2019 NSCA TACTICAL ANNUAL TRAINING

Conflict of Interest Statement

Neither one of the presenters have any actual or potential conflicts of interest in relation to this presentation.

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Pain Neuroscience and the Tactical Athlete

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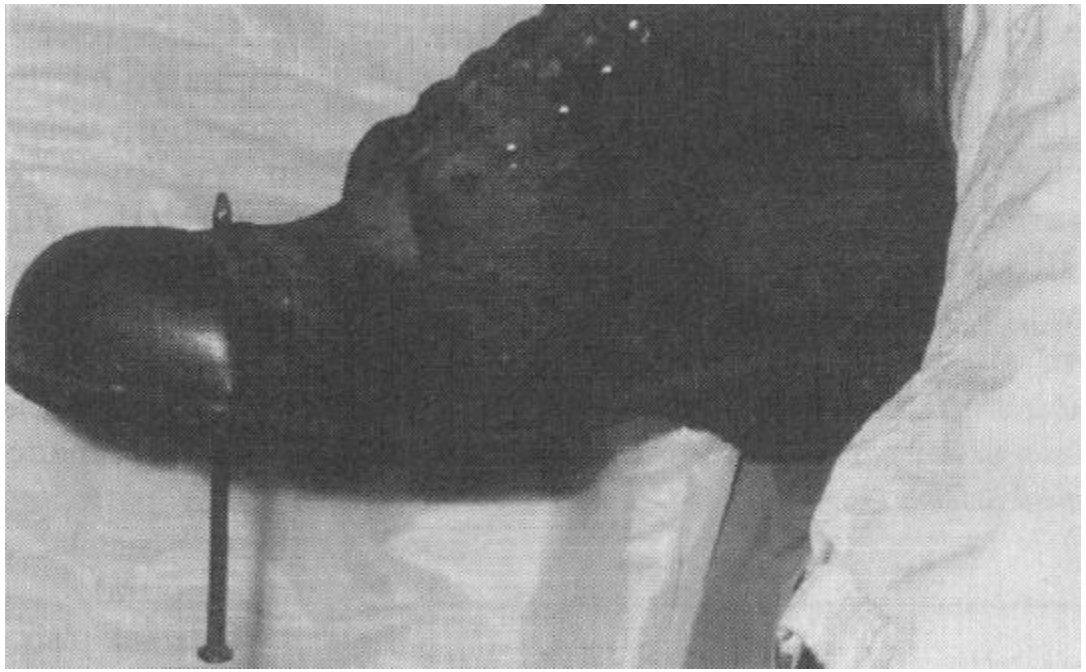
Why should you care about pain neuroscience?

Complicated vs. Complex



"As the smallest movement of the nail was painful he was sedated with **fentanyl and midazolam**."

"When his boot was removed a **miraculous cure** appeared to have taken place."

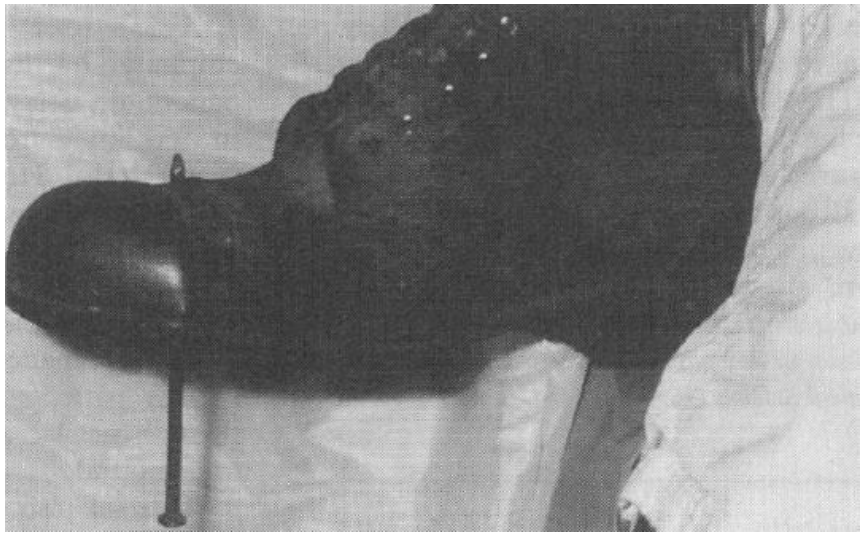
"…the foot was **entirely uninjured**."

British Medical Journal, Vol. 310, No. 6971 (Jan. 7, 1995), p. 70

Was this man in pain?

A Better Understanding

- Pain:
  - An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.



