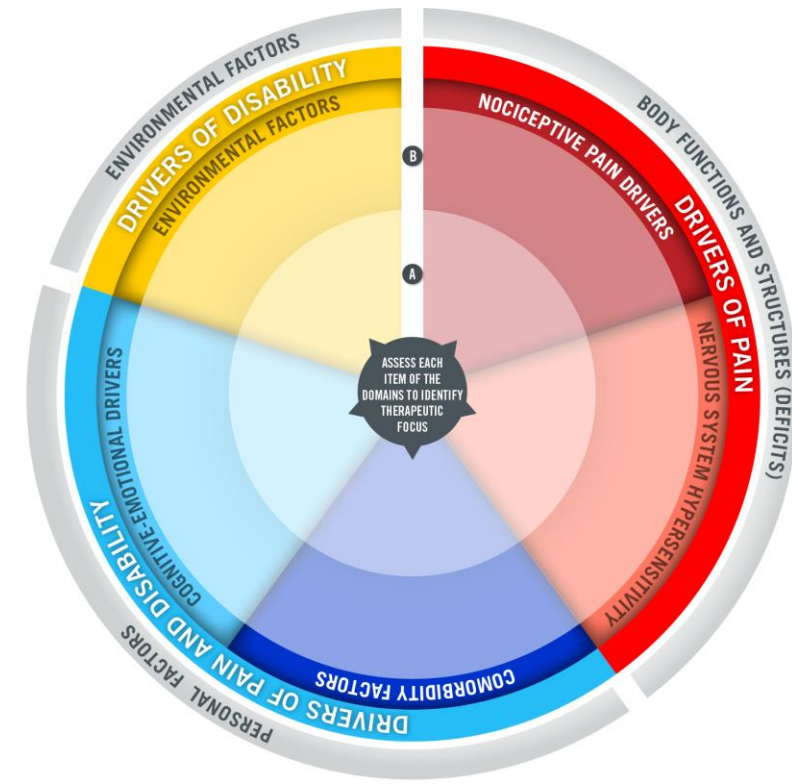


The *Pain and Disability Drivers Management Model*

a structured and pragmatic approach to managing
low back pain

Yannick Tousignant-Laflamme, PT, PhD

Geneviève Beaudoin, TRP



Conflict of interest

- None to declare

Learning objectives

- 1) Understand the relevance of the five domains of the model and identify the different elements related to pain and disability associated with low back pain.
- 2) To analyze the clinical profile of the patient based on the relative contribution of elements of the different domains affecting pain and disability.
- 3) Develop a structured, evidence-based intervention plan that focuses on the key elements affecting pain and disability.

Rehabilitation management of low back pain – it's time to pull it all together!

This article was published in the following Dove Press journal:
Journal of Pain Research
3 October 2017
[Number of times this article has been viewed](#)

Yannick
Tousignant-Laflamme^{1,2}
Marc Olivier Martel³
Anand B Joshi⁴
Chad E Cook⁵

Abstract: In the past, rehabilitation research initiatives for low back pain (LBP) have targeted outcome enhancement through personalized treatment approaches, namely through classification systems (CS). Although the use of CS has enhanced outcomes, common management practices have not changed, the prevalence of LBP is still high, and only selected patients meet the CS profile, namely those with a nociceptive context. Similarly, although practice guidelines propose



You are most likely aware that stratified care (ie: the use of classification systems) in management of LBP is highly recommended. Yet none of the CS we have meet all ICF criteria

PROBLEM

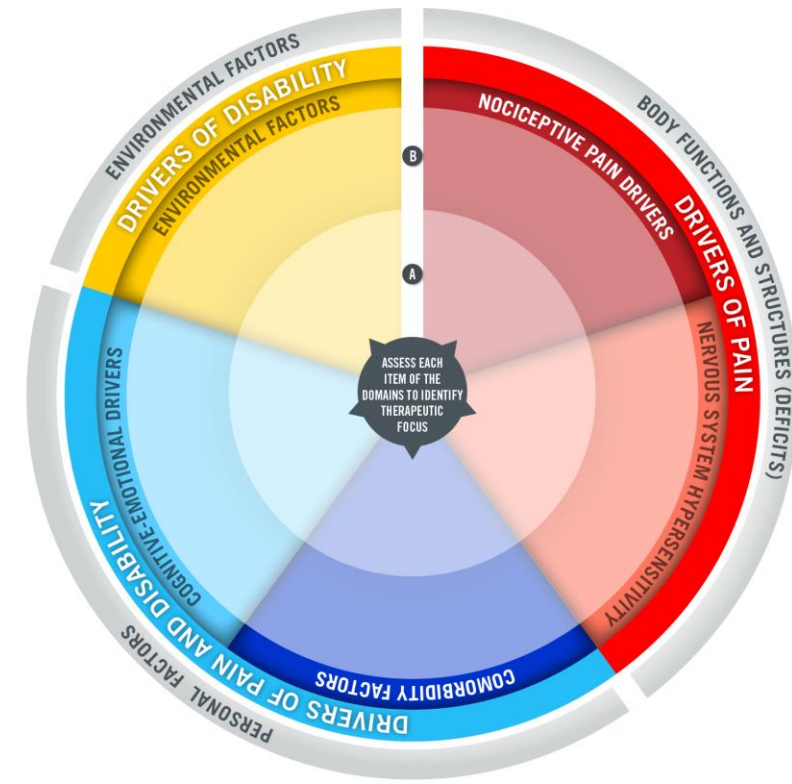


Could the model serve as a structure to guide and enhance pain and disability management for LBP?



Learning objective: Understand the relevance of the Pain and Disability Drivers Management model, and identify the different elements related to pain and disability associated with low back pain

What is the *Pain and Disability Drivers Management Model*??



Why would we need a model to better manage pain?

Clinicians now have many tools helping to structure their approach:

- **Classification tools:**

- multiple mono-disciplinary classification tools designed to target patient-specific treatments (ie: Treatment-based classification, Mckenzie classification system, Movement system impairment classification system, etc)

- **Systematic reviews/meta-analyses on LBP.**

- Provide with level of evidence on the effectiveness of interventions

- **Guidelines:**

- 15 international multidisciplinary guidelines for the treatment of LBP

- **Clinical pathways of care:**

- Clinical pathways of care propose more comprehensive solutions to merge real life clinical care with best practice.

Yet... facts show that:

- LBP is still a major public health problem...(Hoy 2014).
- The self-reported levels of disability in individuals with LBP have not improved in the last decade (GBD 2015).
- Using specific treatment approaches, it has been shown that PT treatment provide small to moderate treatment effect and little cost-effectiveness (Apeldoorn 2012)

What could possibly explain this? [EDITORIAL]

- We don't use Practice Guidelines??



Low Back Pain: Do the Right Thing and Do It Now

JOHN D. CHILDS, PT, PhD, MBA
Associate Editor

TIMOTHY W. FLYNN, PT, PhD
Associate Editor

ROBERT S. WAINNER, PT, PhD¹
J Orthop Sports Phys Ther 2012;42(4):296-299. doi:10.2519/jospt.2012.0105

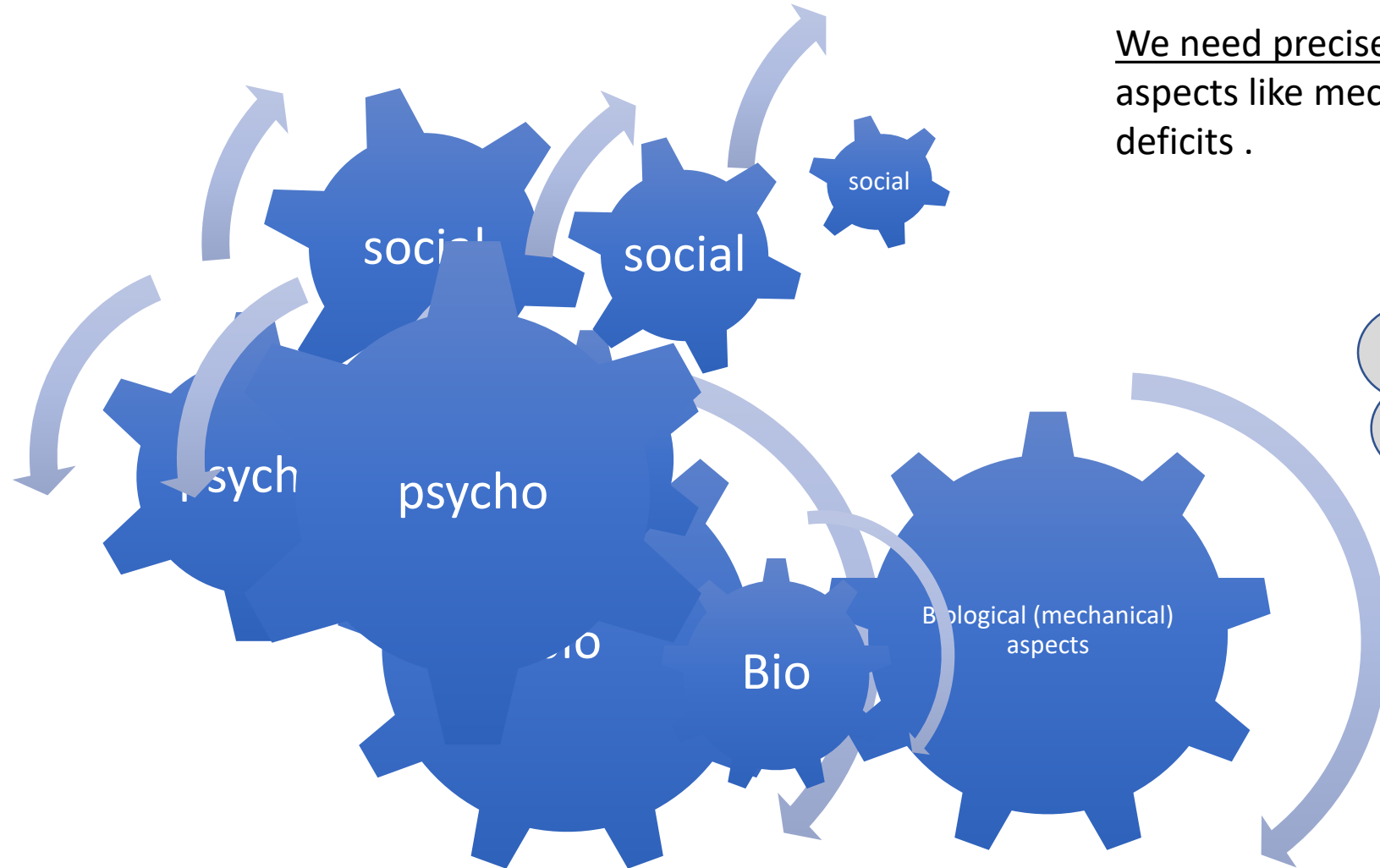
APRIL 2012 | VOLUME 42 | NUMBER 4 | JOURNAL OF ORTHOPAEDIC & SPORTS PHYSICAL THERAPY

