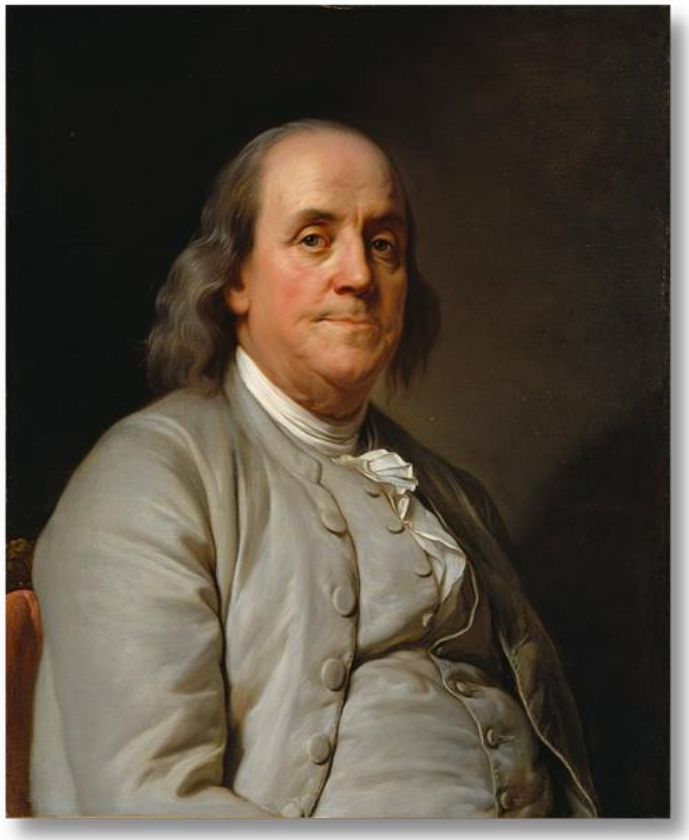
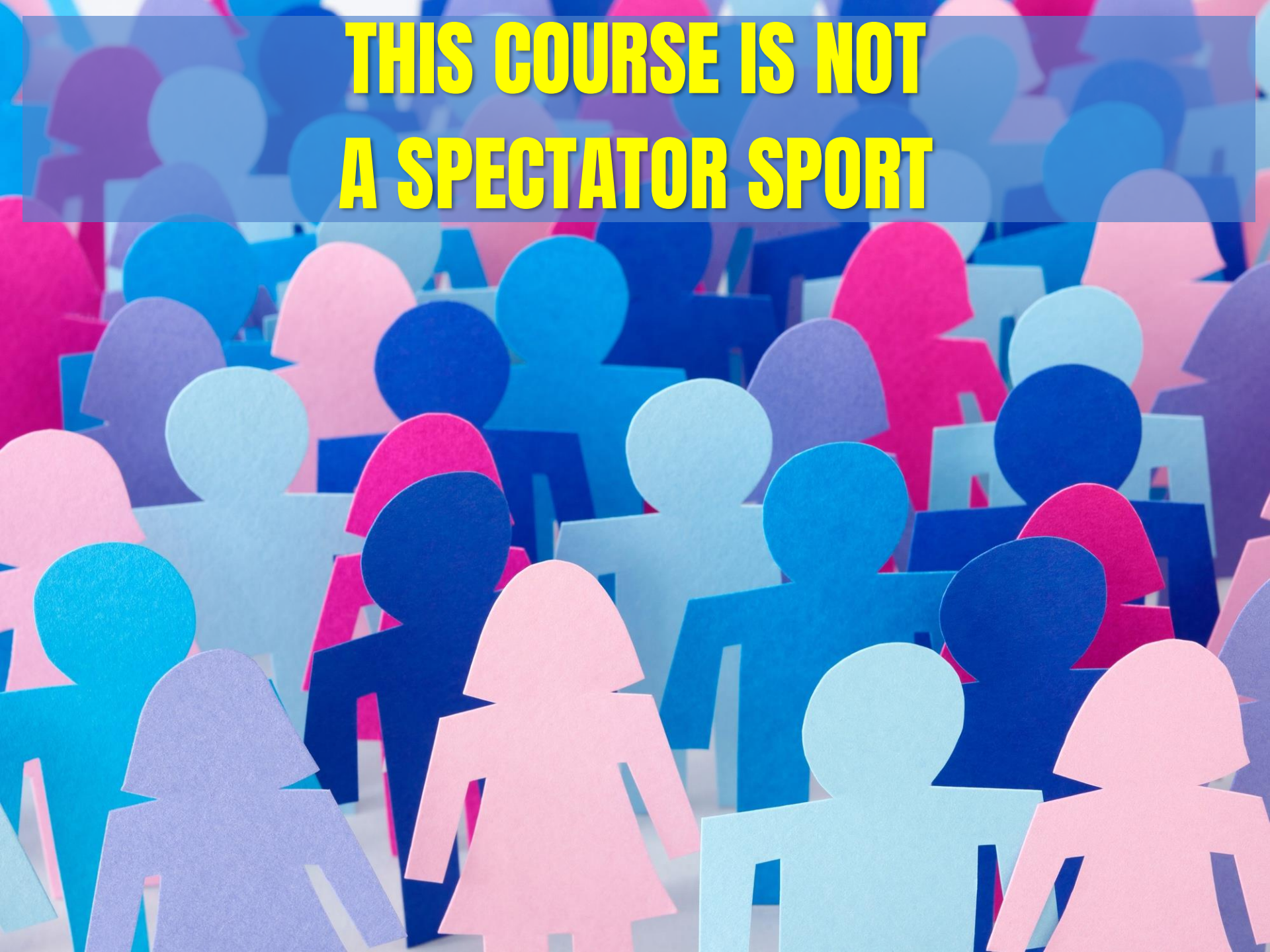
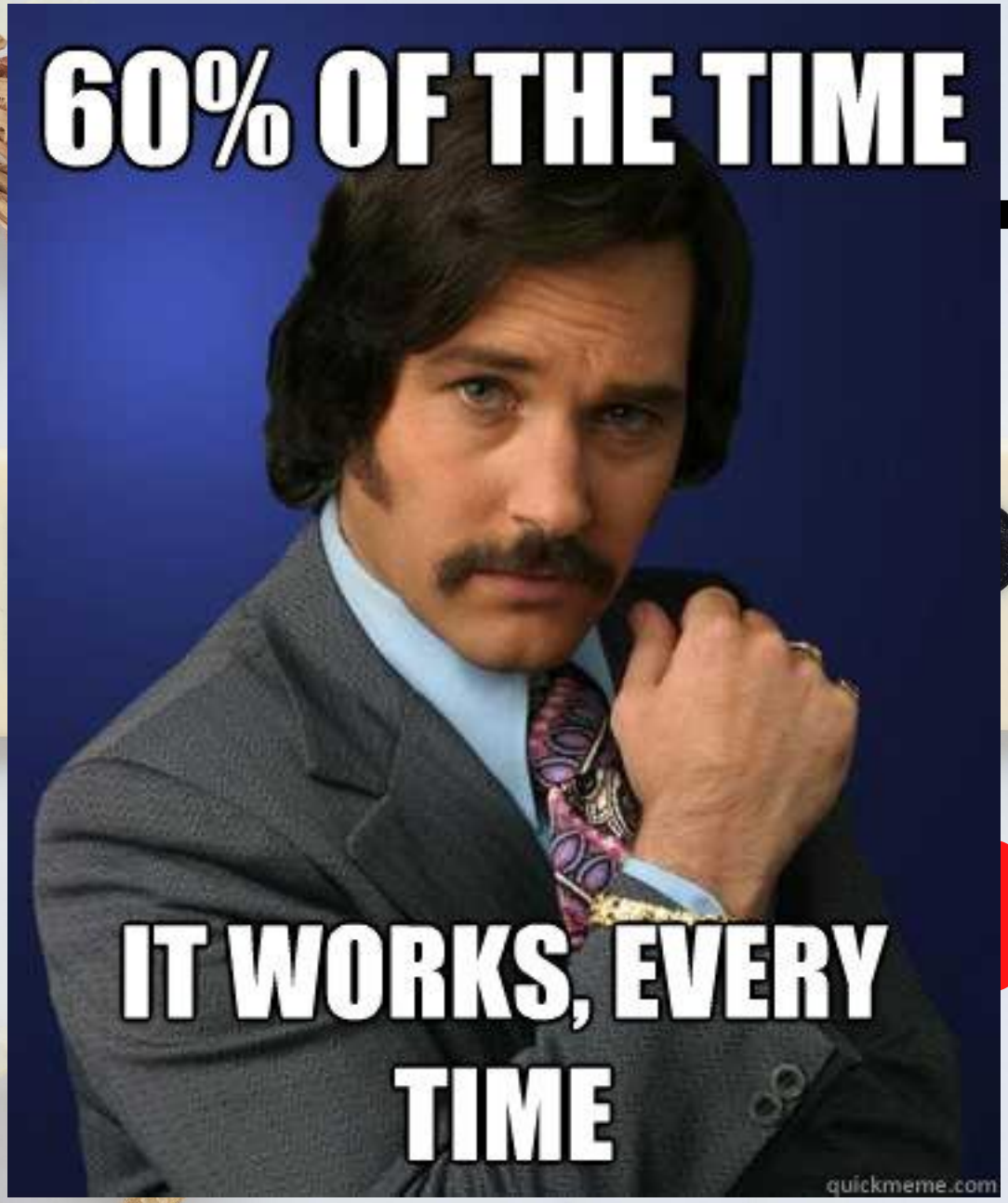

Movement Based
Rehabilitation
Certification

Tell me and I
forget, teach me
and I may
remember,
involve
me and I learn

Franklin




THIS COURSE IS NOT
A SPECTATOR SPORT

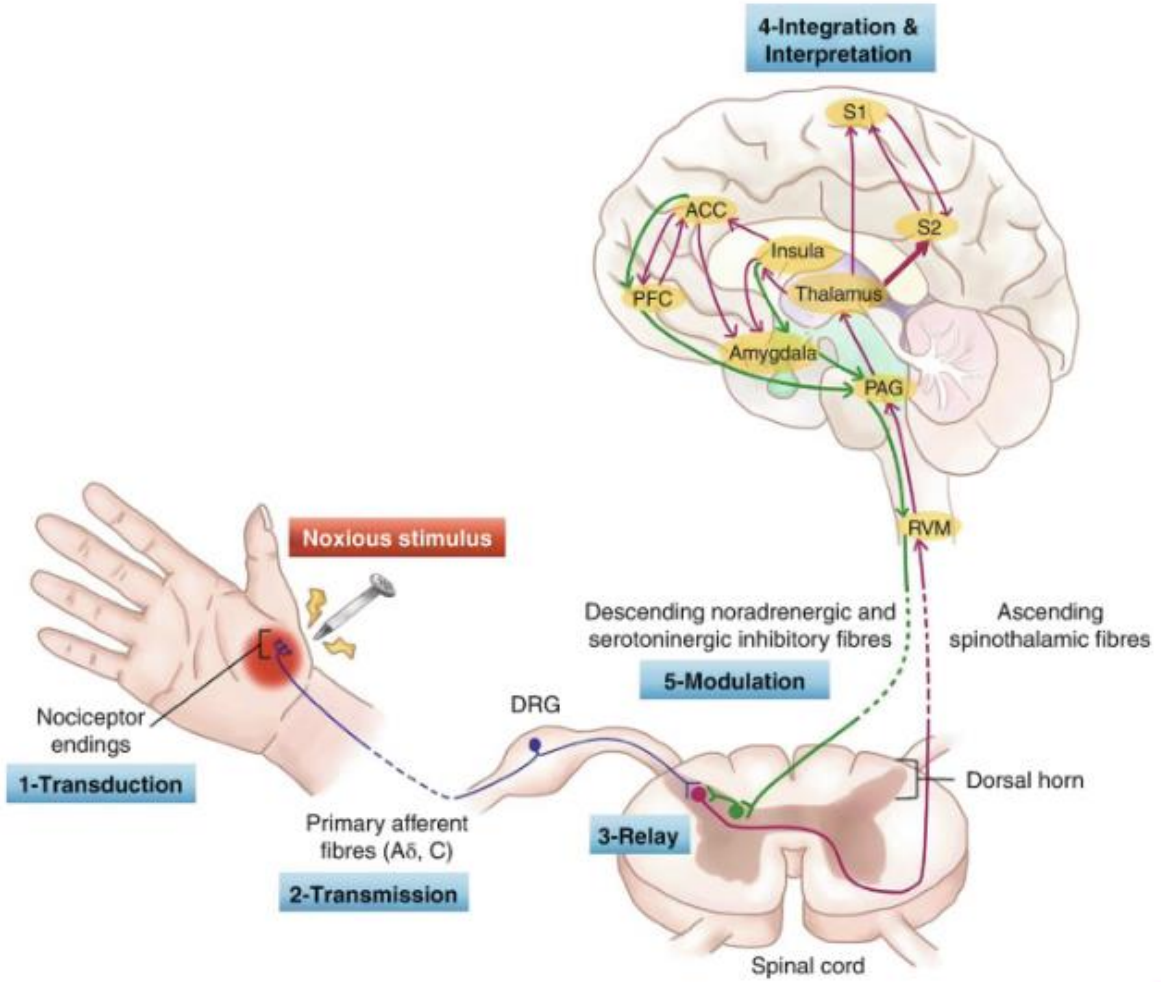

60% OF THE TIME
IT WORKS, EVERY TIME
quickmeme.com

PAIN SCIENCE

“HURT DOESN’T NECESSARILY EQUAL HARM”

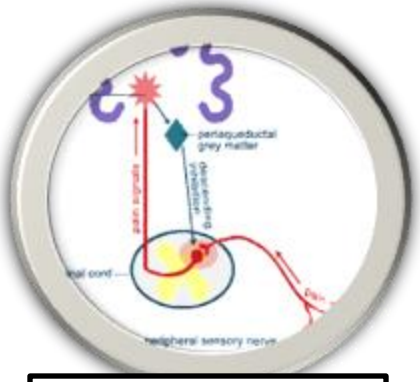
A BEE STING IS A GREAT ANALOGY FOR PAIN!

THE SIMPLEST WAY TO UNDERSTAND PAIN IS A STIMULUS & RESPONSE SYSTEM

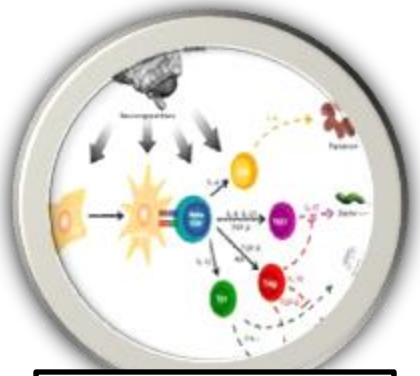


Beliefs/previous experiences/expectations/context

Cortical plasticity

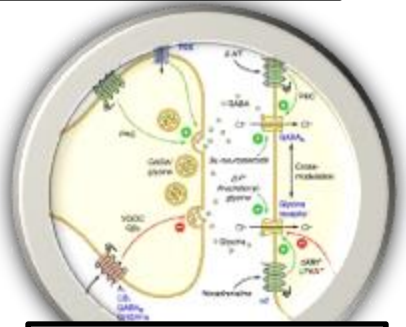


Descending modulation



Neuroimmune

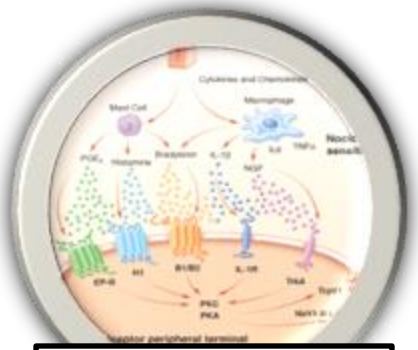
Neurotag/pain memory



Central sensitisation

Stress neurobiology

Nociception

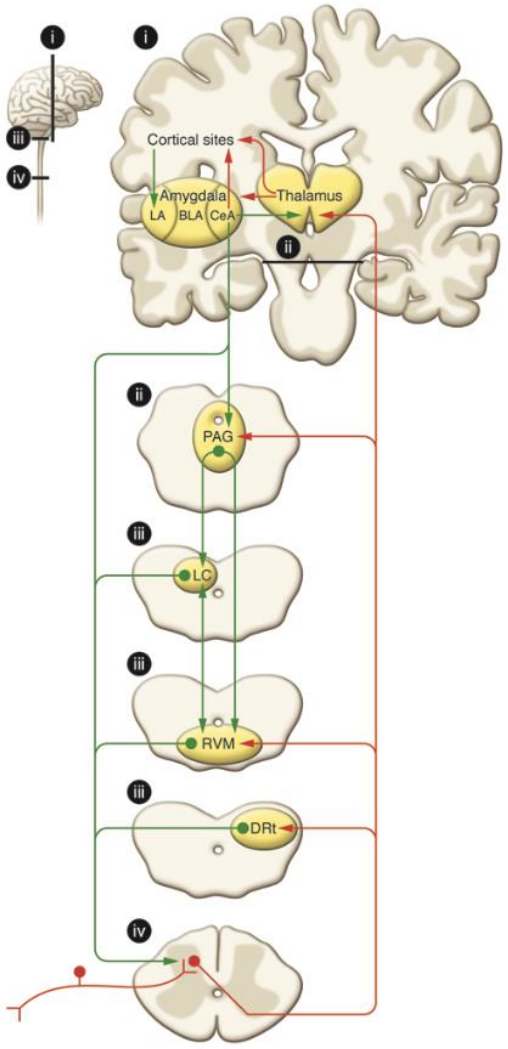


Peripheral sensitisation

WHAT CAUSES PAIN MIGHT NOT BE WHAT MAINTAINS IT!

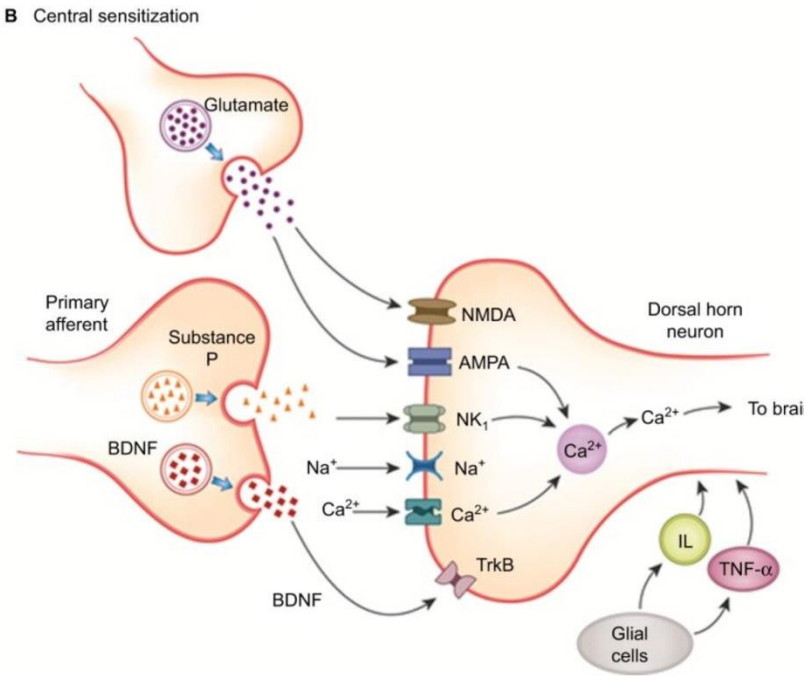
DESCENDING MODULATION

- Internal opioid mechanisms
- Reason for most acute/short term effects of ALL interventions
- Could be stimulated mechanically or perceptually
- Turn pain up or down
- Placebo effects?



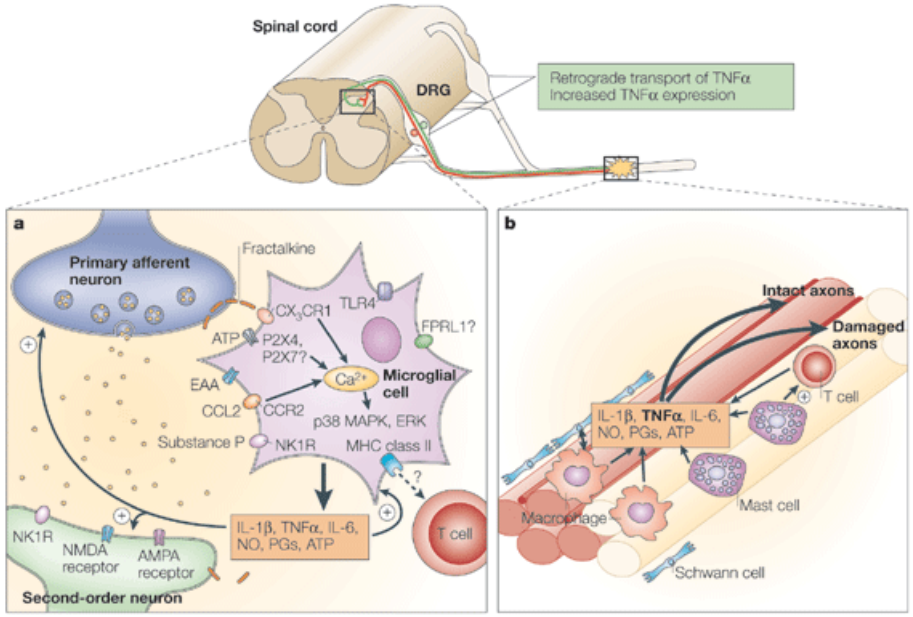
CENTRAL SENSITISATION

- Changes in receptiveness of dorsal horn neurons to nociceptive stimulus
- Nociplastic pain
- Stimulus/response out of whack



IMMUNE SYSTEM

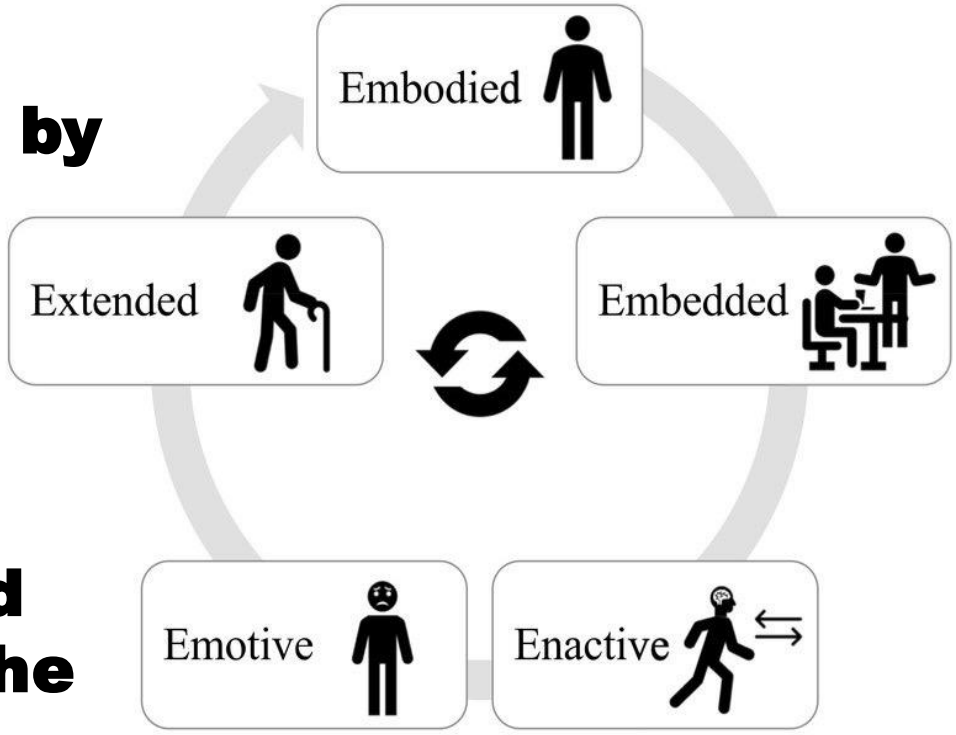
- Longer term
- Epigenetic changes to our behaviors
- Pro/anti nociceptive environment
- Pro/anti inflammatory environment



5 E's

Stillwell & Harman 2019

- **Embodied** – Emphasises the important role of the body
- **Embedded** – Situated in A SOCIAL WORLD
- **Enacted** – Brought forth by embodied interaction
- **Emotive** – Involves emotions or 'feeling'
- **Extended** – Goes beyond our physical bodies to the world around us

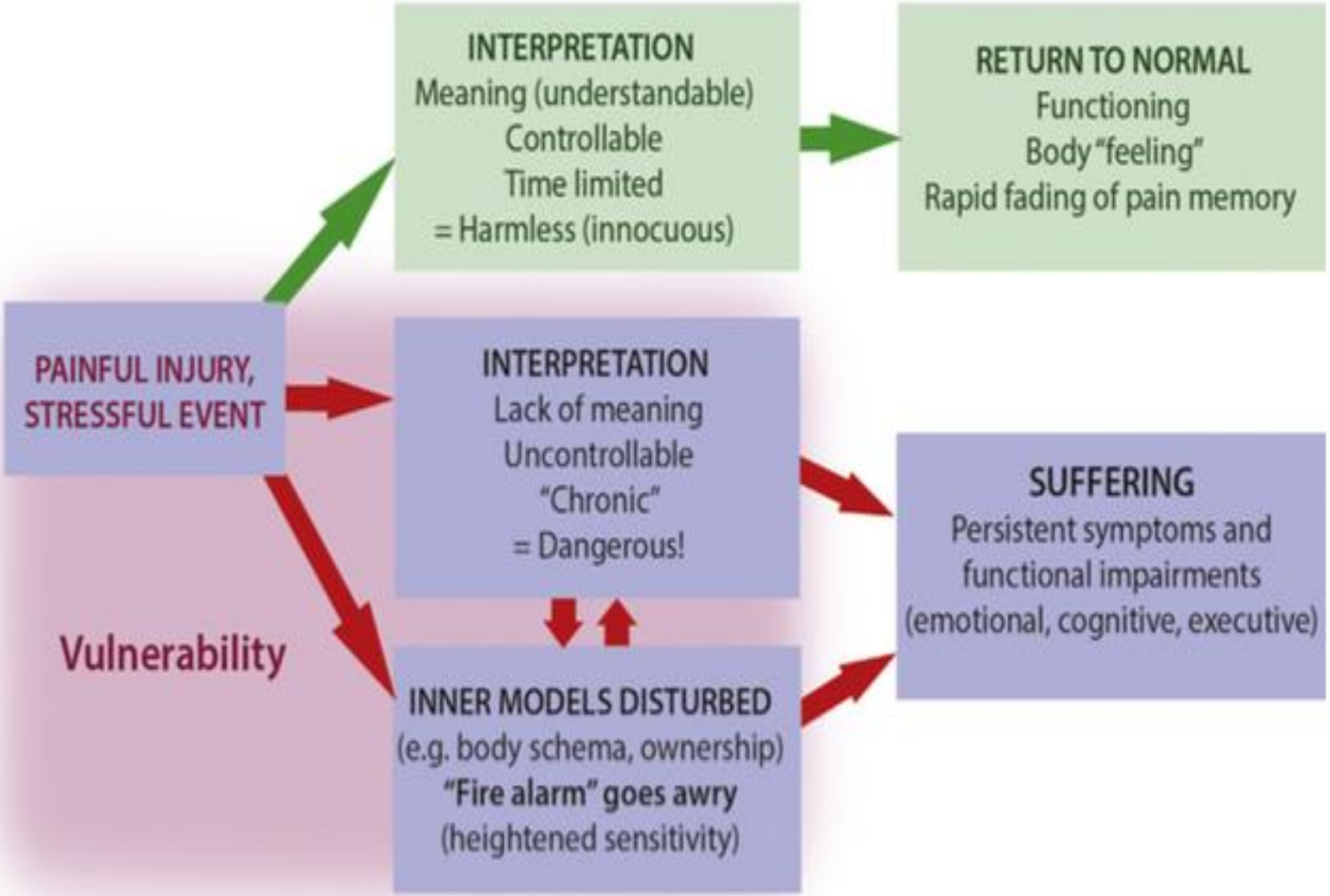


CAUSAL VARIABLES

- Predisposing
- Initiating
- Maintaining

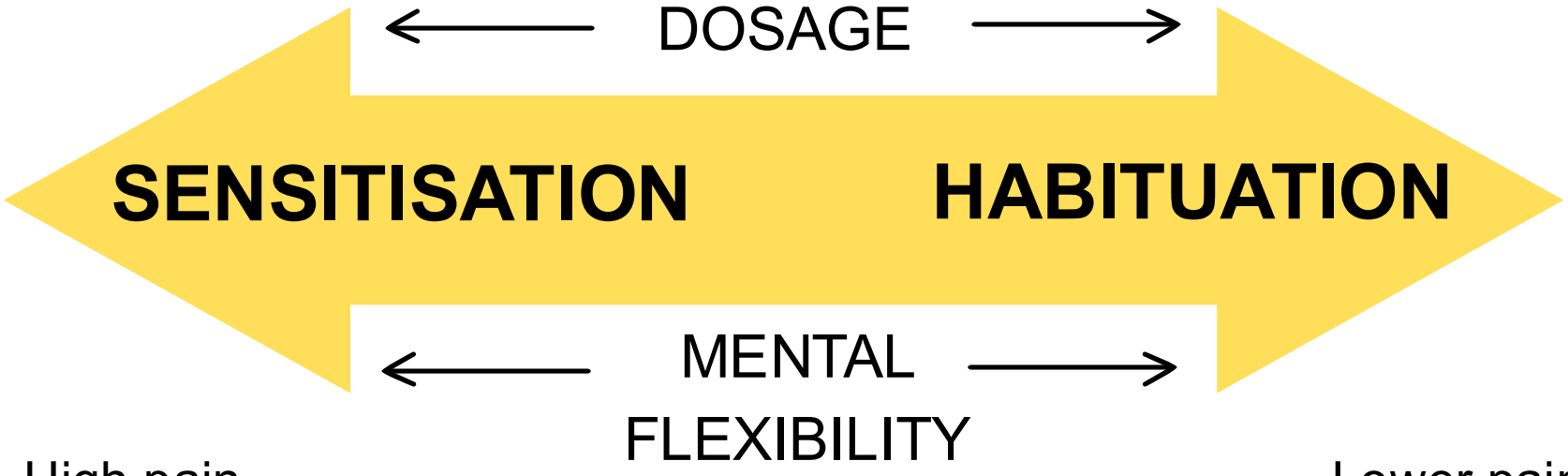
HOW DOES A RUSSIAN DOLL HELP US UNDERSTAND THE EXPERIENCE OF PAIN?

COR-KINETIC
EVOLVING MOVEMENT


INTERPRETATION
Meaning (understandable)
Controllable
Time limited
= Harmless (innocuous)
RETURN TO NORMAL
Functioning
Body "feeling"
Rapid fading of pain memory
PAINFUL INJURY,
STRESSFUL EVENT
INTERPRETATION
Lack of meaning
Uncontrollable
"Chronic"
= Dangerous!
SUFFERING
Persistent symptoms and
functional impairments
(emotional, cognitive, executive)
Vulnerability
INNER MODELS DISTURBED
(e.g. body schema, ownership)
"Fire alarm" goes awry
(heightened sensitivity)

WHAT IF PAIN RELIEF HAS MORE TO DO WITH THE PERSON THAN THE TREATMENT?

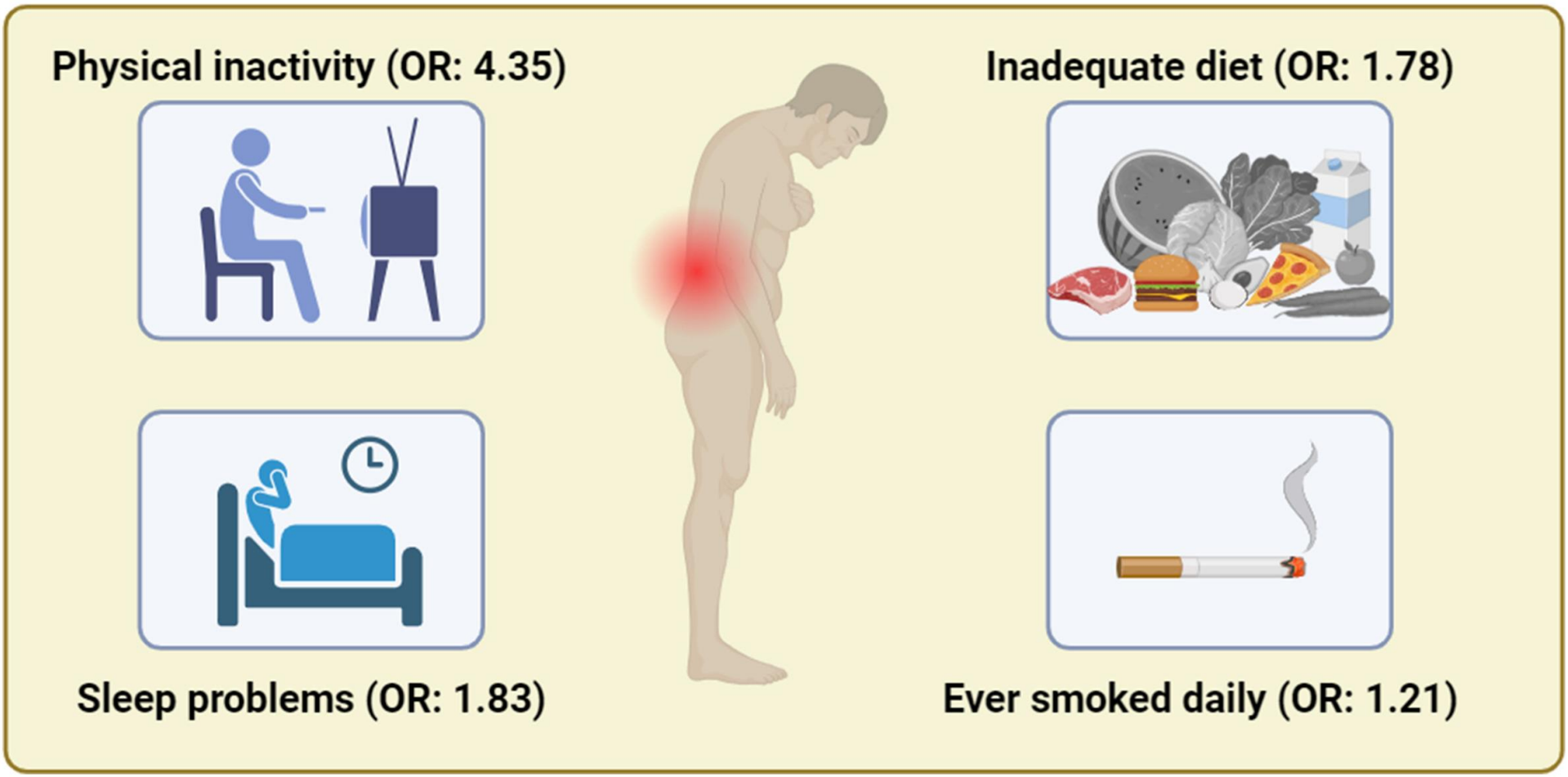
HOW 'ADAPTABLE' IS MY PATIENT?