Nociception ≠ Pain…but it can

- Nociception:
  - The neural process of encoding noxious stimuli.
- Processed by
  - Mechanoreceptors
  - Thermoreceptors
  - Chemoreceptors

How Meaning and Context Affect Pain

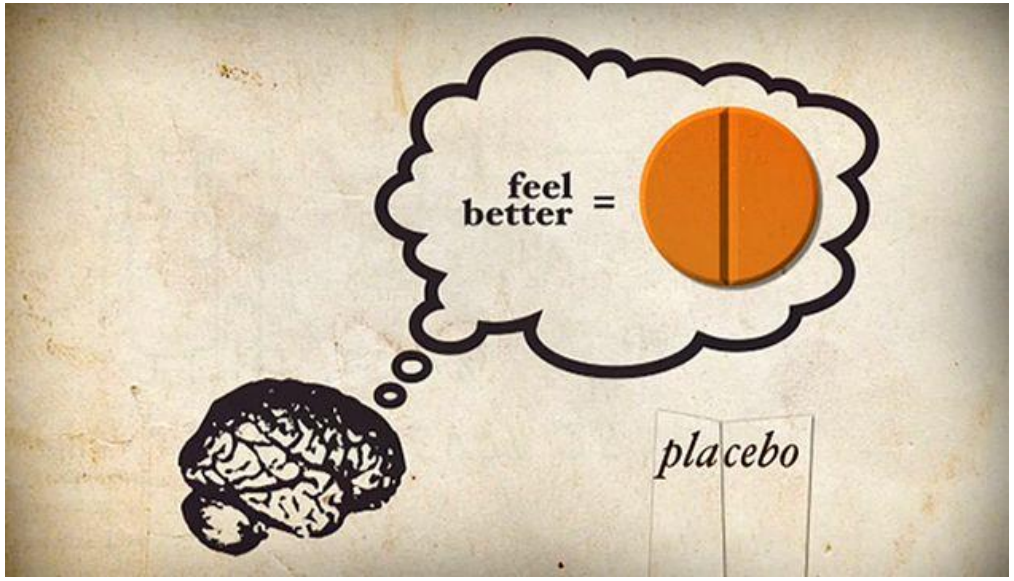
- Does this hurt?

How Meaning and Context Affect Pain

- How about now?

The Brain's Influence on Pain

- Placebo – A substance or procedure without specific activity for the condition being treated
- Closely related is the placebo effect



DEMONSTRATION TO MEDICAL STUDENTS OF PLACEBO RESPONSES AND NON-DRUG FACTORS

- n = 56 University of Cincinnati medical students
- Randomly received one or two placebo capsules colored pink or blue
- Rated positive and negative effects on a 0 – 3 intensity scale

- Subjects receiving two pills experienced more intense effects than those receiving one (16% vs 5%)
- Subjects receiving blue pills felt less alert than those receiving pink (66% vs 26%)
- Those receiving blue pills also felt more drowsy than those receiving pink (72% vs 37%)
- Heart rate and systolic blood pressure changes (81% and 89%, respectively)

Blackwell 1972

Other Aspects of the Placebo Effect

- Attractive branding is a placebo effect in and of itself *Branthwaite 1981*
- Placebo devices may be more effective than pills *Kaptchuk 2006*
- Placebos can lead to withdrawal symptoms *Ockene 2005*
- Certain mental health disorders will magnify placebo effects *Dworkin 2005*
- The placebo effect is diminished by naloxone *Eippert 2009*
- Placebos have an effect even when the patient knows it's a placebo! *Kaptchuk 2010*

The Nocebo Effect

- A harmful, unpleasant or undesirable adverse event a subject manifests after receiving a placebo

