

Lumbar Discogenic Pain Syndrome (DPS)

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Discogenic Pain Syndrome???



What It's Not: The Usual Suspects

- Spondylolisthesis
- Scoliosis
- Spinal Stenosis
- Facet Syndrome
- Disc herniation
- Recurrent disc herniation
- Motion segment instability

Discogenic Pain Syndrome

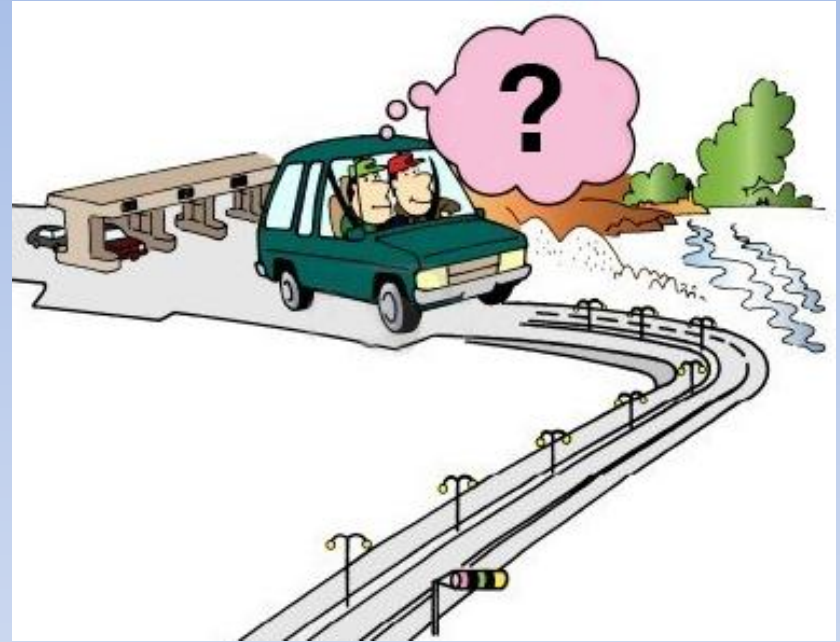
- Defined: the disc and/or vertebral endplate(s) of the motion segment becomes a source of chronic back pain.
- Three causes of Discogenic Pain Syndrome
 - Internal disc disruption (IDD)
 - Isolated disc resorption (IDR)
 - Disc herniation with low back pain greater than lower extremity pain

Why is This Important?

1. High prevalence amongst the undiagnosed
*Calculated at 40% [$p < 0.05$](Schwarzer – 1995)
2. Healthcare professional unawareness
3. Most refractory to conservative and operative care
4. Severely disabling

Overview: where are we going?

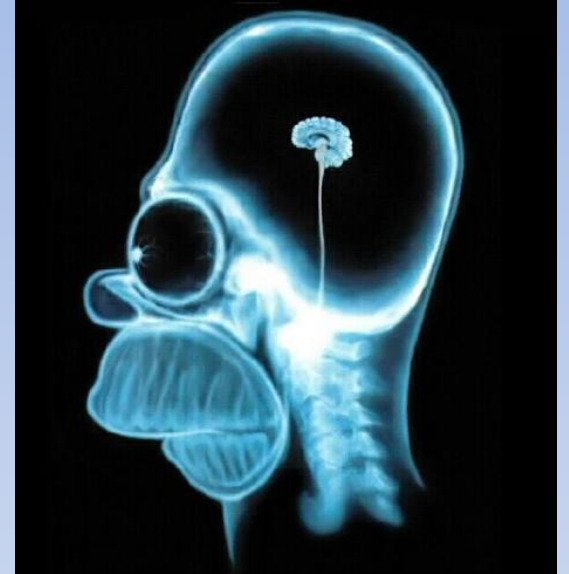
- Basic Spinal Anatomy
- Motion Segment Anatomy & Physiology
- Degenerative Disc Disease (DDD)
- Discogenic Pain Syndrome
 - IDD, IDR, NRDH
 - Research