High pain	Lower pain
High irritability	Low irritability
Multi site pain	Single site pain
Poor lifestyle	Positive lifestyle
Co-morbidities	Good health
Low activity levels	High activity levels
Negative outlook	Positive outlook

COR-KINETIC
EVOLVING MOVEMENT

Unhealthy lifestyles linked to severe pain



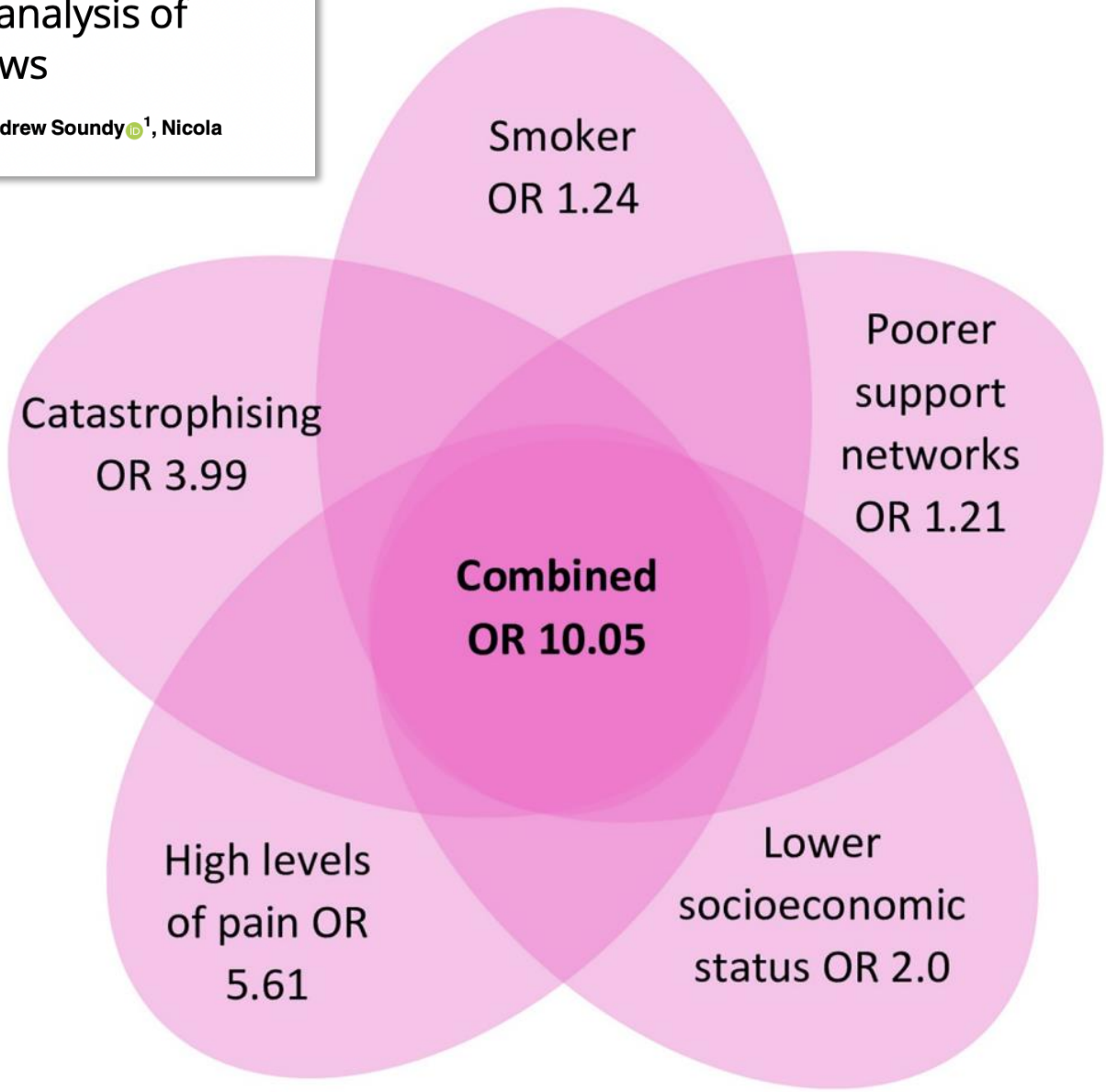
Rodrigo Núñez-Cortés et al

Physical inactivity is the most important unhealthy lifestyle factor for pain severity in older adults with pain: A SHARE-based analysis of 27,528 cases from 28 countries. 2025

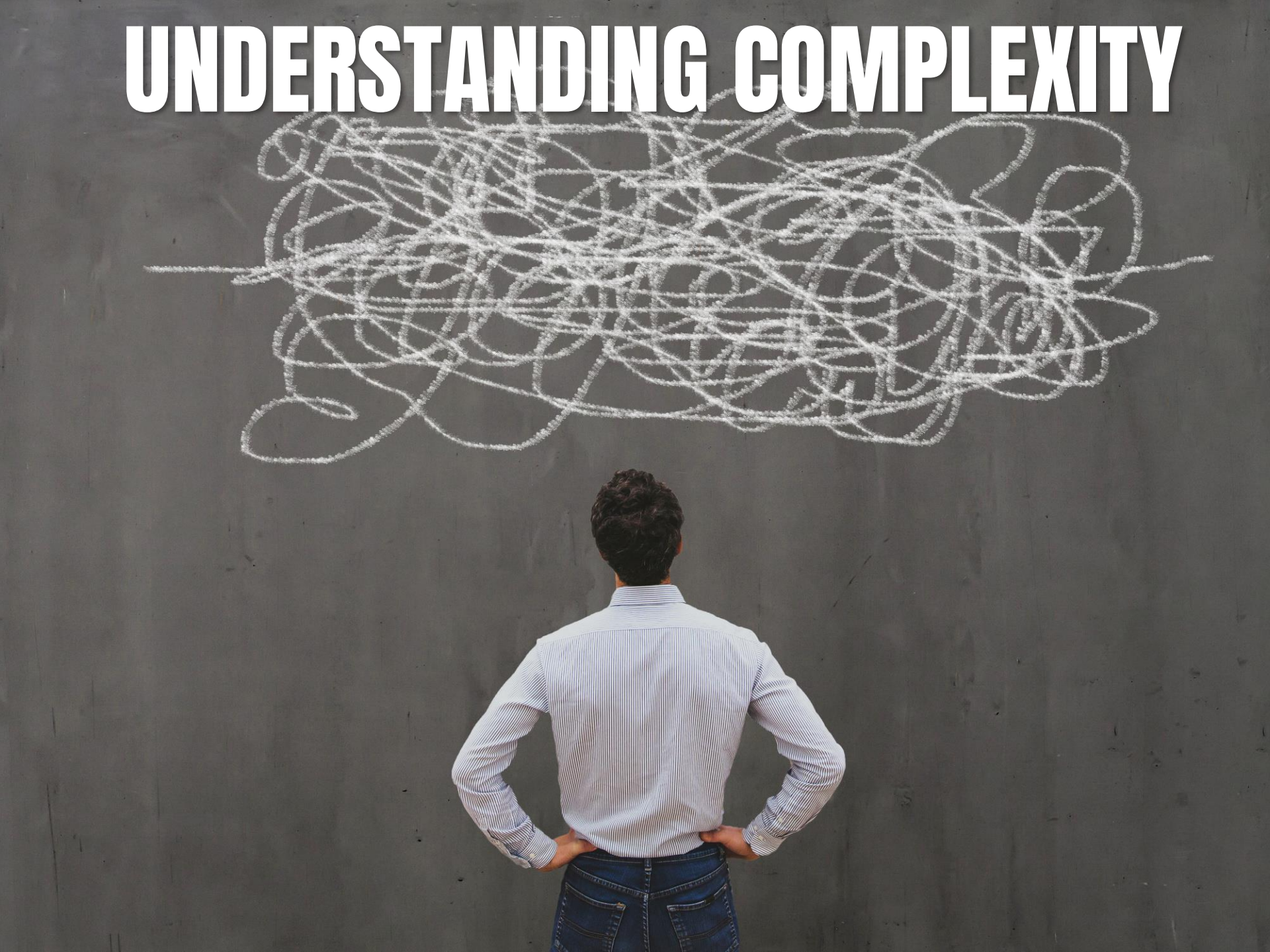
RESEARCH ARTICLE

The biopsychosocial factors associated with development of chronic musculoskeletal pain. An umbrella review and meta-analysis of observational systematic reviews

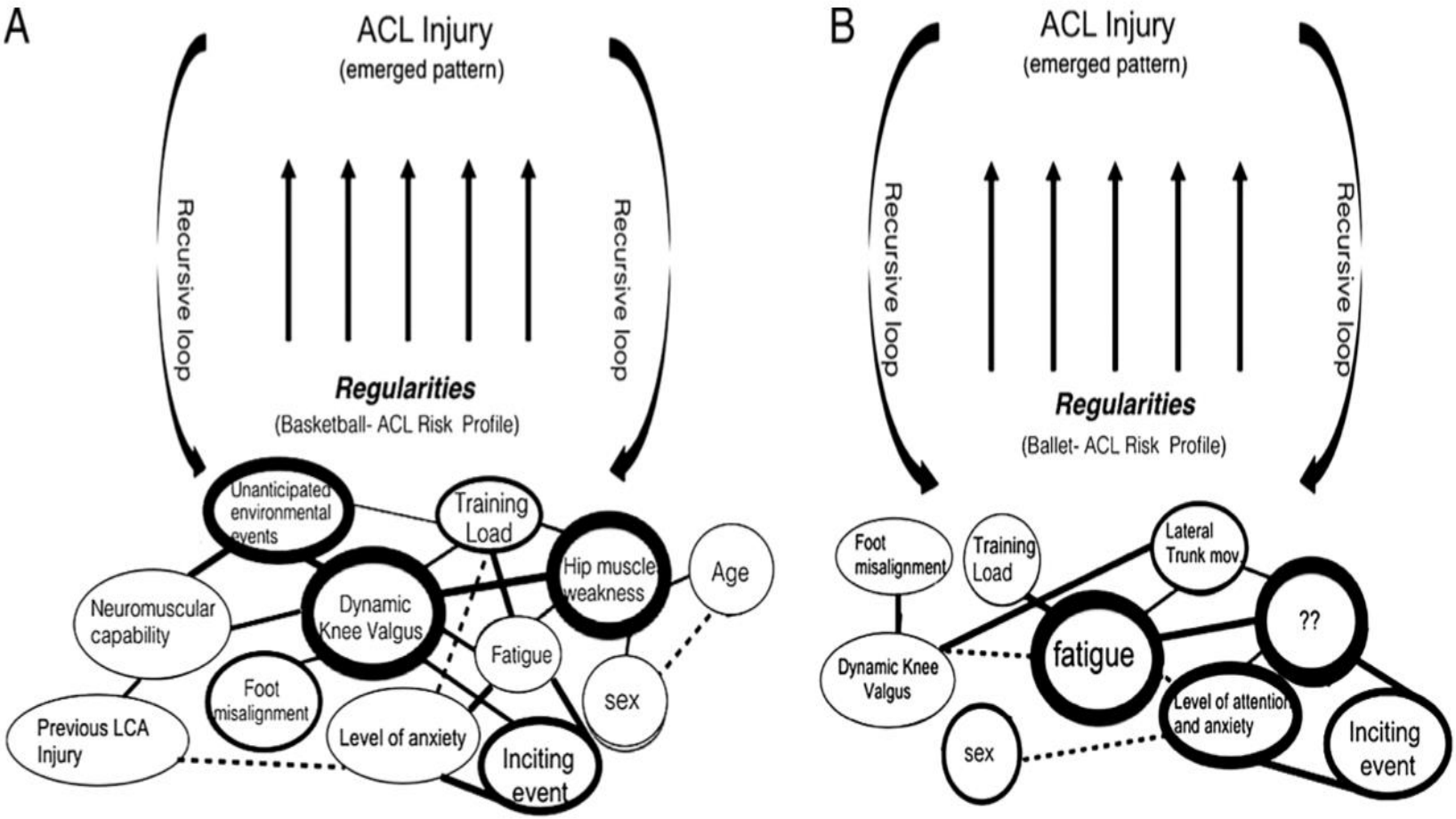
Michael Dunn[1,2,3]*, Alison B. Rushton[1,4], Jai Mistry[2,4], Andrew Soundy[1], Nicola R. Heneghan[1]



UNDERSTANDING COMPLEXITY



EMERGENCE & NON LINEARITY



Bittencourt et al - 2016


SENSITIVE TO
ROBUST
ENTRY

'APPROPRIATE' LOAD

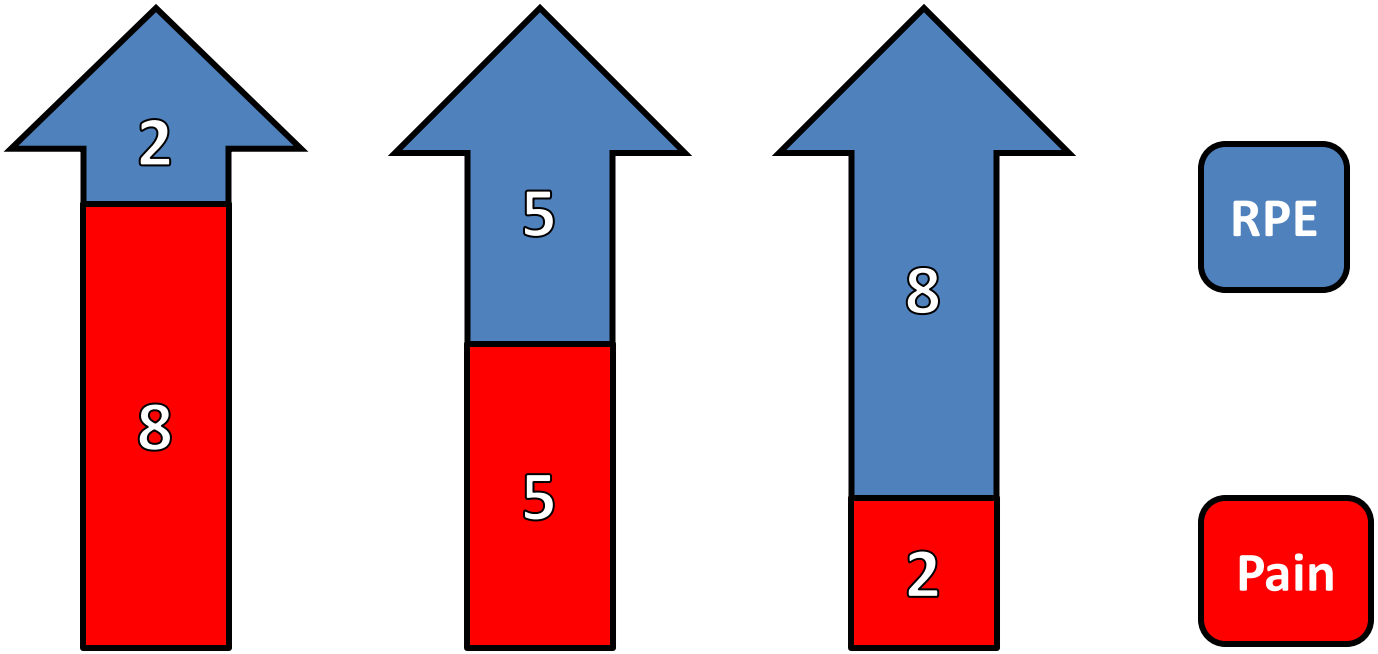
Lower effort
Movement
Yoga/pilates

Basic exercise
Low/medium dosage

Explosive
Heavy
Return to play

Relaxed	Stiff
Effortless	Effortful
Unloaded	Loaded
Variable	Repetitive
Restorative	Overload
Play	Exercise
PAIN	PERFORMANCE

RULE OF 10

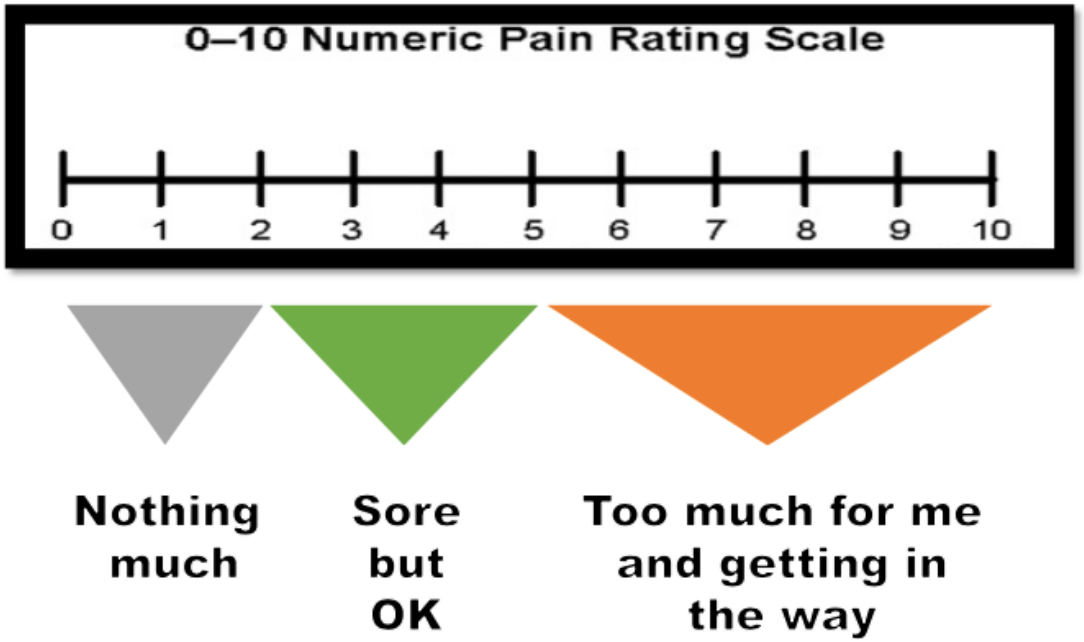


REHAB INTENSITY

	VERY EASY		EASY		MODERATE		HARD		VERY HARD		MAX
RPE	0	1	2	3	4	5	6	7	8	9	10
RIR	20+		10+		5+		3-4		2	1	0

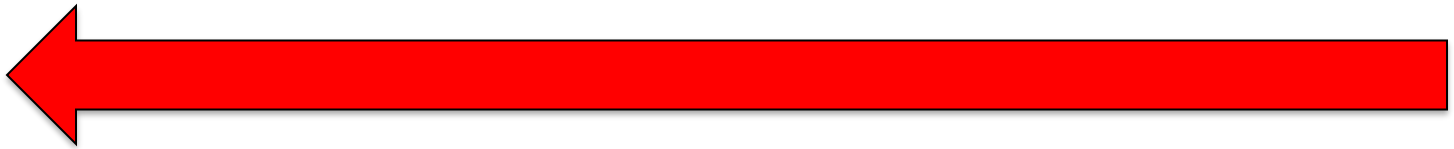
RPE = Rate of Perceived Exertion
RIR = Reps In Reserve

PAIN RESPONSE AS A TREATMENT GUIDE



EXERCISE DOSING SIMPLIFIED

VAS/sensitivity (0-48hrs) goes down



RPE goes up

- Well under acceptable level (patient defined) then increase dosage
- At acceptable level then keep same
- Over acceptable level then decrease

COR-
EVOLVING MOVEMENT

SUBJECTIVE ASSESSMENT

- **Signs & symptoms of pathology**
- **Patient reported**

SUBJECTIVE ASSESSMENT

- Aggravating/easing
- Intensity
- Irritability
- Location
- 24hr pattern (after activity)
- Feeling – shooting/burning
- Localised/diffuse
- When is pain worst e.g. AM/PM/nightime (when)
- Better with rest/activity

OBJECTIVE ASSESSMENT

- Movement
- Special tests
- Palpation
- Neurological
- Range of motion
- Scans

SPECIAL TESTS

- All special tests do the same thing, compress or distract tissues
- They are pain provocation tests
- Unfortunately many are inaccurate as they compress a lot of tissues at the same time
- + test is recreation of original symptom

HEALTH

- Previous Medical History
- Medication
- SNAPSS – Sleep, Nutrition, Alcohol, Physical activity, Sleep, Smoking

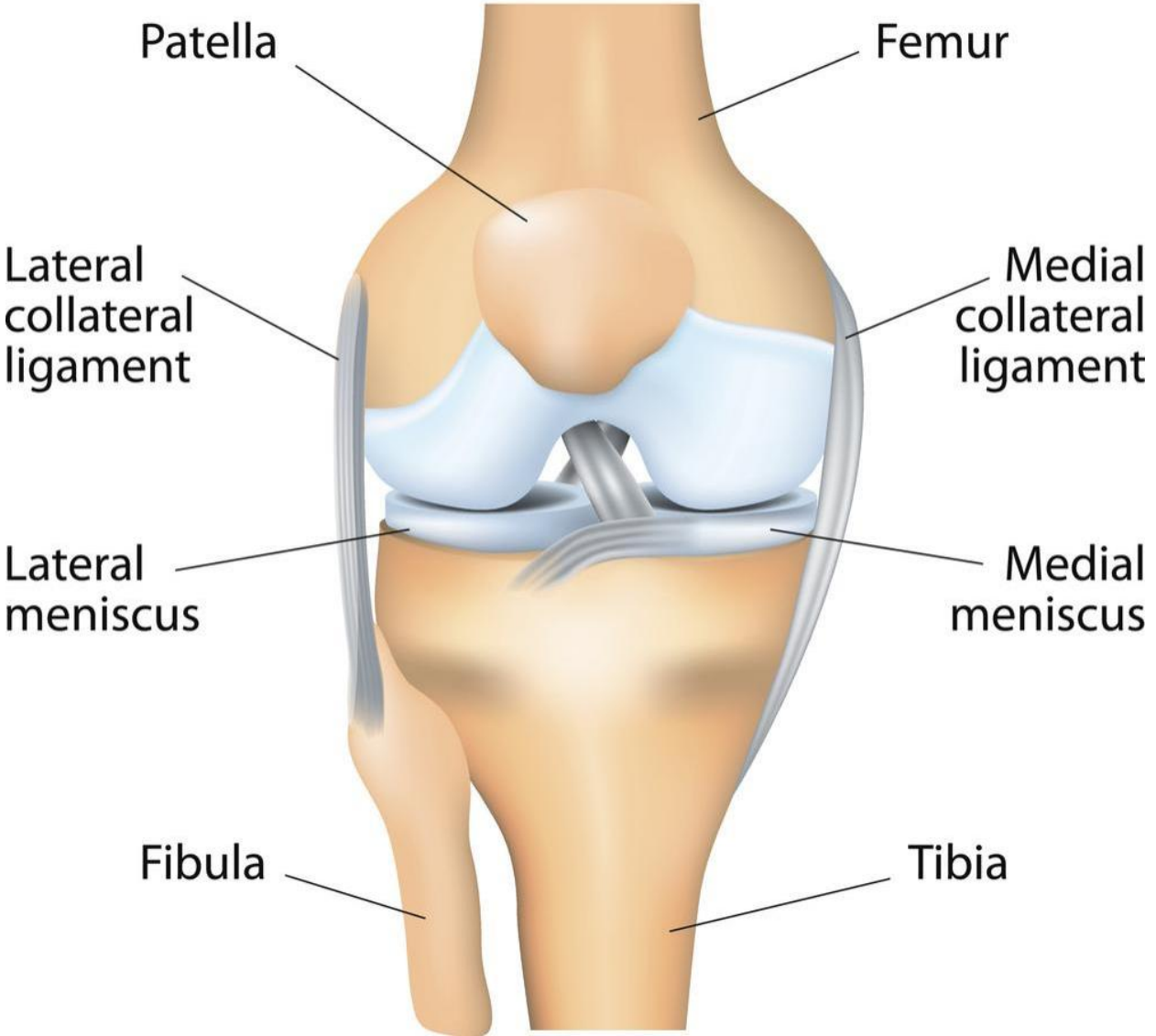
WHAT DO YOU NEED TO KNOW ABOUT KNEE INJURIES?

19-22% of people report knee pain

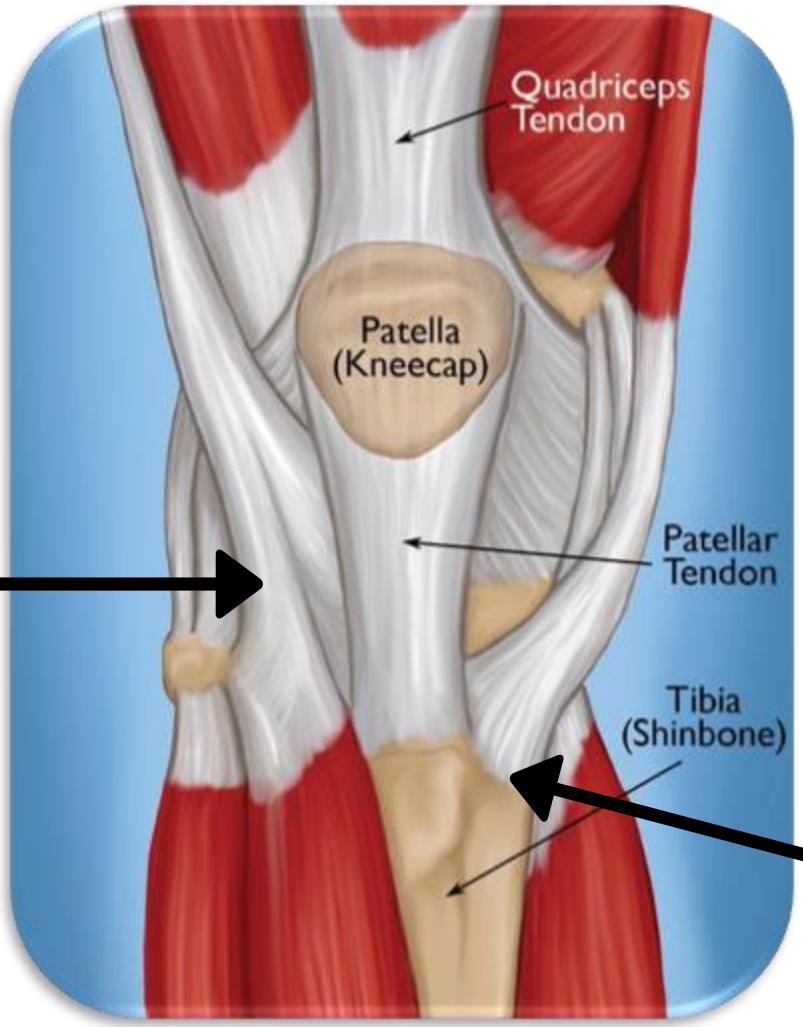
Most common are:

- Patellofemoral pain (runners knee)
- Patella tendinopathy (jumpers knee)
- Osteoarthritis (older population)

THE HUMAN KNEE

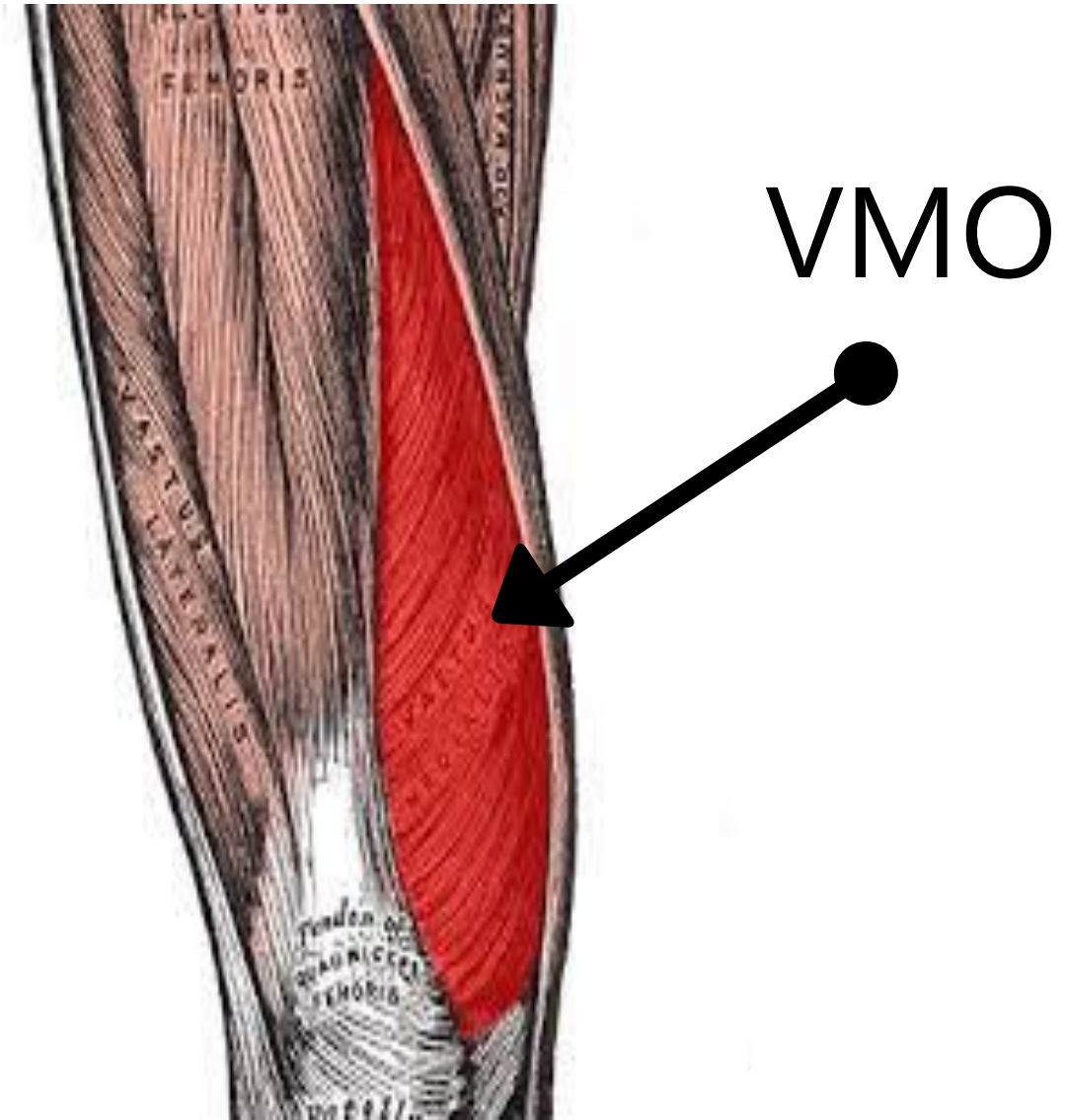


ITB



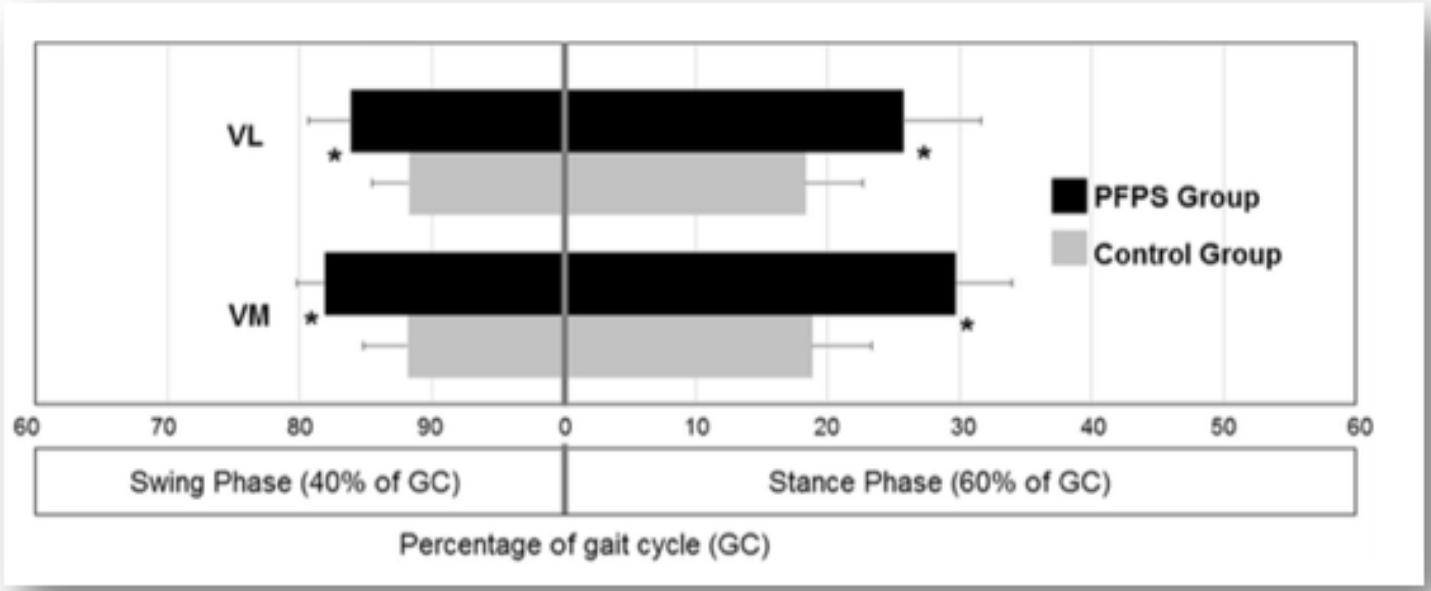
Pes ansurinis

MAGIC VMO MUSCLE?



ALL knee muscles were active for LONGER in those with knee pain compared to controls

Intensity was the SAME



ASSESSMENT

- Varus/valgus stress test
- Anterior drawer
- Posterior drawer
- McMurray test
- Clarkes test
- Thessaly

PATELLA TENDINOPATHY

Jumpers knee

- Those involved with jumping sports
  Volleyball & Basketball
- 18-35
- More men than women

PATELLA TENDINOPATHY

- Heavier & taller athletes seem to suffer more
- Better jumpers seem to develop PT!
- Jumpers Paradox

CLINICAL DIAGNOSIS

This is a CLINICAL diagnosis!

You don't need fancy technology!