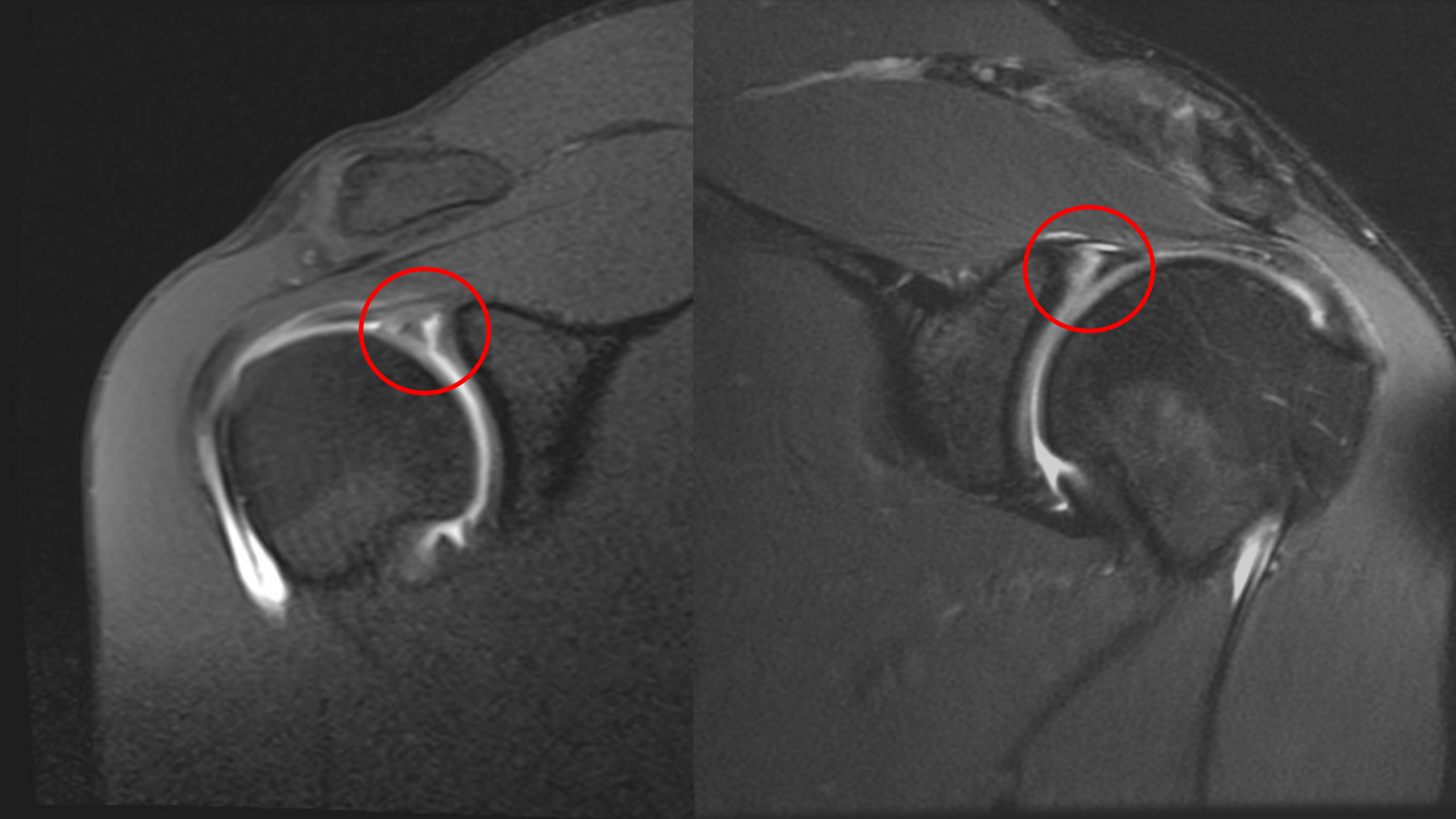
•Boyer 1998

•Kaptchuk 2006

Preferred Terminology: Non-Specific Effects

Key Principles

1. **Non-specific effects of our profession have substantial influence on athlete outcomes.**



Scans on pain free people

51 people (age 40-70)

78% bursal thickening

65% ACJ degeneration

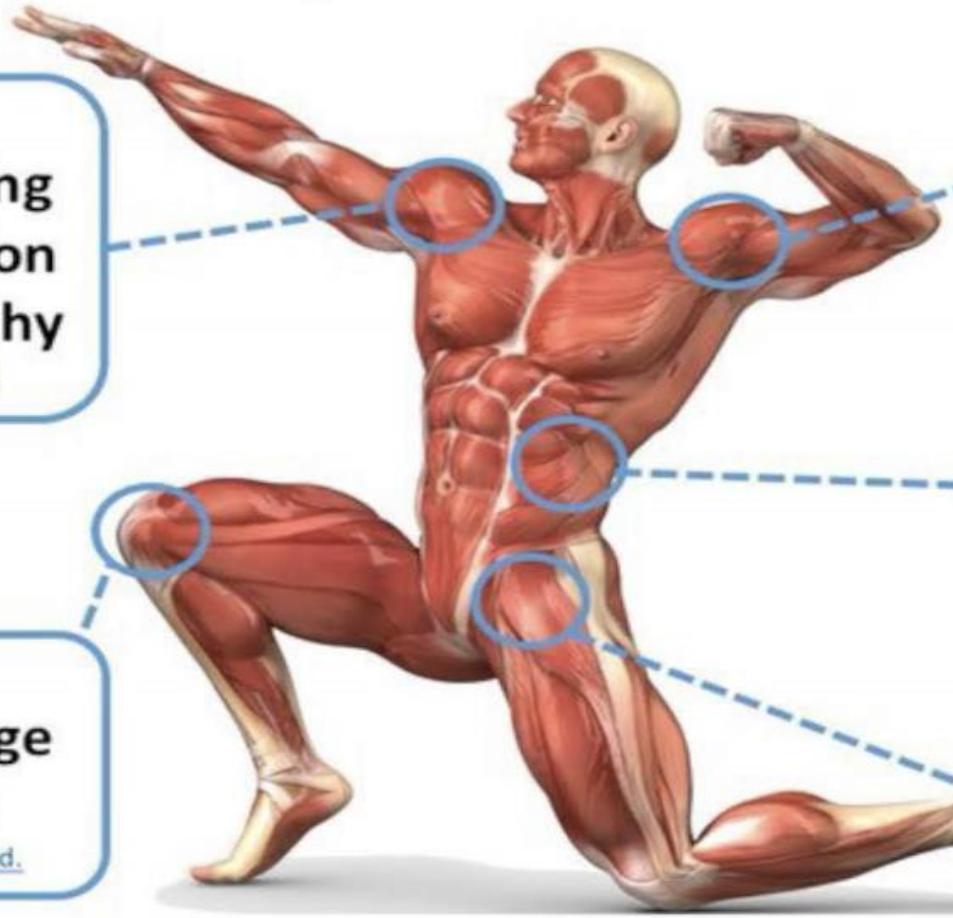
39% cuff tendinopathy

Girish et al (2011) Am J Roentgenol.

53 people (age 40-65)

72% SLAP lesions

Schwartzberg et al (2016) Ortho J Sports Med.



3110 people (age 20-80)

80% disc degeneration

Brinjiki et al (2015) Am J Neuroradiol.

