doctors are better able to plan treatment and have insurance payors authorize treatment costs for abnormalities that would be occult on conventional supine MRI.
- Stress Test MRI® allows surgeons to perform the right procedure for the right patient at the right time and insurance payors to reduce costs of ineffective treatments for the wrong diagnosis.

# *How has leveraging Weight-bearing MRI technology affected surgical approaches to...*

- *the patient experience?*
- *Pre-operative diagnoses?*
- *Surgical procedure strategies?*
- *Impact on correlation of post-operative findings/reports with diagnoses to validate accuracy?*

# What are your lessons learned to share with your peers?

- ✓ Collaborate with experienced company
- ✓ Radiologist with knowledge of unique capabilities of g-scan motion interpretation
- ✓ Factor in investment return based on number of studies and start up costs payments
- ✓ Insurance negotiations
- ✓ Avoid multi scan same day procedures or contrast studies
- ✓ Education promotion to referrals is crucial to success

- Stress Test MRI® require dedicated protocols, experienced technologists, and radiologists with specific training in biomechanics and understanding of pain diagrams
- The IT infrastructure (RIS, PACS, and privacy and security, and medical directorship training requirements) make managed service a most cost effective approach and *“Keep surgeons in the OR rather than appealing surgical rejections by payors”*.

# In Summary...

## 1. Dynamic neural compression during weight-bearing (and flexion-extension in cervical spine).

- a. Better correlation with myelogram and surgical findings than conventional supine imaging.
- b. Dynamic lateral lumbar disc herniation only seen on stress Test MRI.
- c. Often difference between declined versus approved surgical pre-authorization (Jim to comment)

## 2. Milliman criterion

- a. Background history and evolution
- b. Most pertinent use cases where instability or WB neural encroachment complete Milliman criteria
- c. Efficiency and financial implications for the surgical practice.

## 3. Business implications

- a. Direct ROI versus indirect ROI when compared to conventional supine 1.5TR MRI
- b. Experience of a spine surgeon with “In-office” G-scan: James Lynch
- c. Experience of outpatient radiology setting: Dr. Douglas K. Smith MD

## 4. Summarized clinical experience with over 10,000 G-scan Brio MRI examinations

- a. Our experience is similar to literature of more abnormalities on weight-bearing than supine in 30-40% of MRI examinations.
- b. Cervical: Dynamic cord compression and dynamic nerve root compression explaining the frequent concavity on the cervical cord on supine images.
- c. Lumbar: unique dynamic lateral lumbar disc herniation with extraforaminal L5 nerve root compression during weight-bearing.
- d. Extremities: foot and ankle and hips and knees.

## 5. Lessons learned from unsuccessful projects

- a. Failure to consider effects of other equipment leading to artifacts on scanning quality.
- b. Inaccurate ProForma determination: multiscan discount, patient size or claustrophobia, Medicare and governmental payor percentage, any Stark or local referral/compliance issues, support platform requirements.
- c. Underestimate the importance of experienced readers and MRI techs committed to technique of WB.
- d. Misunderstanding of the G-scan Brio as a screening test rather than a commodity “crank them through test”.



# Net Take-aways on Weight-Bearing MRI

- ✧ New frontier of non-invasive Imaging technology
- ✧ Redefining imaging of spinal motion and direct impact on nerves
- ✧ Combine this technology with orthokinematics – vertebral motion analysis to improve diagnosis and deliver better surgical and thereby patient outcomes.

# *Thank you!*

## *Welcoming Questions...*

### **CME Next Steps:**

- Webinar content has been submitted to the ASRT for continued education / CME credit.
- All registered attendees will receive an email confirmation after the webinar, with CME credit instructions, replay link, access to the content
- Please contact [shughes@esaoteusa.com](mailto:shughes@esaoteusa.com) for next steps.