Basic Spinal Anatomy: Lumbar Spine

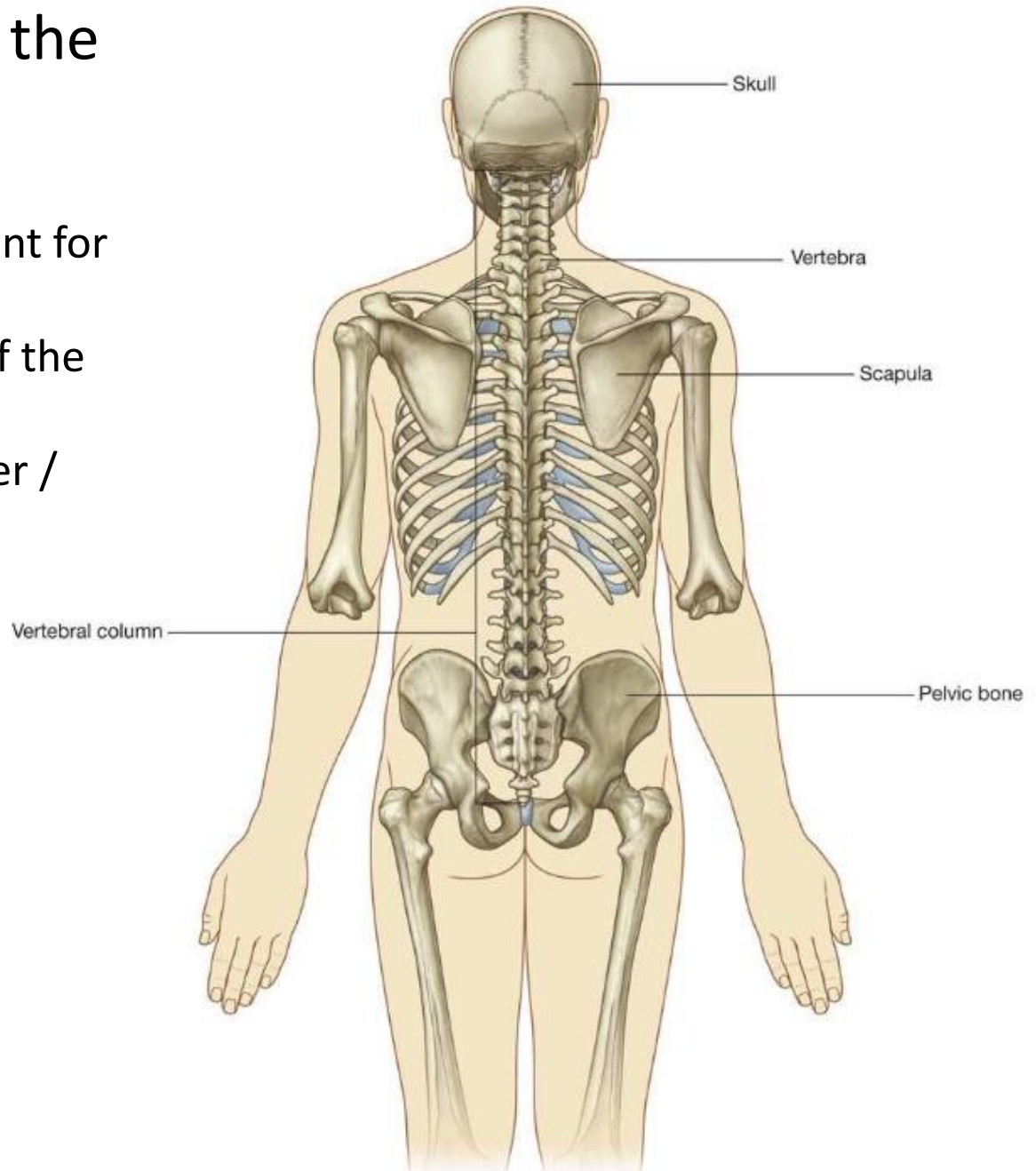
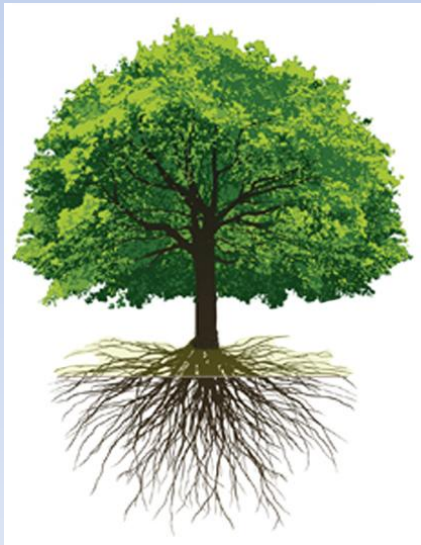


Osteology



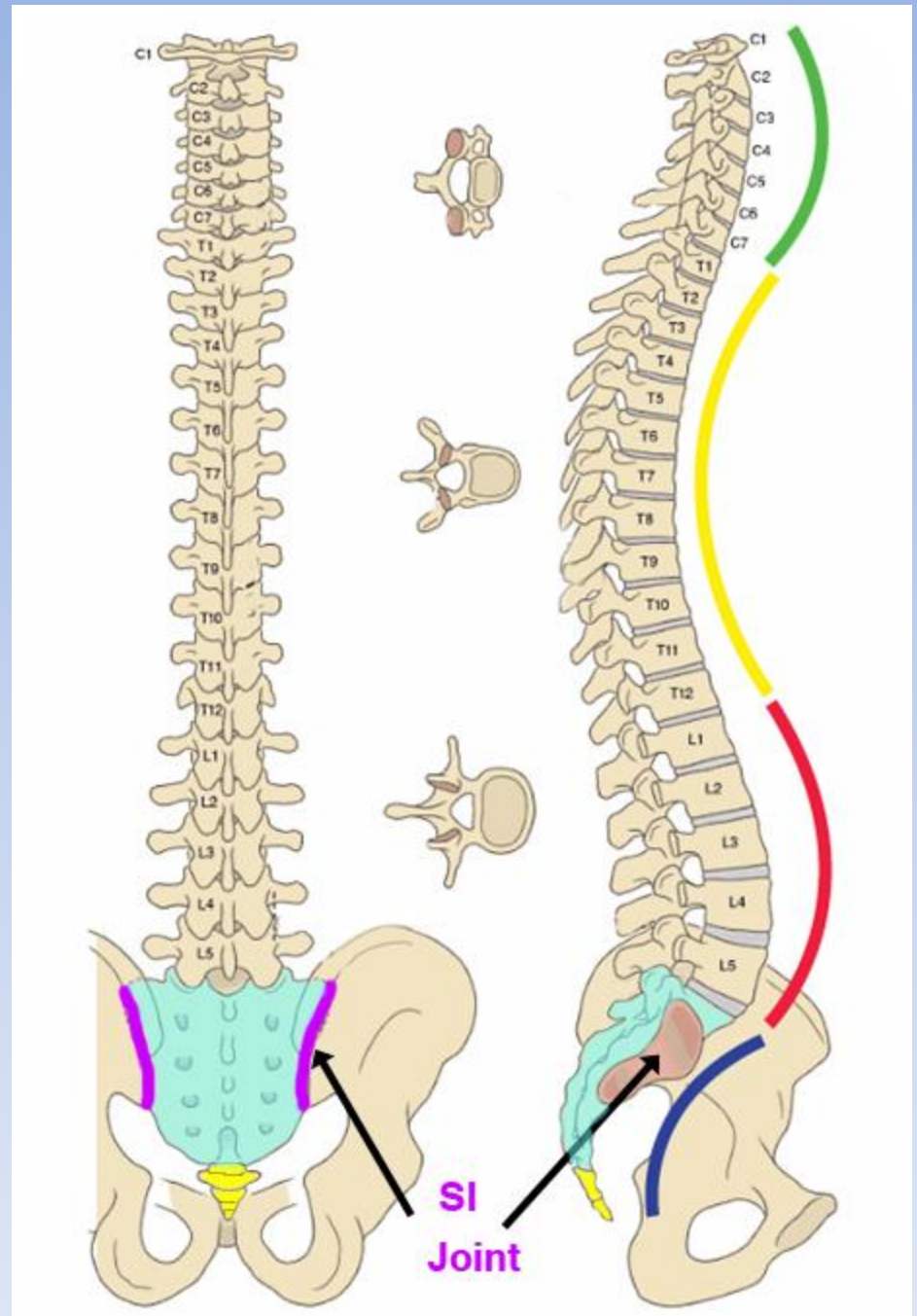
Spine: the “Tree” of the Body: (Limbs & Roots)