Imaging can be used but not necessary

CLINICAL DIAGNOSIS

1) Pain localized to the inferior pole of the patella

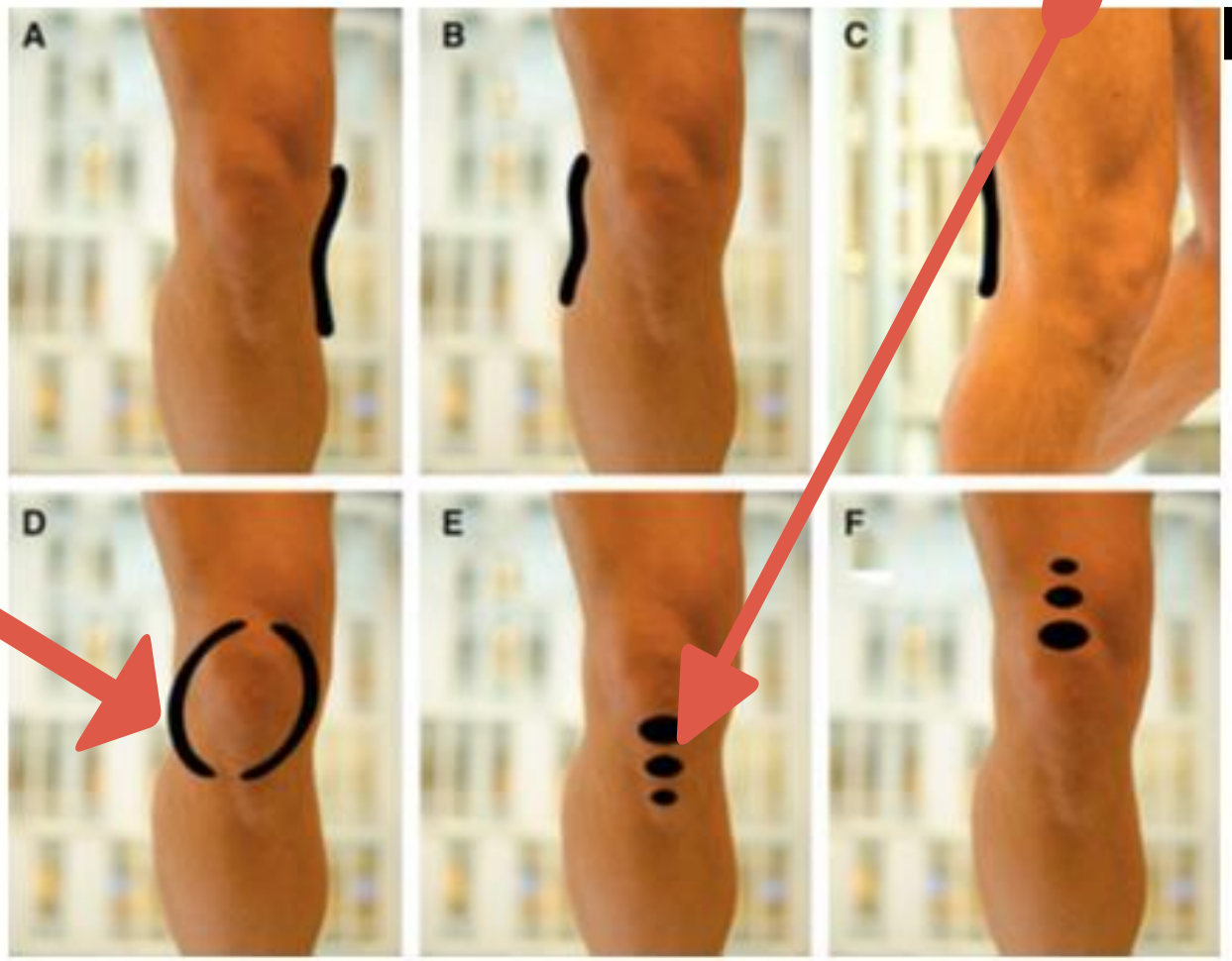
2) Load-related pain that increases with the demand on the knee extensors, notably in activities that store and release energy in the patellar tendon

3)Pain on explosive activities no pain at rest
Jumpers
Knee

4) Dose dependent pain – Greater pain with more load

Patella tendinopathy

PF P



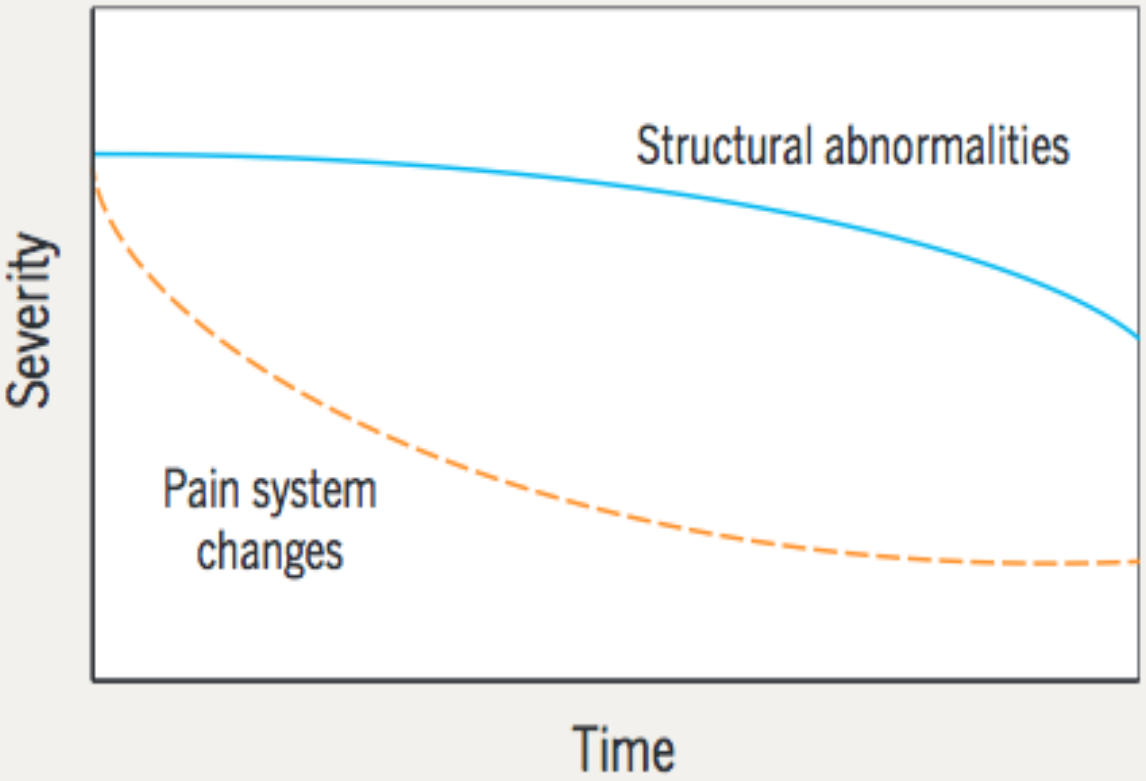


FIGURE. A proposed paradigm of the time course for changes to tendon structure and pain pathways following treatment. Specifically, it is suggested that improvements in clinical presentation of pain precede the much slower restoration of tendon structure.

The Disconnect Between Structure and Symptoms in Tendinopathy

Ryan et al JOSPT 2015


PAIN AROUND
OR BEHIND
KNEECAP
SPREAD OUT
OVER LARGER
AREA

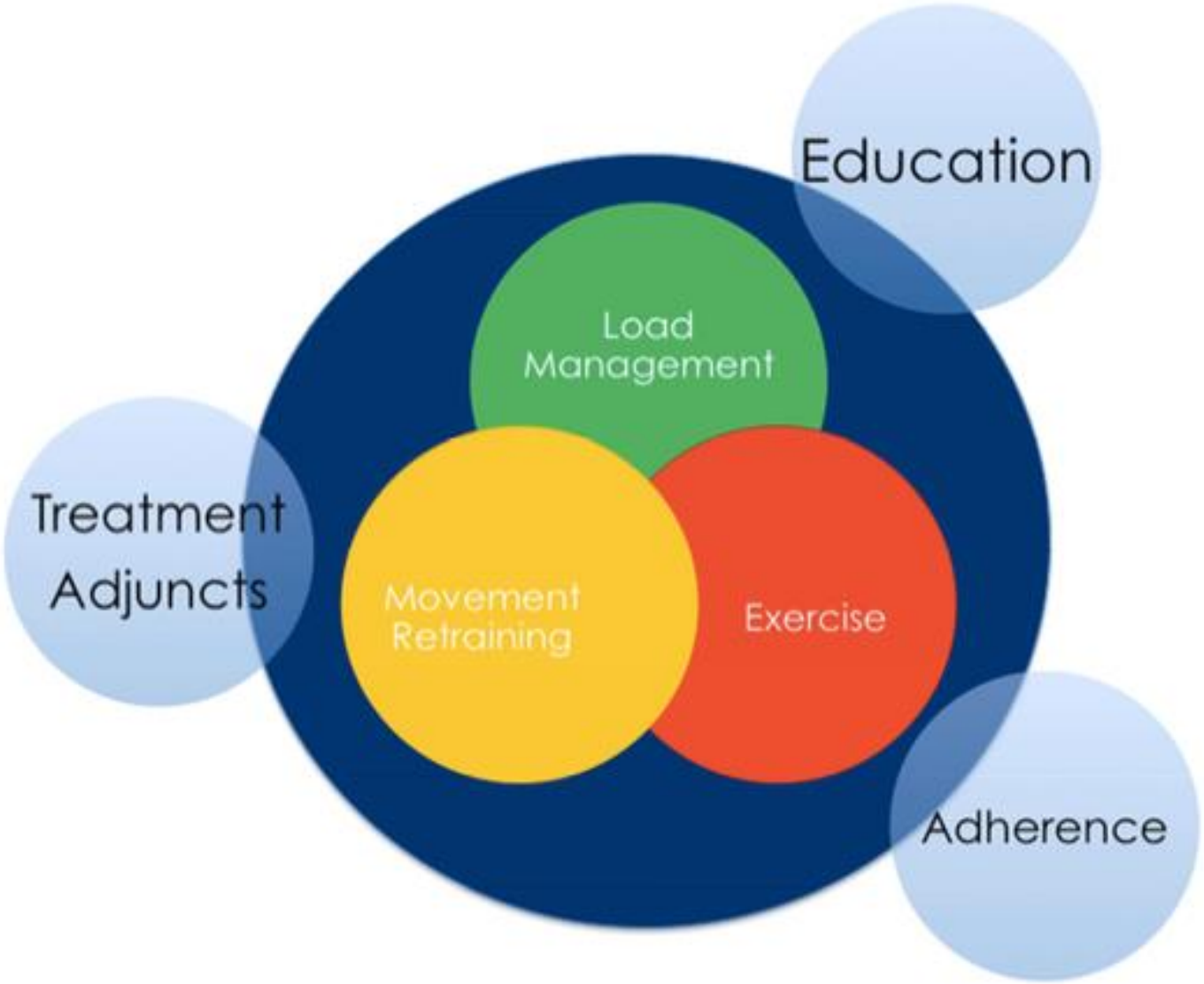
Diffuse pain around around the front of the knee

• Aggravated by activities that load the joint
Eg: stairs, sitting (cinema sign), squatting, running

• Pain around or behind the patella, which is aggravated by at least one activity that loads the patellofemoral joint during weight bearing on a flexed knee (eg, squatting, stair ambulation, jogging/running, hopping/jumping)"

CLINICAL DIAGNOSIS

What is irritating
your clients pain?



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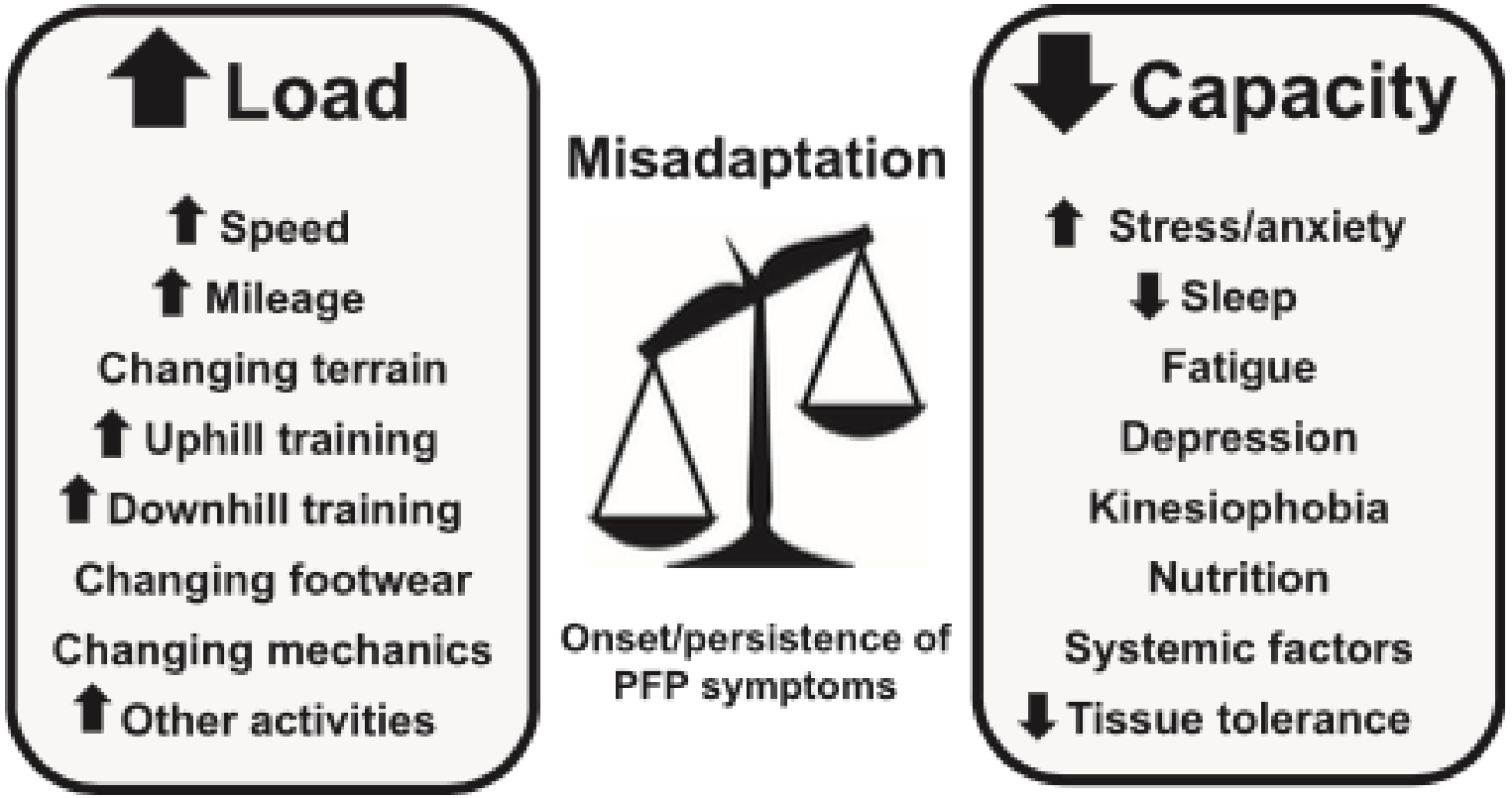
PATELLOFEMORAL PAIN -Lack & Neal 2018



JF Escullier et al

RUNNING MODIFICATION

Increase step rate

Wider running gait

Run 'quiter'

ORTHOTICS CAN HELP

OFF THE SHELF IS FINE

CHANGE THE LOAD

PATELLA TAPING

McConnell taping

Zinc oxide tape

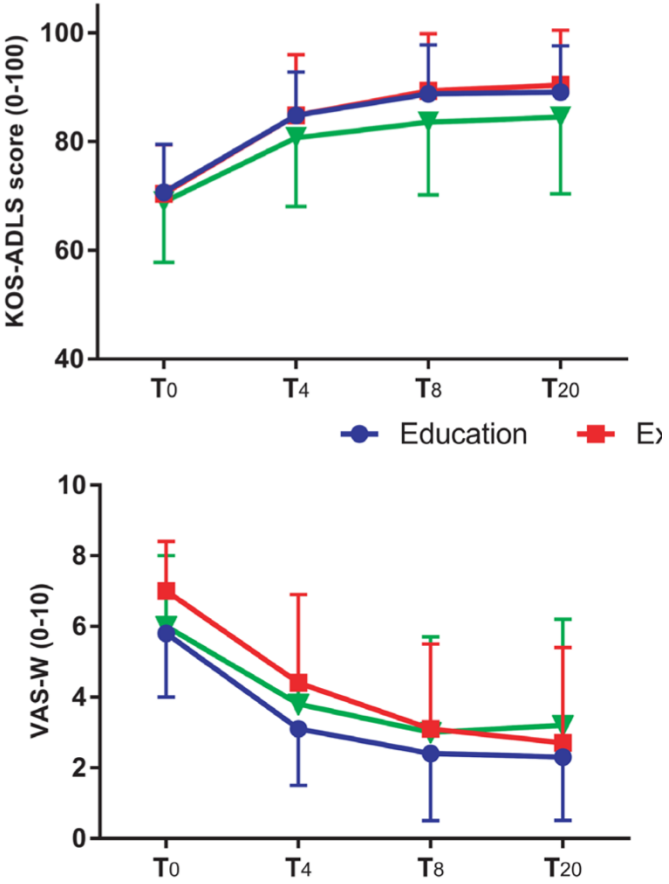
Useful to temporary provide pain relief

Is combining gait retraining or an exercise programme with education better than education alone in treating runners with patellofemoral pain?A randomised clinical trial

Jean-Francois Esculier,[1,2,3] Laurent Julien Bouyer,[1,2] Blaise Dubois,[1,3] Pierre Fremont,[1] Lynne Moore,[1] Bradford McFadyen,[1,2] Jean-Sébastien Roy[1,2]

- Runners received education on load management and were instructed to self-modify running training according to symptoms. They were asked to increase the frequency of their weekly trainings, to decrease each session's duration and speed and to avoid downhill and stairs running.

- Runners were instructed to maintain PFP level at no more than 2/10 during running.



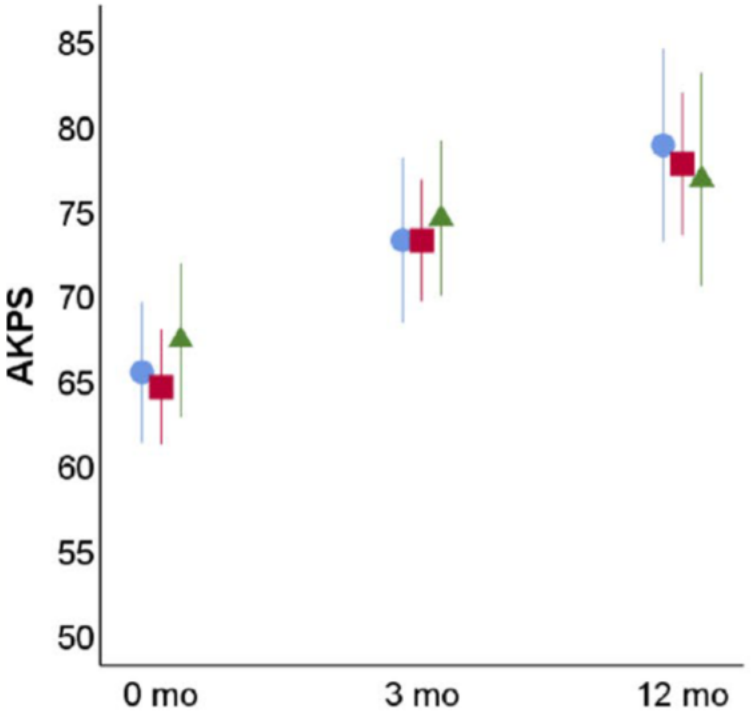
ORIGINAL ARTICLE

WILEY

Patellofemoral pain: One year results of a randomized trial comparing hip exercise, knee exercise, or free activity

Alexandra Hott[1] | Jens Ivar Brox[2,3] | Are Hugo Pripp[4] | Niels Gunnar Juel[3] | Sigurd Liavaag[5]

"After 1 year, there was no difference in effectiveness of knee exercise, hip exercise, or free physical activity, when combined with patient education in PFP"



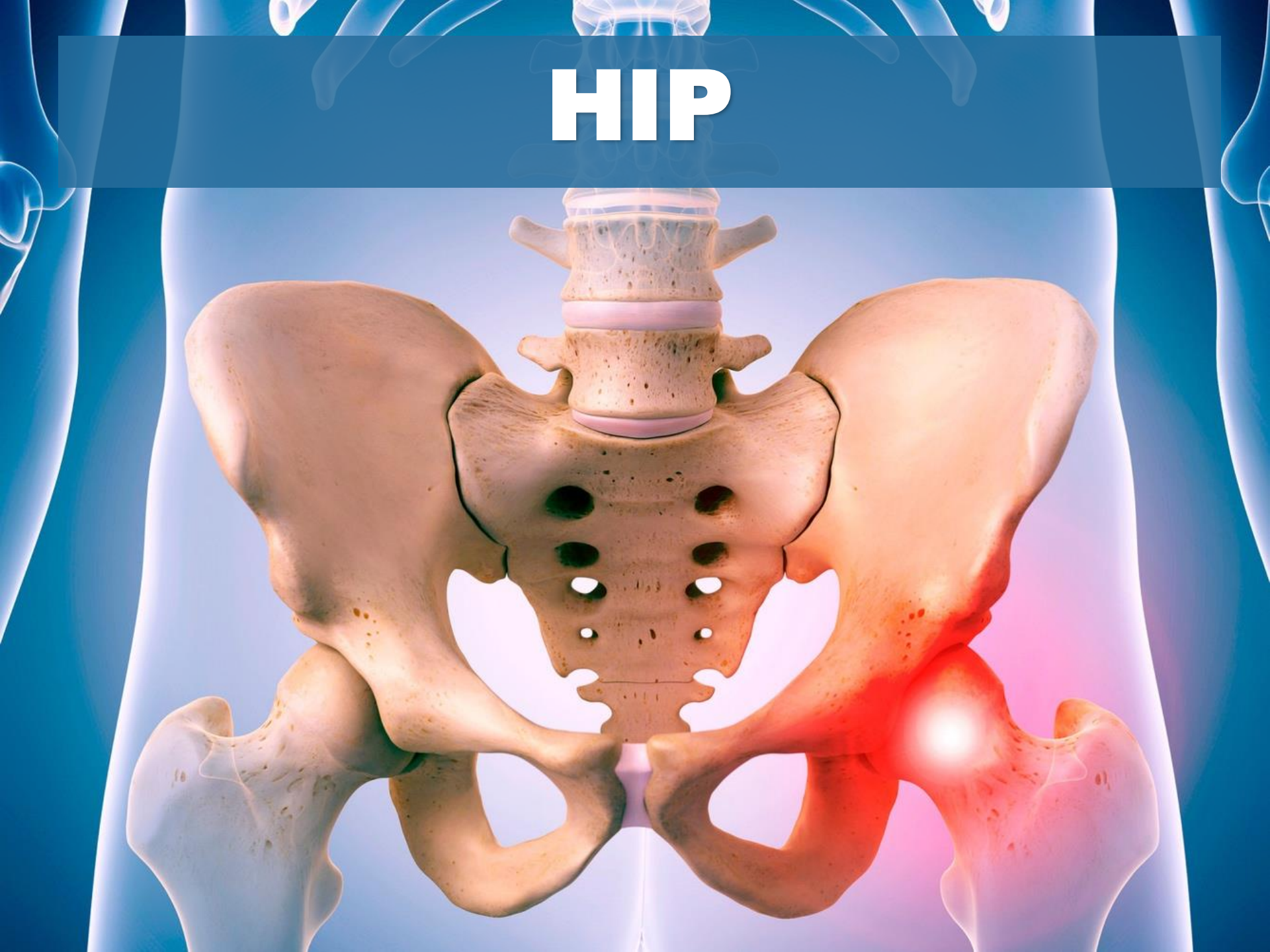
ALL GROUPS RECEIVED EDUCATION

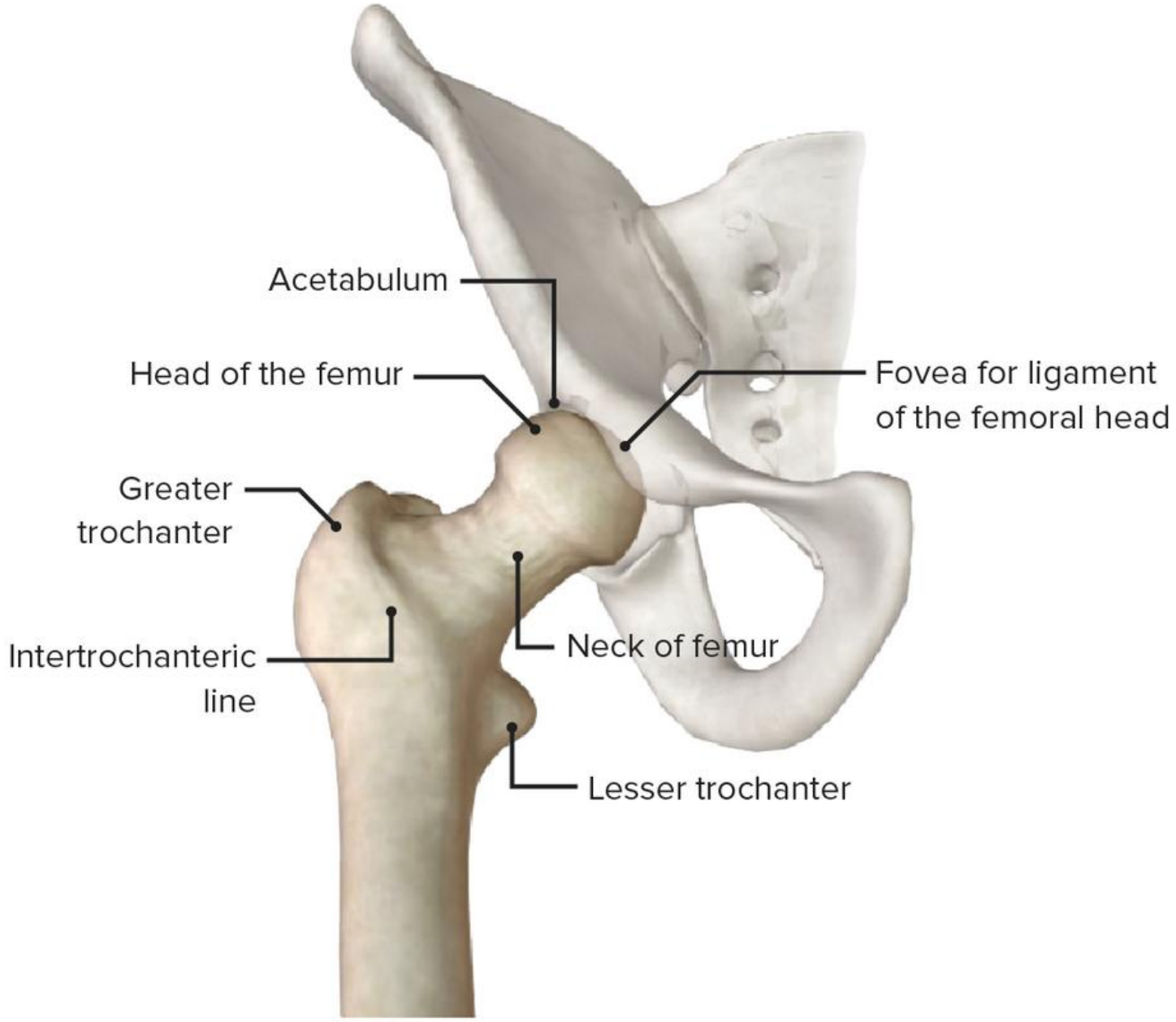
These elements include reassurance and explanations of pain mechanisms, presented in conjunction with thorough patient-centered history and physical examination

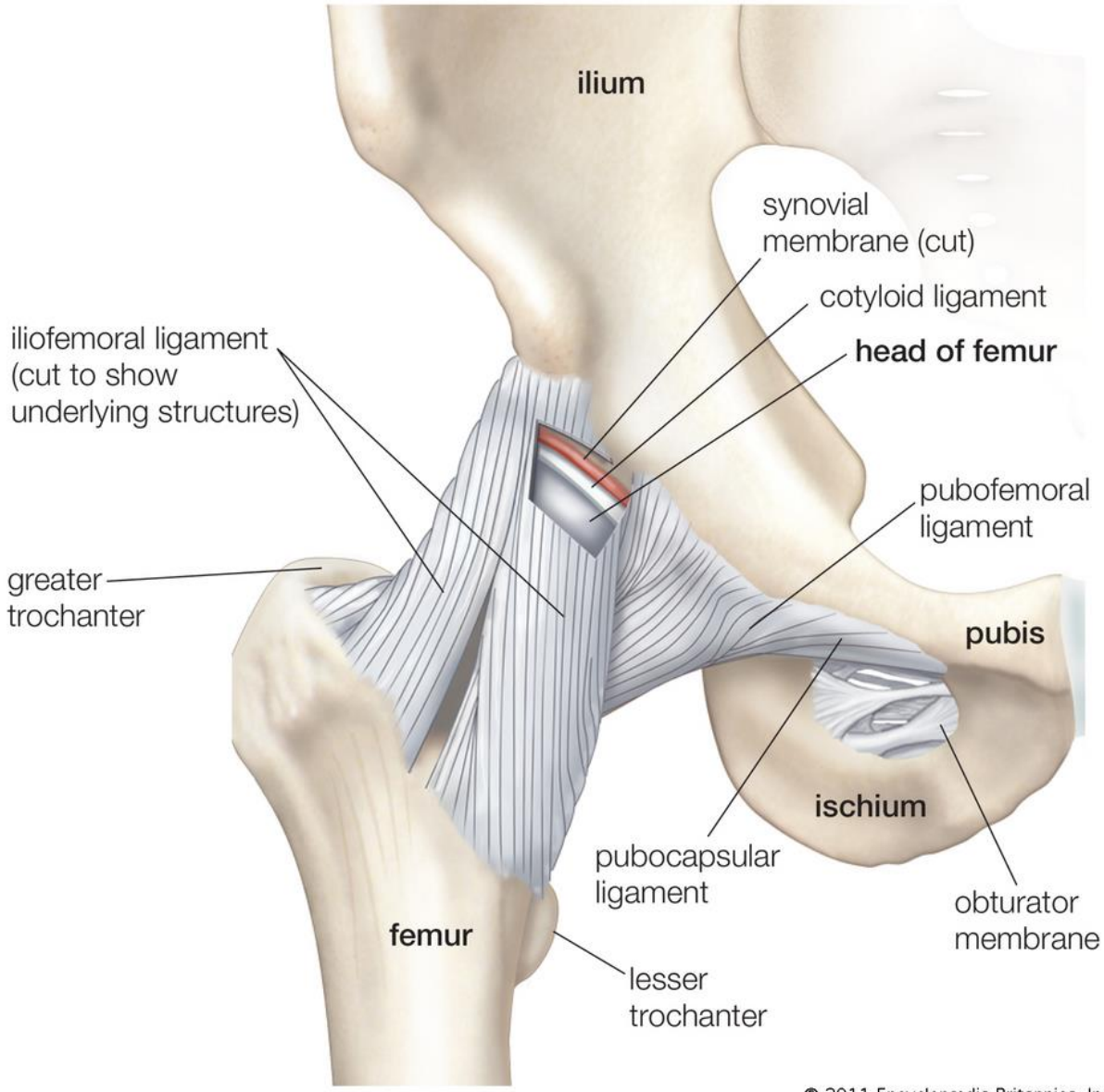
Information focused on the benign nature of PFP as a “loading pain” as opposed to an “injury,” emphasizing that there was no evidence of injury to the structures of the knee.

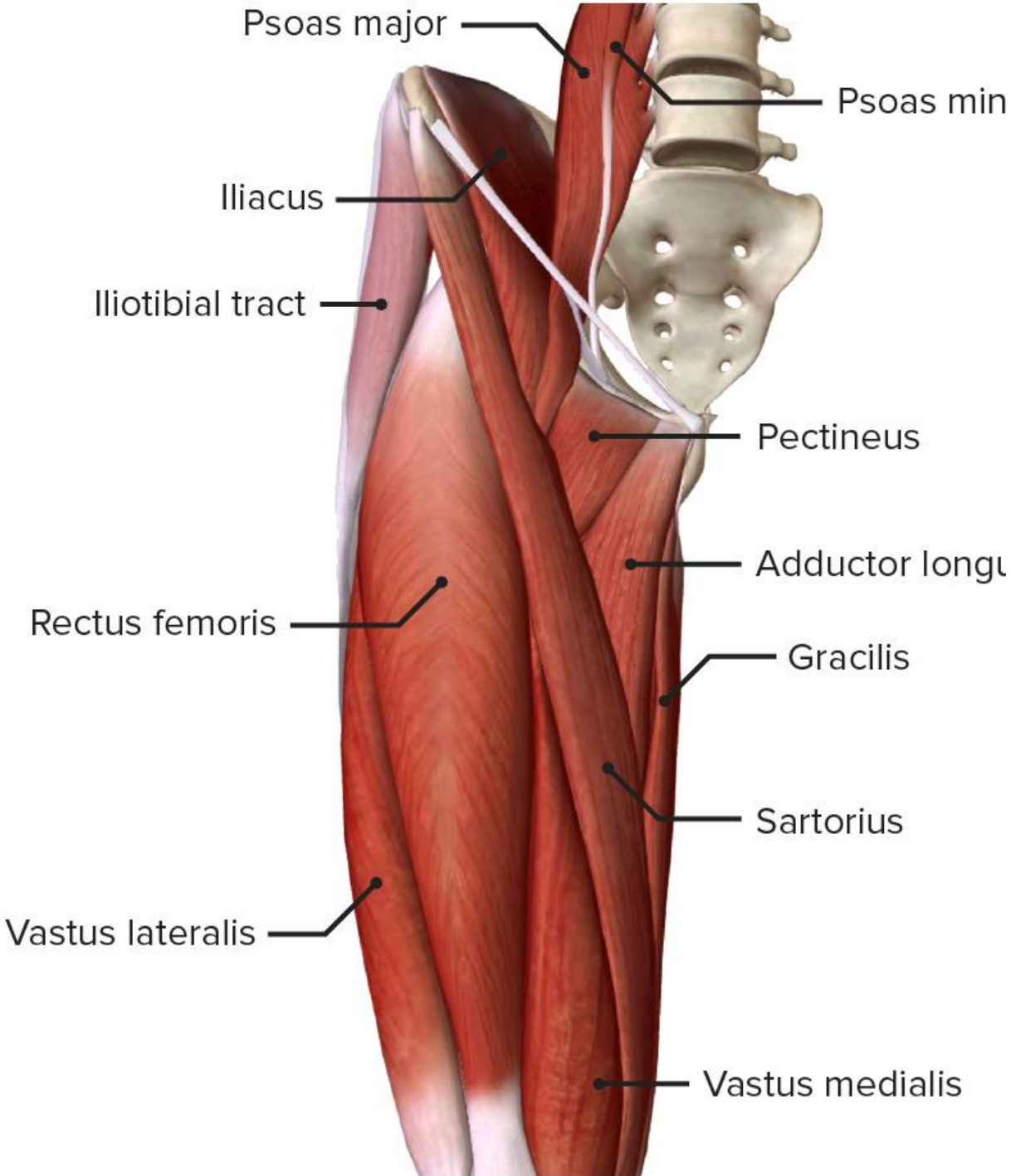
Patients were encouraged to gradually increase physical activity without excessively provoking knee pain.