710 people (age 51-89)

68% cartilage damage

72% osteophytes

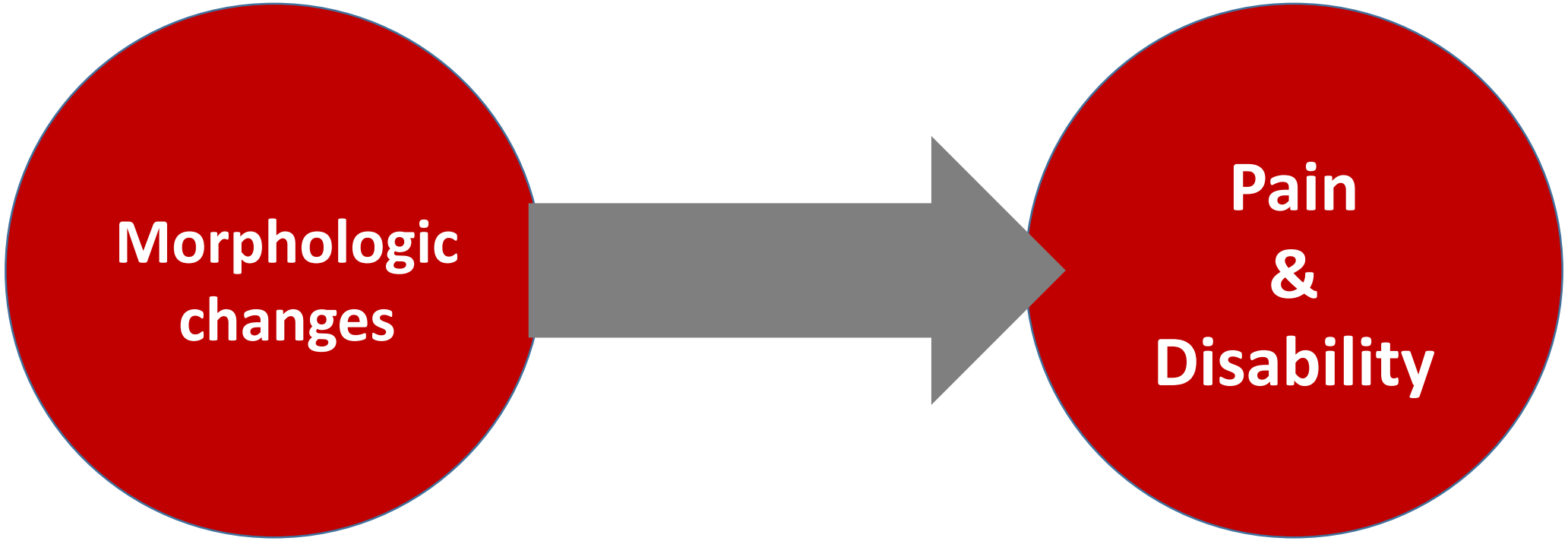
Guermazi et al (2012) Brit J Sports Med.

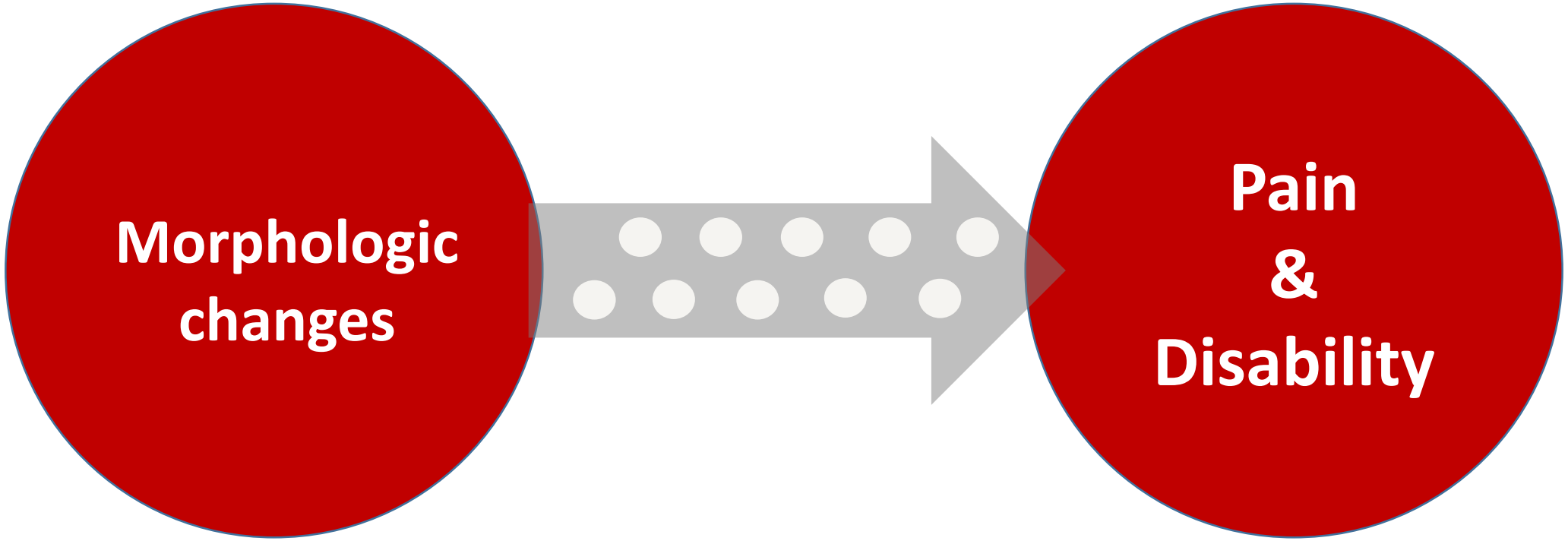
45 people (age 15-66)

69% labral lesions

Register et al (2012) Am J Sports Med.