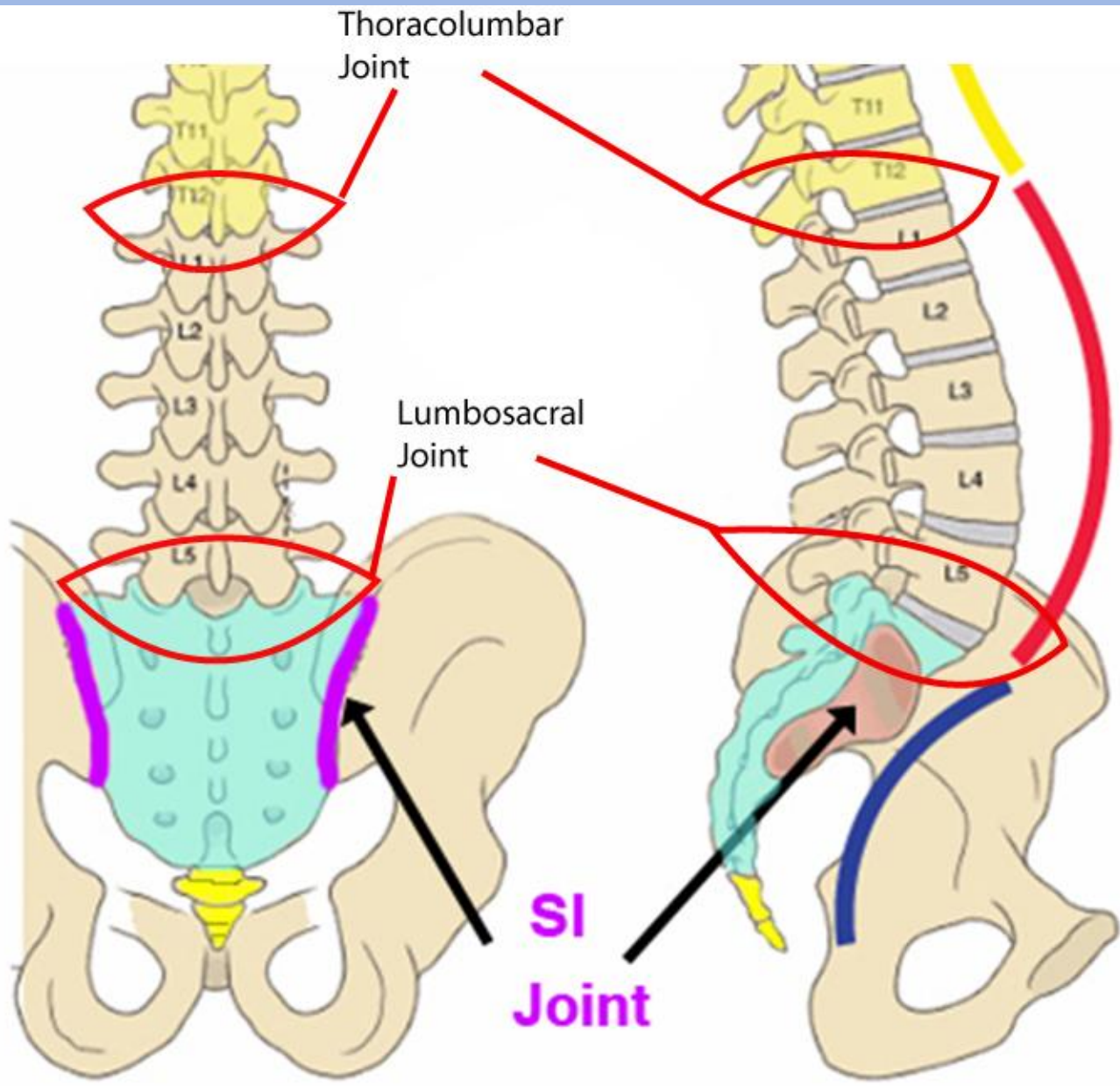
- Indirect attachment point for **Limbs**.
- Allows for movement of the head and **Trunk**.
- Spinal Nerve **Roots** enter / **Leave** the CNS & ANS.



Spine

- Make of 33 vertebrae (24 true motion segments)
 - 7 Cervical
 - 12 Thoracic
 - **5 Lumbar**
 - 1 Sacrum (5 fused vertebrae)
 - 1 Coccyx (4 fused vertebrae)
 - 2 Coxal bones
 - Form SI joints
 - Not part of the spine