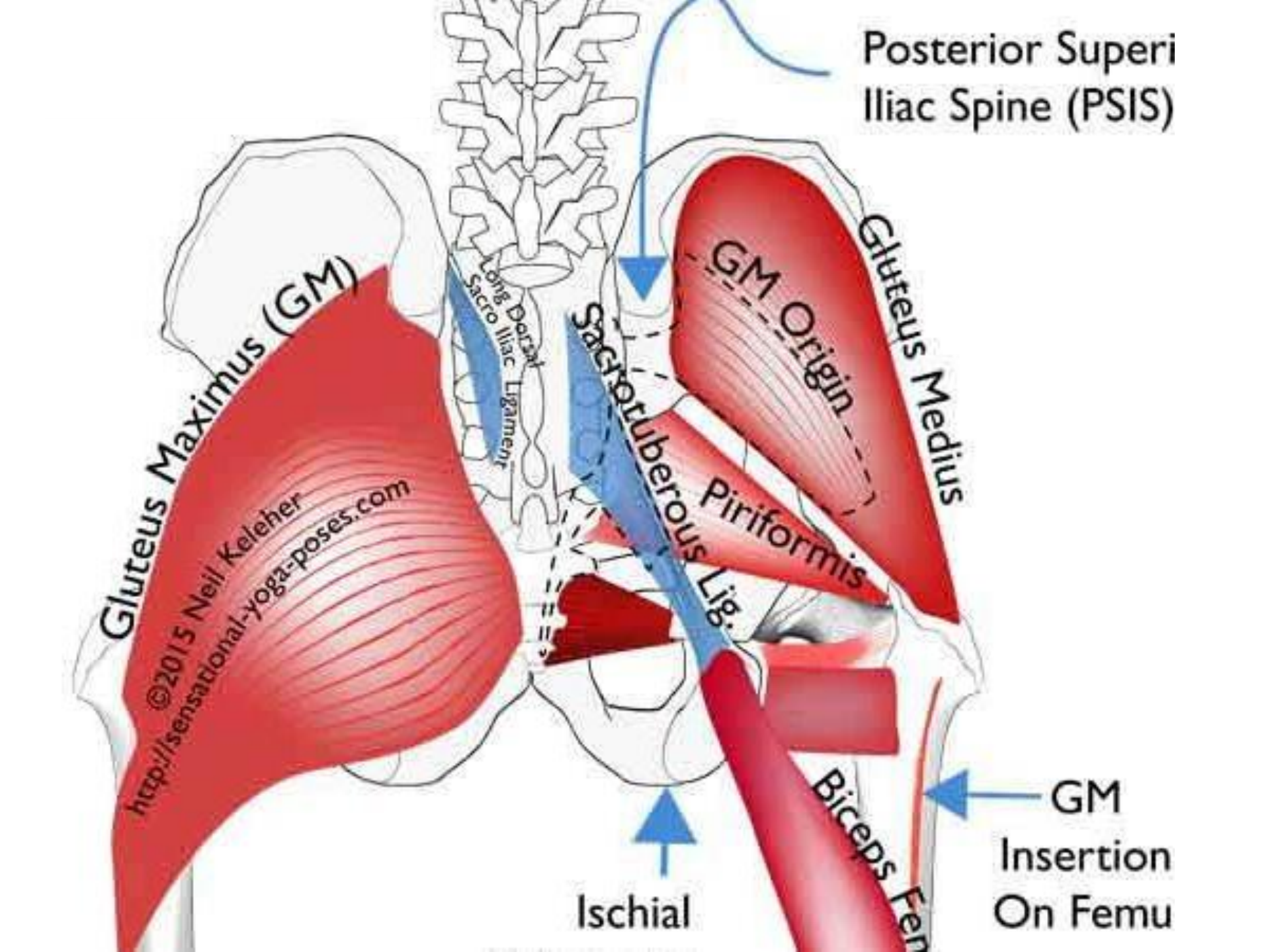
HIP



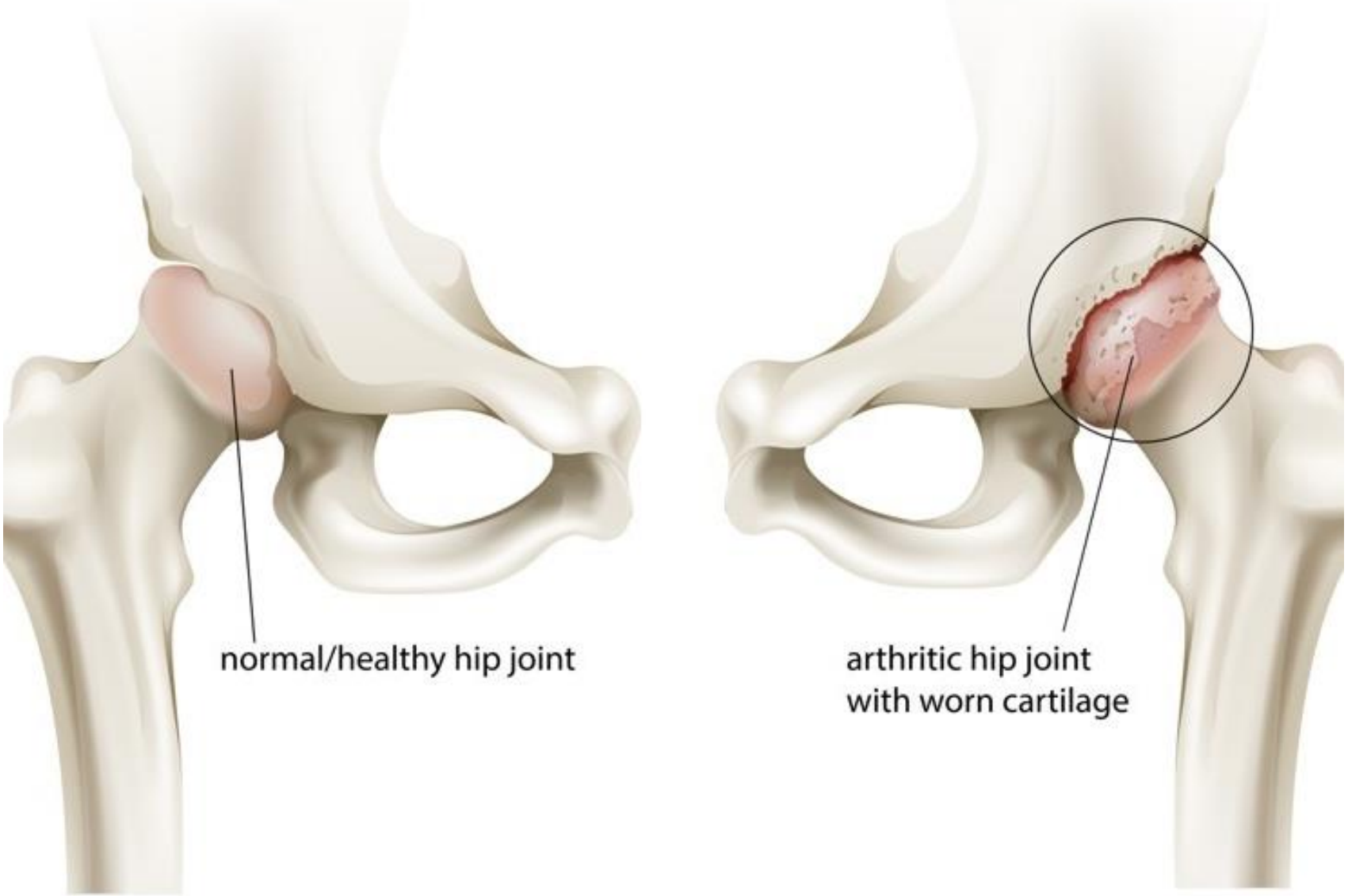

Acetabulum
Head of the femur
Fovea for ligament of the femoral head
Greater trochanter
Intertrochanteric line
Neck of femur
Lesser trochanter




Psoas major
Psoas min
Iliacus
Iliotibial tract
Pectineus
Adductor longu
Rectus femoris
Gracilis
Sartorius
Vastus lateralis
Vastus medialis


Posterior Superi
Iliac Spine (PSIS)
Gluteus Maximus (GM)
Long Dorsal
Sacro Iliac Ligament
Sacrotuberous Lig.
GM Origin
Gluteus Medius
Piriformis
©2015 Neil Keleher
http://sensational-yoga-poses.com
Ischial
GM
Insertion
On Femu

Arthritis of the Hip Joint



Assessment of the degree of pelvic tilt within a normal asymptomatic population Man Ther 2011 Herrington

- 85% of males and 75% of females presented with an anterior pelvic tilt, 6% of males and 7% of females with a posterior tilt and 9% of males and 18% of females presented as neutral

Can you identify an ATP??

- The study found a range of values for the ASIS-PSIS of 0–23 degrees, with a mean of 13 and standard deviation of 5 degrees.
- Asymmetry of pelvic landmarks resulted in side-to-side differences of up to 11 degrees in ASIS-PSIS tilt and 16 millimeters in innominate height.
- These results suggest that variations in pelvic morphology may significantly influence measures of pelvic tilt and innominate rotational asymmetry.

Variation in Pelvic Morphology May Prevent the Identification of Anterior Pelvic Tilt – Preece 2008

LATERAL HIP TENDINOPATHY

WHAT?

- Lateral hip pain over greater trochanter
- Pain with activity on lateral hip

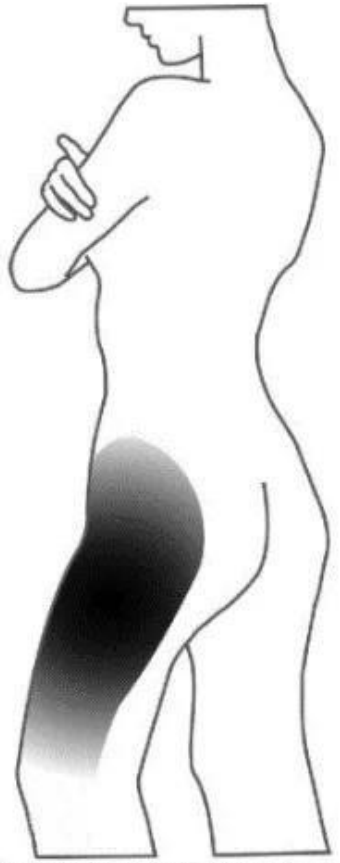
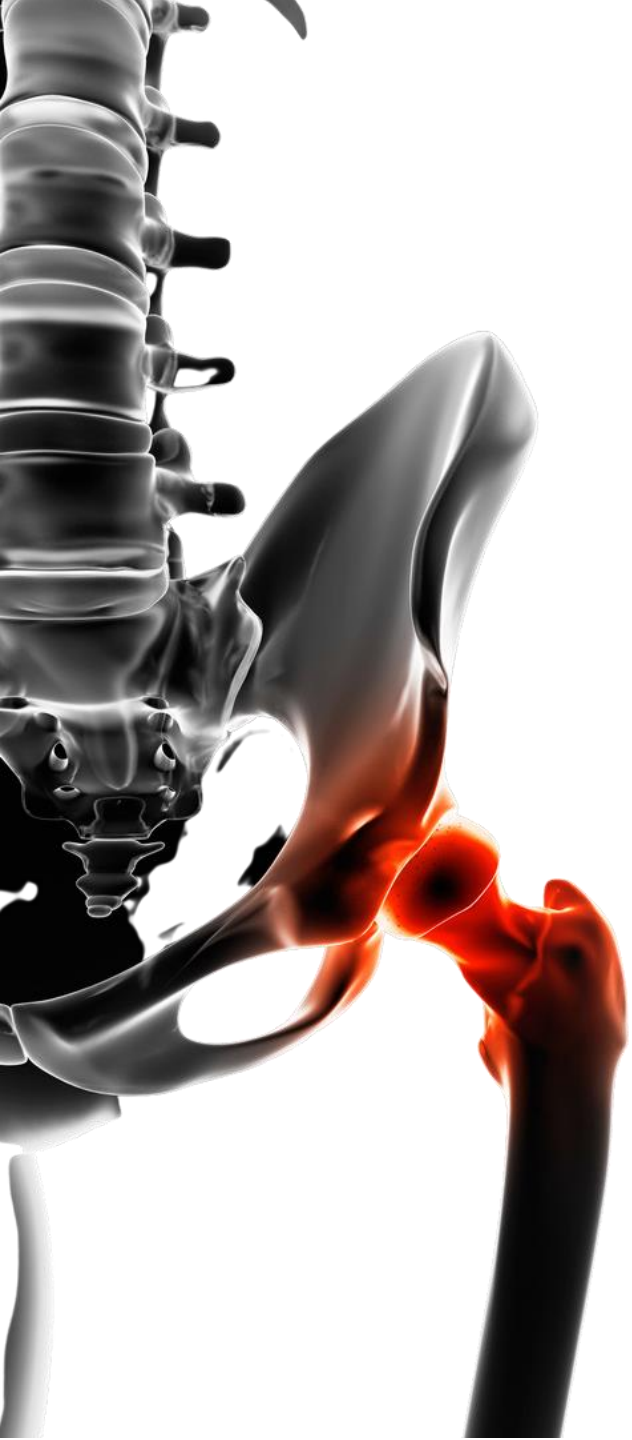


Figure 2. The typical pain referral pattern in greater trochanteric pain syndrome. The most common referral pattern extends from the darkest to the lightest regions. Drawing by Olive Chung.

WHO?

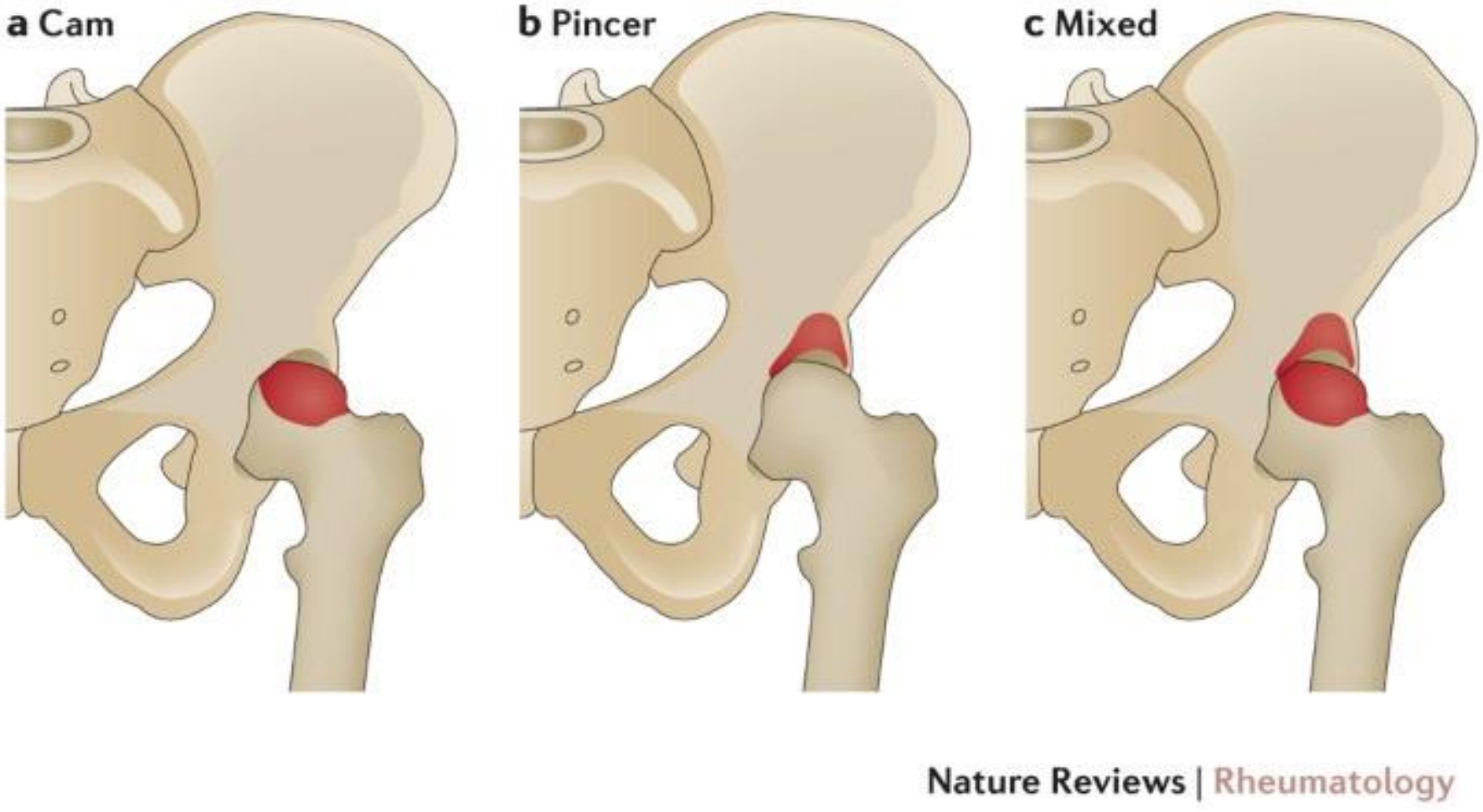
- More women than men
- Over 40
- Runners
- De conditioned



TESTS

- Palpation
- Single leg stance > 30 secs
- Resisted abduction
- Resisted external rotation
- Resisted from EOR

Femoroacetabular impingement

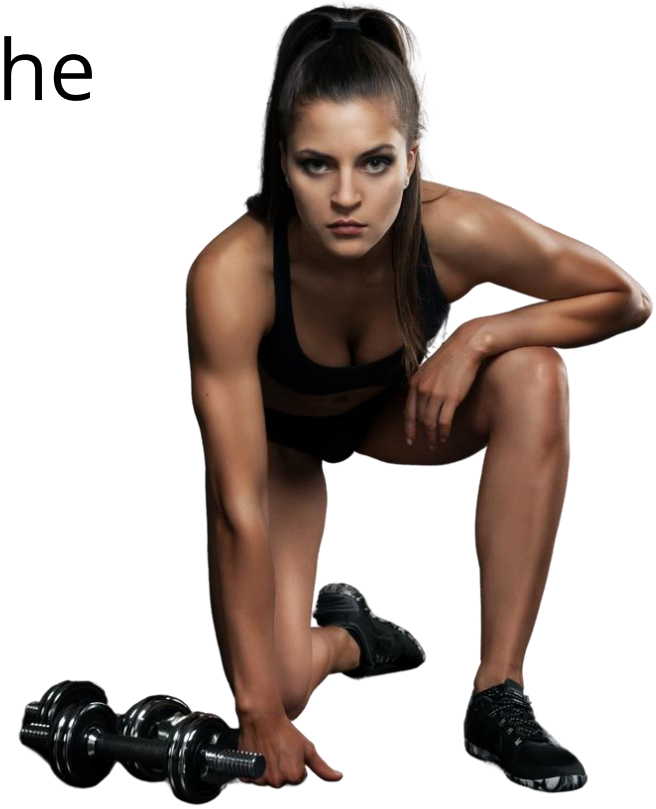


WHAT?

- Moderate to marked hip or groin pain related to certain movements or positions
- Pain reported in the thigh, back or buttock
- Stiffness
- Restricted hip range of motion
- Clicking and/or catching
- Decreased ability to perform activities of daily living and sports.

WHO?

- Healthy, active adults
- Most frequently between the ages of 25 and 50 years



TESTS

- **FADIR** - Flexion, adduction, internal rotation
- **FABER** - Flexion, abduction, external rotation
- 4 point hip scour

OA IS NO1 REASON FOR HIP REPLACEMENTS

- Degenerative joint disease resulting in breakdown of cartilage

OA DIAGNOSIS

1- Recurrent joint pain in the last month.
2- Narrowed joint space around joint margin on the radiographs in standing or load position.
3-Middle-aged and aged patients (40 years old or older).
4-Morning stiffness ≤30min.
5-Palpable bone crepitation on movement of joint.

OA RISK FACTORS

- Lifetime risk of developing =25.3%
- Age - Increases between 50-70
- Ethnicity? Chinese women higher prevalence compared to caucasian

OA RISK FACTORS

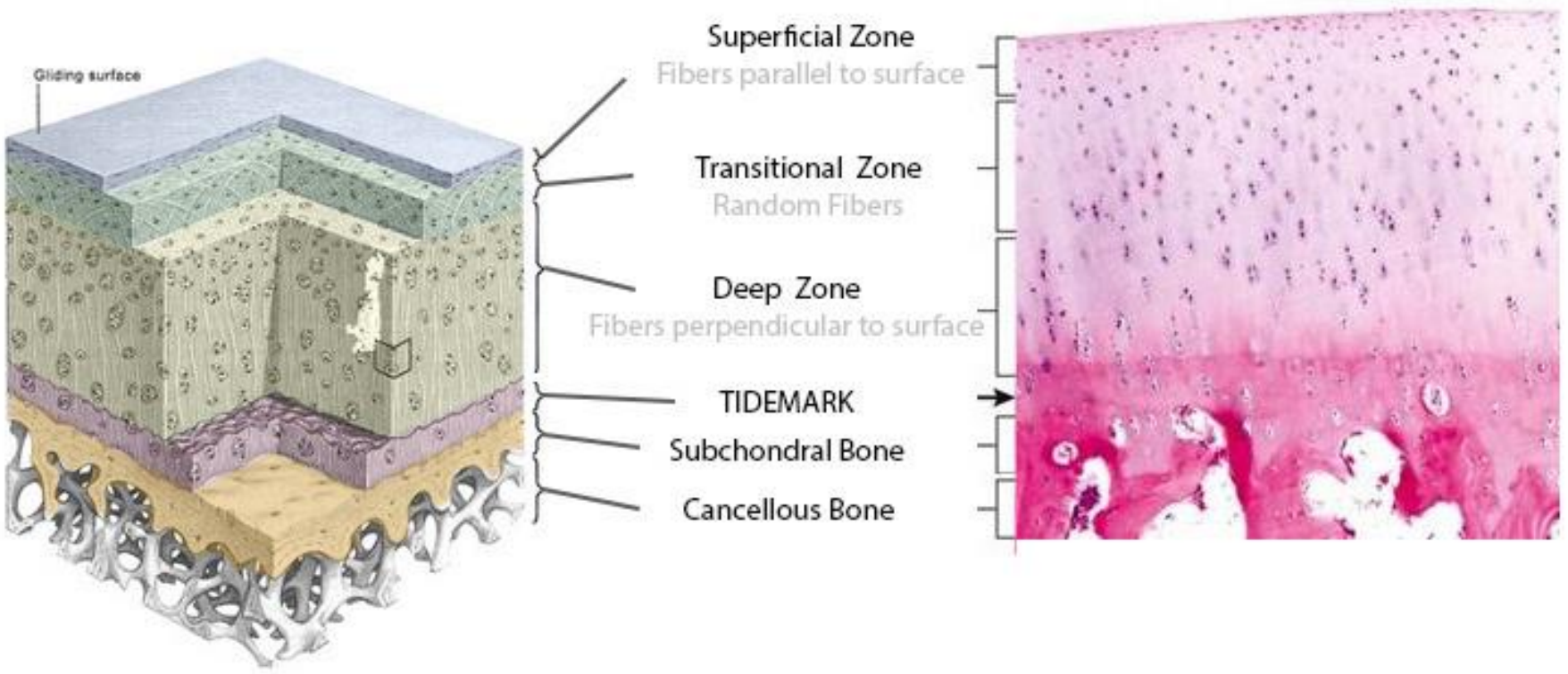
- Sports participation. Elite level sport
- Obesity
- Previous trauma
- Sex - Female
- Genetics - Family history of OA

OVERUSE OR RUST?

- Knee OA prevalence was found to be 16% among the postindustrial sample
- Only 6% and 8% among the early industrial and prehistoric samples

Wallace 2017

CARTILAGE IS 80% WATER!

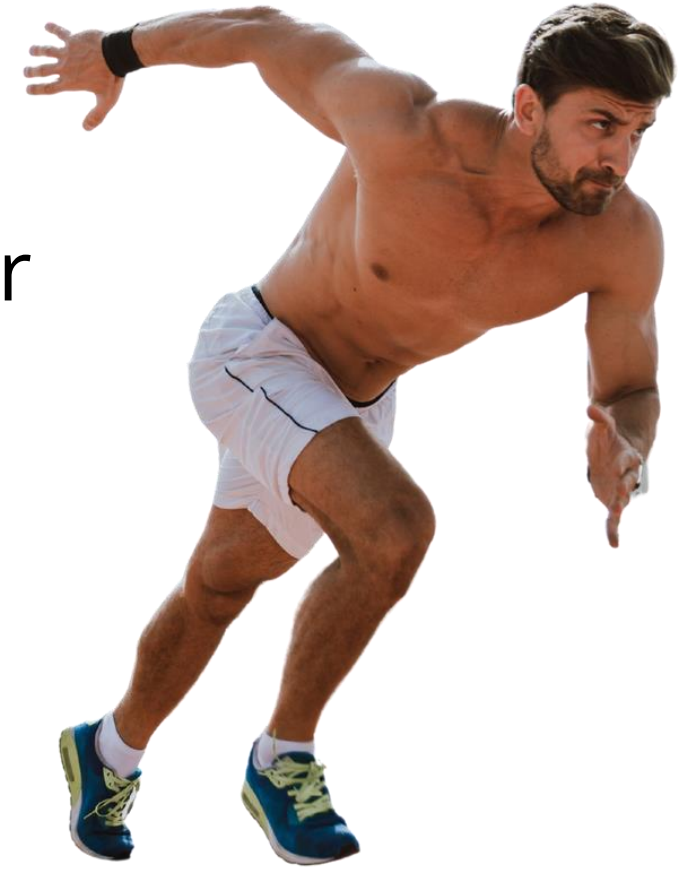


IT ACTS LIKE A SPONGE!

- Lubricates the joint surface
- Cushions against forces
- 7 times slippier than ice!

MOVEMENT HELPS!

- No blood supply
- Movement helps the sponge suck up water



WASTE PRODUCTS

- Movement also helps to get rid of waste products like wringing a sponge out
- Lack of movement may mean our joint health is affected

BELIEFS

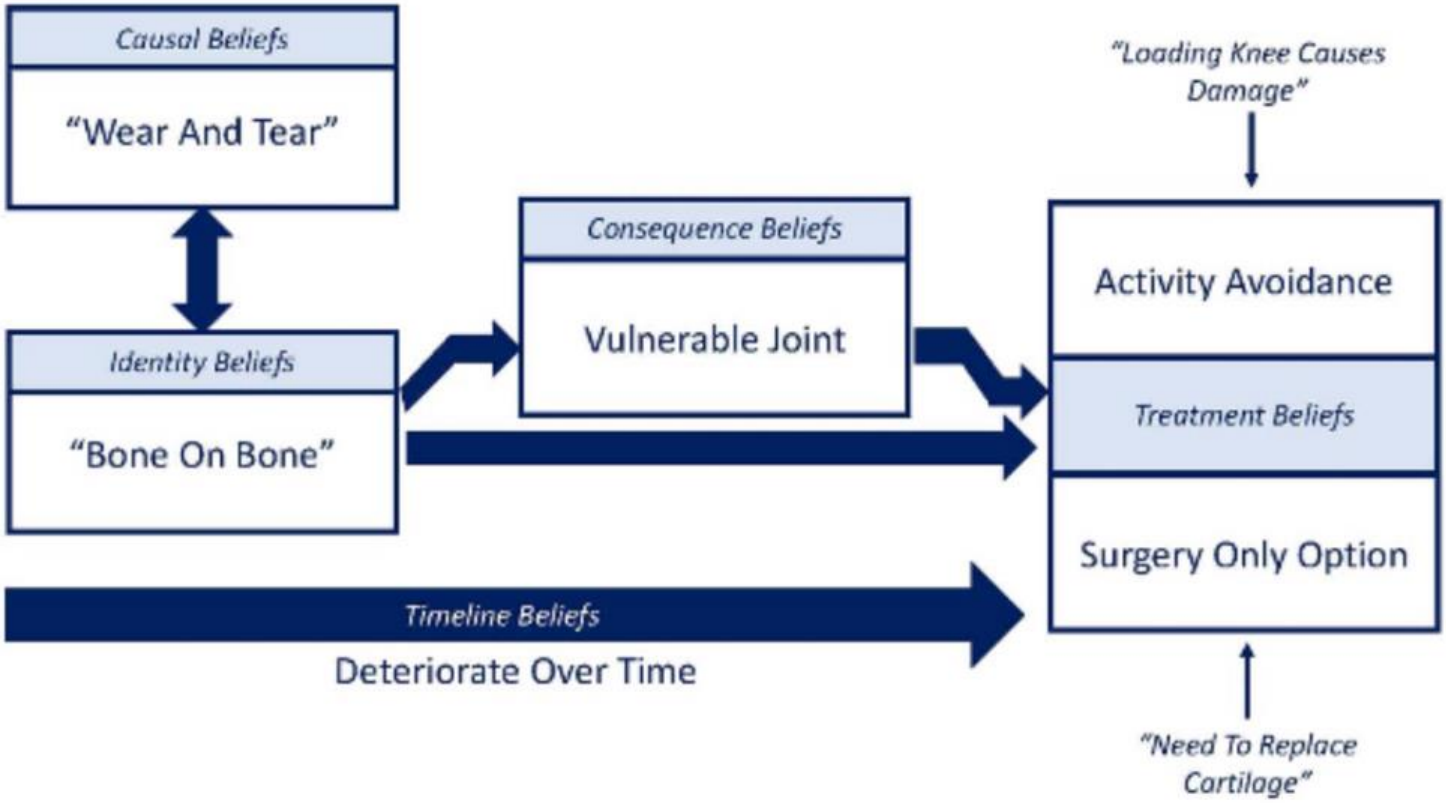


Fig. 1 The beliefs of participants with endstage knee OA are shown.

Misconceptions and the Acceptance of Evidence-based Nonsurgical Interventions for Knee Osteoarthritis. A Qualitative Study - 2019

BELIEFS

- What have they been told?
- Doctors/family/friends/internet
- What are their beliefs about their bodies?
- What they think they should be doing/not doing

RUNNING & OA

- 74,752 runners reported 2004 OA and 259 hip replacements during 7.1-year follow-up
- 14,625 walkers reported 695 OA and 114 hip replacements over 5.7 years20
- Reduced BMI was a factor

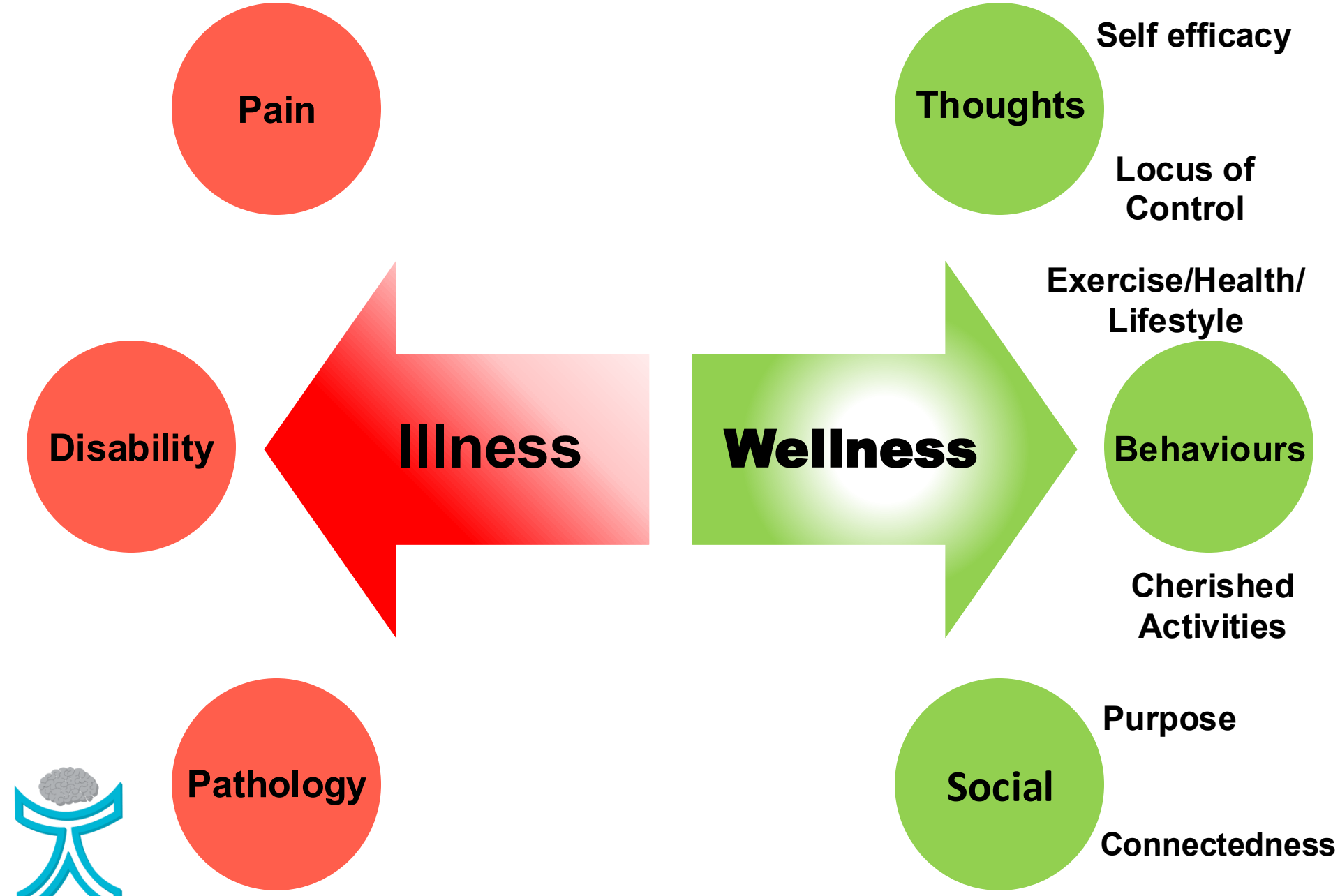
RUNNING & OA

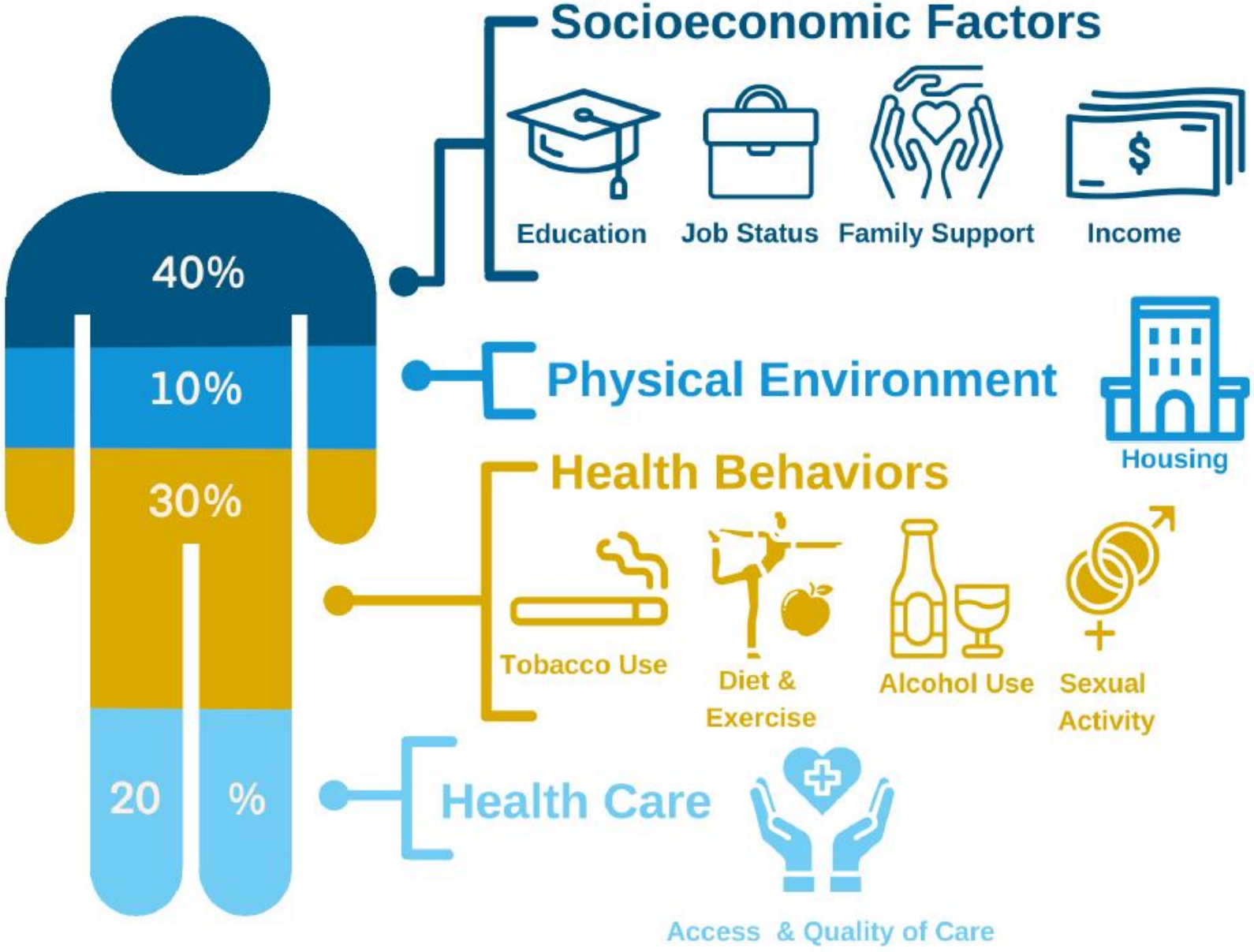
- U.S. marathoners, the arthritis prevalence was 8.8%
- Matched U.S. population at 17.9%
- No significant risks associated with running duration, intensity, mileage, or number of marathons completed