- Systematic reviews/meta-analyses :
 - Only provide evidence for discreet interventions.
- Classification systems (CS) :
 - Dominant paradigm = biomechanical/nociceptive
 - Very limited integration of social factors... even comorbidities!

Could it be that the multiple drivers of pain, disability, and their interaction require a model that is comprehensive enough to identify and address each related issue?



So what would be an ideal model?

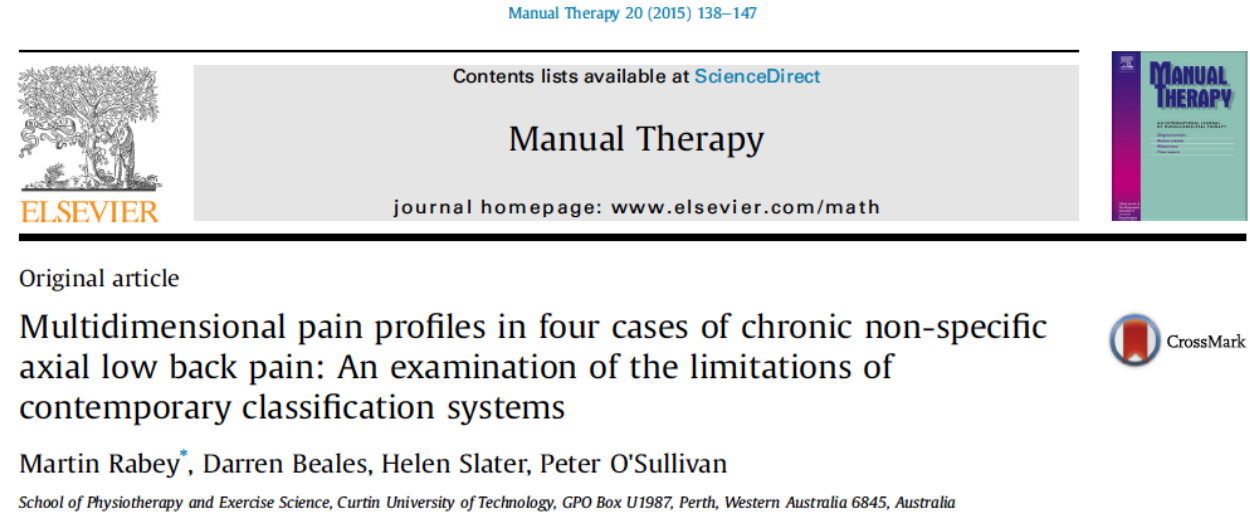


We need precise tailoring that goes beyond aspects like mechanical or sensori-motor control deficits .

Most CS mainly focus on nociceptive influences

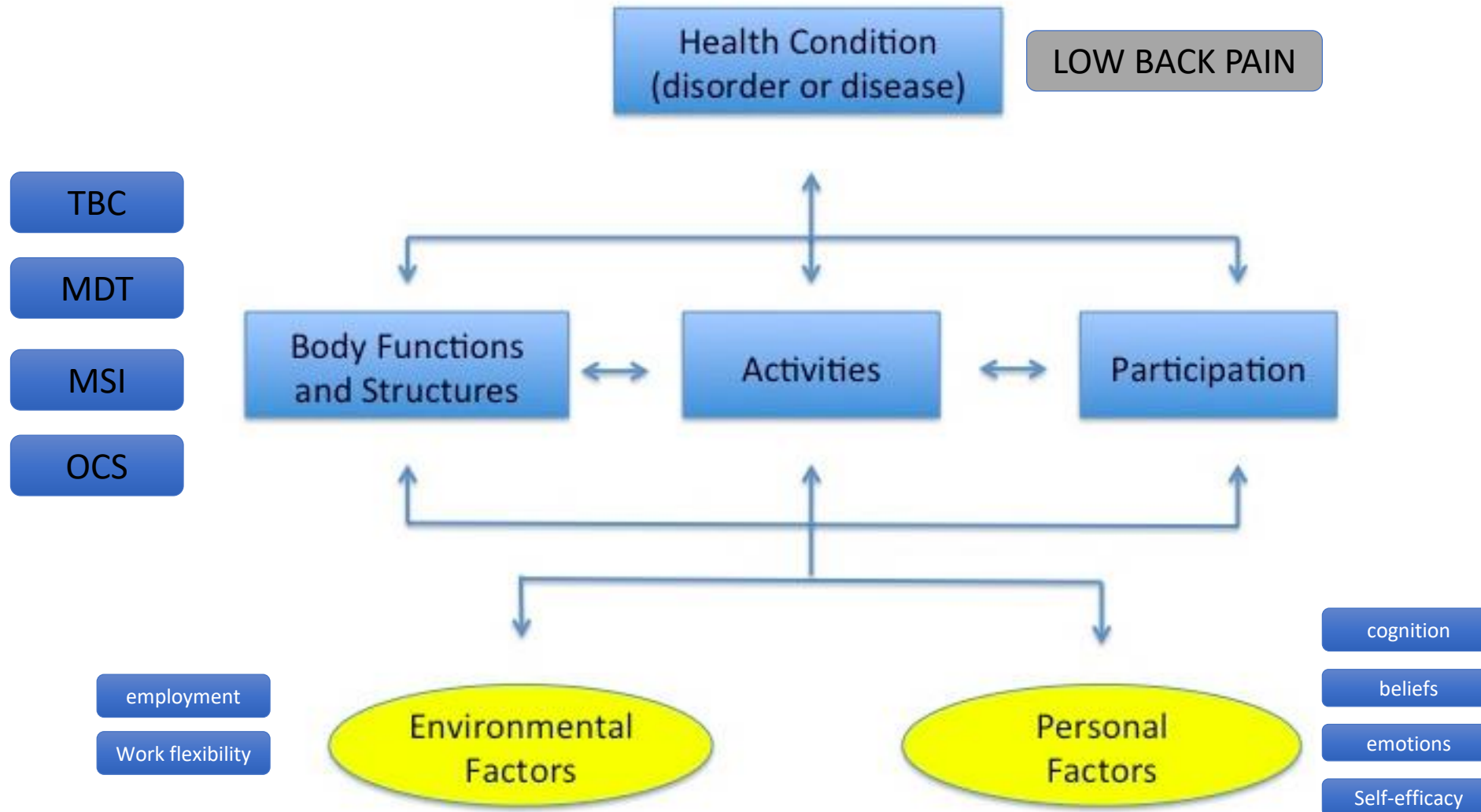
Do we need a new perspective?