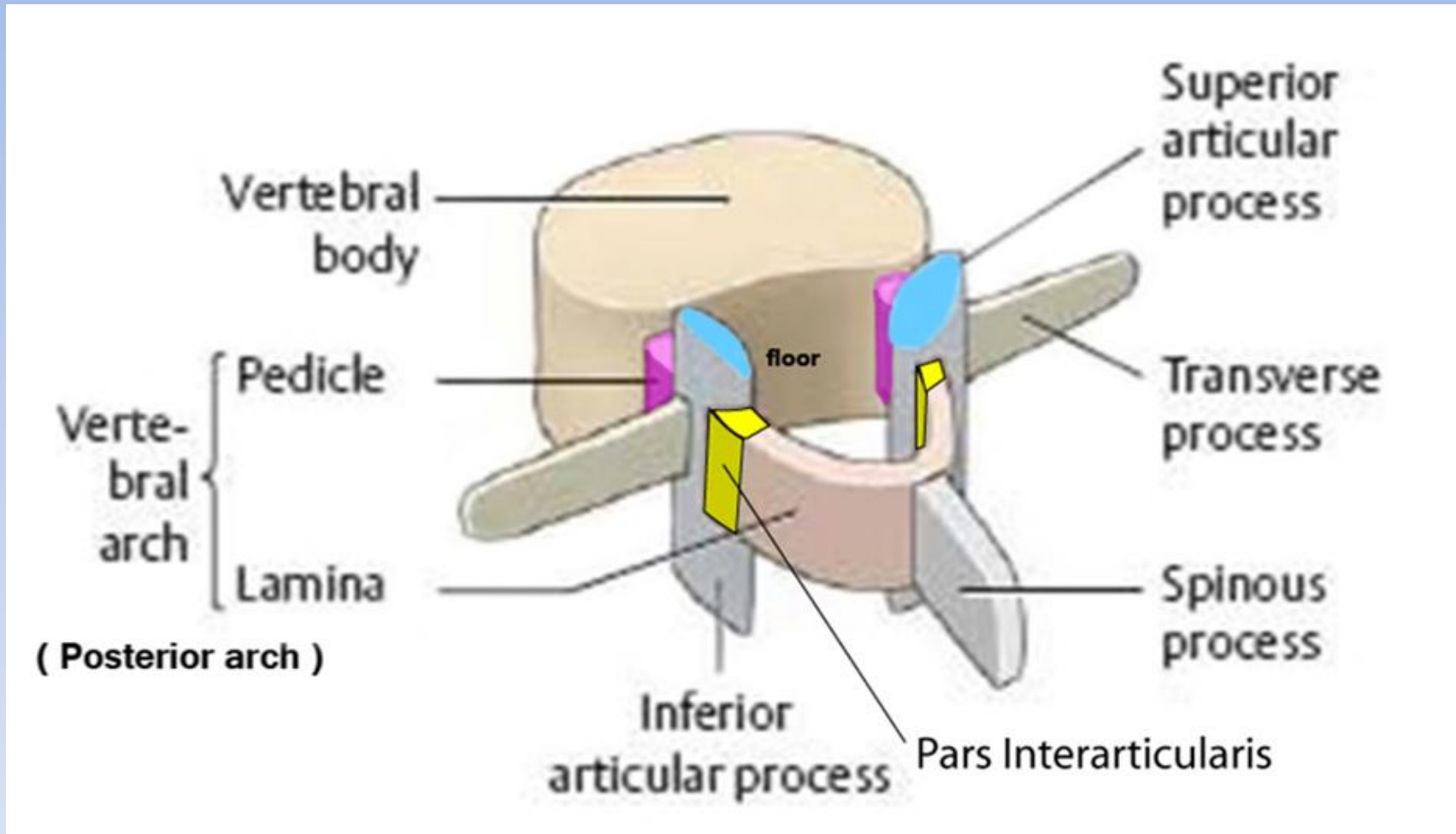


Thoracolumbar
Joint

Lumbosacral
Joint

SI
Joint

Parts of a vertebrae: Job of posterior arch



Jumping Ahead in the Presentation

Discogenic Pain Syndrome

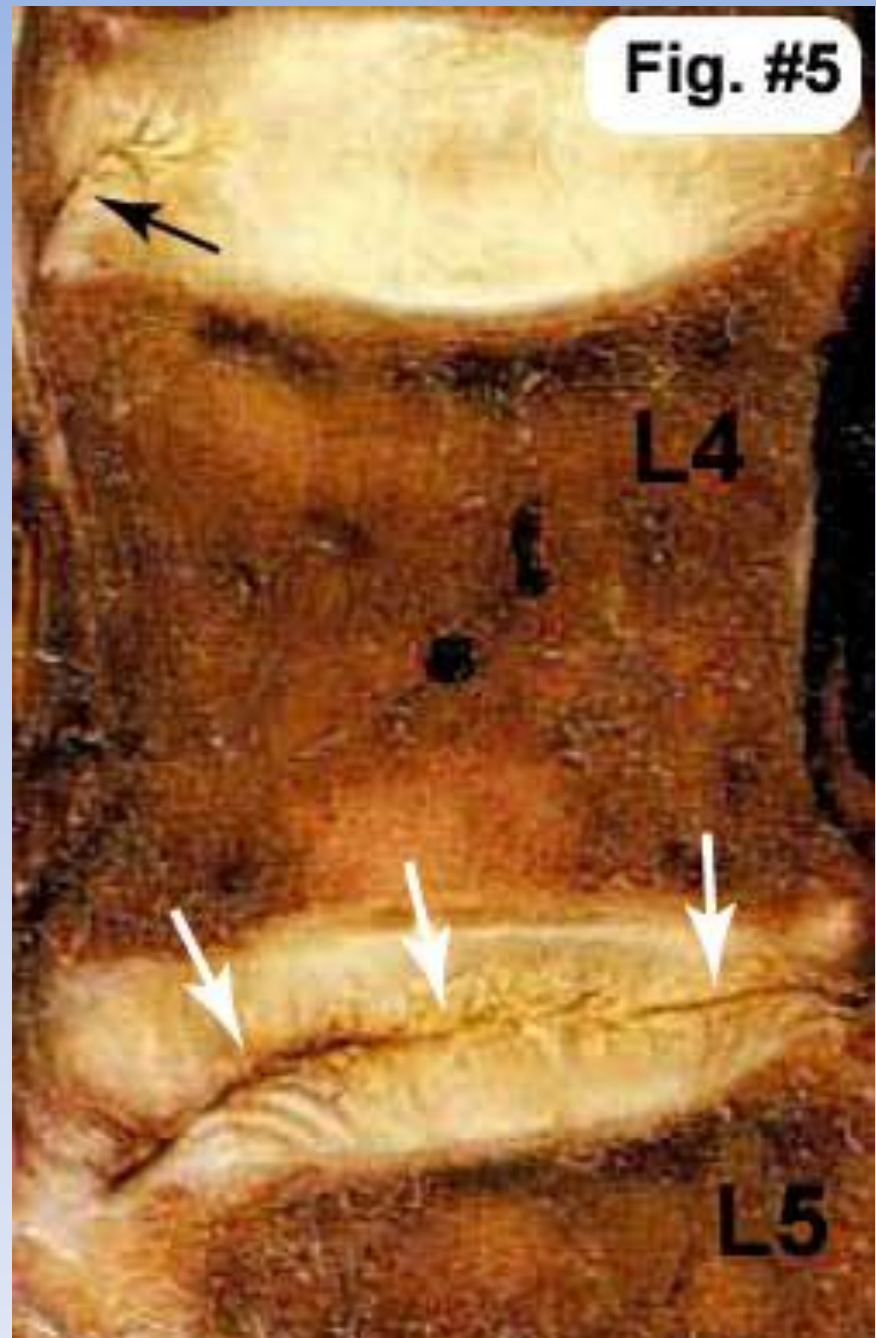
- Internal Disc Disruption
- Non-Radiculopathic Disc Herniation
- Isolated Disc Reabsorption