The Sports Physio @adammeakins


Morphologic changes
Pain & Disability


Morphologic changes
Pain & Disability

Sham Surgery in Orthopedics: A Systematic Review of the Literature

- Six randomized controlled trials, all rated as high quality
  - Vertebroplasty (2), IDET (2), debridement for knee OA (1) and lateral epicondylitis (1)
- Compared real surgical procedure with sham (placebo)
- Heterogeneity prevented pooling of data

Louw 2017

Table 4 Efficacy of sham surgery in orthopedic

Outcome	Barendse et al. 2001	Moseley 2002	Pauza et al. 2004	Buchbinder et al. 2009	Kallmes et al. 2009	Kroslak 2012
Decrease pain ratings	N	N	-	N	N	N
Improve function	N	N	-	NA	N	N
Improve quality of life	N	NA	NA	N	N	N
Decrease disability	N	NA	-	N	N	NA
Adverse events	NA	NA	NA	N	NA	NA
Increase perceived recovery	N	NA	NA	N	NA	N
Improve general health	NA	NA	NA	NA	N	NA

NA = not applicable.

\+ Indicates sham surgery was superior to real surgical procedure.

N Indicates sham surgery and the real surgical procedure has similar outcomes.

\- Indicates real surgical procedure was superior to sham surgery.

Louw 2017

Arthroscopic subacromial decompression for subacromial shoulder pain (CSAW): a multicentre, pragmatic, parallel group, placebo-controlled, three-group, randomised surgical trial

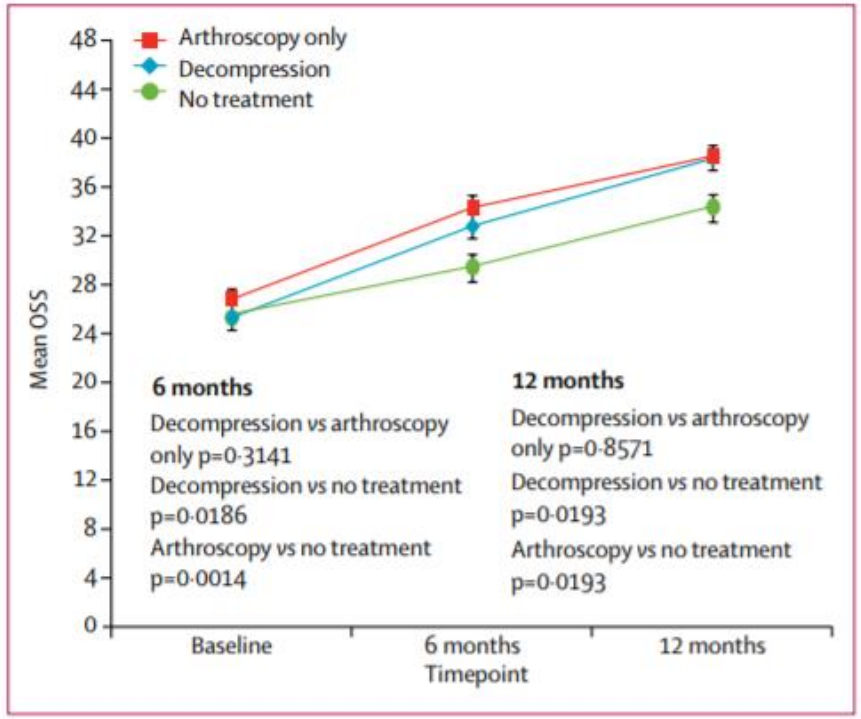


***Figure 2*: Oxford Shoulder Score in the intention-to-treat analyses**
Data are mean (95% CI) shown at follow-up timepoints. OSS=Oxford Shoulder Score.

Implications of all the available evidence

During the past three decades, clinicians and patients with subacromial shoulder pain have accepted minimally invasive arthroscopic subacromial decompression surgery in the belief that it provides reliable relief of symptoms at low risk of adverse events and complications. However, the findings from our study suggest that surgery might not provide clinically significant benefit over no treatment, and that there is no benefit of decompression over arthroscopy only. These results should be shared with patients considering surgery.

Beard 2018

Key Principles

1. Non-specific effects of our profession have substantial influence on athlete outcomes.
2. **Structural change may not be the source of pain; altering it may not be the source of recovery.**