Ponzio 2018

EXERCISE & OA

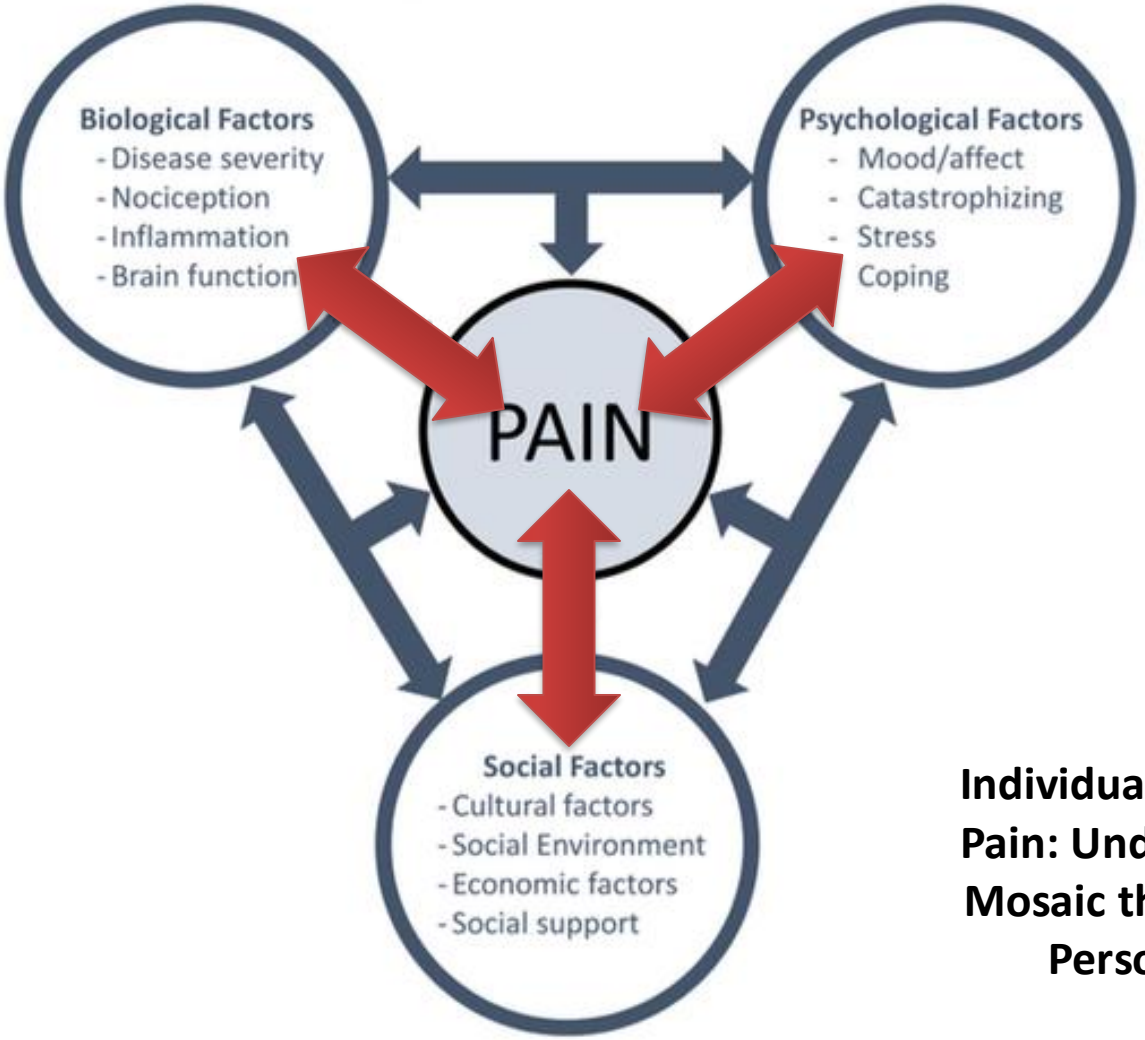
- Key factor in managing OA
- Help clients understand it is safe & advised
- Overcome belief barriers


Pain
Disability
Pathology
Illness
Wellness
Thoughts
Self efficacy
Locus of Control
Exercise/Health/ Lifestyle
Behaviours
Cherished Activities
Social
Purpose
Connectedness
COR-KINETIC
EVOLVING MOVEMENT


40%
10%
30%
20
%
Socioeconomic Factors
Education
Job Status
Family Support
Income
Physical Environment
Housing
Health Behaviors
Tobacco Use
Diet &
Exercise
Alcohol Use
Sexual
Activity
Health Care
Access & Quality of Care

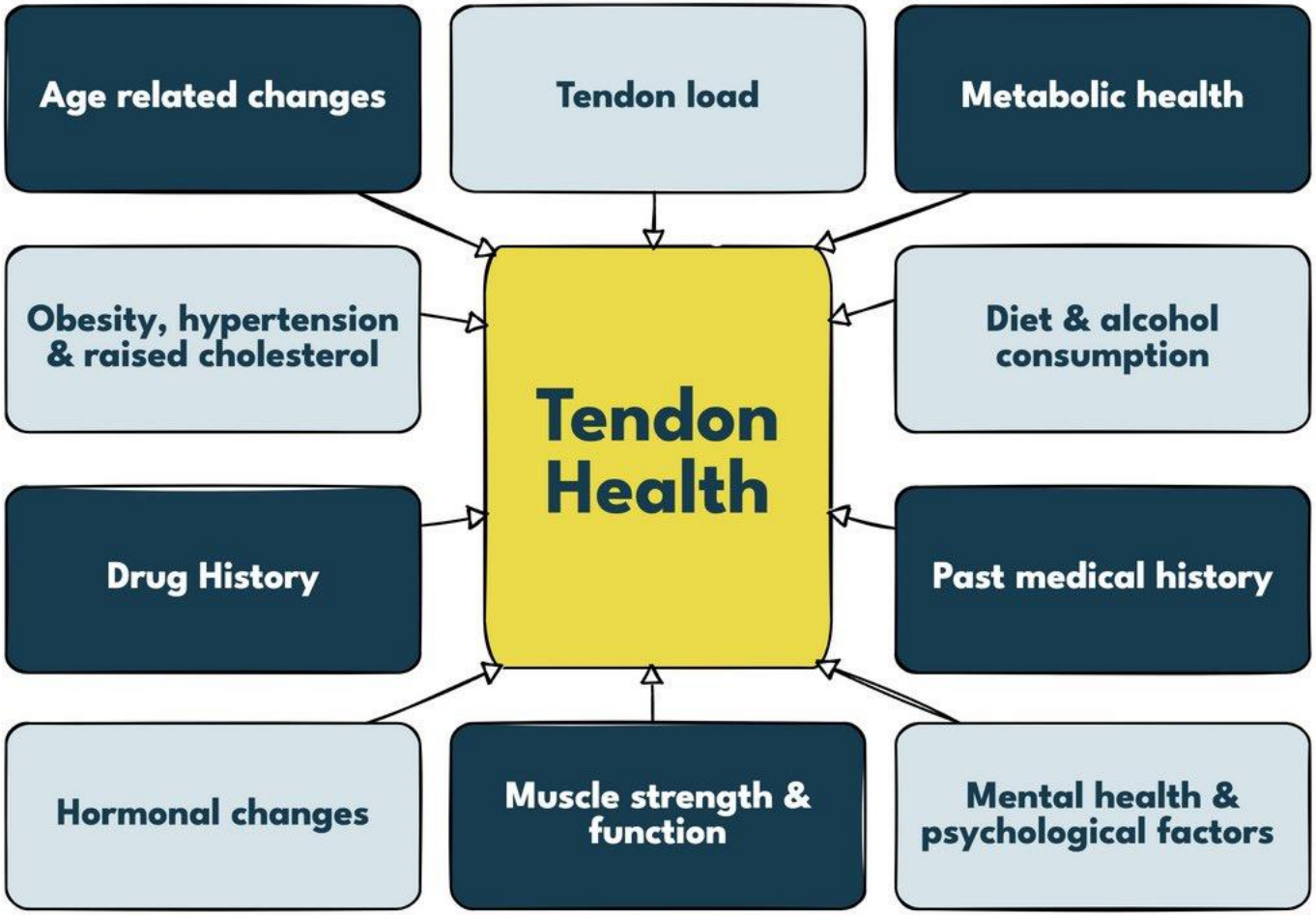
BPS MODEL OF PAIN

Page 18



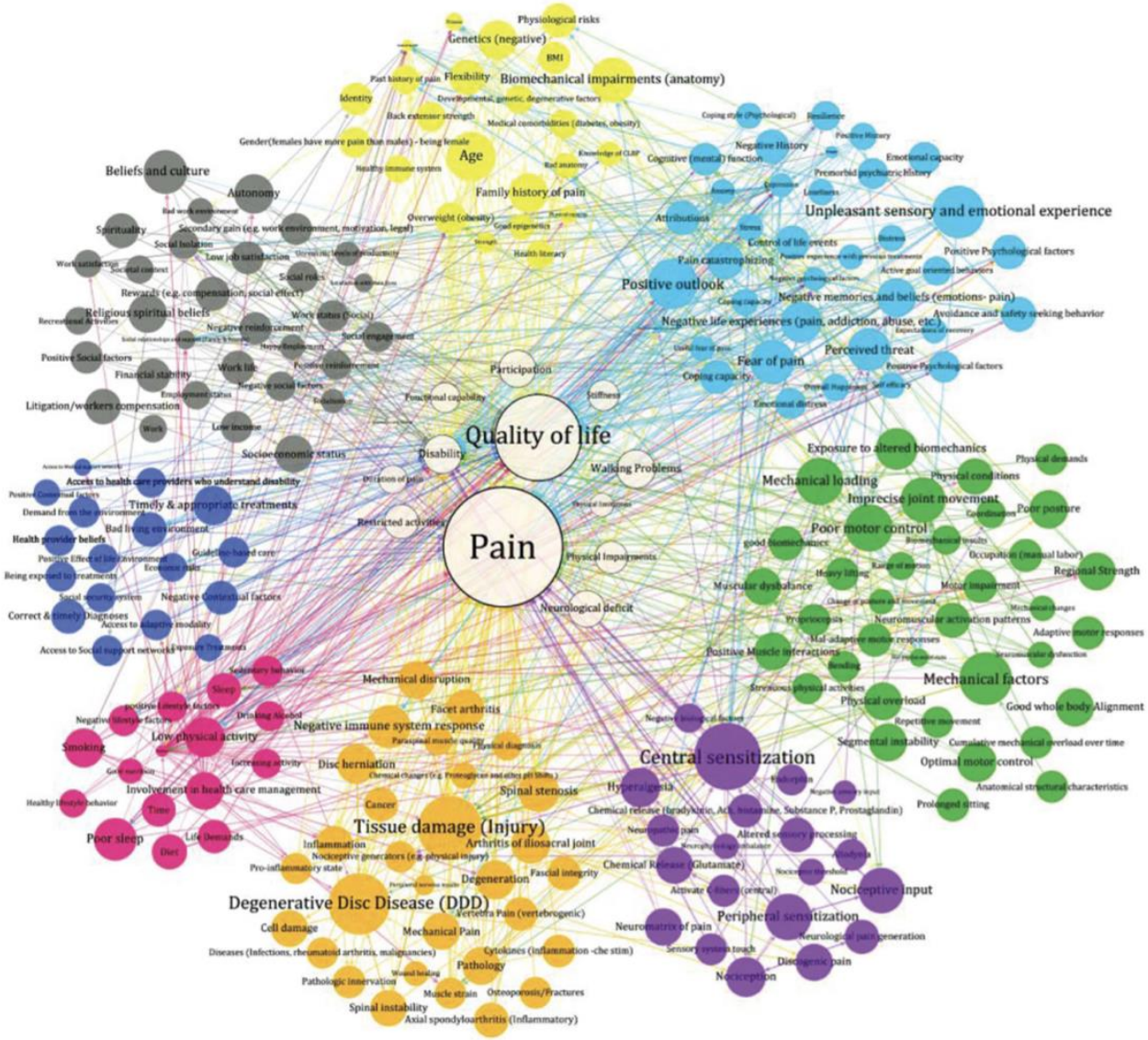
Individual Differences in Pain: Understanding the Mosaic that Makes Pain Personal - 2017

Tendon Health Factors



RUNNINGPHYSIO
BETTER. FASTER. STRONGER

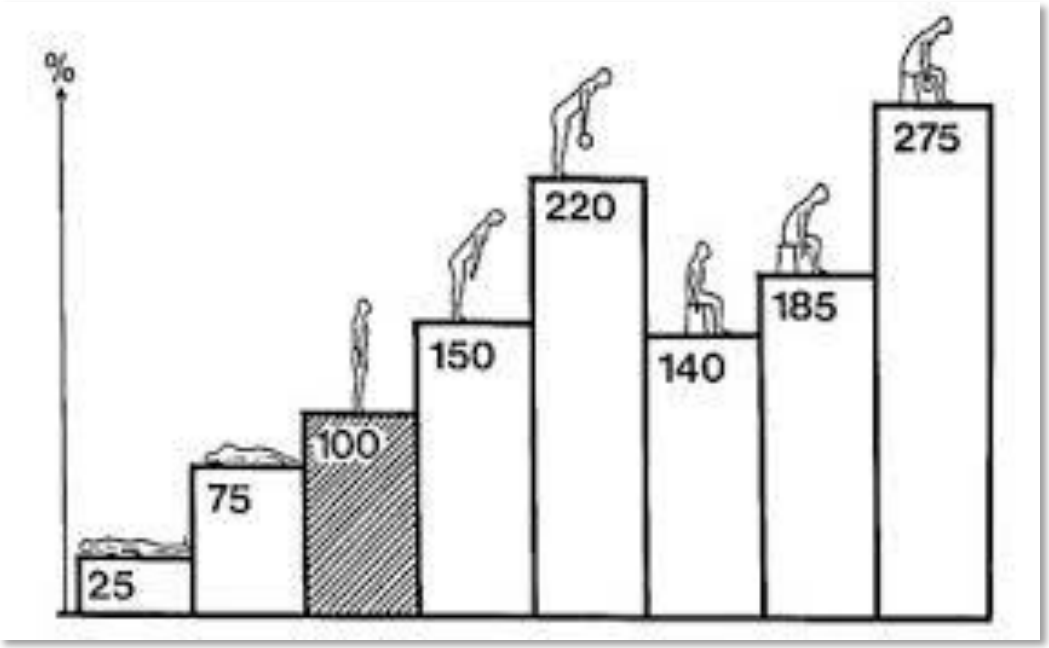

LOW
BACK
PAIN
Making sense of the problem!



Cholewicki
JOSPT 2019

I've been studying back pain for the past 50 yrs, and if anyone says they know where back pain comes from, they're full of shit”

A Nachemson



Rheumatology, 2023, **00**, 1–7
https://doi.org/10.1093/rheumatology/kead587
Advance access publication 8 November 2023
Original Article

British Society for Rheumatology RHEUMATOLOGY OXFORD

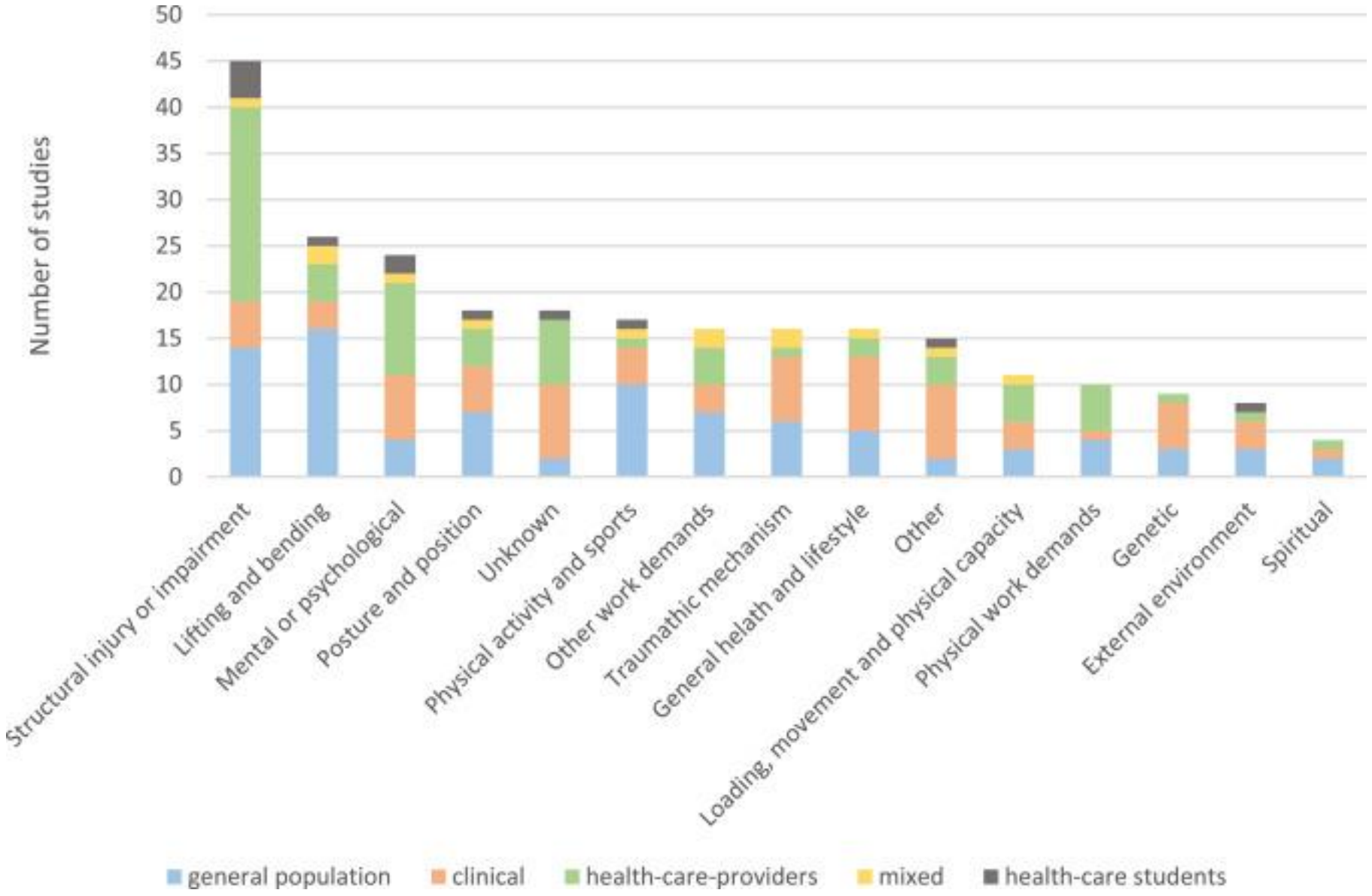
Clinical science

Negative back beliefs are associated with increased odds of low back pain and disability: a 10-year cohort study in men

Mahnuma M. Estee [1], YuanYuan Wang [1], Stephane Heritier[1], Donna M. Urquhart[1], Flavia M. Cicuttini[1], Mark A. Kotowicz[2,3,6], Sharon L. Brennan-Olsen[4,5], Julie A. Pasco[1,2,3,6], Anita E. Wluka [1,*]

In a male community-based population, **negative beliefs** regarding the consequences of LBP were associated with an **increased likelihood of developing high-intensity pain and/or high disability**.

Addressing negative back beliefs in the community may reduce the incidence of high-intensity pain and/or high disability over 10 years in men

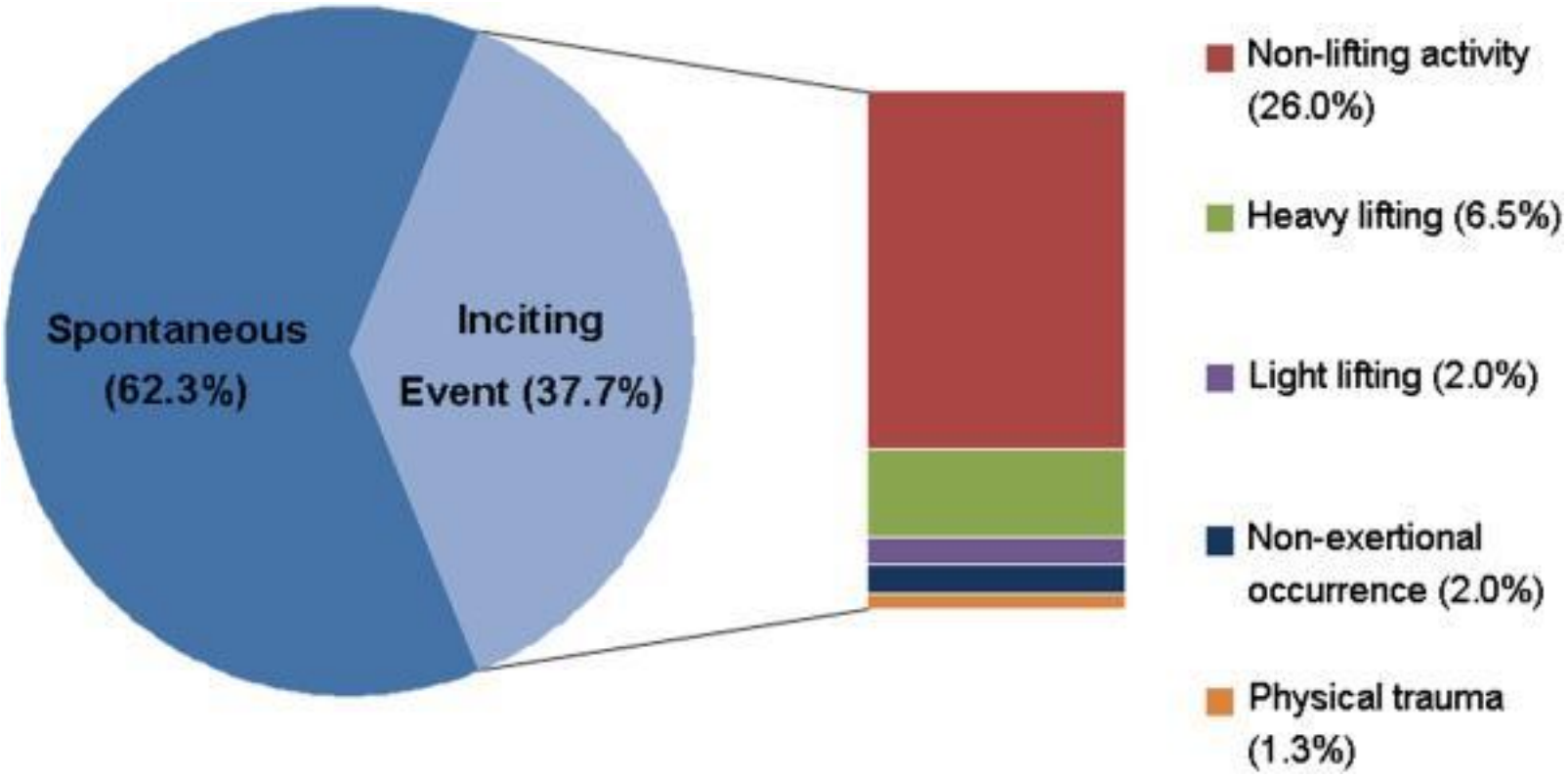


Søren Grøn, What do people believe to be the cause of low back pain? A scoping review 2023

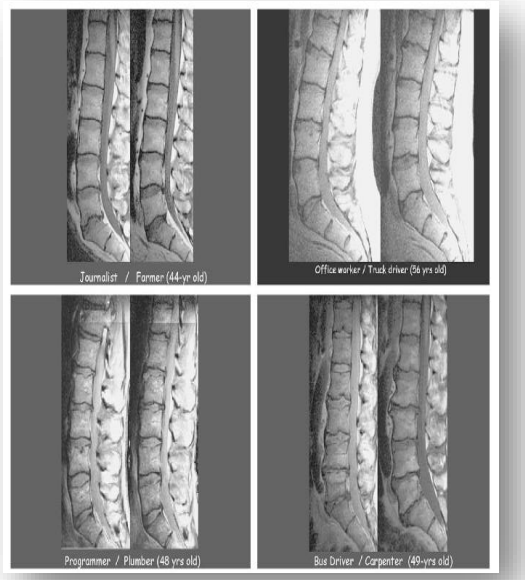
Inciting Events Associated with Lumbar Disk Herniation

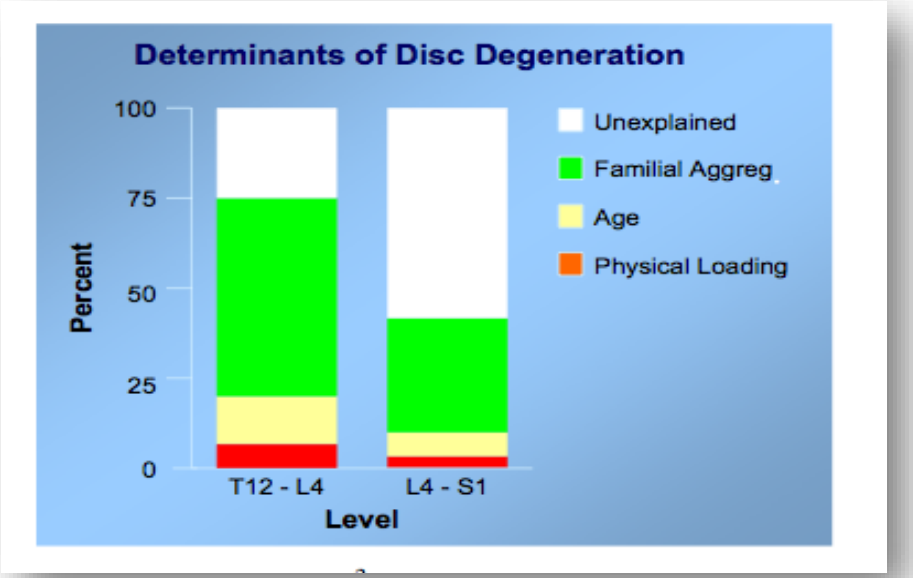
Pradeep Suri, MD,[1,2,3,4] David J Hunter, MBBS, PhD,[1] Cristin Jouve, MD,[2,5] Carol Hartigan, MD,[2,5] Janet Limke, MD,[2,5] Enrique Pena, MD,[5] Bryan Swaim, MS,[1] Ling Li, MPH,[1] and James Rainville, MD[2,5]

▸ Author information ▸ Copyright and License information PMC Disclaimer



The Twin Spine Study: Contributions to a changing view of disc degeneration†





PHYSICAL LOADING explains less than 5% of disc degeneration.

"This raises the question, do some of the particular environmental physical loading exposures serve primarily to exacerbate symptoms rather than cause the underlying pathology?" **Battie 2009**

Article

CLINICAL REHABILITATION

Clinical Rehabilitation
1–12

DOI: 10.1177/0269215514540919
cre.sagepub.com
SAGE

The probability of spontaneous regression of lumbar herniated disc: a systematic review

Chun-Chieh Chiu[1], Tai-Yuan Chuang[2],

The rate of spontaneous regression was found to be:

- 96% for disc sequestration
- 70% for disc extrusion
- 41% for disc protrusion
- 13% for disc bulging.

The rate of complete resolution of disc herniation was 43% for sequestrated discs and 15% for extruded discs

Timeframes of studies generally between 3 months to 1 year

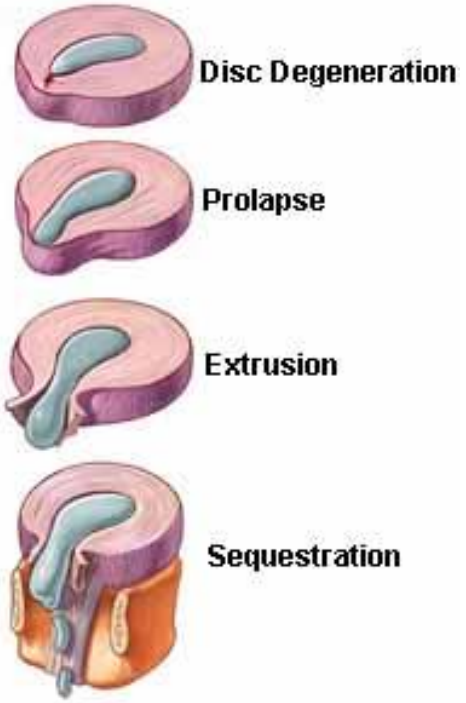


Table 2. Physical Activities, Stress, and Depression: Risk of Flare-ups During An Acute Low Back Pain Episode*

	n (%) of control periods (n=247)	n (%) of flare periods (n=81)	Odds ratios (95% CI)
Physical Activities			
Lifting a heavy object (≥35 lbs.)			
Any heavy lifting (1 or more times)	30 (12.2%)	5 (6.2%)	0.6 (0.2-2.3)
Repeated heavy lifting (>5 times)	11 (4.5%)	3 (3.7%)	0.9 (0.2-4.3)
Running or jogging	13 (5.3%)	3 (3.6%)	0.2 (0.02-1.3)
Non-contact sports (tennis, swimming, cycling, etc.)	23 (9.3%)	3 (3.7%)	0.4 (0.1-1.6)
Prolonged sitting (> 6 hours)	38 (15.4%)	28 (34.6%)	**4.4 (2.0-9.7)**
Prolonged standing (>6 hours)	10 (4.1%)	6 (7.4%)	1.6 (0.2-17)
Physical therapy for back pain	39 (15.8%)	10 (12.3%)	0.4 (0.2-1.1)
Stress and Depression			
Stressful event	14 (5.7%)	11 (13.6%)	1.9 (0.7-5.3)
Depressed mood	3 (1.2%)	6 (7.4%)	1.2 (0.4-3.7)
Stress or depression	15 (6.1%)	14 (17.3%)	**2.5 (1.0-6.0)**

*contact sport and physical trauma exposures were not analyzed due to cell counts of 0
CI=confidence interval; odds ratios **in bold** indicate statistically significant associations with 95% CI excluding unity (prior to roundingof decimal places)

Suri 2018

- Major global problem
- Complex condition with multiple contributors
- Tissue source is often difficult to identify

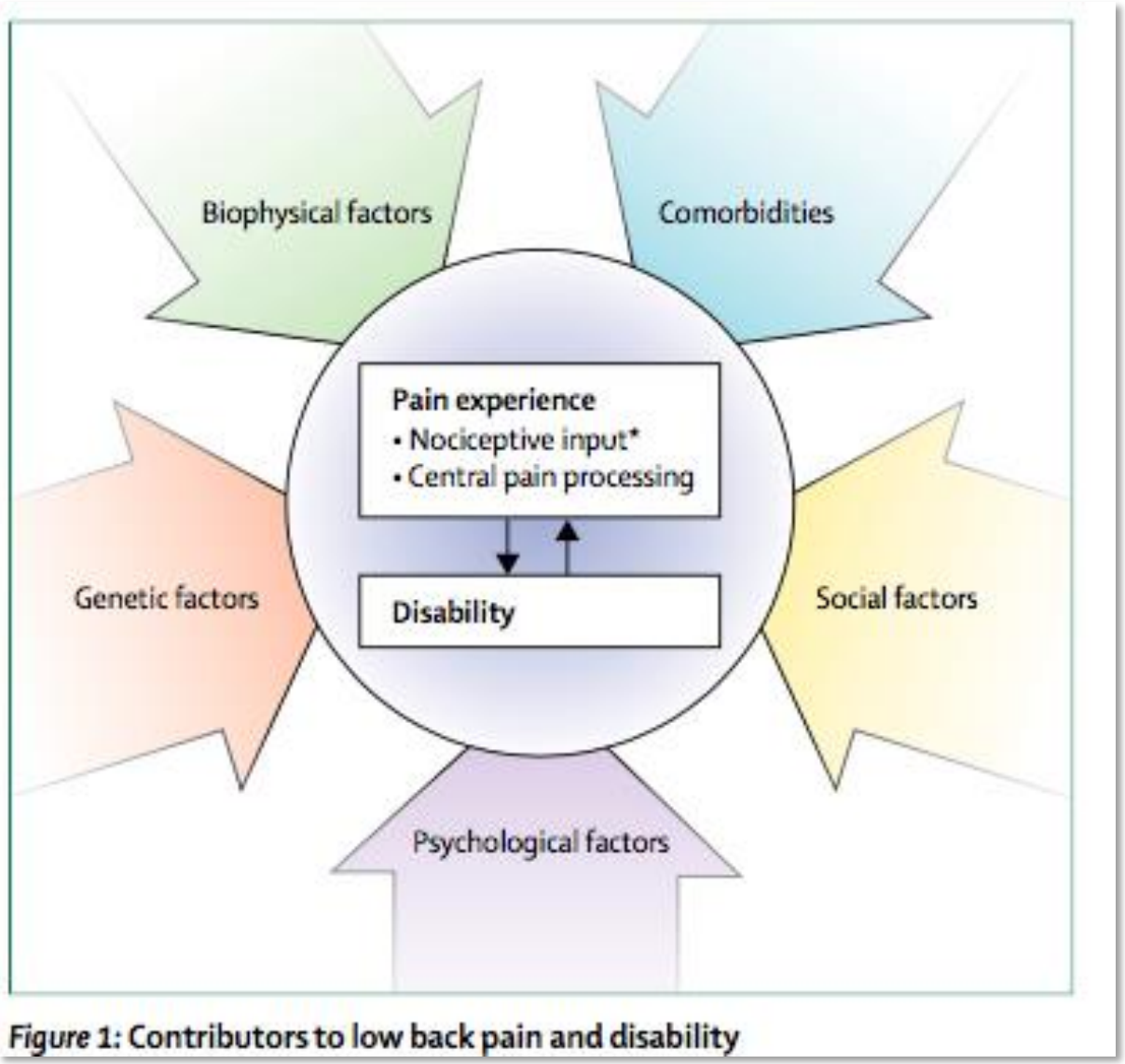


Figure 1: Contributors to low back pain and disability

Hartvigsen 2018

	Outcomes (predictor scale: association with low back pain disability)
Symptom-related factors	
Previous episodes	Chronic disabling pain* at 3–6 months; more *vs* less episodes: median LR 1·0 (range 0·9–1·2); chronic disabling pain* at 12 months; more *vs* less episodes: median LR 1·1 (range 0·95–1·2)
Back pain intensity	Chronic disabling pain* at 3–6 months; high intensity pain *vs* non-high: median LR 1·7 (range 1·1–3·7); chronic disabling pain* at 12 months; high intensity pain *vs* non-high: median LR 1·3 (range 1·2–2·0)
Presence of leg pain	Chronic disabling pain* at 3–6 months; leg pain or radiculopathy *vs* no leg pain: median LR 1·4 (range 1·1–1·7); chronic disabling pain* at 12 months; leg pain or radiculopathy *vs* no leg pain: median LR 1·4 (range 1·2–2·4)
Lifestyle factors	
Body mass	Chronic disabling pain* at 3–6 months; BMI >25 or >27 *vs* lower BMI: median LR 0·91 (range 0·72–1·2); chronic disabling pain* at 12 months; BMI >25 or >27 *vs* lower BMI: median LR 0·84 (range 0·73–0·97)
Smoking	Chronic disabling pain* at 3–6 months; current smoker *vs* not: median LR 1·2 (range 1·0–1·6)
Physical activity	Disability 1–5 years; significant association in one of five studies (no effect size reported)
Psychological factors	
Depression	Mixed outcomes; significant associations with poor outcome in eight of 13 cohorts; OR (range) 1·04–2·47
Catastrophising	Disability at 3–12 months; significant association in nine of 13 studies; high catastrophising: OR 1·56 (95% CI 1·05–2·33); 0–6 scale: 7·63 (3·70–15·74); 0–52 scale: 1·05 (1·02–1·08); contribution to explained variance: 0–23%
Fear avoidance beliefs	Pain or activity limitation at 3–12 months; no pooled estimates; no systematic association between fear avoidance and outcome; poor work-related outcome at 3–12 months; elevated fear avoidance: OR (range) 1·05 (95% CI 1·02–1·09) to 4·64 (1·57–13·71; from four studies done by disability insurance companies); chronic disabling pain* at 3–6 months; high *vs* no fear avoidance: median LR 2·2 (range 1·5–4·9); chronic disabling pain* at 12 months; median LR 2·5 (range 2·2–2·8)
Social factors	
Physical work loads	Chronic disabling pain* at 3–6 months; higher *vs* lower physical work demands: median LR 1·2 (range 1·1–1·6); chronic disabling pain* at 12 months; higher *vs* lower physical work demands: median LR 1·4 (range 1·2–1·7)
Education	Chronic disabling pain* at 3–6 months; no college education or not college graduate *vs* more education: median LR 1·0 (range 0·97–1·3); chronic disabling pain* at 12 months; no college education or not college graduate *vs* more education: median LR 1·1 (range 1·1 –1·2)
Compensation	Chronic disabling pain* at 3–6 months; compensated work injury or sick leave *vs* not compensated work injury or sick leave: median LR 1·3 (range 0·97–2·7); chronic disabling pain* at 12 months; compensated work injury or sick leave *vs* not compensated work injury or sick leave: median LR 1·4 (range 1·2–1·8)
Work satisfaction	Chronic disabling pain* at 3–6 months; less *vs* more work satisfaction: median LR 1·1 (range 0·64–1·8); chronic disabling pain* at 12 months; less *vs* more work satisfaction: median LR 1·5 (range 1·3 –1·8)

RESEARCH REPORT

Does the Number of Comorbidities Predict Pain and Disability in Older Adults With Chronic Low Back Pain? A Longitudinal Study With 6- and 12-Month Follow-ups

Lemes, Ítalo R. PT, PhD[1,2]; Morelhão, Priscila K. PT, PhD[1,3]; Verhagen, Arianne PT, PhD[4]; Gobbi, Cynthia PT, PhD[5]; Oliveira, Crystian B. PT, PhD[6]; Silva, Nayara S. PT, MSc[1]; Lustosa, Lygia P. PT, PhD[1,†]; Franco, Márcia R. PT, PhD[7]; Pinto, Rafael Z. PT, PhD[2]

The number of comorbidities at baseline predicted pain and disability at 6-month and 12-month follow-ups in older adults with chronic LBP. These results highlight the role of comorbidities as a predictive factor of pain and disability in patients with chronic LBP

RESEARCH ARTICLE Open Access

What is the association between the presence of comorbidities and the appropriateness of care for low back pain?