DPS Generalities

- **Almost always a consequence of DDD.**
- Usually a **progression**:
 - Disc loses water content (**DDD**).
 - Full thickness annular tear develops (**IDD**).
 - May progress to **non-radiculopathic disc herniations**.
 - Severe disc degeneration (discopathy) and endplate degeneration (rat-bite & Modic changes) follows (**IDR**).
- Very difficult to treat and very disabling.

Internal Disc Disruption (IDD)

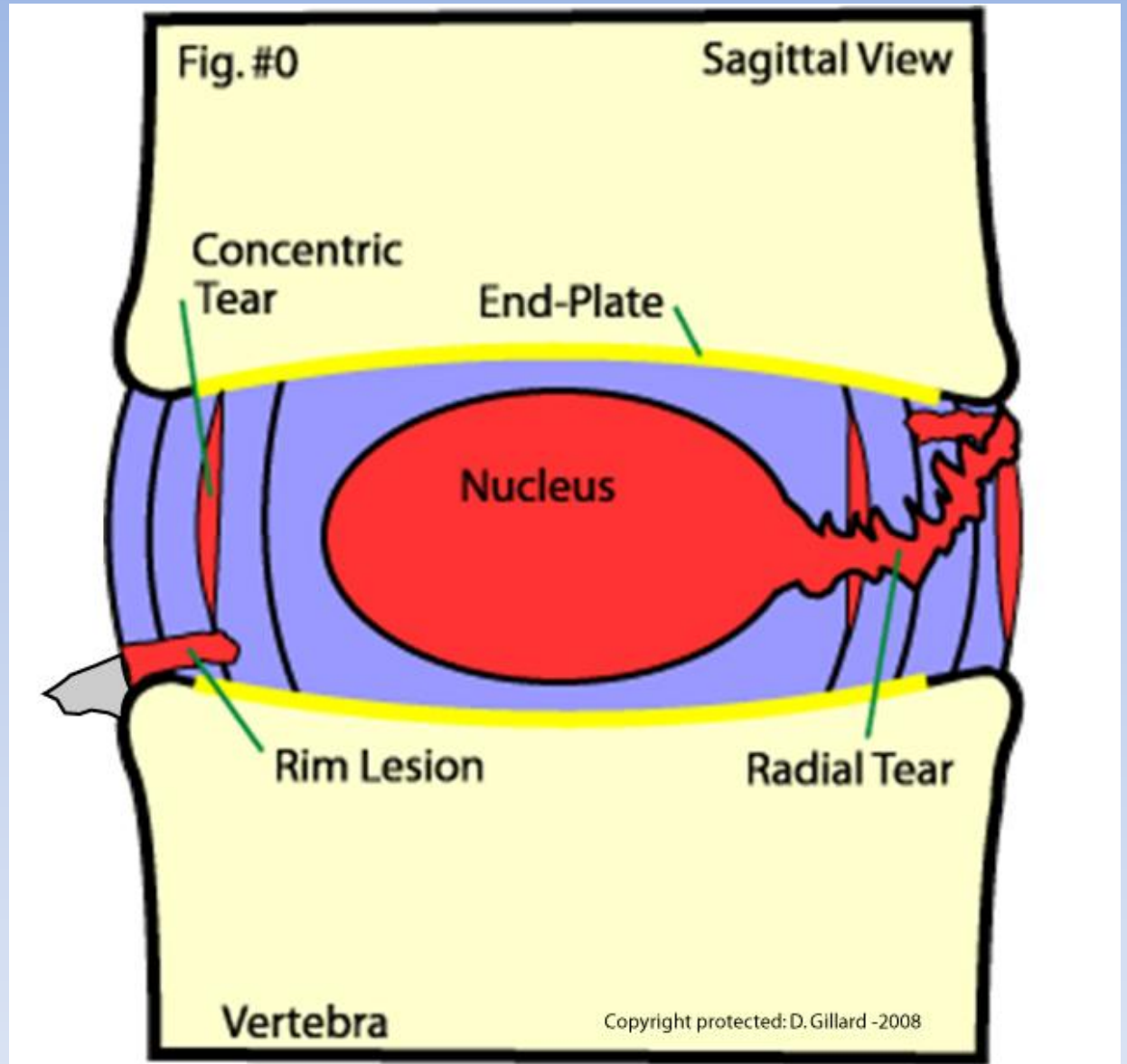
- Results from annular tears
 - From nucleus to outer annulus
 - Originate in outer annulus