- Recently, Rabey et al. (2016) stated that we need *“a flexible, biopsychosocial classification system that may allow profiling across multiple relevant dimensions, to facilitate targeted care based on the dominant factors present in individual profiles”*

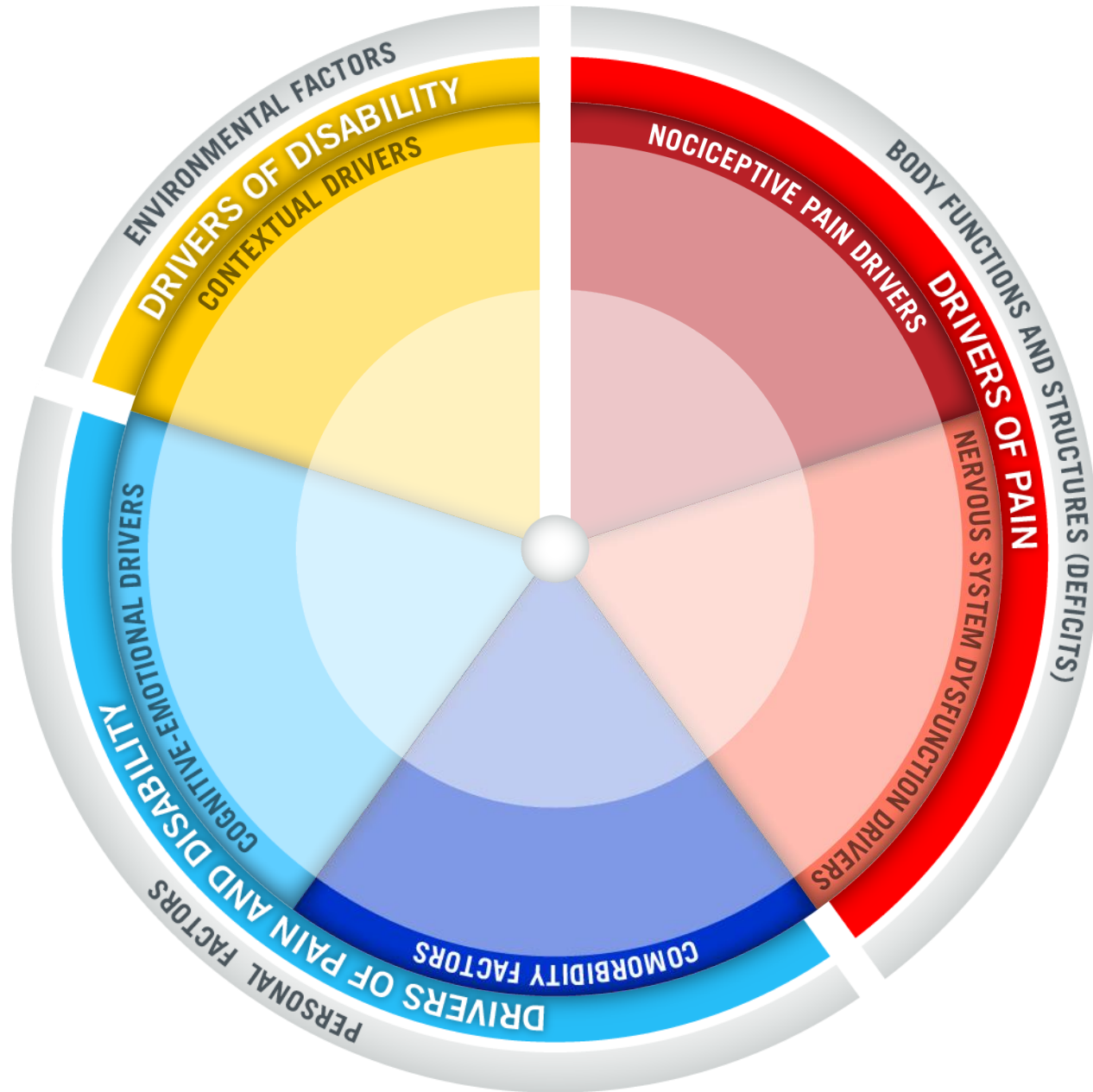


Where to start to improve things?

Could a structure based on the ICF model help?

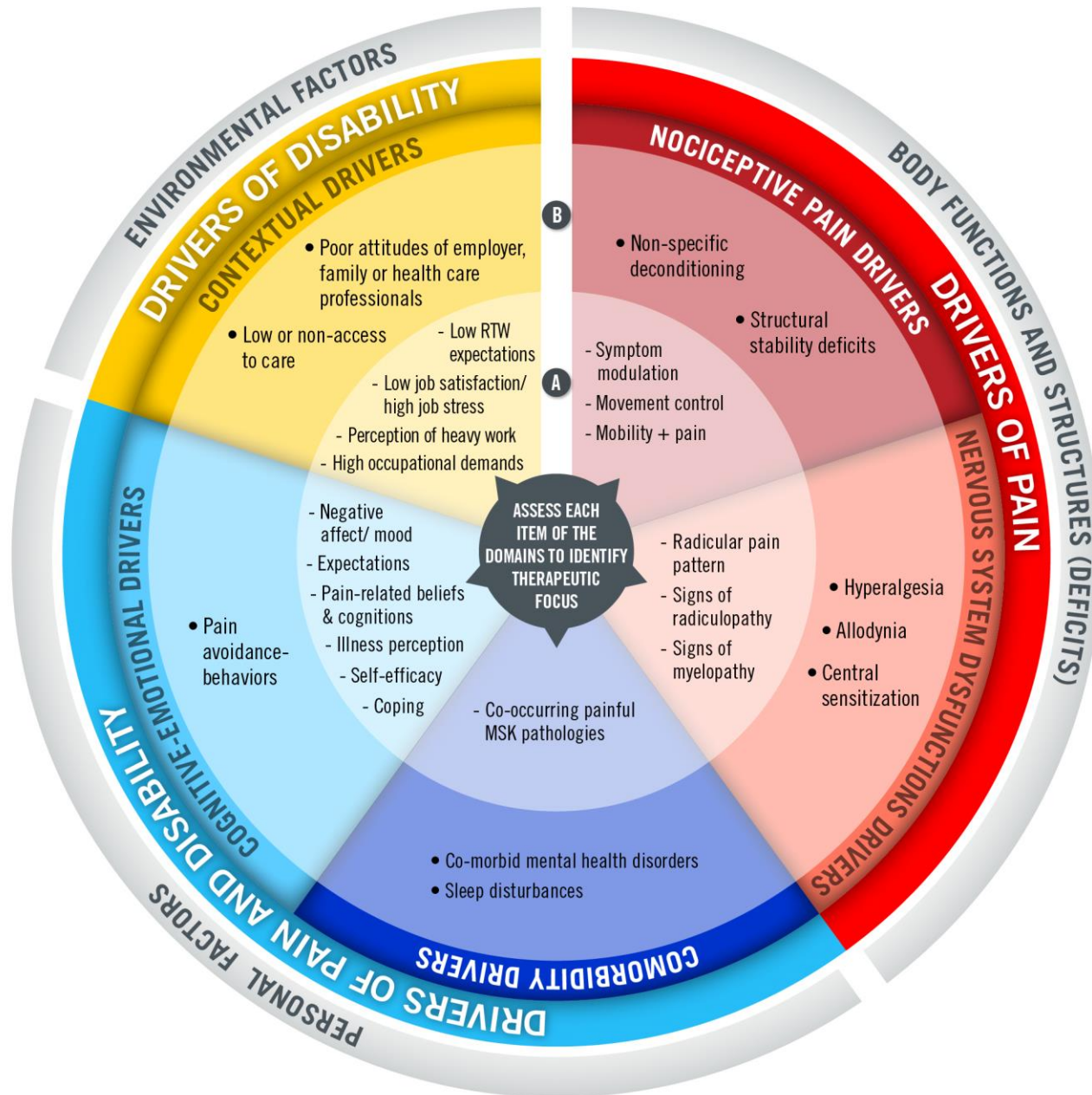


Pain and Disability Drivers Management Model



Our model proposes to establish the profile of patients based on the known drivers of pain & disability