Top ten Conditions on the CareTrack list	Self-report	
	Number of LBP patients with condition	Percentage of LBP patients with condition
Hypertension	67	40.9
Osteoarthritis	50	30.5
Hyperlipidaemia	66	40.2
Dyspepsia	42	25.6
Depression	36	22.0
Osteoporosis	25	15.2
Coronary Artery Disease	16	9.8
Diabetes	20	12.2
Asthma	23	14
Obesity ([a])		
Atrial Fibrillation	13	7.9

› Pain. 2009 May;143(1-2):21-5. doi: 10.1016/j.pain.2008.12.033. Epub 2009 Feb 12.

Physical activity and low back pain: a U-shaped relation?

Hans Heneweer [1], Luc Vanhees, H Susan J Picavet

- Being physically active is often suggested to be important in the prevention and management of low back pain. This simple view does not take into account that the relation between the level of activity and back pain may be a U-shaped curve - i.e. both inactivity and excessive activities present an increased risk

- A moderate increased risk for CLBP was found for both participants with a sedentary lifestyle and for those being involved in physical strenuous activities

European Spine Journal
https://doi.org/10.1007/s00586-024-08154-4

ORIGINAL ARTICLE

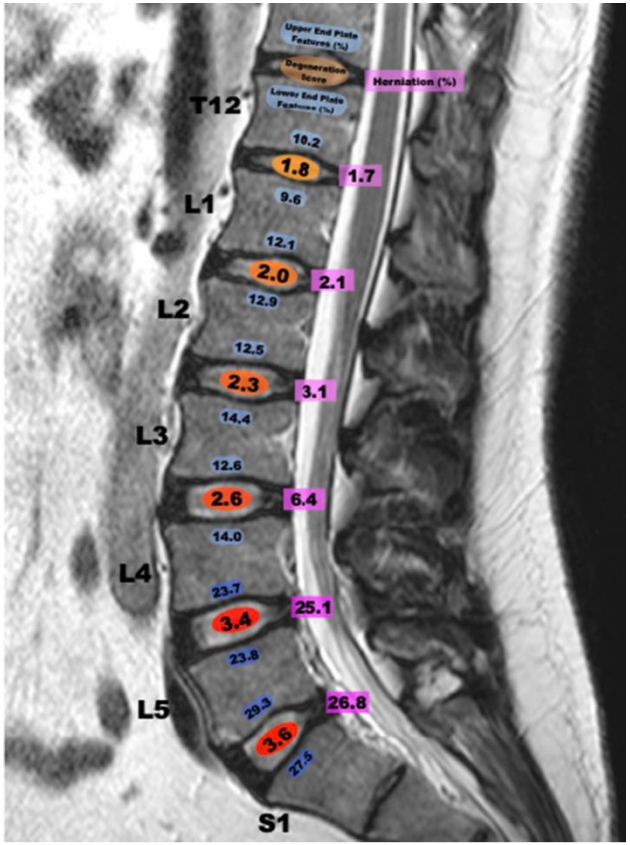
Check for updates

Obesity increases the odds of intervertebral disc herniation and spinal stenosis; an MRI study of 1634 low back pain patients

Anand H. Segar[1,2,3] · Alice Baroncini[4] · Jocelyn P. G. Urban[3] · Jeremy Fairbank[1,2] · Andrew Judge[5,6] · Iain McCall[7]

From this analysis, BMI is an important predictor of spinal stenosis and disc herniation.

For disc degeneration, age was the most important factor and although increasing BMI was associated with greater DD, this is unlikely to be clinically relevant.



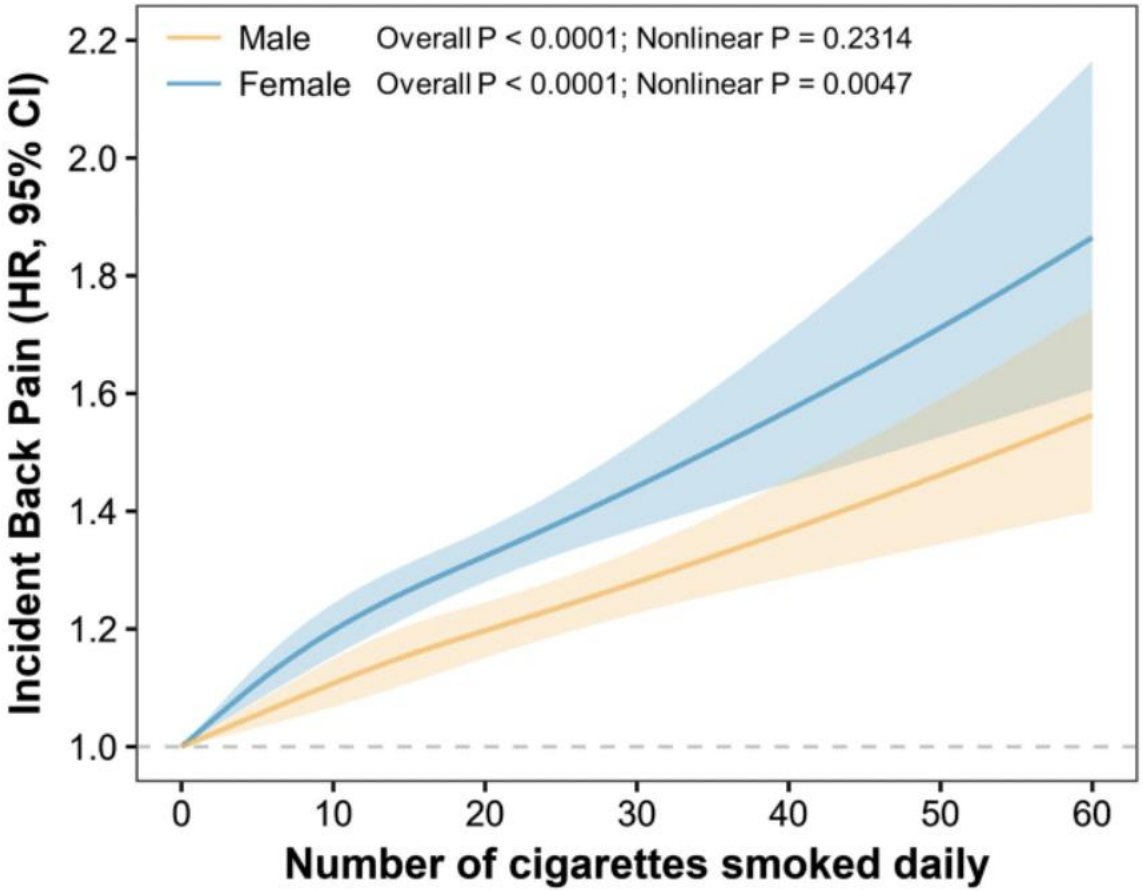
MRI-derived abdominal adipose tissue is associated with multisite and widespread chronic pain

Zemene Demelash Kifle ,[1] Jing Tian,[1] Dawn Aitken,[1] Phillip E Melton,[1,2]
Flavia Cicuttini,[3] Graeme Jones,[1] Feng Pan[1]

Abdominal adipose tissue was associated with chronic musculoskeletal pain, suggesting that excessive and ectopic fat depositions may be involved in the pathogenesis of multisite and widespread chronic musculoskeletal pain. The identified stronger effects in women than men may reflect sex differences in fat distribution and hormones.

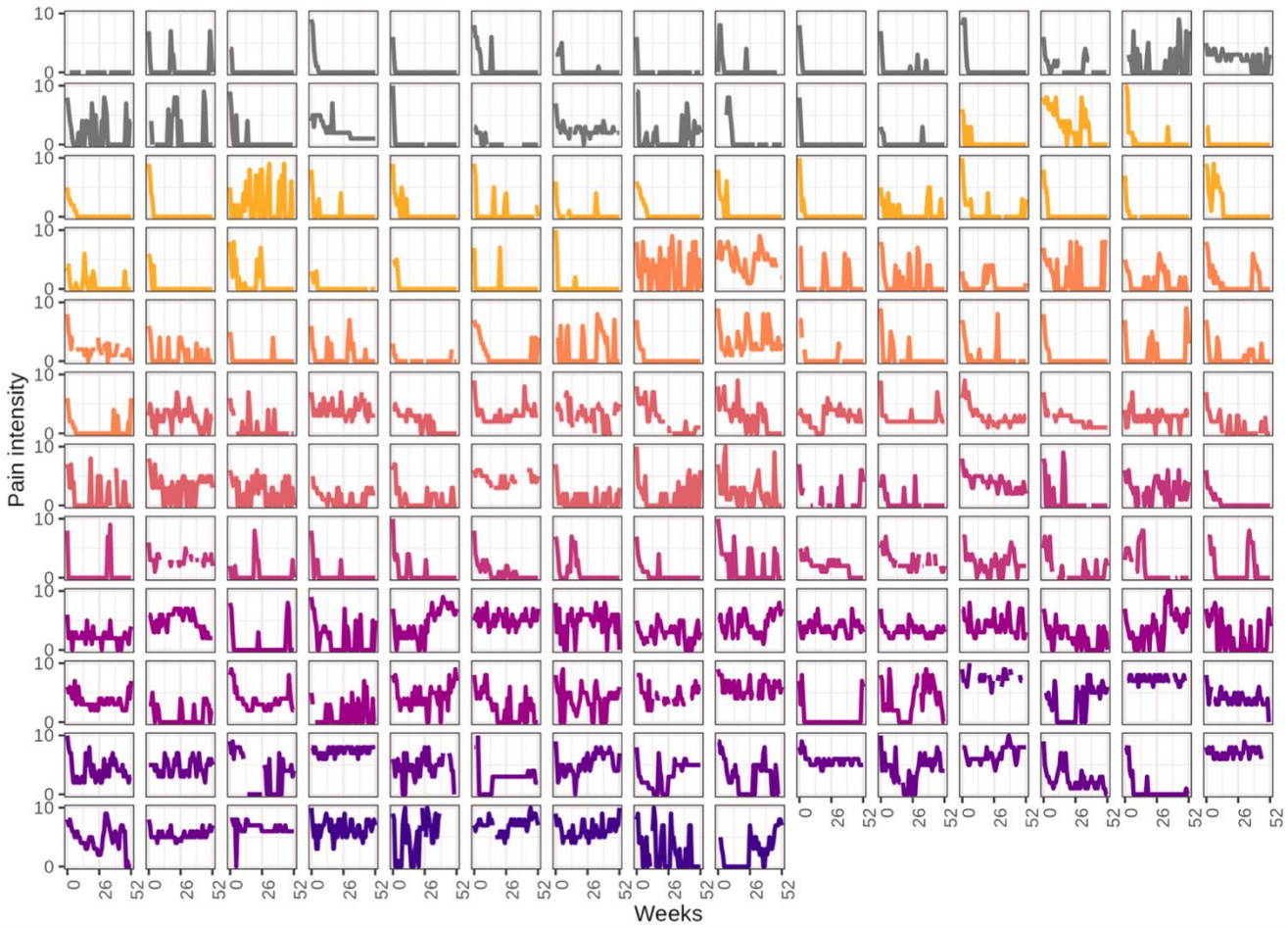
Association between smoking and incident back pain: A prospective cohort study with 438 510 participants

Hao-Ran Xu[1,2,3*], Yong-Hui Zhang[1,2*], Thanh Luan Ngo[2], Qi-Hao Yang[2], Shu-Hao Du[2], Xue-Qiang Wang[1,2,3]



Do Visual Pain Trajectories Reflect the Actual Course of Low Back Pain? A Longitudinal Cohort Study

Casper Glissmann Nim,[*,†,‡] Werner Vach,[§] Aron Downie,[¶] and Alice Kongsted[‡,‖]

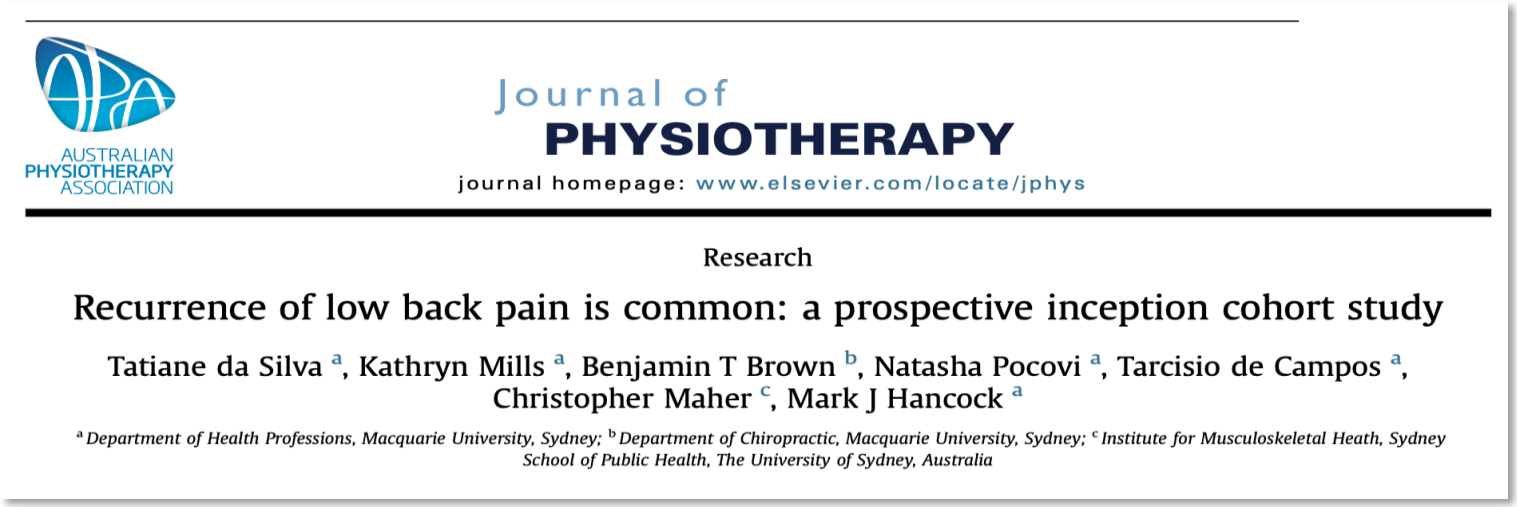


Prognosis of a new episode of low-back pain in a community inception cohort

Tarcisio F. de Campos[1,2,3] | Tatiane M. da Silva[4] | Christopher G. Maher[5] | Natasha C. Pocovi[1] | Mark J. Hancock[1]

- The median duration of the new episode of LBP was 5 days (95% CI 3.99 to 6.02)

- The main implication of our study is that given the short duration of most episodes of LBP, the community should be reassured about the favourable prognosis of LBP and encouraged to try to self-manage most episodes



AUSTRALIAN PHYSIOTHERAPY ASSOCIATION

Journal of PHYSIOTHERAPY

journal homepage: www.elsevier.com/locate/jphys

Research

Recurrence of low back pain is common: a prospective inception cohort study

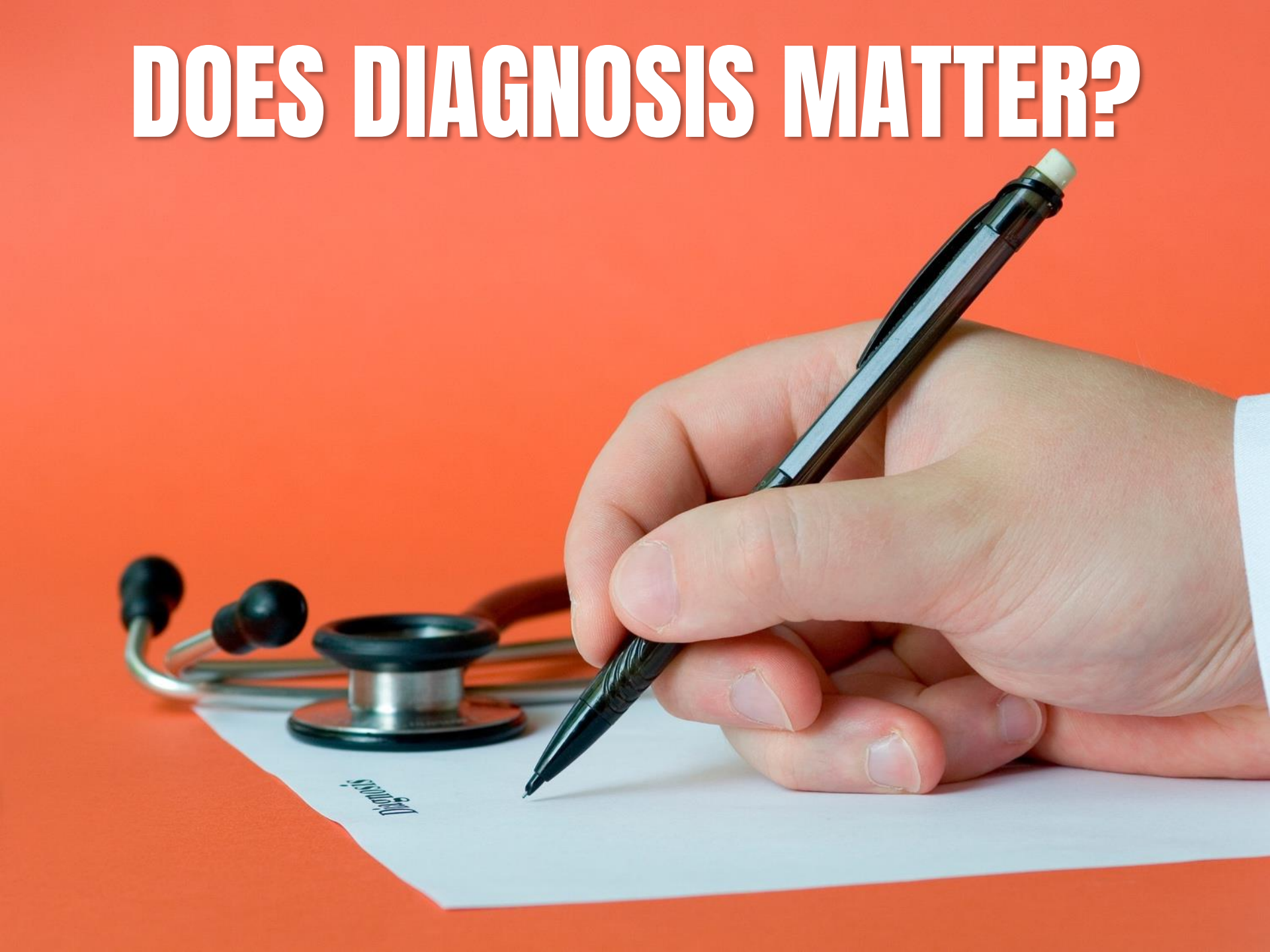
Tatiane da Silva [a], Kathryn Mills [a], Benjamin T Brown [b], Natasha Pocovi [a], Tarcisio de Campos [a], Christopher Maher [c], Mark J Hancock [a]

[a] Department of Health Professions, Macquarie University, Sydney; [b] Department of Chiropractic, Macquarie University, Sydney; [c] Institute for Musculoskeletal Heath, Sydney School of Public Health, The University of Sydney, Australia

- Recurrence of low back pain is very common, with more than two-thirds of individuals having a recurrence within 12 months after recovery

- Within 12 months after recovery, 69% (95% CI 62 to 74) of participants had a recurrence of an episode of low back pain, 40% (95% CI 33 to 46) had a recurrence of activity-limiting low back pain, and 41% (95% CI 34 to 46) had a recurrence of low back pain for which healthcare was sought

DOES DIAGNOSIS MATTER?



GRANULARITY

> Level of detail considered in a decision-making process

SERIOUS PATHOLOGY ALWAYS MATTERS!

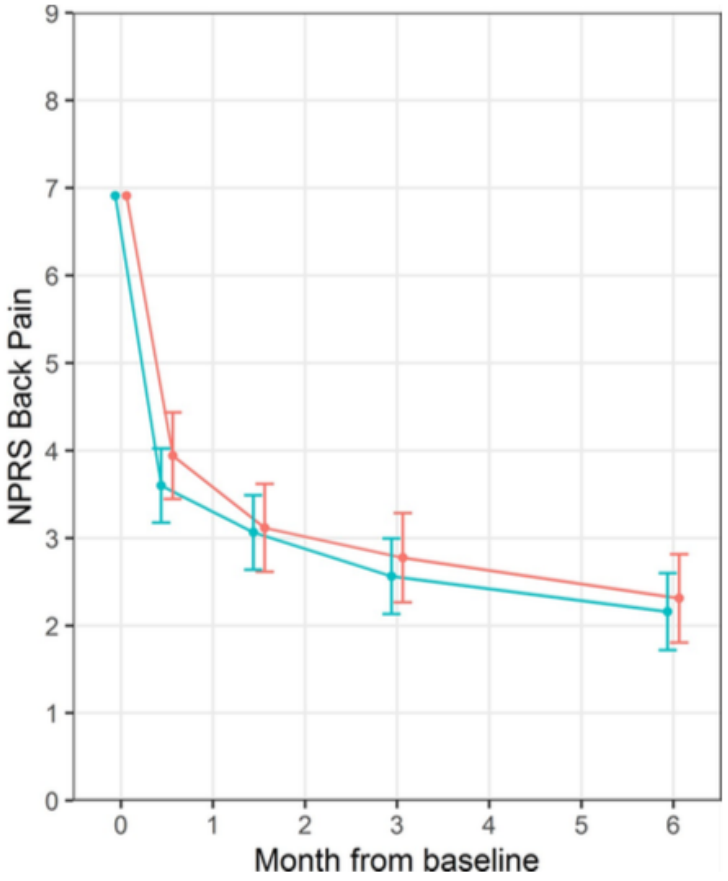
COR-KINETIC
EVOLVING MOVEMENT

SPECIFIC PATHOLOGY MATTERS

- Radicular pain
- Radiculopathy
- Stenosis
- Inflammatory
- axSpA
- AS

DOES IT MATTER MUCH AFTER THIS?

COR-KINETIC
EVOLVING MOVEMENT



RESEARCH ARTICLE

The Fear Reduction Exercised Early (FREE) approach to management of low back pain in general practice: A pragmatic cluster-randomised controlled trial

Ben Darlow[1]*, James Stanley[2], Sarah Dean[3], J. Haxby Abbott[4], Sue Garrett[1], Ross Wilson[4], Fiona Mathieson[5], Anthony Dowell[1]

88% changed significantly in 6 weeks (majority 2 weeks)

Broad inclusion criteria (pragmatic)

Stratified care versus usual care for management of patients presenting with sciatica in primary care (SCOPiC): a randomised controlled trial

Kika Konstantinou, Martyn Lewis, Kate M Dunn, Reuben Ogollah, Majid Artus, Jonathan C Hill, Gemma Hughes, Michelle Robinson, Benjamin Saunders, Bernadette Bartlam, Jesse Kigozi, Sue Jowett, Christian D Mallen, Elaine M Hay, Danielle A van der Windt, Nadine E Foster

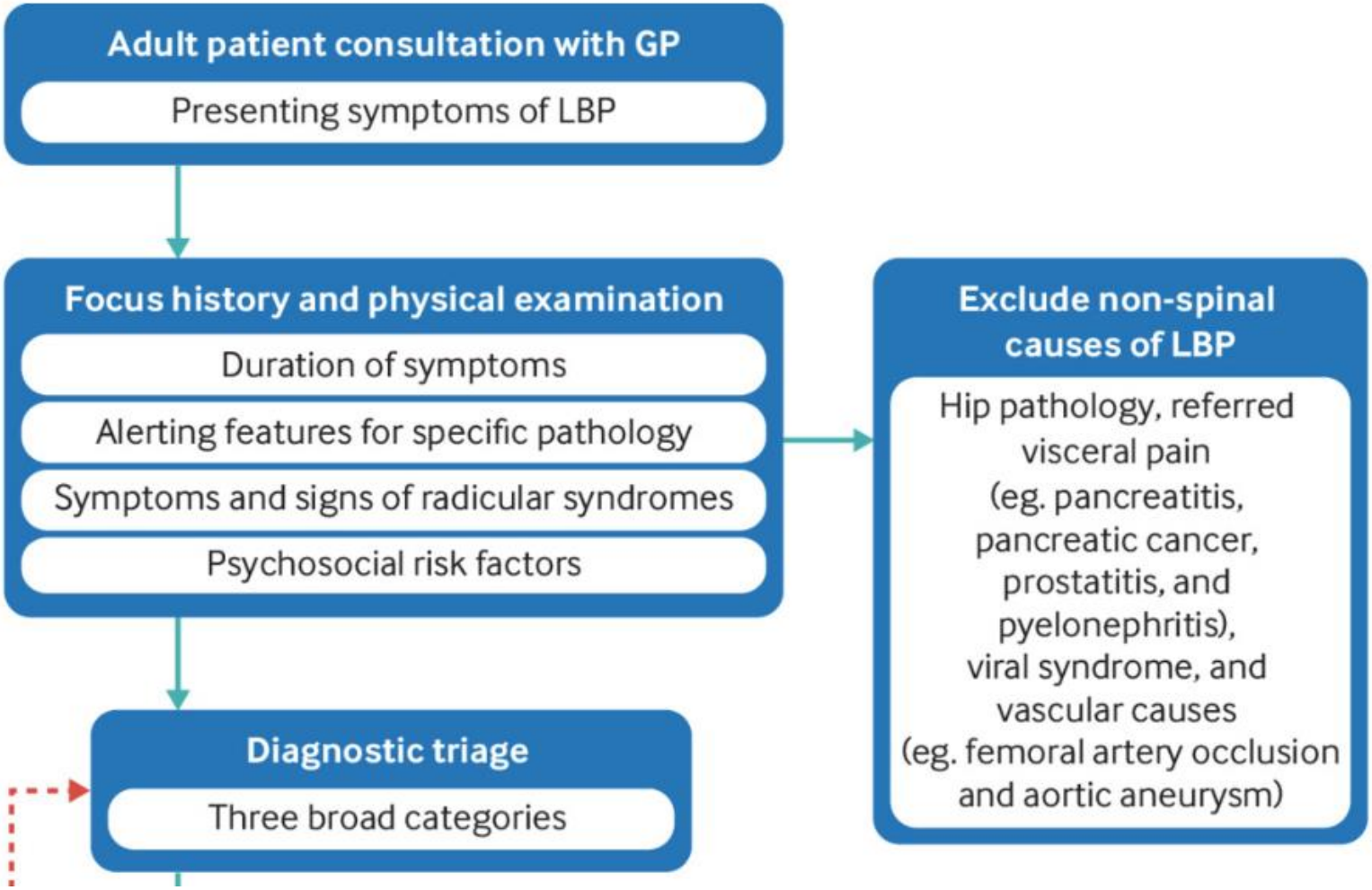
75% around 50% better @ 12 wks

Baseline leg pain 6.8

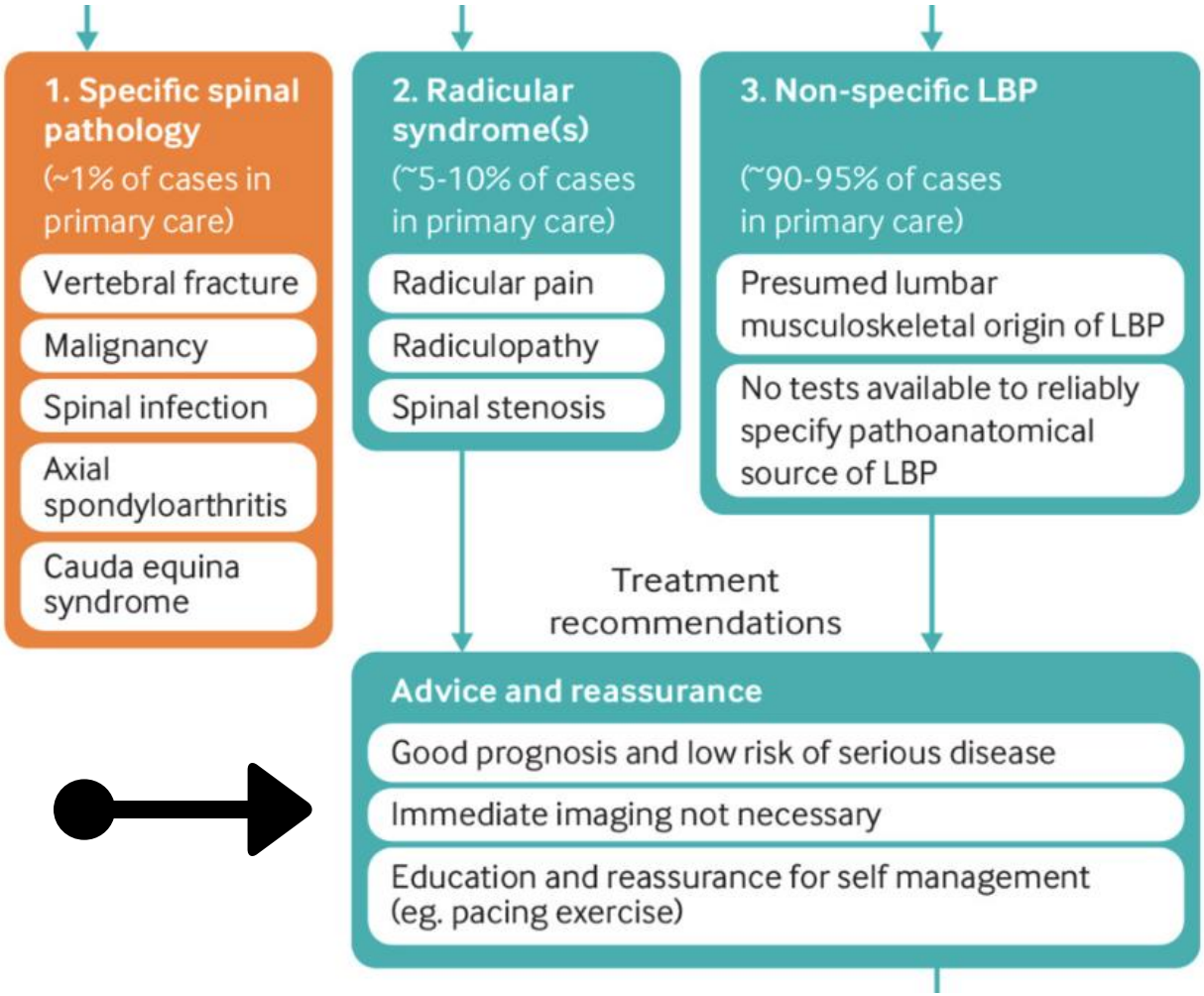
Baseline back pain 5.9

Still around 3/10 at 12 months

Global perceived change (GPC)		
4 months (stratified care; n=188, usual care; n=194)		
Completely recovered	28 (15%)	26 (13%)
Much Better	50 (27%)	59 (30%)
Better	48 (26%)	59 (30%)
No change	39 (21%)	32 (16%)
Worse	23 (12%)	18 (9%)
12 months (stratified care; n=174, usual care; n=176)		
Completely recovered	34 (20%)	30 (17%)
Much Better	63 (36%)	58 (33%)
Better	34 (20%)	42 (24%)
No change	30 (17%)	34 (19%)
Worse	13 (7%)	12 (7%)


Adult patient consultation with GP
Presenting symptoms of LBP
Focus history and physical examination
Duration of symptoms
Alerting features for specific pathology
Symptoms and signs of radicular syndromes
Psychosocial risk factors
Exclude non-spinal causes of LBP
Hip pathology, referred visceral pain (eg. pancreatitis, pancreatic cancer, prostatitis, and pyelonephritis), viral syndrome, and vascular causes (eg. femoral artery occlusion and aortic aneurysm)
Diagnostic triage
Three broad categories