Different Flavors of Tears

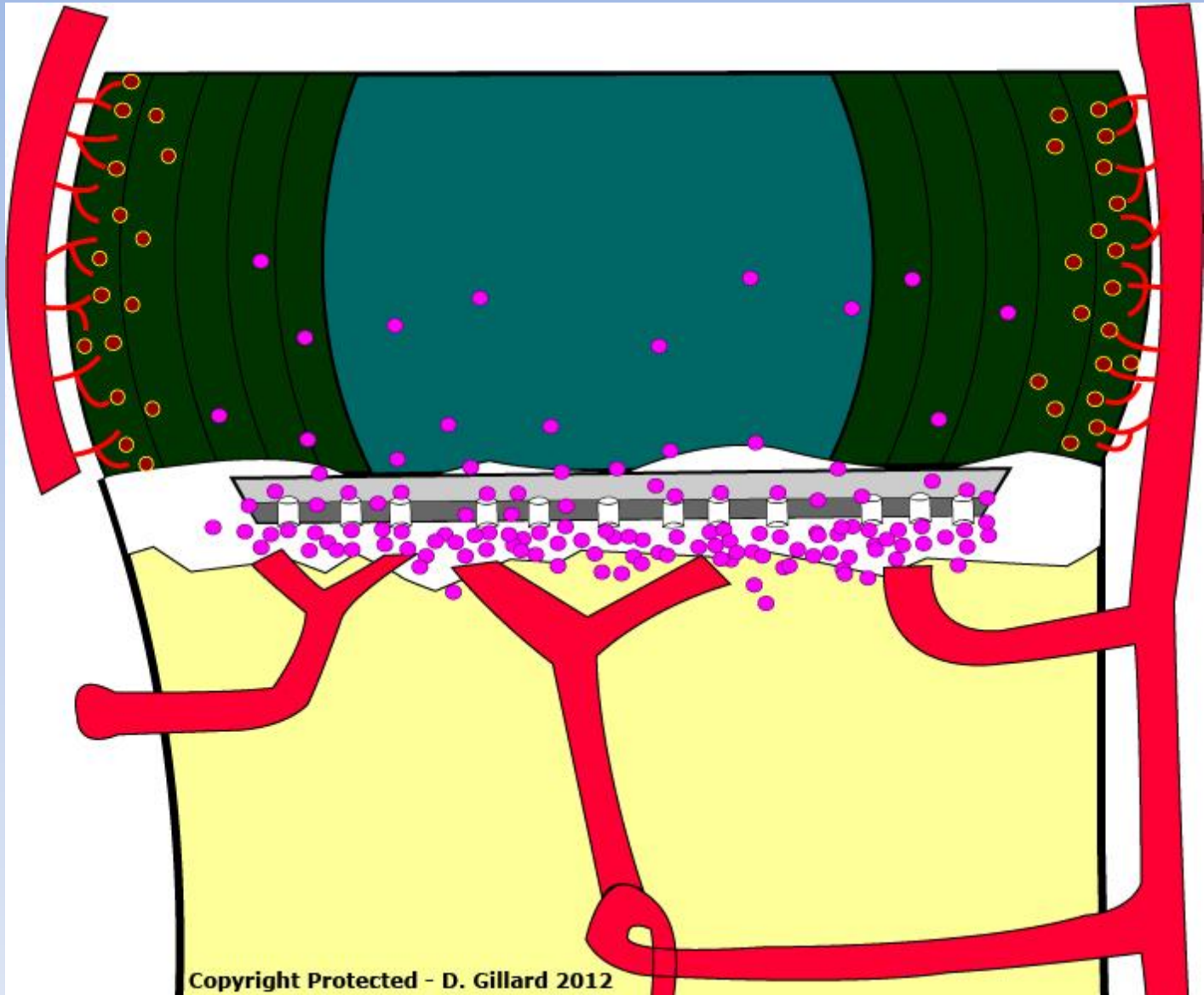
- **Radial annular tear** (a.k.a. full thickness annular tear)
 - Runs from nucleus toward the outer annulus
 - Grading system
- **Concentric annular tear**
 - Occurs in the outer one third
 - The tear is between lamellae
 - Maybe extremely painful
 - Traumatically induced
- **Rim lesion**
 - Occur in the other one third
 - Tear is through lamellae
 - Will develop into a full thickness annular tear
 - Traumatically induced
 - Often associated with a traction spur