ACP
American College of Physicians
Best Practice Advice

CLINICAL GUIDELINE

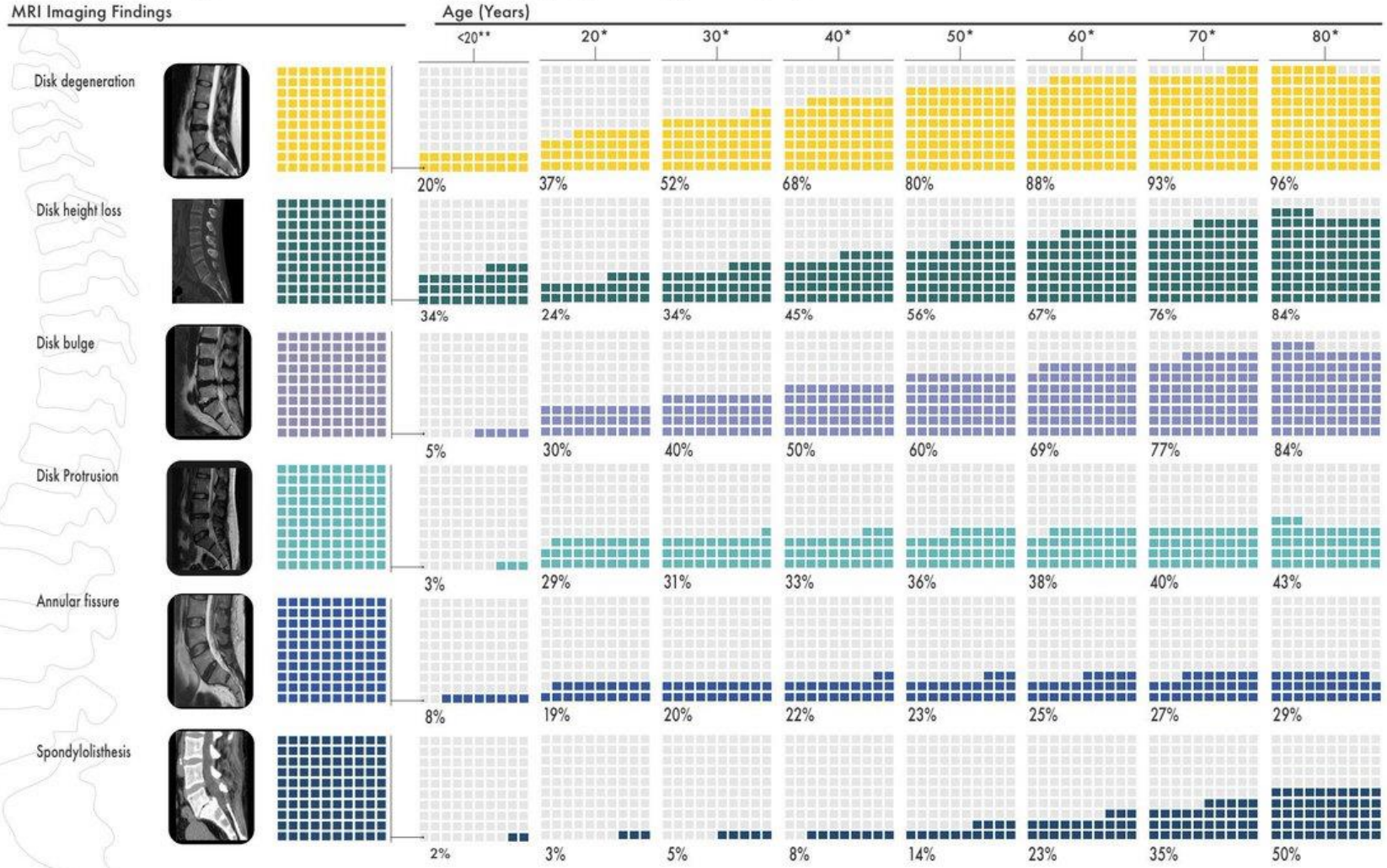
Diagnostic Imaging for Low Back Pain: Advice for High-Value Health Care From the American College of Physicians

Roger Chou, MD; Amir Qaseem, MD, PhD, MHA; Douglas K. Owens, MD, MS; and Paul Shekelle, MD, PhD, for the Clinical Guidelines Committee of the American College of Physicians*

Diagnostic imaging is indicated for patients with low back pain only if they have severe progressive neurologic deficits or signs or symptoms that suggest a serious or specific underlying condition. In other patients, evidence indicates that routine imaging is not associated with clinically meaningful benefits but can lead to harms. Addressing inefficiencies in diagnostic testing could minimize potential harms to patients and have a large effect on use of resources by reducing both direct and downstream costs. In this area, more testing does not equate to better care. Implementing a selective approach to low back imaging, as suggested by the American College of Physicians and American Pain Society guideline on low back pain, would provide better care to patients, improve outcomes, and reduce costs.

Ann Intern Med. 2011;154:181-189. www.annals.org
For author affiliations, see end of text.

Prevalence of degenerative lumbar spine imaging findings in asymptomatic individuals*



*Source: Brinjikji W., et al. AJNR Am J Neuroradiol. 2015 April; 36(4):811-816
**Source: Ramadorai U., et al. Incidental Findings on Magnetic Resonance Imaging of the Spine in the Asymptomatic Pediatric Population: A Systematic ReviewEvidence-Based Spine-Care Journal Vol. 5 No. 2/2014