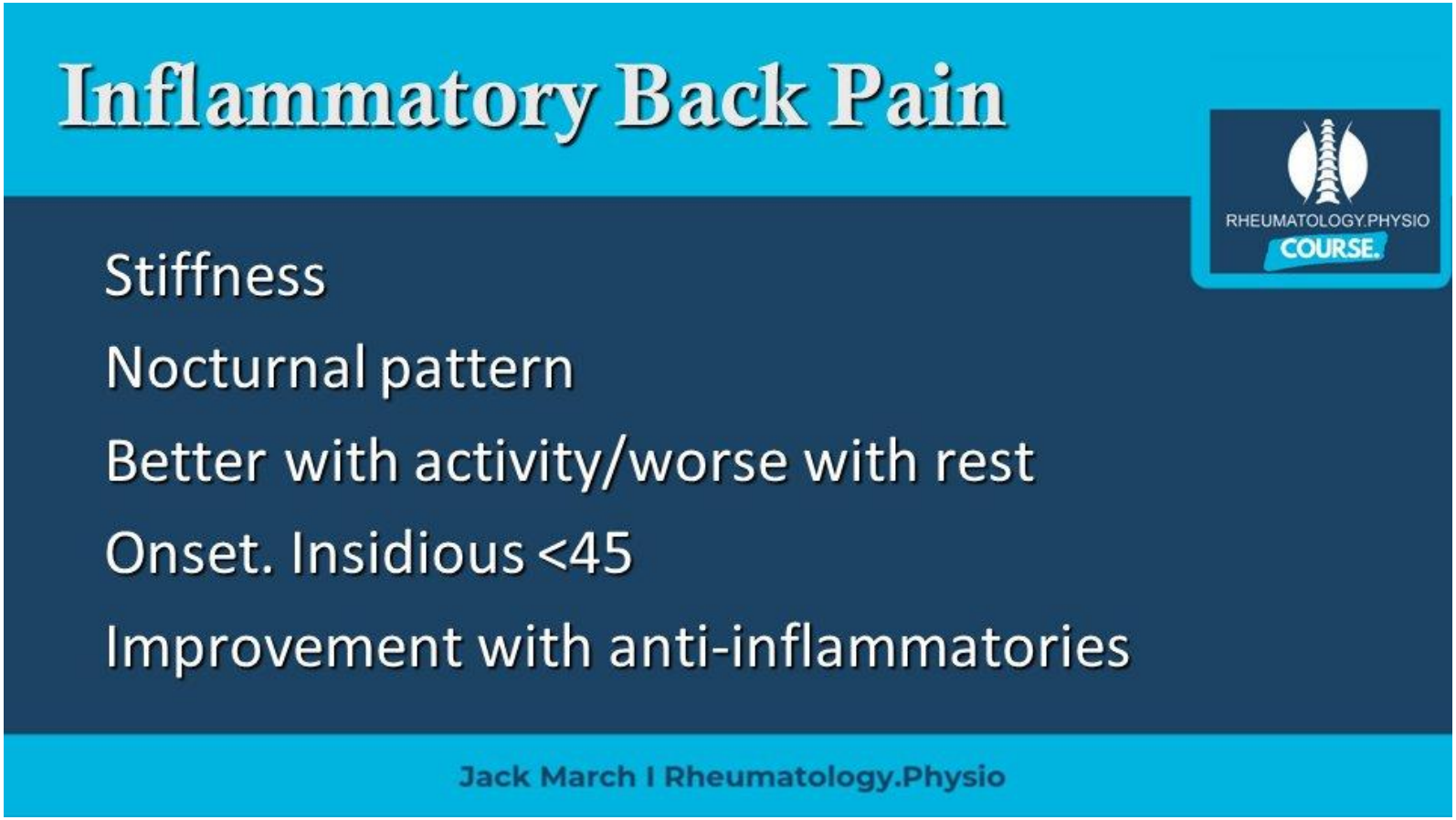
Hall 2021


1. Specific spinal pathology
(~1% of cases in primary care)
Vertebral fracture
Malignancy
Spinal infection
Axial spondyloarthritis
Cauda equina syndrome
2. Radicular syndrome(s)
(~5-10% of cases in primary care)
Radicular pain
Radiculopathy
Spinal stenosis
3. Non-specific LBP
(~90-95% of cases in primary care)
Presumed lumbar musculoskeletal origin of LBP
No tests available to reliably specify pathoanatomical source of LBP
Treatment recommendations
Advice and reassurance
Good prognosis and low risk of serious disease
Immediate imaging not necessary
Education and reassurance for self management (eg. pacing exercise)

99%

RED FLAGS & INDEX OF SUSPICION

INFLAMMATORY BACK PAIN

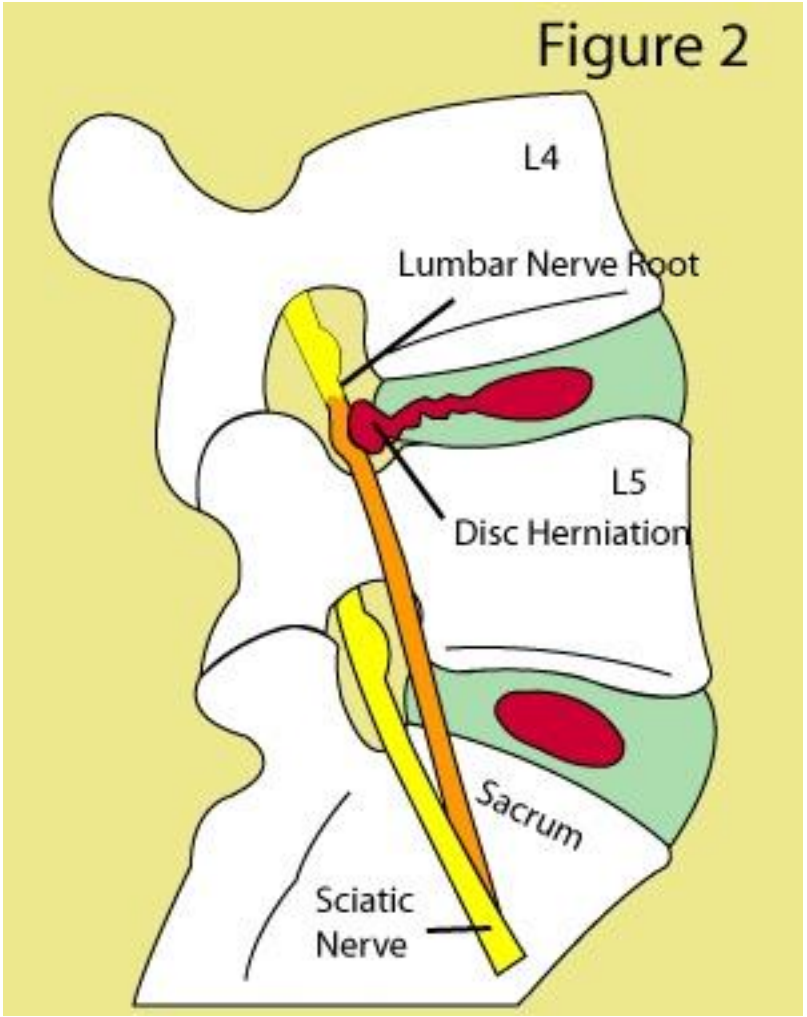


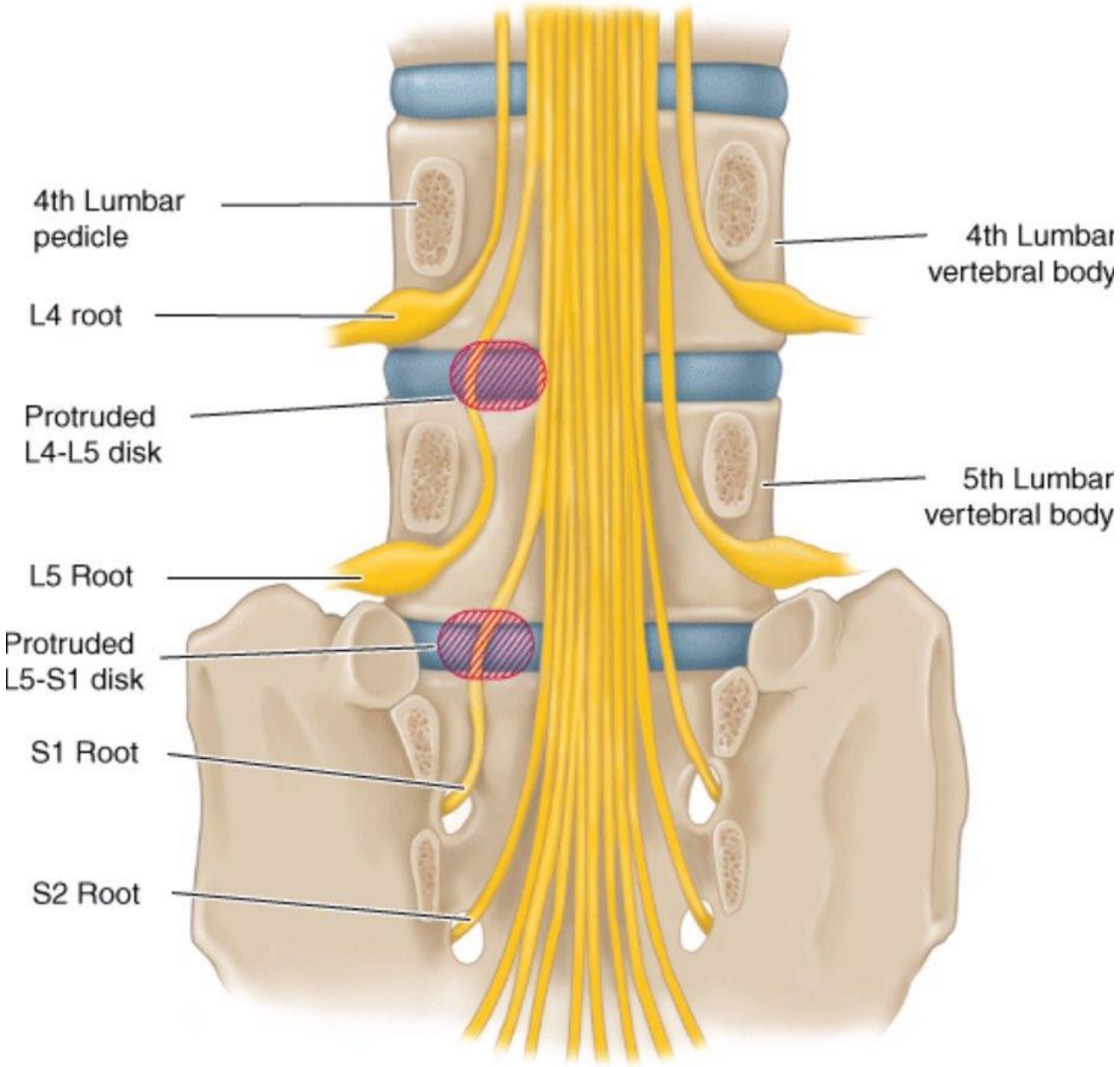
SCREENDEM

Skin - rash or psoriasis?
Colitis or Crohns?
Relatives – family history of inflammatory arthritis?
Early Morning Stiffness?
Eyes – has the patient had Uveitis?
Nail involvement?
Dactylitis?
Enthesopathy?
Medication and Movement response?

RADICULAR PAIN

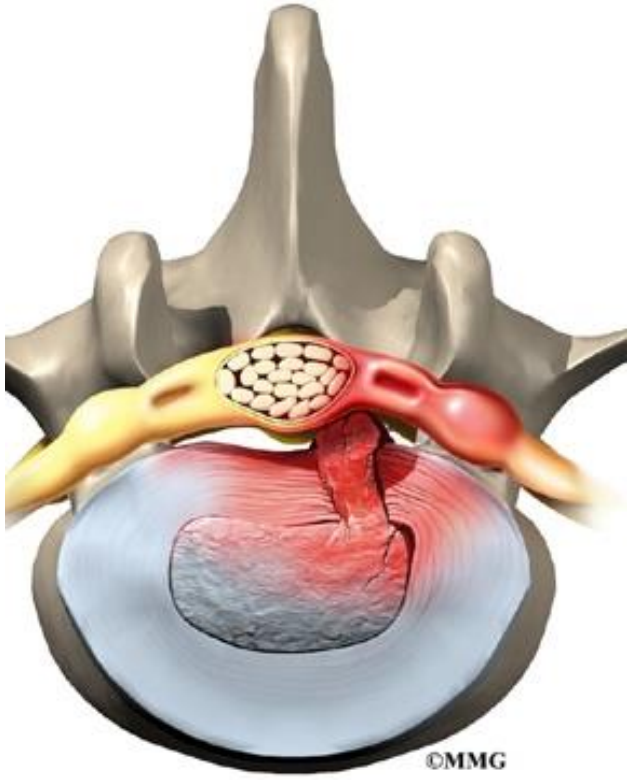
- Sensitised nerve root
- Compression or chemical irritation

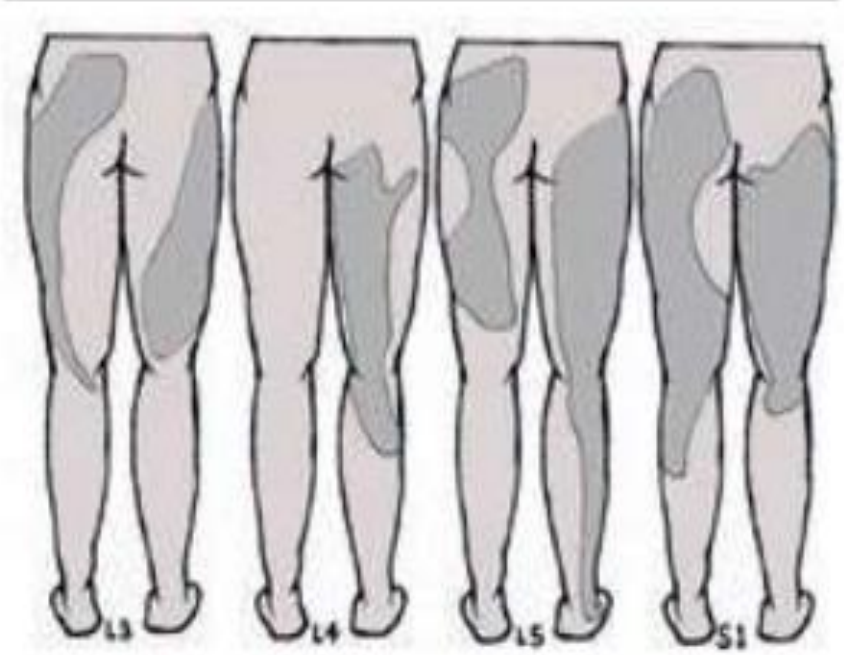


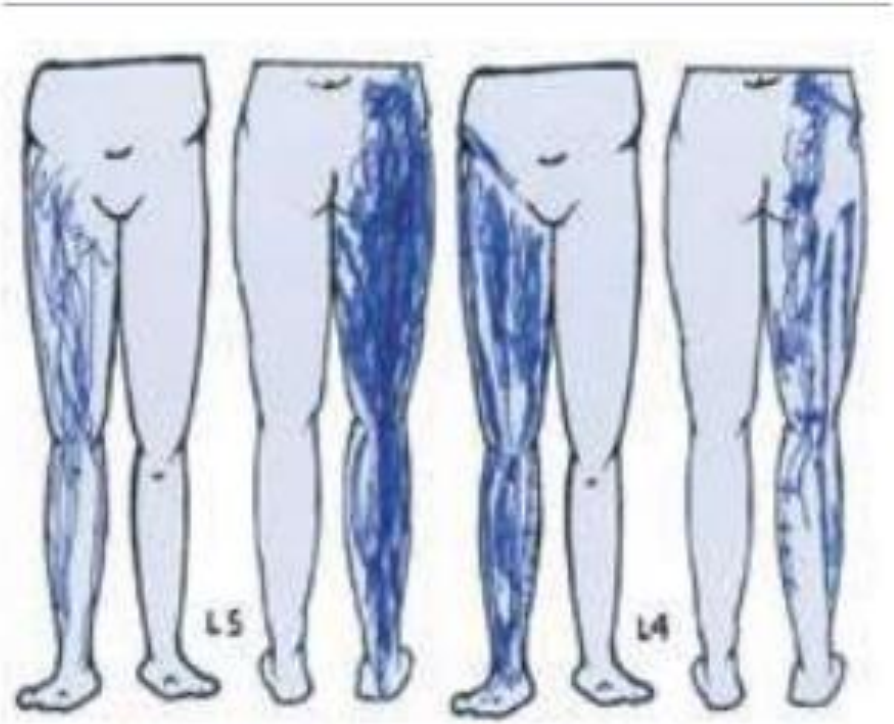

4th Lumbar pedicle
L4 root
Protruded L4-L5 disk
L5 Root
Protruded L5-S1 disk
S1 Root
S2 Root
4th Lumbar vertebral body
5th Lumbar vertebral body

RADICULAR

- Leg pain worse than back pain
- Numbness or Pins & needles
- +ve SLR or slump test
- Pain below knee
- Neuro deficits (weakness, sensation & reflex)
- Rule out hip – FadERR
- Stynes 2018

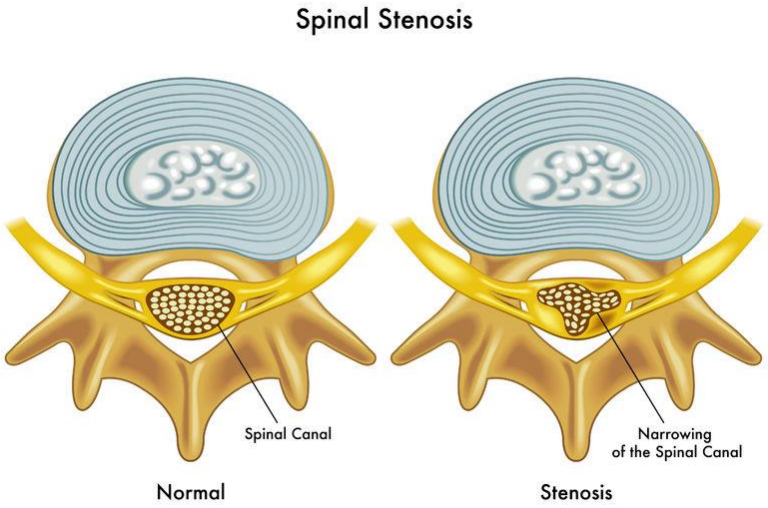



L3
L4
L5
S1


L5
L4

STENOSIS

- Age > 60 with bilateral leg pain
- Pain provoked by sustained extension > 30s
- Pain relieved by leaning forward & sitting or flexing the spine
- Negative SLR



Clinical Classification Criteria for Neurogenic Claudication caused by Lumbar Spinal Stenosis. The N-CLASS criteria.

Stéphane Genevay MD


SENSITIVE

PAIN® 147 (2009) 17–19

PAIN®

www.elsevier.com/locate/pain

Topical review

On the definitions and physiology of back pain, referred pain, and radicular pain

Nikolai Bogduk *

University of Newcastle, Newcastle Bone and Joint Institute, Royal Newcastle Centre, PO Box 664J, Newcastle, NSW 2300, Australia

> Back pain and somatic referred pain are common, but radicular pain is not

Narrative review

The role of spinal surgery in the treatment of low back pain

Lachlan Evans[1], Thomas O'Donohoe[1], Andrew Morokoff[1,2], Katharine Drummond[1,2]

December 2022

- Spinal surgery has a role in alleviating radicular pain and disability resulting from neural compression, or where back pain relates to cancer, infection, or gross instability.

- Spinal surgery for all other forms of back pain is unsupported by clinical data, and the broader evidence base for spinal surgery in the management of LBP is poor and suggests it is ineffective

- Chronic LBP should be managed with a holistic biopsychosocial approach of generally non-surgical measures

Clinical Neurology and Neurosurgery 224 (2023) 107551

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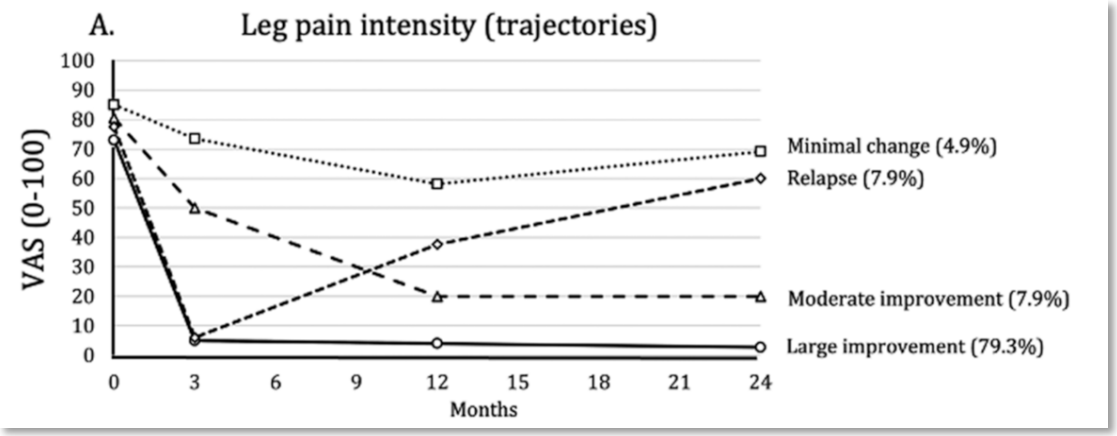
Clinical Neurology and Neurosurgery

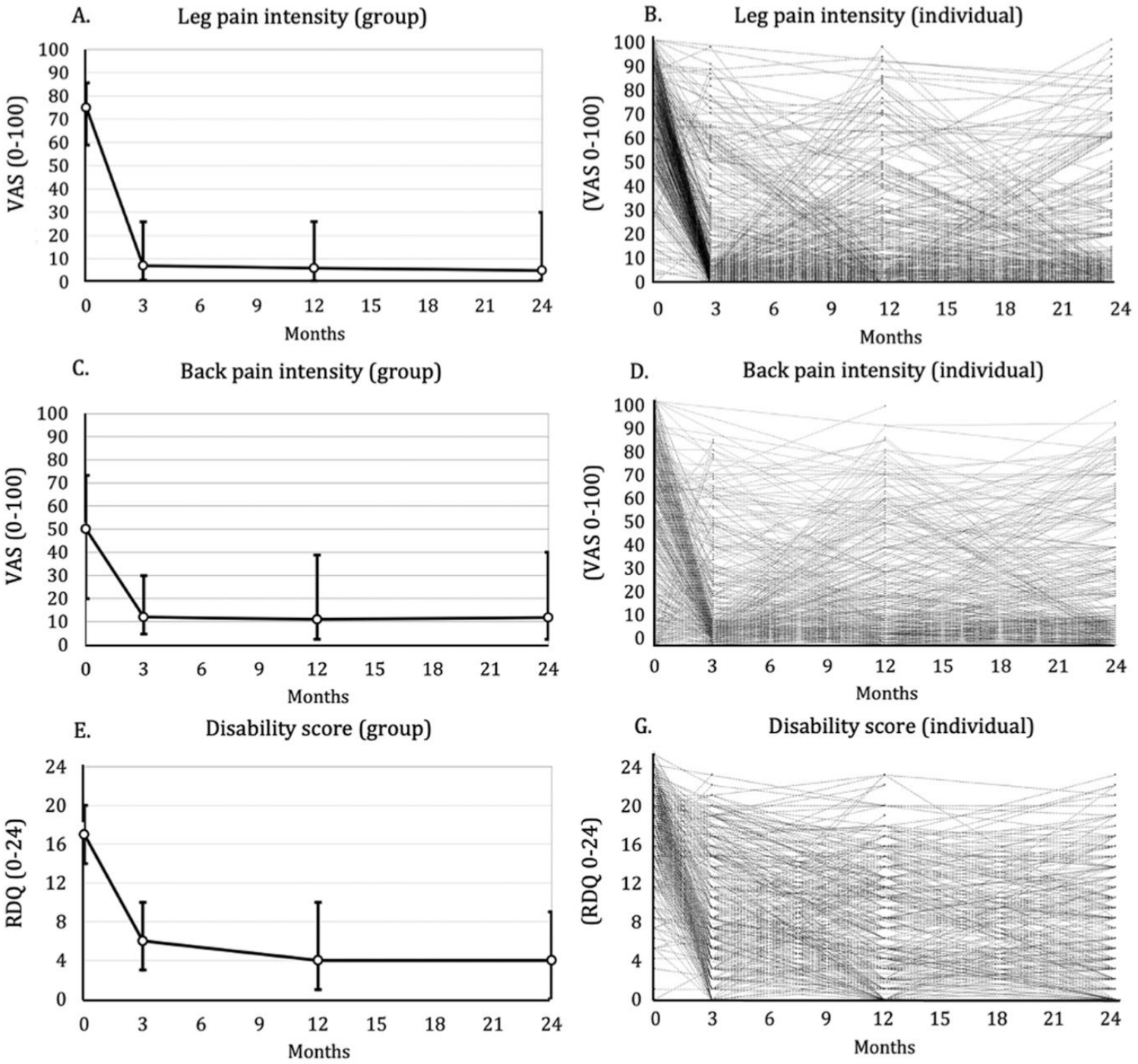
journal homepage: www.elsevier.com/locate/clineuro

Variability in recovery following microdiscectomy and postoperative physiotherapy for lumbar radiculopathy: A latent class trajectory analysis☆

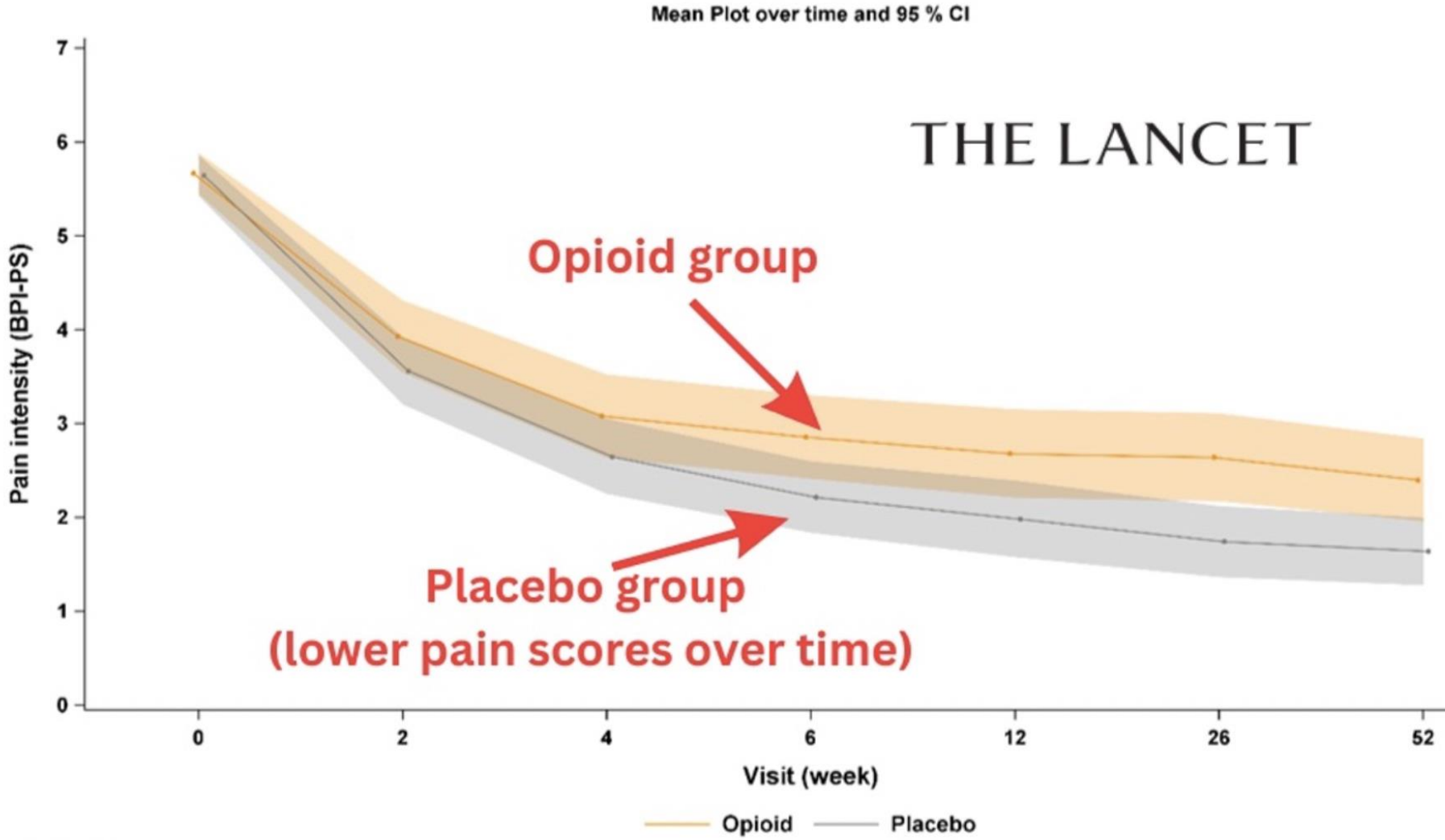
Stijn J. Willems [a,1], Michel W. Coppieters [a,b,c,2], Servan Rooker [d,e,3], Raymond Ostelo [f,g,4], Trynke Hoekstra [h,5], Gwendolyne G.M. Scholten-Peeters [a,6,*]

"In conclusion, our results confirmed the high variability in the clinical course for people with lumbar radiculopathy undergoing micro- discectomy and post-operative physiotherapy. Furthermore, our study revealed four distinctive subgroups of how these people recover"




A.
Leg pain intensity (group)
VAS (0-100)
Months
B.
Leg pain intensity (individual)
(VAS 0-100)
Months
C.
Back pain intensity (group)
VAS (0-100)
Months
D.
Back pain intensity (individual)
(VAS 0-100)
Months
E.
Disability score (group)
RDQ (0-24)
Months
G.
Disability score (individual)
(RDQ 0-24)
Months

Opioids not effective for acute back and neck pain



Number of patients :							
Opioid	174	136	127	132	124	121	12
Placebo	171	140	122	138	129	126	12

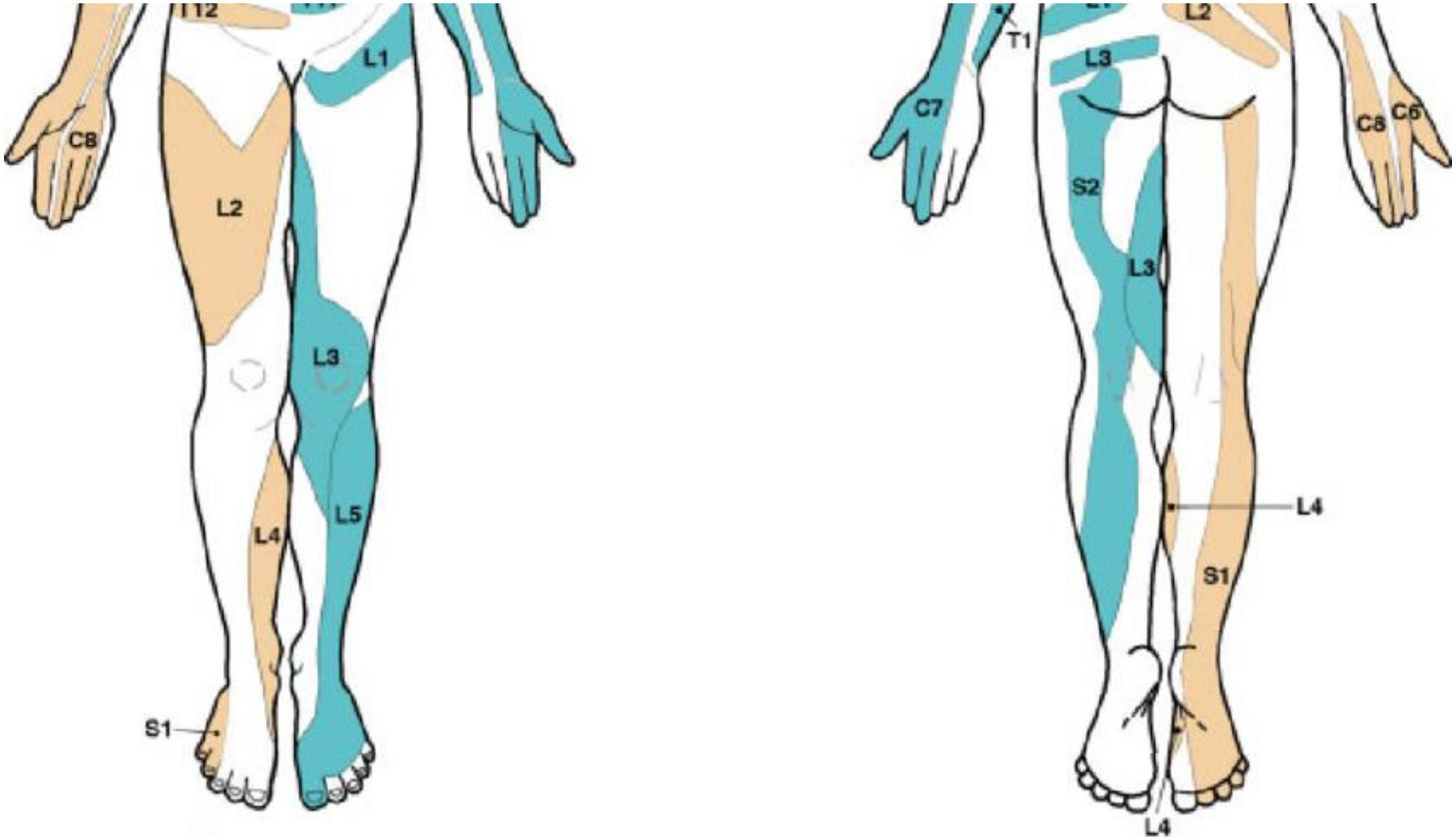
MOVEMENT ASSESSMENT

- What would you look at?
- What hurts?
- Basic physiological movements
- Speed
- Face
- Breathing
- Persons thoughts about moving?

PHYSICAL EXAM

- Walking
- SLR + cross sign
- Classic muscle + sensory testing
- Basic movements

DERMATOMES



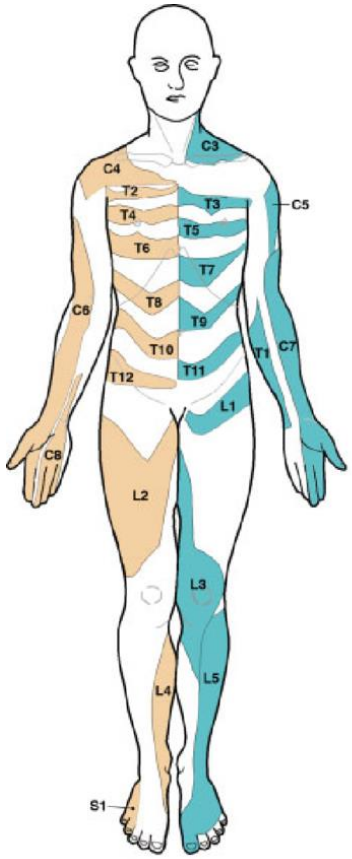
MUSCLE TEST

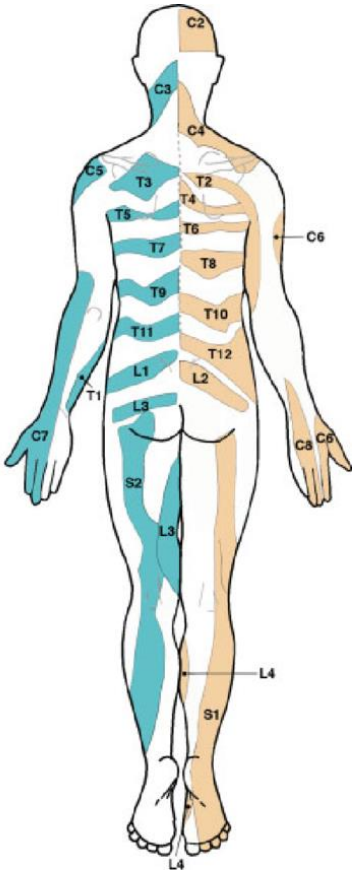
L3 – Knee extension

L4 – Dorsi flexion

L5 – Big toe extension

S1 - Heel raise





PHYSICAL EXAM

- Getting up and down off the floor
- Standing bending/rotating/side flexing
- Specific activities that hurt/feared
- Areas of concern – palpate
- Relaxed freedom of movement – Shake out a swing arms
- Basic strength tests – dorsal raise/crunch
- Moving quickly

PHYSICAL EXAM

What movement/activity do you have most trouble with?