Annular Tears

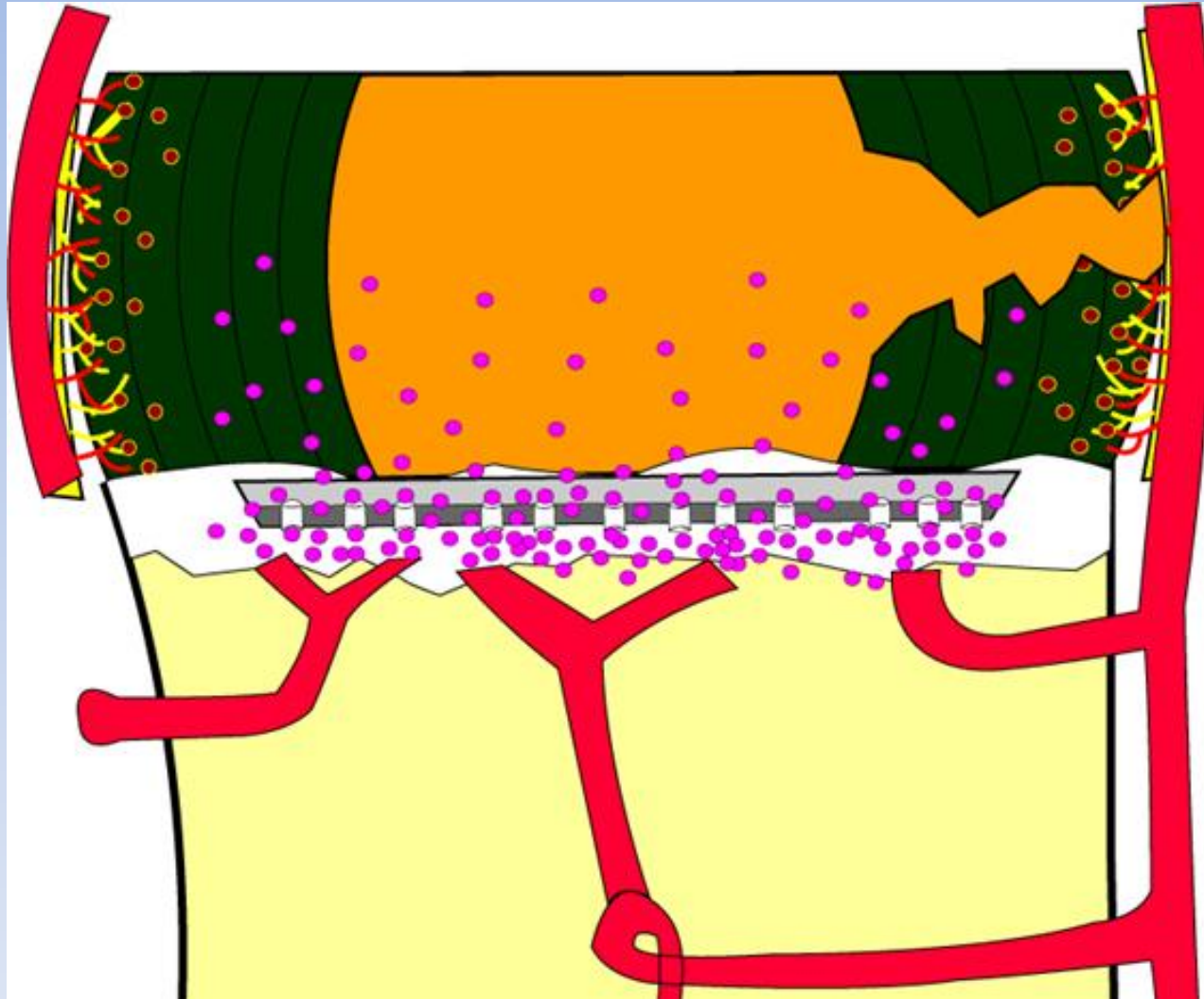


Jumping Ahead

Endplate Sclerosis



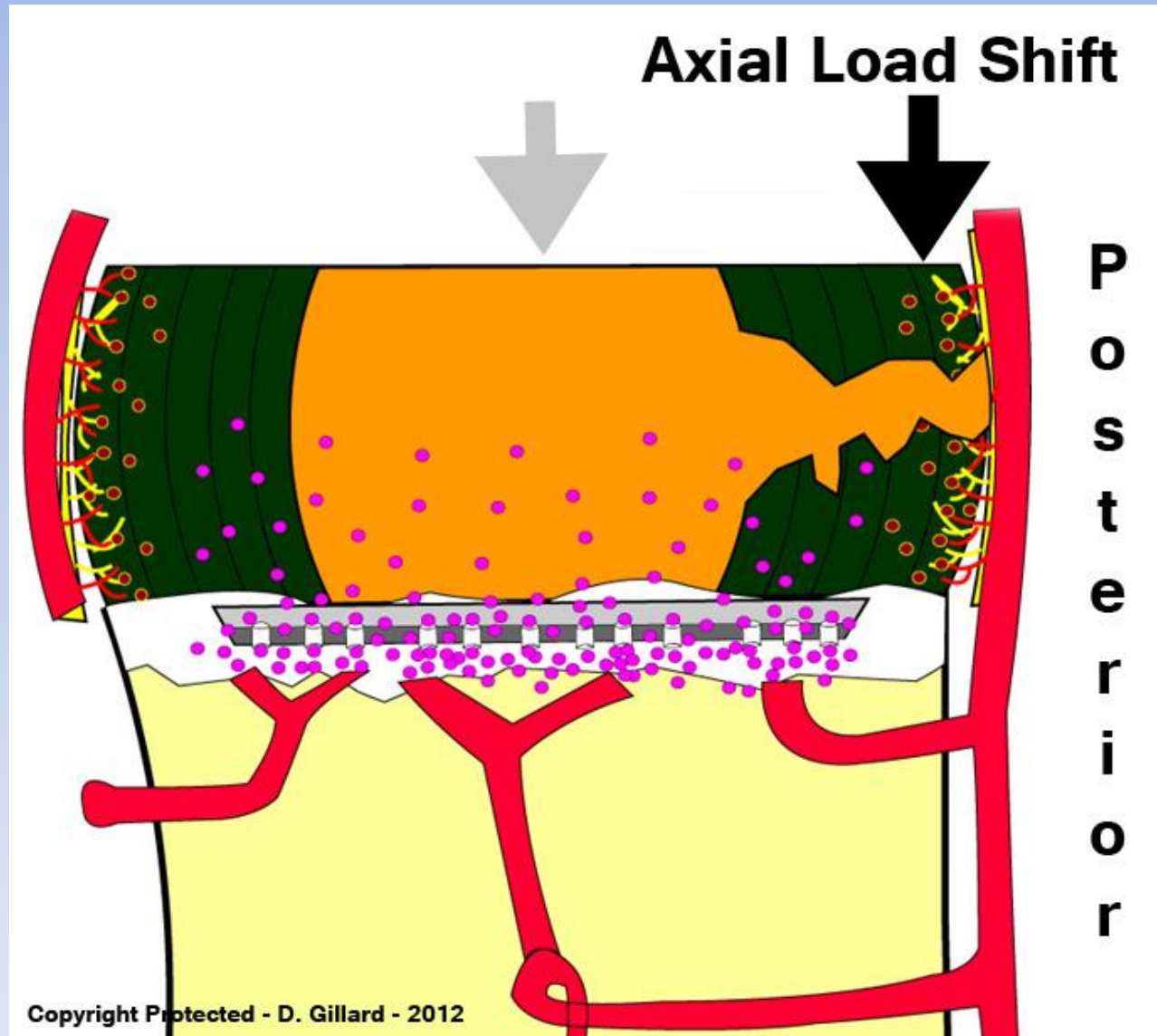
Grade III Annular Tear (IDD)



What causes the pain?