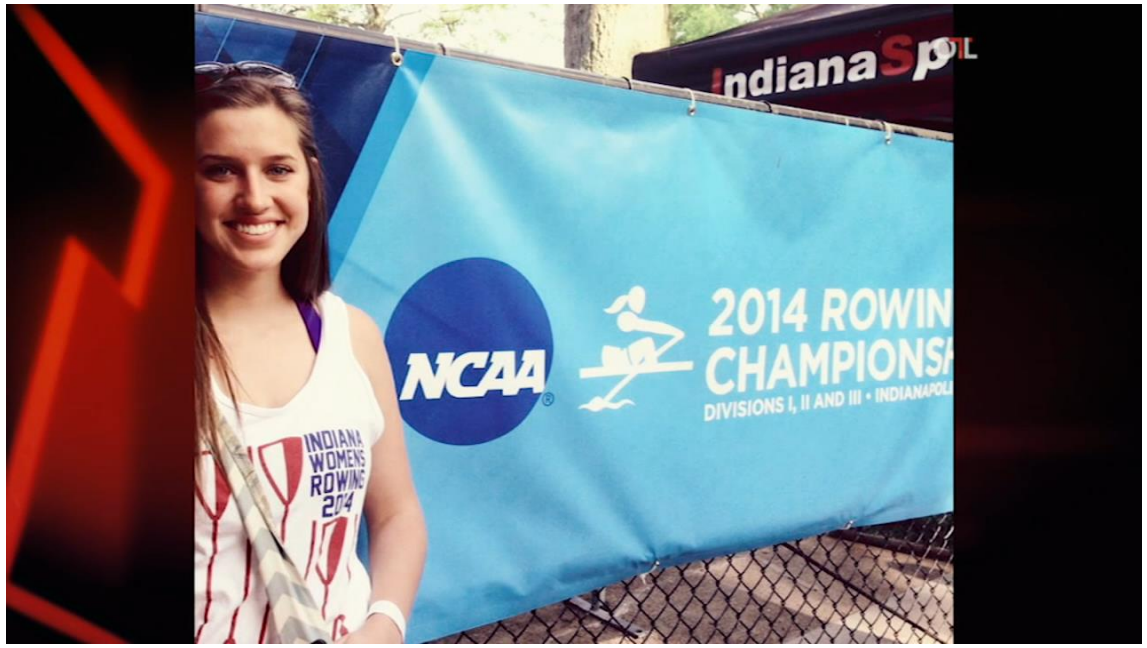
GETTING YOU BACK IN THE GAME

Key Principles

1. Non-specific effects of our profession have substantial influence on athlete outcomes.
2. Structural change may not be the source of pain; altering it may not be the source of recovery.
3. **Be aware of diagnostic imaging guidelines – do not lead your athletes toward unnecessary procedures.**

The Power of Words

- Back pain in a collegiate rower



"Words are the most powerful tool a doctor possesses, but words, like a two-edged sword, can maim as well as heal."

– Bernard Lown, MD

Misinformation

“Her upper body is no longer fully connected to her lower body. There’s just scar tissue holding that together.”

“Pregnancy would be risky for her because of the pressure it would put on an already fragile spine.”

“Anything with weight above my head I cannot do.”

Some Important Context

- Back pain prevalence in rowers 47.5 – 82.2% *Perich 2006, Hosea and Hannafin 2012*
- High correlation (r=0.83) between training load and incidence of LBP *Newlands 2015*
- Asymptomatic adolescent rowers have abnormal MRIs in 40.9% of cases *Maurer 2010*
- No association of slip progression and LBP in those with spondylolisthesis – across 45 years of data! *Beutler 2003*
- Spontaneous resorption of herniations occurs in 2/3 of patients *Zhang 2017*
- Post-collegiate rowers have the same prevalence of LBP as general population *Teitz 2003*