Most important 'special test'

Other Potential nociceptive contributors to low back pain that have undergone investigation

Intervertebral disc

There is no widely accepted reference standard for discogenic pain

Facet joint

Clinical identification of individuals whose facet joints are contributing to their pain is not possible

Vertebral end plate

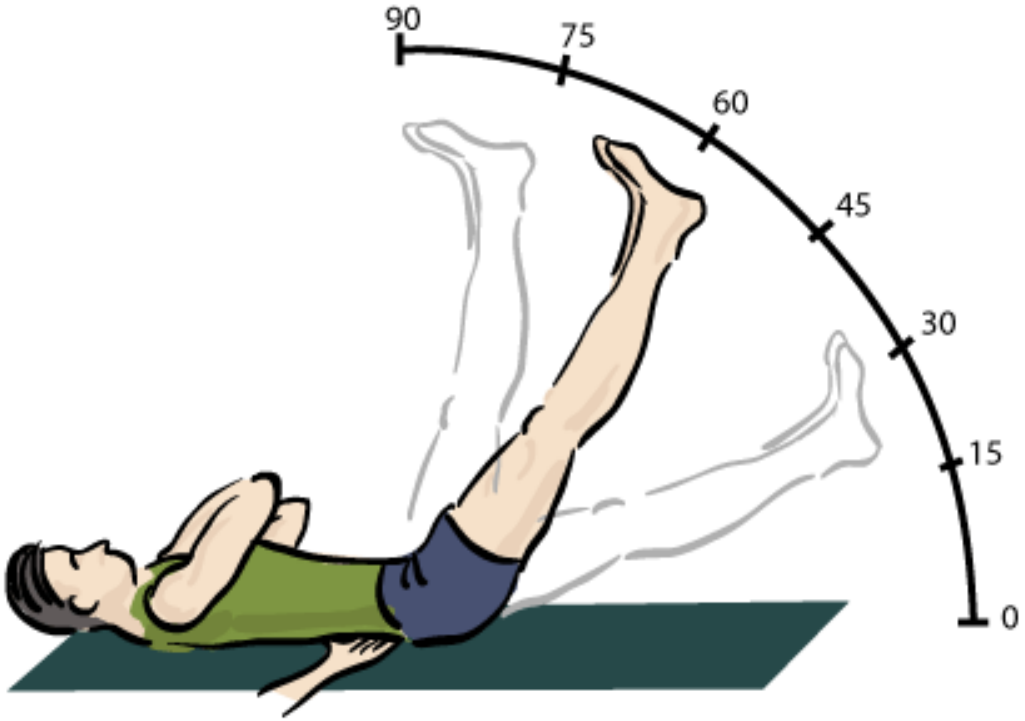
Identification of individuals in whom Modic changes are contributing to their pain is not possible

What low back pain is and why we need to pay attention - Lancet 2018

STRAIGHT LEG RAISE

Attempt to assess neurological tissue

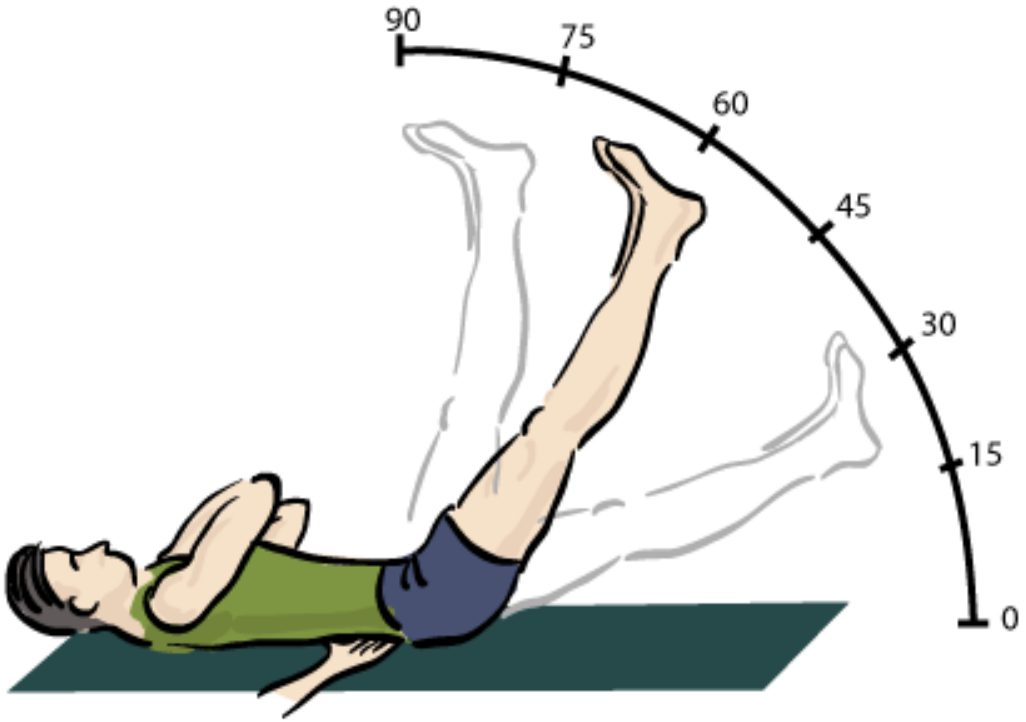
Sensitive not specific



STRAIGHT LEG RAISE - CROSSED SIGN

More specific than sensitive

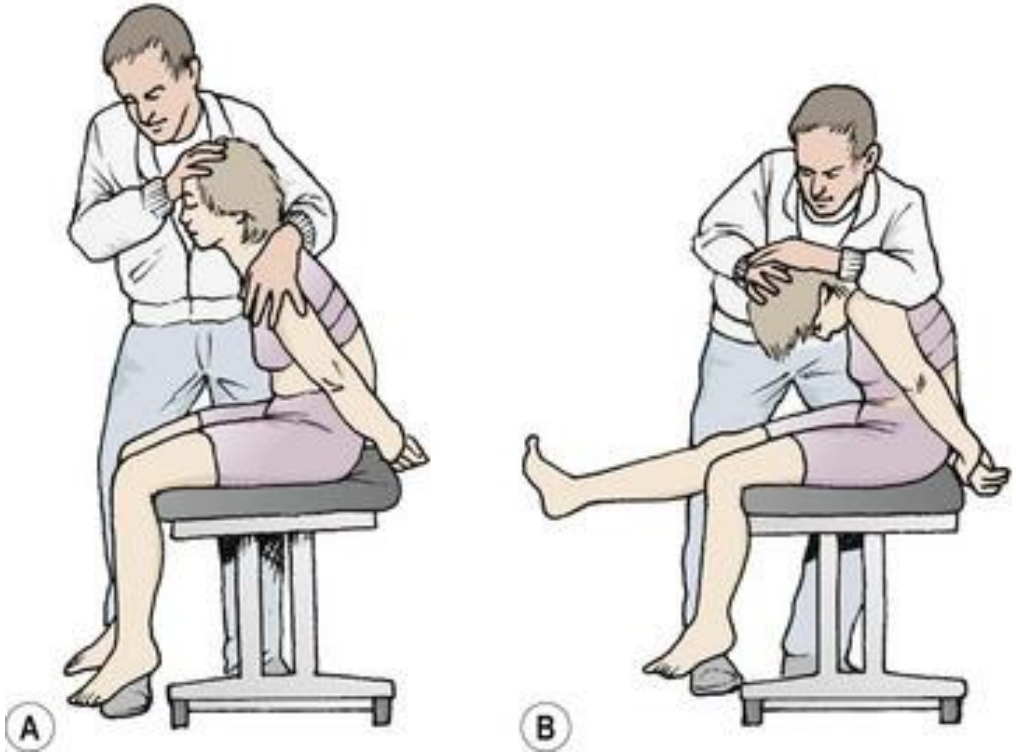
+ve test is original symptom



SLUMP

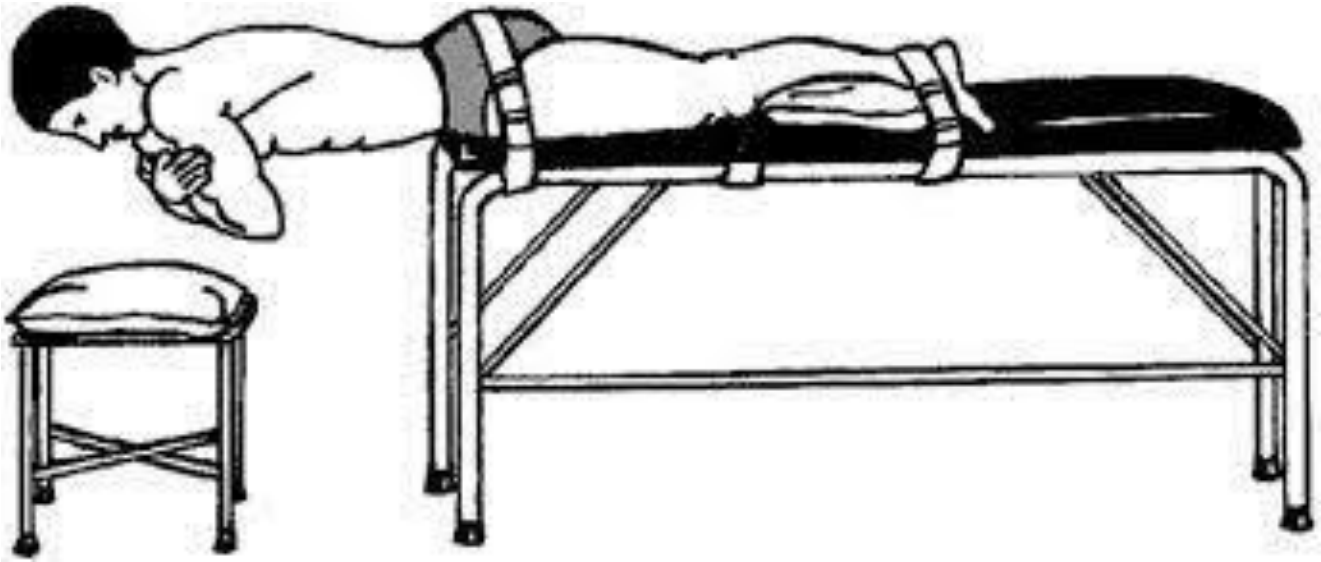
Attempt to assess neurological tissue

Sensitive not specific



BIERING-SORENSON TEST

Muscular endurance test



KEMPS TEST

Facet joint test

Extension & rotation

Poor Dx accuracy

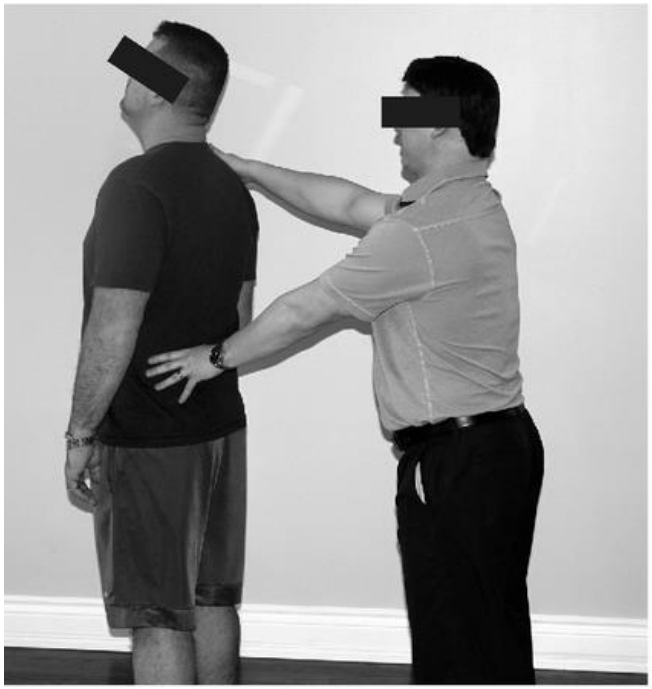


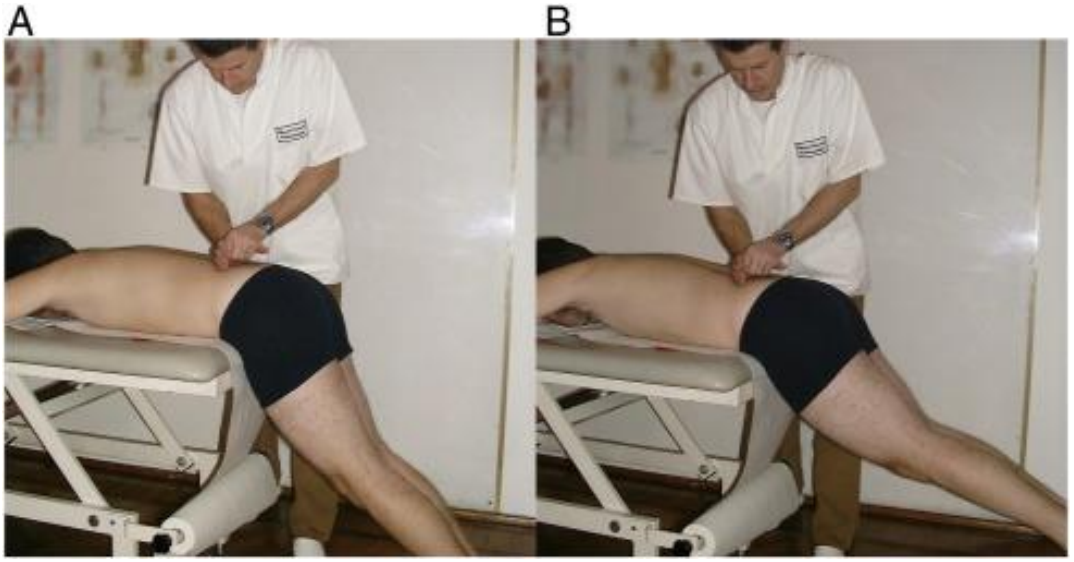
Figure 2a:

Figure 2b:

PRONE INSTABILITY TEST

Likelihood of a patient with low back pain responding to a stabilization exercise program

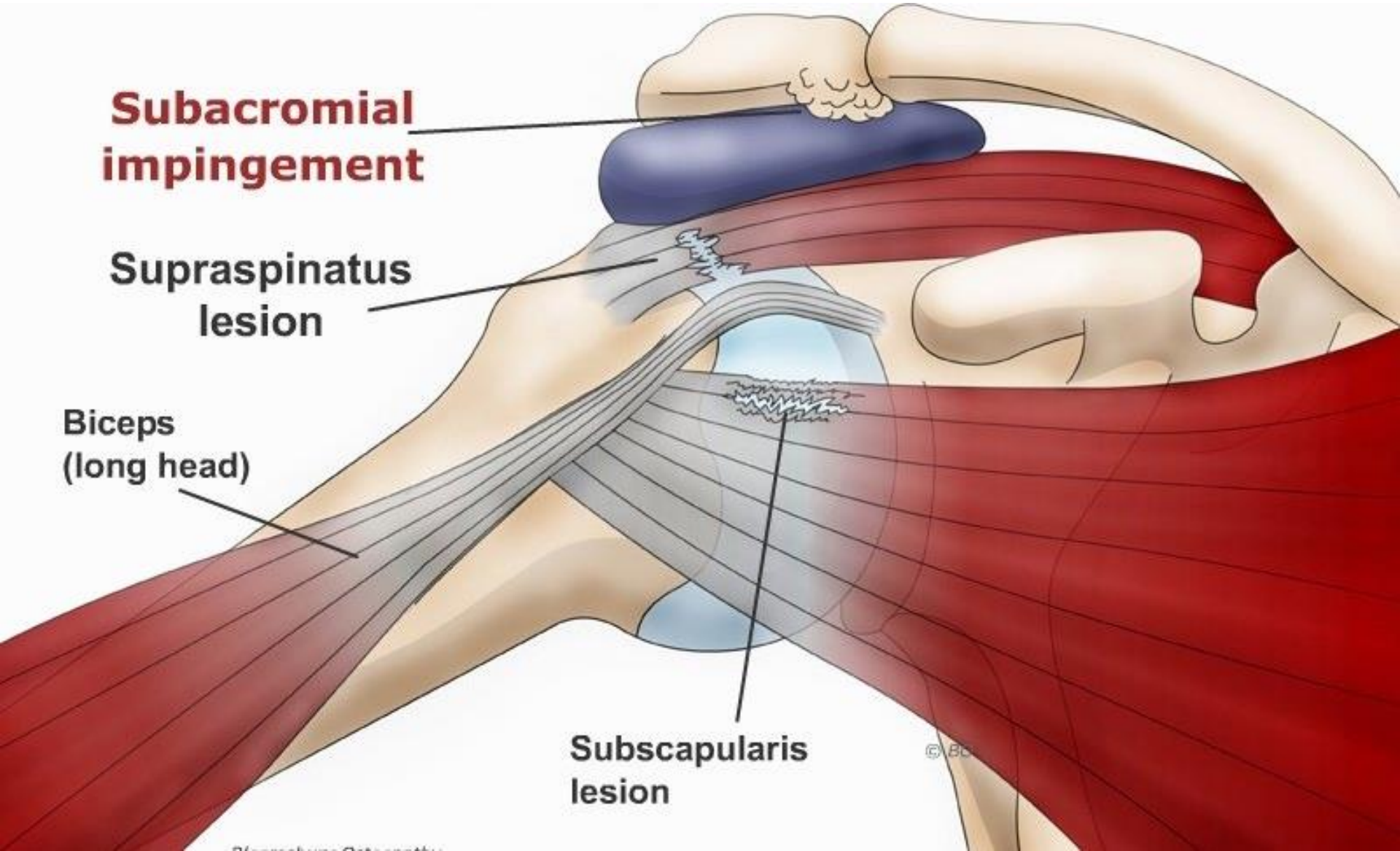
Core stability not a valid gold standard



SHOULDER PAIN

SHOULDER PAIN

- Sub acromial pain
- Frozen shoulder
- Cervical radiculopathy


Subacromial impingement
Supraspinatus lesion
Biceps (long head)
Subscapularis lesion

SUB ACROMIAL PAIN

Guideline for diagnosis and treatment of subacromial pain syndrome

A multidisciplinary review by the Dutch Orthopaedic Association

Ron Diercks[1], Carel Bron[2], Oscar Dorrestijn[1], Carel Meskers[4], René Naber[5], Tjerk de Ruiter[4], Jaap Willems[1], Jan Winters[3], and Henk Jan van der Woude[6]

"SAPS is defined as all non-traumatic, usually unilateral, shoulder problems that cause pain, localized around the acromion, often worsening during or subsequent to lifting of the arm"

SUB ACROMIAL PAIN

- Rotator cuff syndrome affects patient populations in an age-dependent manner, ranging from 5% to 10% of patients aged 20 and younger to over 60% of patients aged 80 or older

SUB ACROMIAL PAIN

- Not stiff
- Painful
- Can be weak
- Hurts with arm overhead

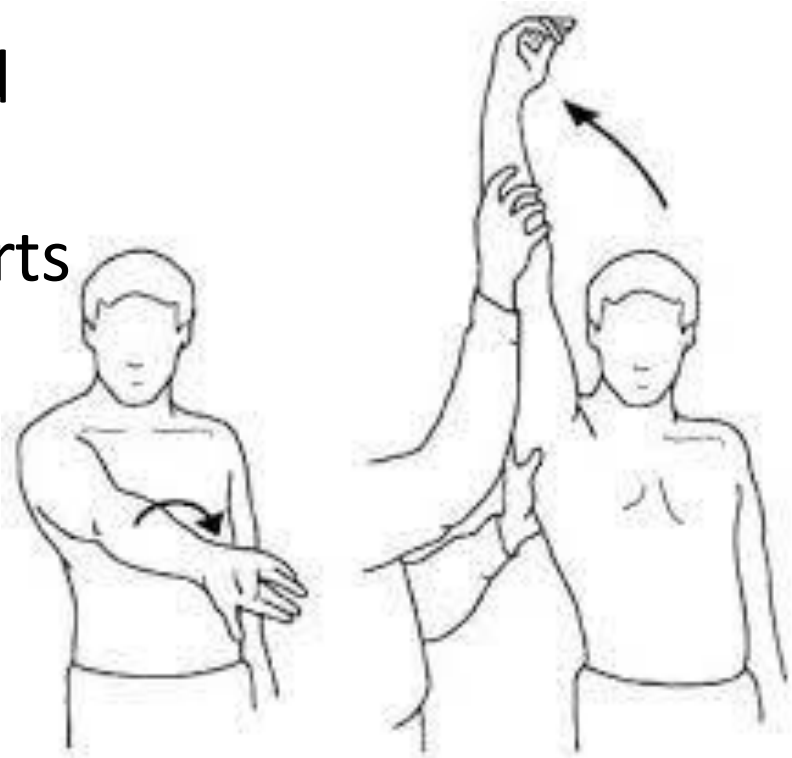
HAWKINS KENNEDY

- The patient sits or stands with their arm flexed at the shoulder and elbow to 90 degrees. The examiner stabilizes the shoulder and internally rotates the arm until resistance is felt or the patient experiences pain

NEERS

- The examiner stabilizes the patient's scapula with one hand and passively flexes the patient's arm while it's internally rotated

- Positive test - The patient reports pain in the tip of the shoulder near the acromian process



RESISTED EXTERNAL ROTATION

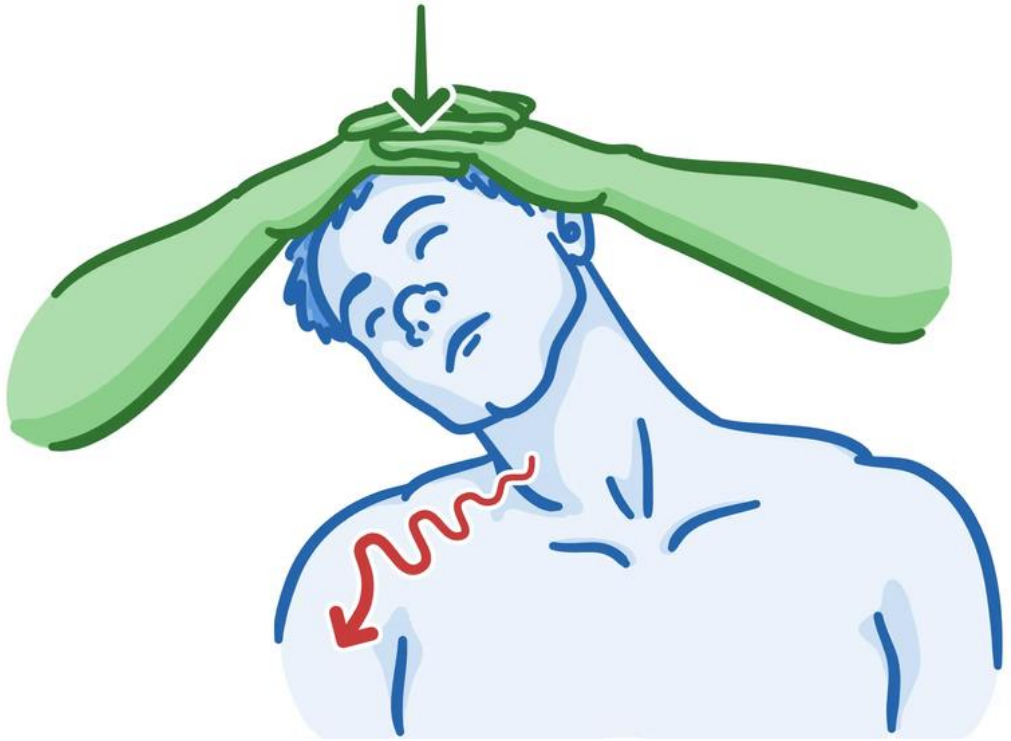
- The patient is seated or standing
- Arms at side, elbows flexed 90°
- Important to keep elbow tucked against chest wall
- Patient externally rotates shoulders against resistance
- Positive test - Pain or weakness

CERVICAL RADICULOPATHY

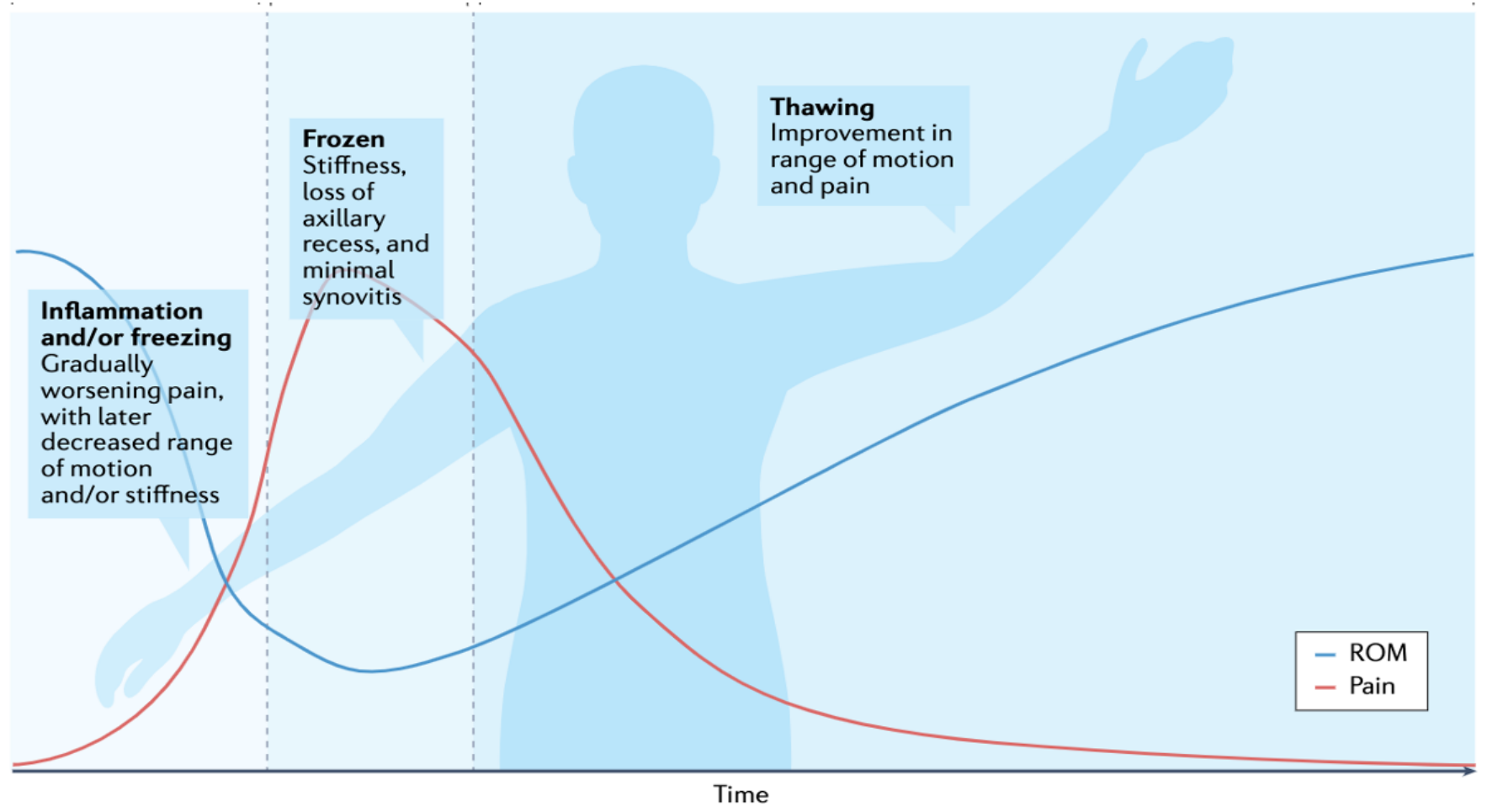
- Referred from the neck
- Nerve type pain
- Not stiff
- Brought on by movement on the neck

SPURLINGS TEST

- The examiner extends and side-bends the patient's neck, then applies downward pressure on the patient's head



FROZEN SHOULDER



HOW LONG?

- Described as self limiting
- 1 - 2 years
- This is being challenged
- Leads to lack of intervention
- Symptoms can last 4 years +

Hand C **(2008) Long-term outcome of frozen shoulder.** J Shoulder Elbow Surg.

ASSESSMENT

History

- Age
- 50 (+/- 10 years)
- Sudden onset of severe pain followed by gross loss of function

Presentation

- Severe, constant, unrelenting pain
- Very easily irritated and aggravated when moved suddenly or accidentally jarred or knocked

ASSESSMENT

Location of Pain

- Widespread and varied

Problems and Disabilities

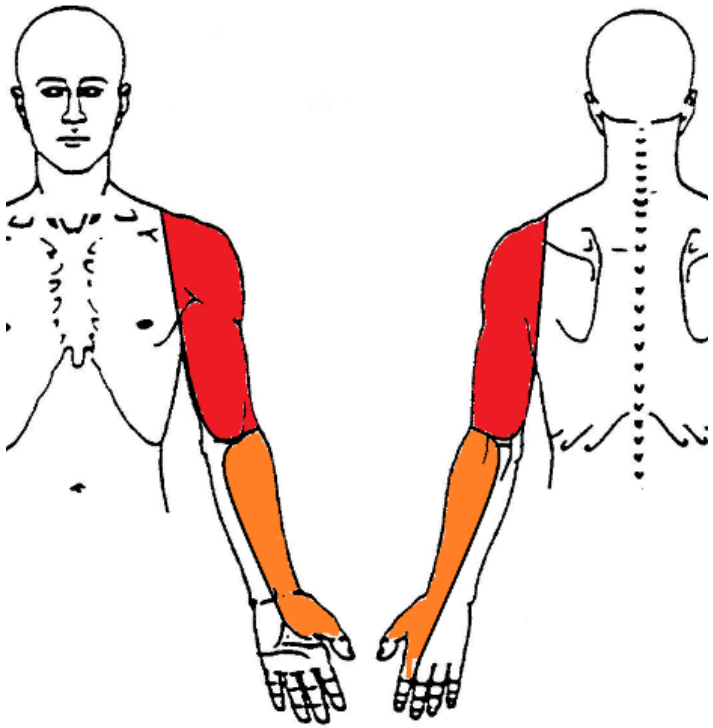
- Everything

Easing Factors

- Nothing much

Other Health/Lifestyle Factors

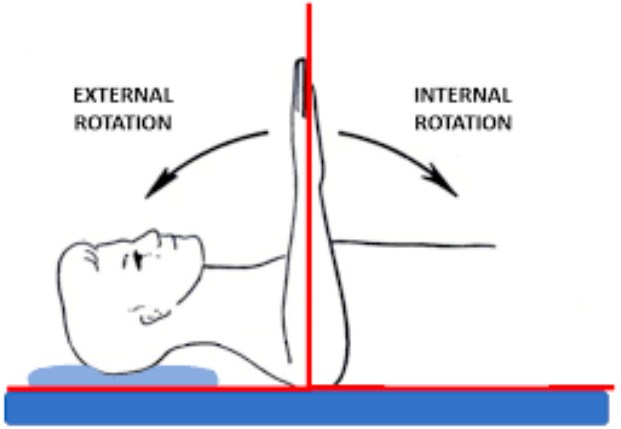
- DM, CVD, Smoker, Sedentary



ASSESSMENT

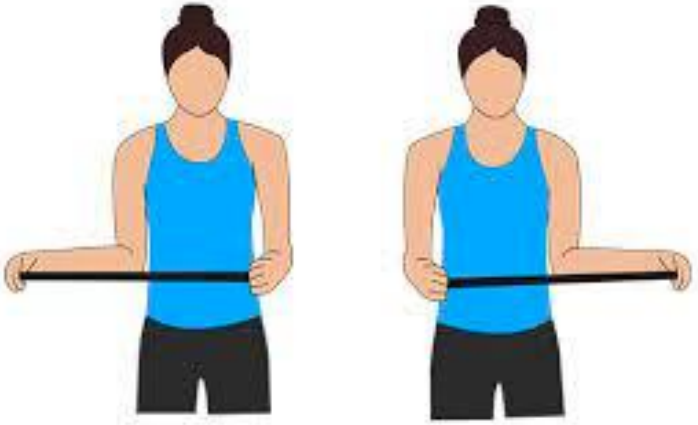
Active ROM

- External rotation - Reduced by 50%
- Other directions 25%



Passive ROM

- External rotation - Reduced by 50%
- Other directions 25%



ASSESSMENT

Sleep

- Can be more painful at night
- Strategies to find comfort

ASSESSMENT

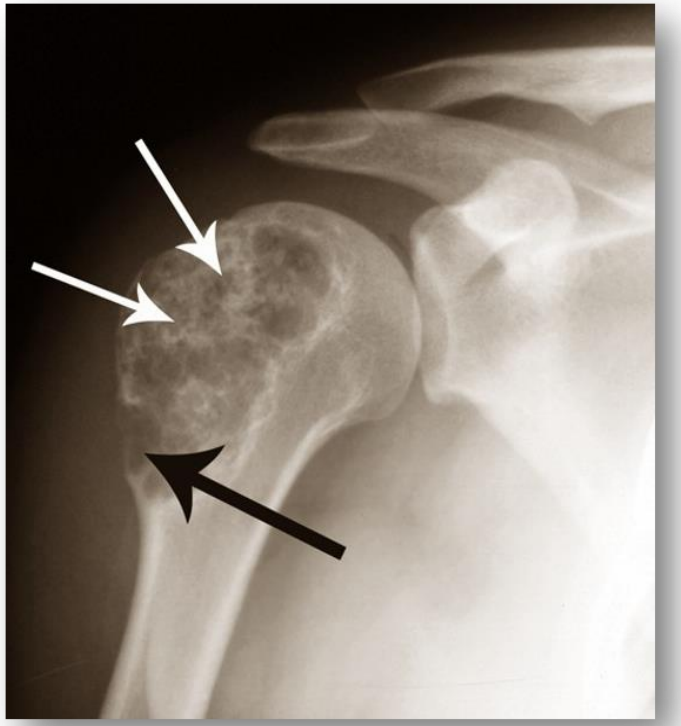
Signs of serious pathology < 1%

- Previous history of cancer
- Recent weight loss
- Night sweats
- Not a normal 'mechanical' presentation

Quan GM **(2005) Lessons learnt from the painful shoulder; a case series of malignant shoulder girdle tumours misdiagnosed as frozen shoulder.** Int Semin Surg Oncol.

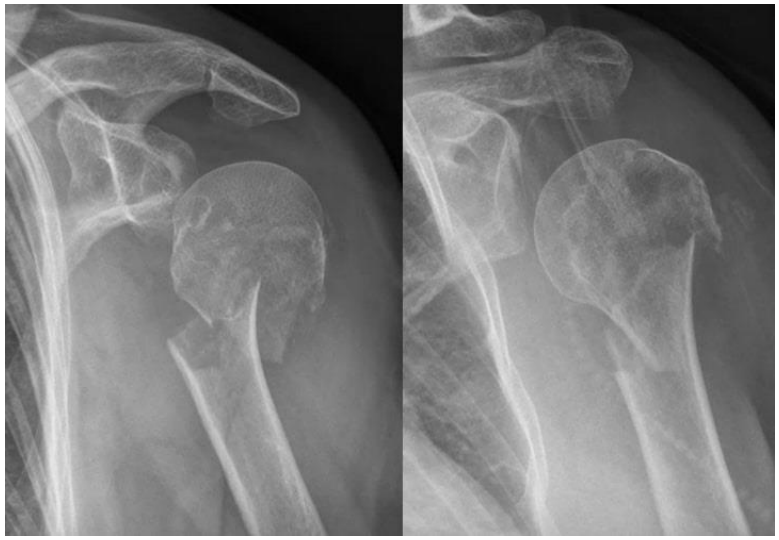
ASSESSMENT

- XR is recommended to exclude other BONY pathology masquerading



Quan GM **(2005) Lessons learnt from the painful shoulder; a case series of malignant shoulder girdle tumours misdiagnosed as frozen shoulder.** Int Semin Surg Oncol.

Osteoarthritis



- Over 50 (fs rare over 60)
- Slower onset than fs
- Loss of ROM
- Stiff
- X ray to differentiate

Fracture - Proximal humeral

- Recent MOI
- Stiff
- X ray to differentiate
- Can develop secondary fs