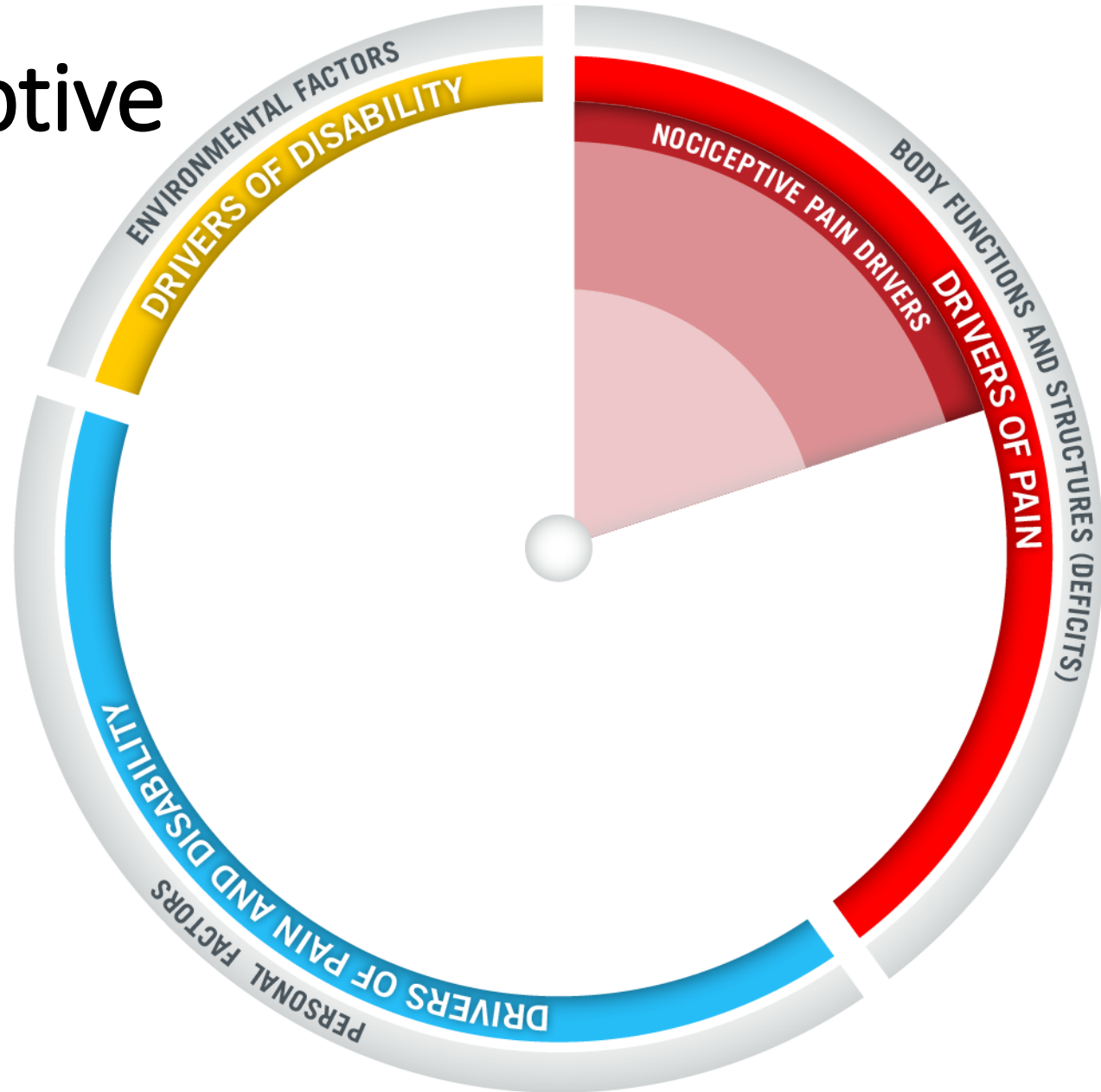
Each domain contains elements grounded on the known mechanisms driving the presence of painful symptoms and/or disability in LBP.



In an attempt to quantify the severity of each domain, each domain includes two categories :

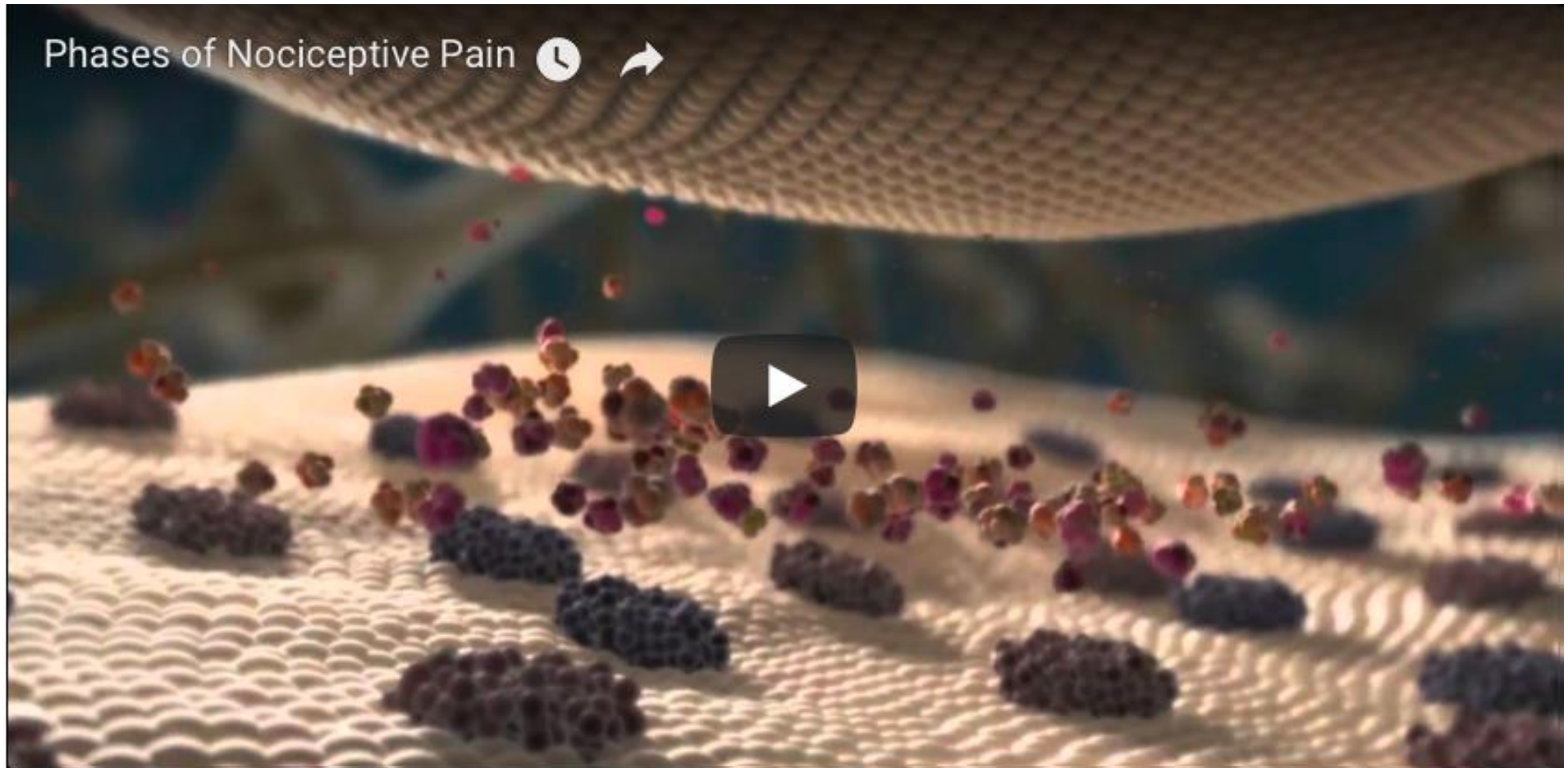
- (A) implicates more common and modifiable elements,
- (B) involves elements that are more complex, less modifiable and that will prompt more aggressive or interdisciplinary care to more effectively address the problematic issue.

Domain 1: Nociceptive Pain Drivers



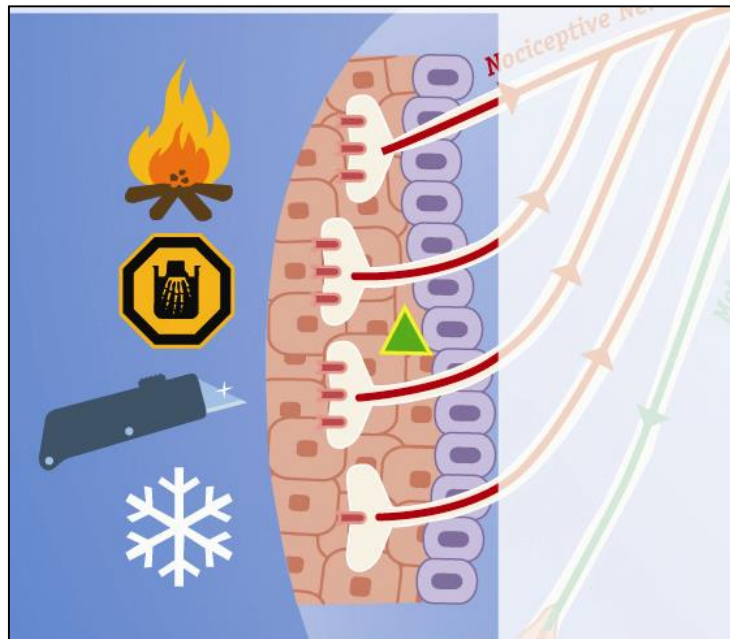
What is nociceptive pain?