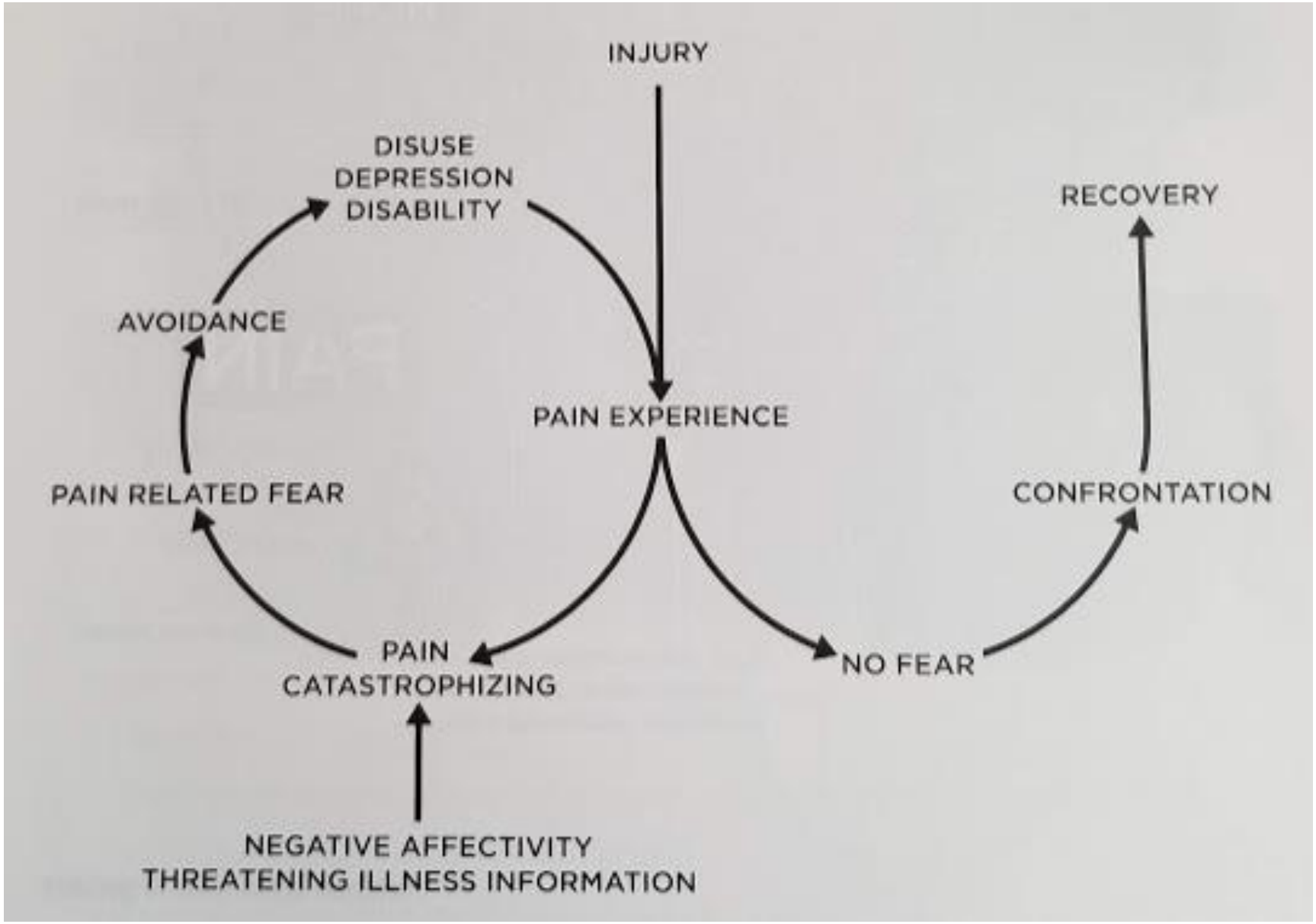
PAIN-RELATED FEAR, PAIN INTENSITY AND FUNCTION IN INDIVIDUALS WITH CHRONIC MUSCULOSKELETAL PAIN: A SYSTEMATIC REVIEW AND META-ANALYSIS

- Seventy observational studies
- Total sample of 15,623 individuals
- “Greater levels of fear of pain, pain-related anxiety and fear-avoidance beliefs were significantly associated with greater pain intensity and disability.”

Martinez-Calderon 2019

Key Principles

1. Non-specific effects of our profession have substantial influence on athlete outcomes.
2. Structural change may not be the source of pain; altering it may not be the source of recovery.
3. Be aware of diagnostic imaging guidelines – do not lead your athletes toward unnecessary procedures.
4. **The words you choose can seriously affect an athlete – for better or worse.**



Vlaeyen and Linton 2000

Words That Harm, Words That Heal

"I'm broken"

"Put your bad leg on the table"

"I've got a glass back"

"Your spine is so unstable"

"This is going to hurt"

"You're a high-risk patient"

"I've got a slipped disc"

"What's your pain right now?"

"Your hips are out of alignment"

"Your joint is just bone on bone"

"You're presenting with a full-thickness tear of the supraspinatus tendon…"

Bedell 2004

TABLE

Typical Words to Avoid and Alternatives for Patients

Words to Avoid	Alternatives
Chronic degenerative changes	Normal age changes
Negative test results	Everything appears normal
Instability	Needs more strength and control
Wear and tear	Normal age changes
Neurological	Nervous system
Don't worry	Everything will be okay
Bone on bone	Narrowing/tightness
Tear	Pull
Damage	Reparable harm
Paresthesia	Altered sensations
Trapped nerve	Tight, but can be stretched
Lordosis	The normal curve in your back
Kyphosis	The normal curve in your back
Bulge/herniation	Bump/swelling
Disease	Condition
Effusion	Swelling
Chronic	It may persist, but you can overcome it
Diagnostics	X-ray or scan
You are going to have to live with this	You may need to make some adjustments

“You just need to get stronger”

“You’re going to blow your back out”

“Do your bad side first”

Is it time to reframe how we care for people with non-traumatic musculoskeletal pain?

- Structural changes are often given as a diagnosis for a patient's pain
  - Exponential increase in elective "corrective" procedures, some with questionable efficacy
- Clinicians have invented treatments for conditions that may not exist or be reliably detected
- This has created an expectation in passive treatments for a quick "cure"
- Diabetics and asthmatics do not expect their conditions to resolve
- Should some of our patients be any different?

Lewis and O'Sullivan 2018

Tying It All Together

1. Non-specific effects of our profession have substantial influence on athlete outcomes.
2. Structural change may not be the source of pain; altering it may not be the source of recovery.
3. Be aware of diagnostic imaging guidelines – do not lead your athletes toward unnecessary procedures.
4. The words you choose can seriously affect an athlete - for better or worse.

Frame your athlete interactions in terms of recovery and management, not pathology.

Additional Resources

- Explain Pain
- YouTube
  - “Why Things Hurt”
  - “Understanding pain and what to do about it in less than 5 minutes”
- Continuing Education Courses

EIM INTERNATIONAL SPINE & PAIN INSTITUTE

Therapeutic Neuroscience Education

Teaching People About Pain

Pain Neuroscience and the Tactical Athlete

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