- **Biochemical irritation** (inflammation)
 - Cytokines
 - Autoimmune
- **Biomechanical irritation** (compression)
 - Weight bearing shift
- Chronic Pain: nerve in growth

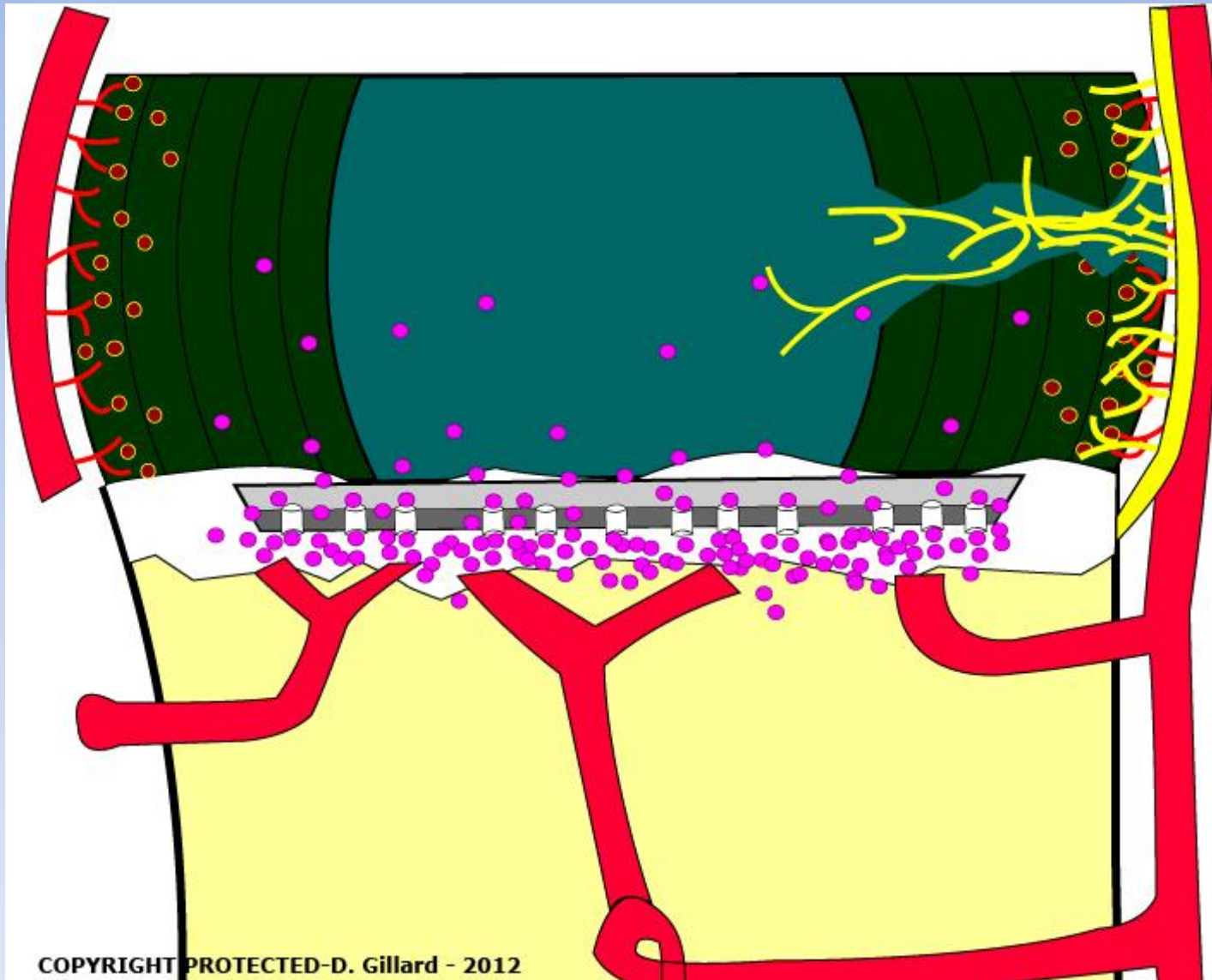
Mechanical Irritation



Annular Tear Healing

- HEALING: May w/ scar / granulation tissue but always be a source of chronic pain
 - Nerve ingrowth
 - Easy to re-injury the tear

Nociceptive Ingrowth



Making the Diagnosis

- Gold standard: **Provocative CT Discography**
 - Controversial secondary to significant false positive rate.
 - Sensitized people.
 - Nothing better has come along.
 - CAN DAMAGE THE DISC!
 - Carragee Study
 - **Concordant pain** at target disc w/ control.
 - Anesthetizing will create a non-painful disc.
- **Diagnostic Injections.**
 - Intractable low back pain aggravated by sitting and relieved by lying supine.
 - Often a negative neurological evaluation and negative MRI.
 - Facet blocks and epidural steroid injections are negative.
- **MRI findings.**
 - Visible annular tear on T2-weight.
 - HIZ sign.

Treatment:

- **Very difficult to treat!**
- Conservative care first
 - Strengthen the core
 - Get heart rate up
 - **Diurnal stimulation**
 - Inversion table (stim diurnal change)
 - Intermittent traction devices (Vax D, DRS, DRX-9000, Spine-Med)
- Pre-fusion “Experimental” treatments
 - IDET, SED & and similar SED-like treatment
- Interbody fusion
 - **Make damn sure the pain is not coming from the facets or SI joints!**

End of Sample Presentation