"pain that arises from actual or threatened damage to non-neural tissue and is due to the activation of nociceptors"



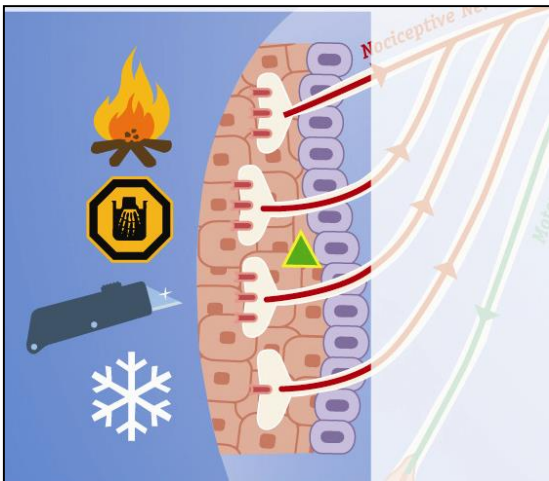
In the context of Low back pain

- PAIN: a deficit in relation to the ICF, is mostly somatic or inflammatory, and can come from many potential body structures



Nociceptive versus neuropathic pain

NOCICEPTIVE PAIN	NEUROPATHIC PAIN
SOMATIC	PERIPHERAL NS
INFLAMMATORY	CENTRAL NS
VISCERAL	



Step 1: confirm the presence of nociceptive pain

The PainDetect questionnaire

Musculoskeletal Science and Practice 27 (2017) 40–48



ELSEVIER

Contents lists available at ScienceDirect

Musculoskeletal Science and Practice

journal homepage: www.journals.elsevier.com/aquaculture-and-fisheries/



Original article

Distinguishing between nociceptive and neuropathic components in chronic low back pain using behavioural evaluation and sensory examination



N. Spahr^{a, b, *}, D. Hodkinson^a, K. Jolly^a, S. Williams^a, M. Howard^{a, 1}, M. Thacker^{a, b, c, 1}

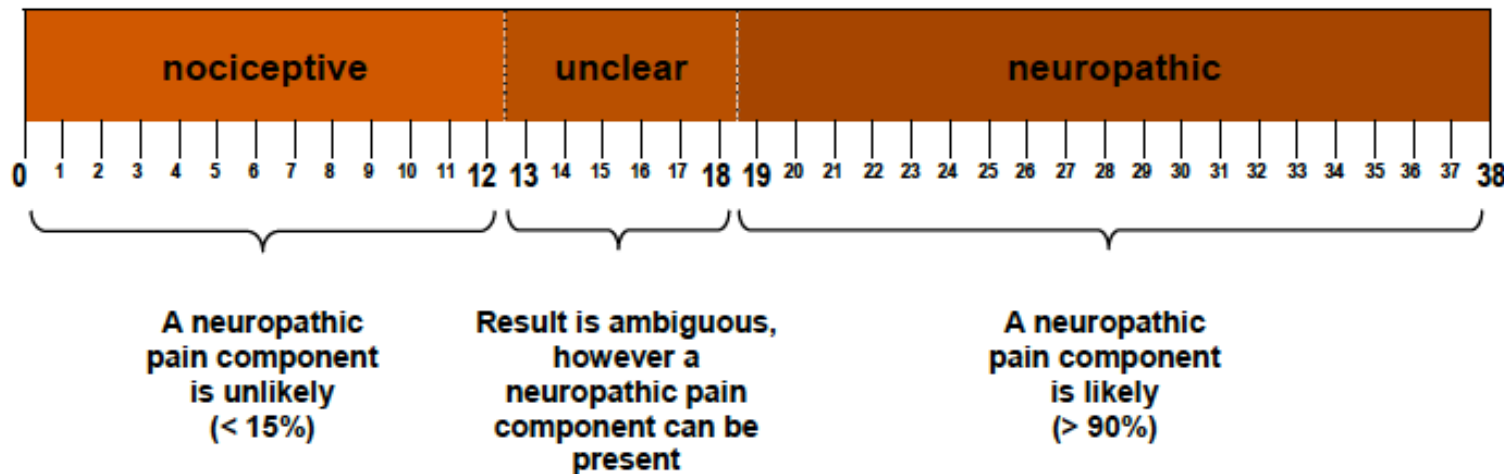
^a Dept. of Neuroimaging, Institute of Psychiatry, Psychology and Neuroscience, King's College London, UK

^b Dept. of Physiotherapy, Guy's & St Thomas' NHS Foundation Trust, London, UK

^c Centre of Human & Aerospace Physiological Sciences, King's College London, UK

Screening Result

Final score

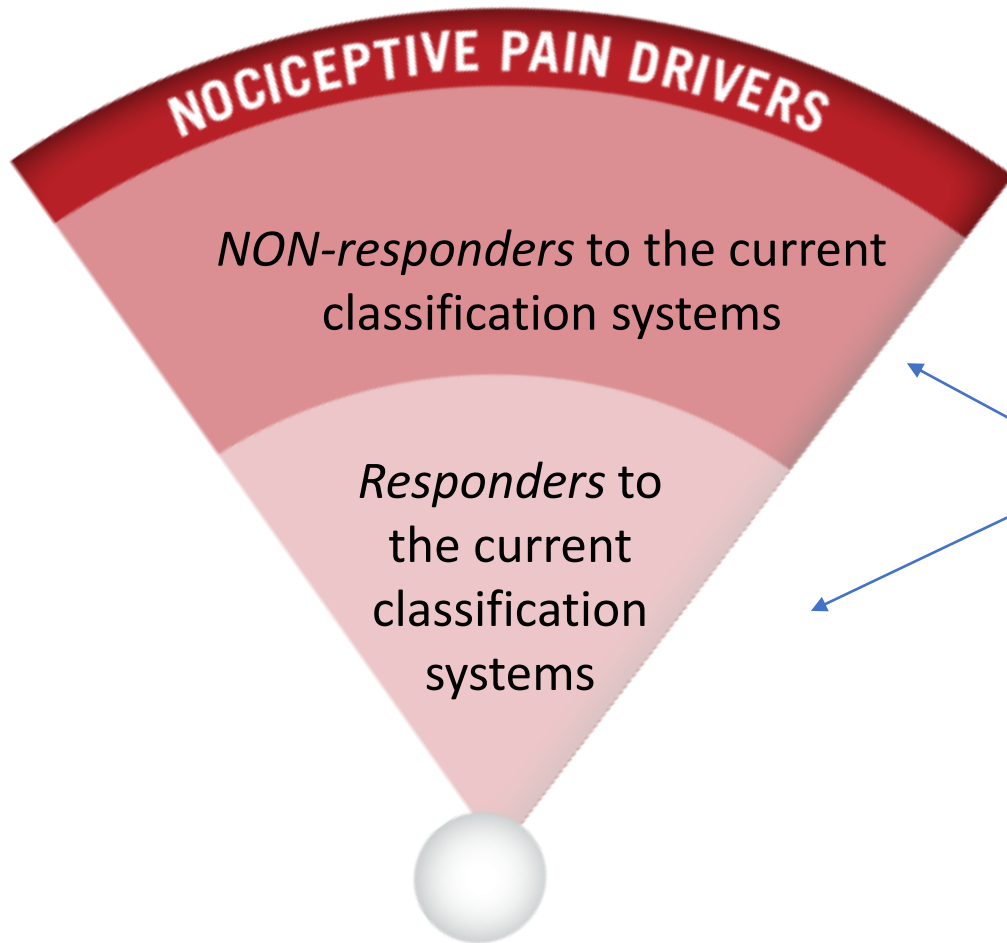


1-12: nociceptive

13-18: unclear (or mixed)

19-38: most likely neuropathic

The two sub-domains

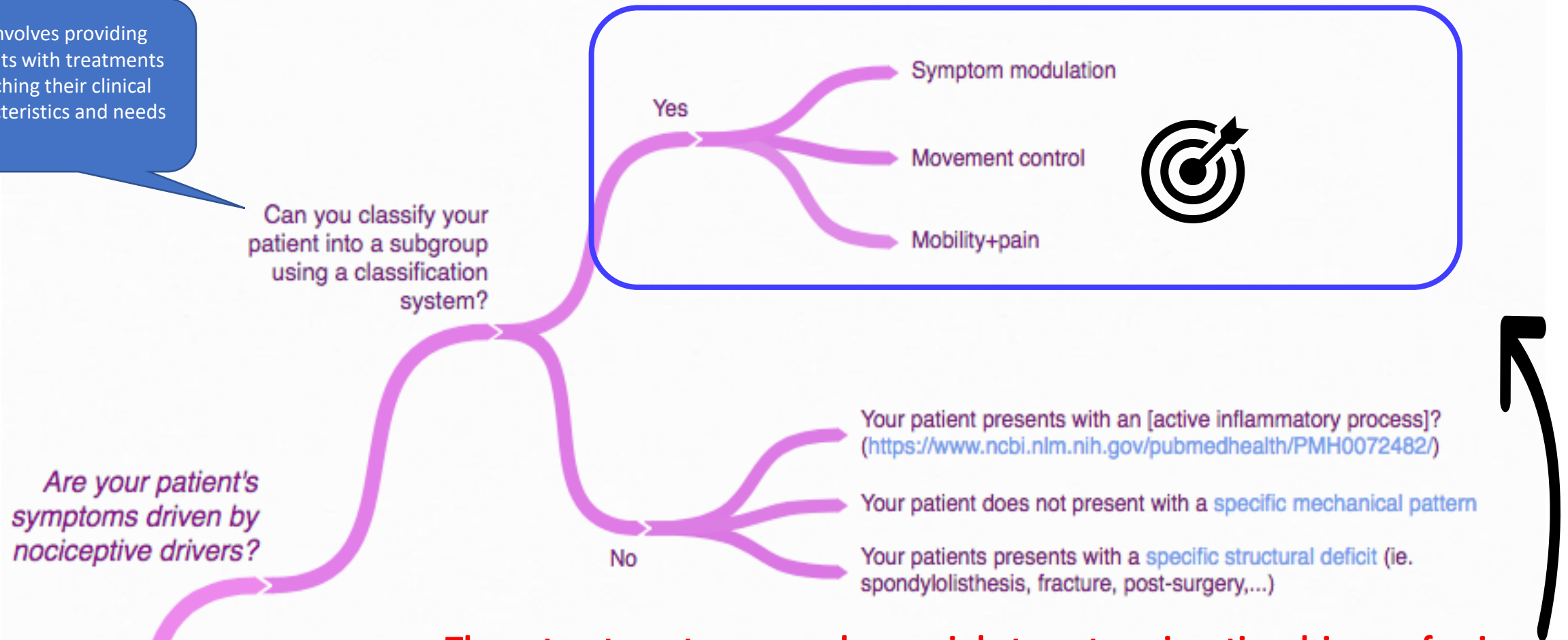


- (A) implicates more common and modifiable elements,
- (B) involves elements that are more complex, less modifiable or that will prompt more aggressive/interdisciplinary care to more effectively address the problematic domain.

NOCICEPTIVE PAIN DRIVERS DOMAIN:

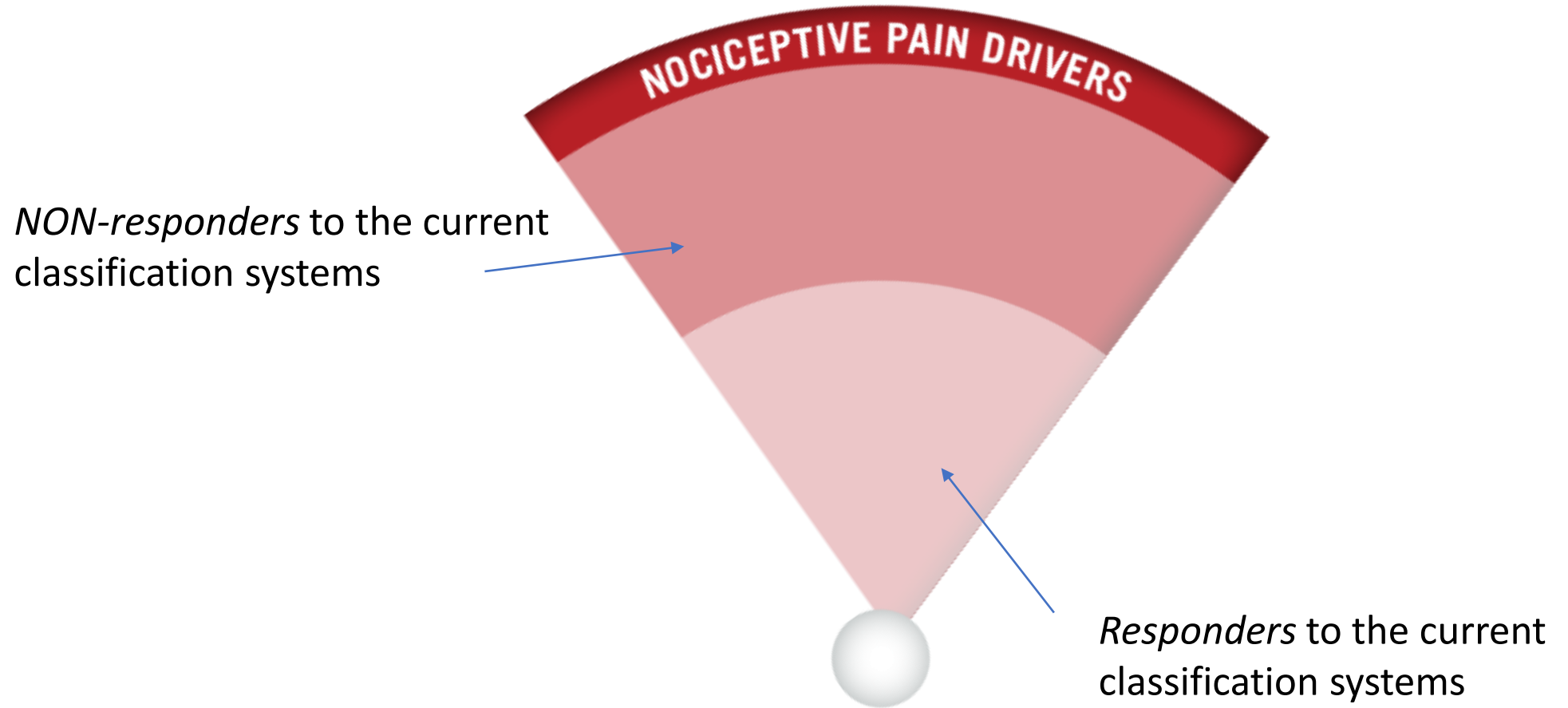
Are your patient's symptoms driven by nociceptive drivers??

CS involves providing patients with treatments matching their clinical characteristics and needs



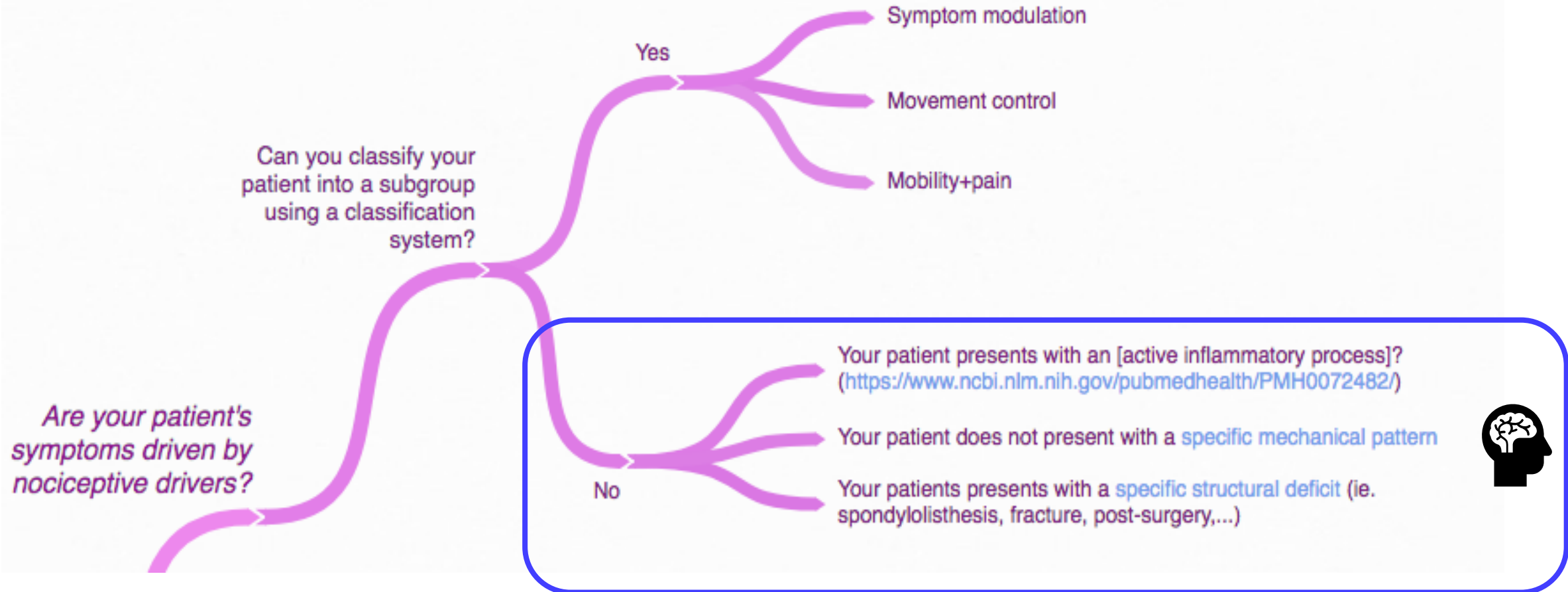
These treatments approaches mainly target nociceptive drivers of pain

And what about non-responders with nociceptive pain?



NOCICEPTIVE PAIN DRIVERS DOMAIN:

Are your patient's symptoms driven by nociceptive drivers??



NOCICEPTIVE PAIN DRIVERS:

B) Non-responders to classification systems

- Non-Responders, ie: patients with
 - post-surgical condition
 - Highly deconditioned patients...are likely to have somatic or inflammatory pain

...they are likely to respond to general (non-specific) exercises

Analgesia through [Exercise induced hypoalgesia](#)



NIH Public Access

Author Manuscript

J Pain. Author manuscript; available in PMC 2013 December 01.

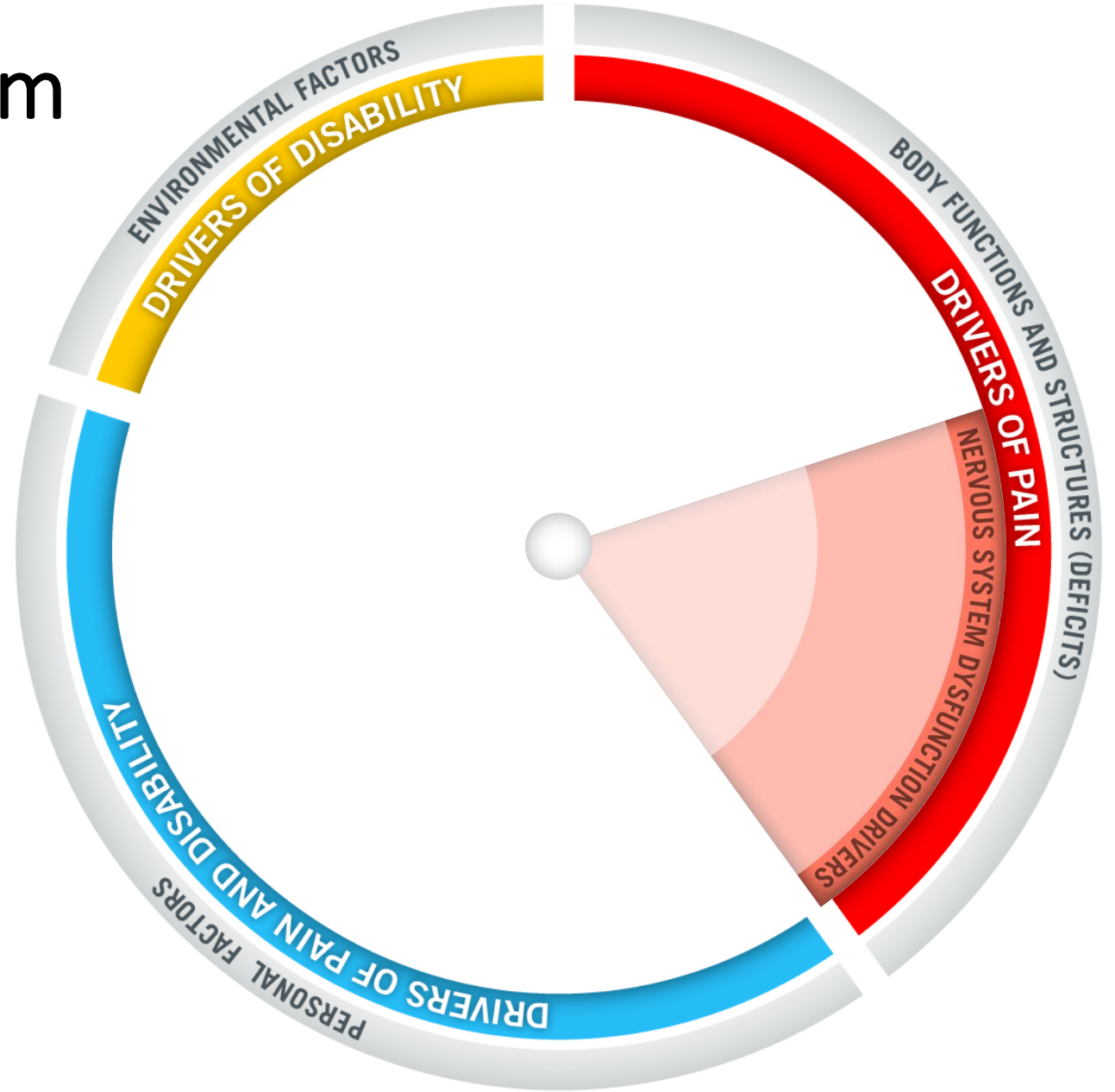
Published in final edited form as:

J Pain. 2012 December ; 13(12): 1139–1150. doi:10.1016/j.jpain.2012.09.006.

A meta-analytic review of the hypoalgesic effects of exercise

Kelly M. Naugle, Roger B. Fillingim, and Joseph L. Riley III
Comprehensive Center for Pain Research, University of Florida

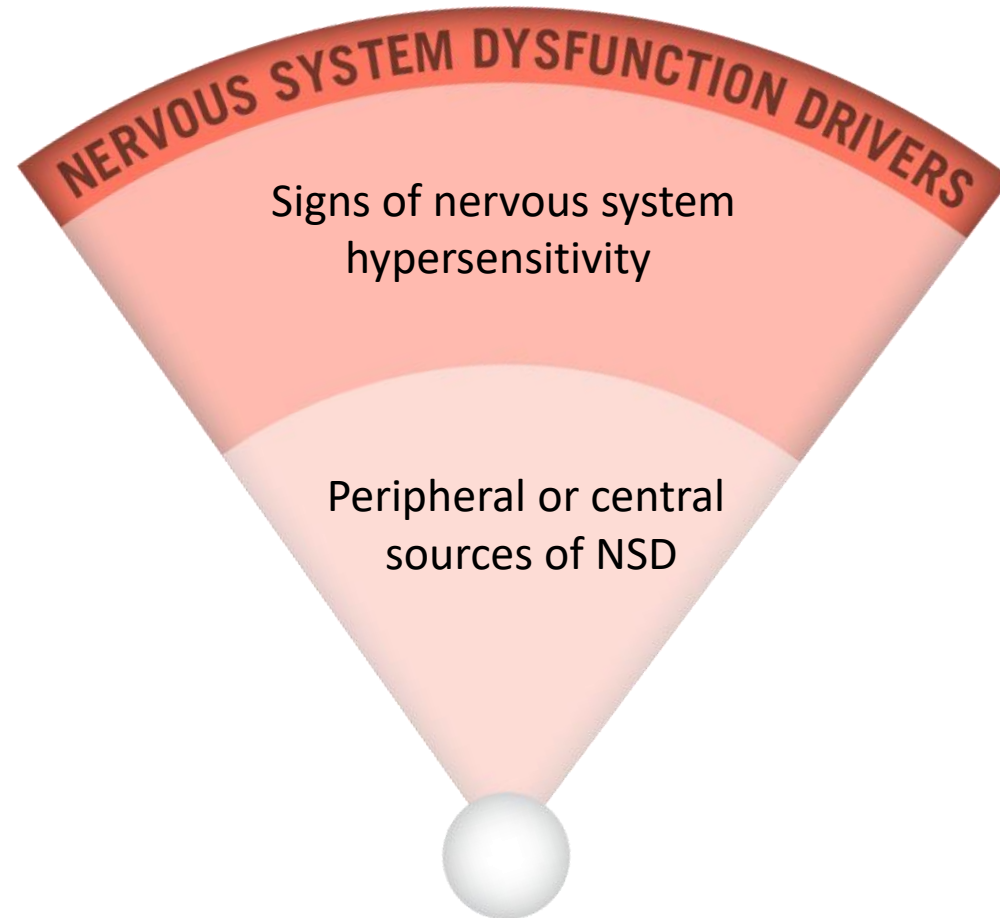
Domain 2: Nervous System Dysfunctions drivers



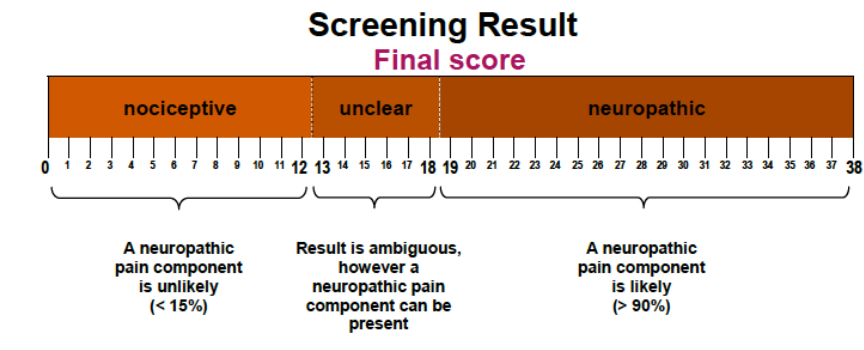
Nervous system dysfunction drivers

- Deficits arising from the nervous system itself can also drive the painful symptoms
- Alterations of the nervous system may take place at the peripheral, spinal and even supra-spinal levels of the nervous system and can lead to hypersensitivity, thus driving painful symptoms

Nervous system dysfunction (NSD) drivers



A) What are evidence of peripheral or central sources of NSD?



Clinical signs and symptoms suggesting peripheral hypersensitivity

- Tingling/paresthesia or burning/shooting pain
- Radicular pain pattern
- radiculopathy

- Neurological exam
- Algometry



Ever heard of neuropathic pain?

🔗 Learn on the use of the DN4 questionnaire 🔍

B) Evidence of nervous system hypersensitivity

Palpation

Von Frey monofilament

Qualitative Sensory Testing

Allodynia



Verbal reports

Pain drawings

Widespread pain
location



Verbal reports

Behaviors

Hyperalgesia or
disproportionate pain
intensity in relation to
injury



How to assess CS in clinical settings?
The Central sensitization Inventory



Central Sensitization Inventory

ORIGINAL ARTICLE

Establishing Clinically Relevant Severity Levels for the Central Sensitization Inventory

Randy Neblett, MA, LPC, BCB*; Meredith M. Hartzell, PhD*; Tom G. Mayer, MD[†];
Howard Cohen, MD[‡]; Robert J. Gatchel, PhD, ABPP[§]

© 2016 World Institute of Pain, 1530-7085/17/\$15.00
Pain Practice, Volume 17, Issue 2, 2017 166–175

Extreme (60-100)

Severe (50-59)

Moderate (40-49)

Mild (30-39)

Subclinical (0-29)

Are your patient's painful symptoms driven by nervous system dysfunctions?

Does your patient present with peripheral nervous system dysfunctions?

Radicular pain pattern (RPP) (differences between RPP and radiculopathy)

Anamnesis/Self-report

Signs of radiculopathy

Signs of myelopathy

Observations

Sympathetic nervous system dysfunction

signs

Does your patient present with nervous system hypersensitivity?

Special tests

Increased neural mechanosensitivity

Neurodynamic tests: SLR, slump, PKB

Clinical exam

Sensory changes

Specific signs and symptoms associated with NSH

Evidence of central sensitization

Central sensitization Inventory (CSI), Part A

<40

No

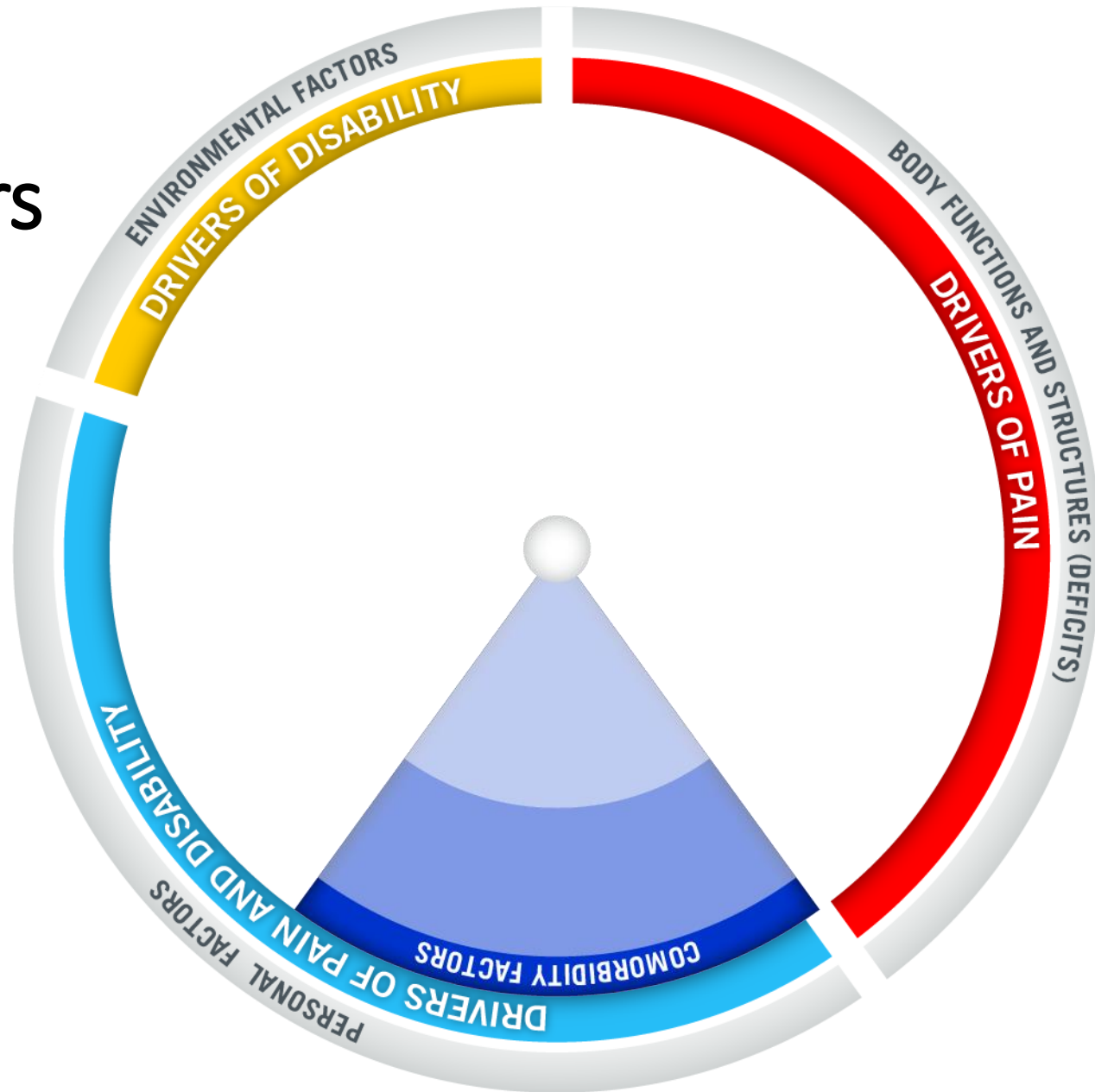
>40

Yes

Sleep disturbances due to pain

Screening: Central Sensitization Inventory (Q1-12-17-22) and follow-up: Brief Pain Inventory (Q9)

Domain 3: Comorbidity factors



Comorbidities: driving pain and disability?

Besides their diagnosis of LBP, patients can also present with certain physical and mental health comorbidities.

- Studies have shown that **physical comorbidities** tend to worsen the severity of symptoms of LBP (Ramond-Roquin, 2015))
- Mental health comorbidities have also been found to be quite prevalent among patients with LBP (Katz 2015)
 - Depression and anxiety disorders =20-50 %
 - Personality disorders are also common psychiatric comorbidities observed among these patients

These can certainly influence symptom severity and treatment delivery

ORIGINAL ARTICLE

Impact of co-morbidities on resource use and adherence to guidelines among commercially insured adults with new visits for back pain

Sean D. Rundell DPT, PhD^{1,2}  | Laura S. Gold PhD^{3,5} | Ryan N. Hansen PharmD, PhD^{7,8} | Brian W. Bresnahan PhD^{4,6}

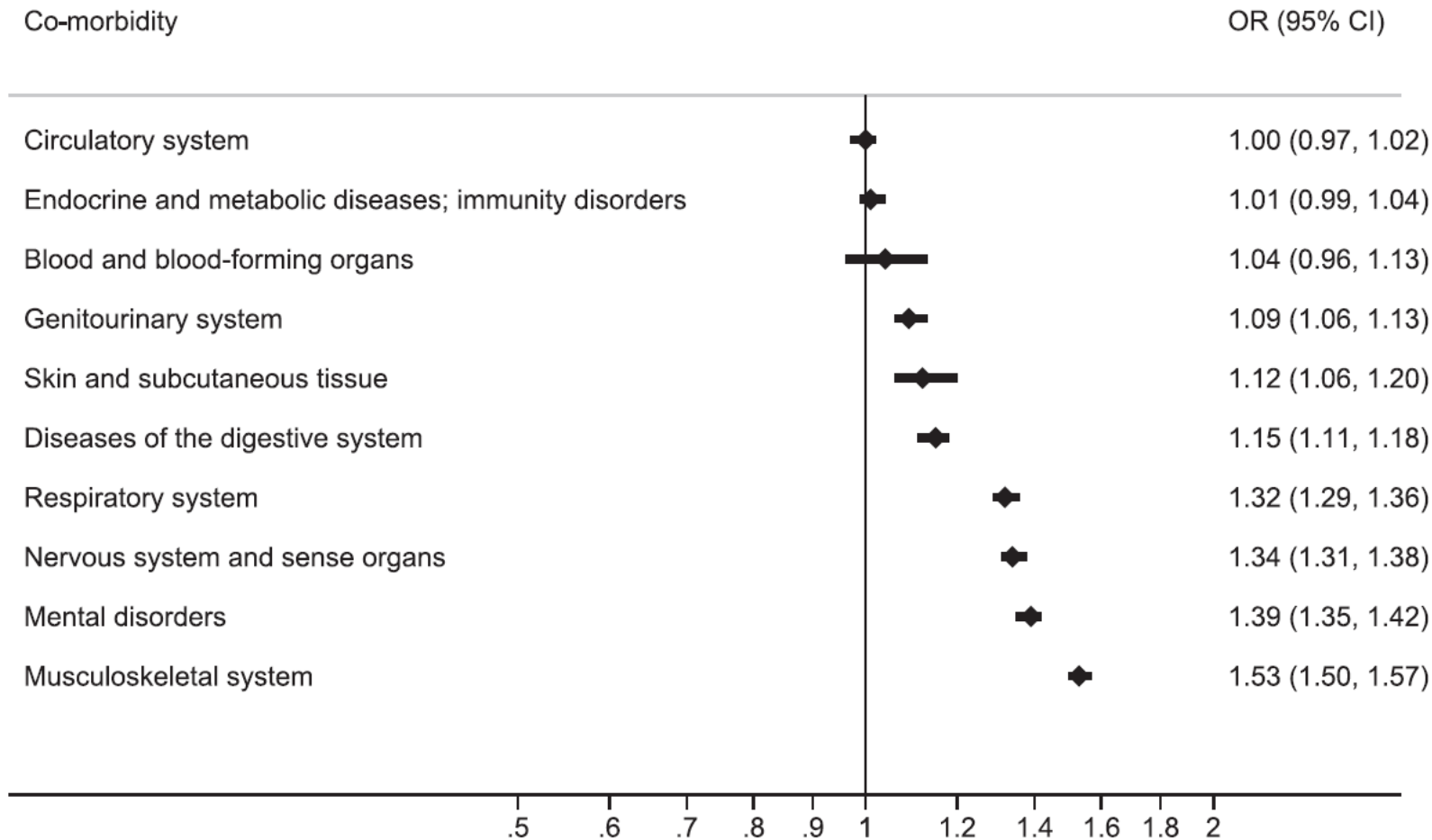


FIGURE 1 Adjusted associations between chronic conditions and higher long-term back-related resource use. Odds ratios (OR) and 95% confidence intervals (CIs)

COMORBIDITY FACTORS

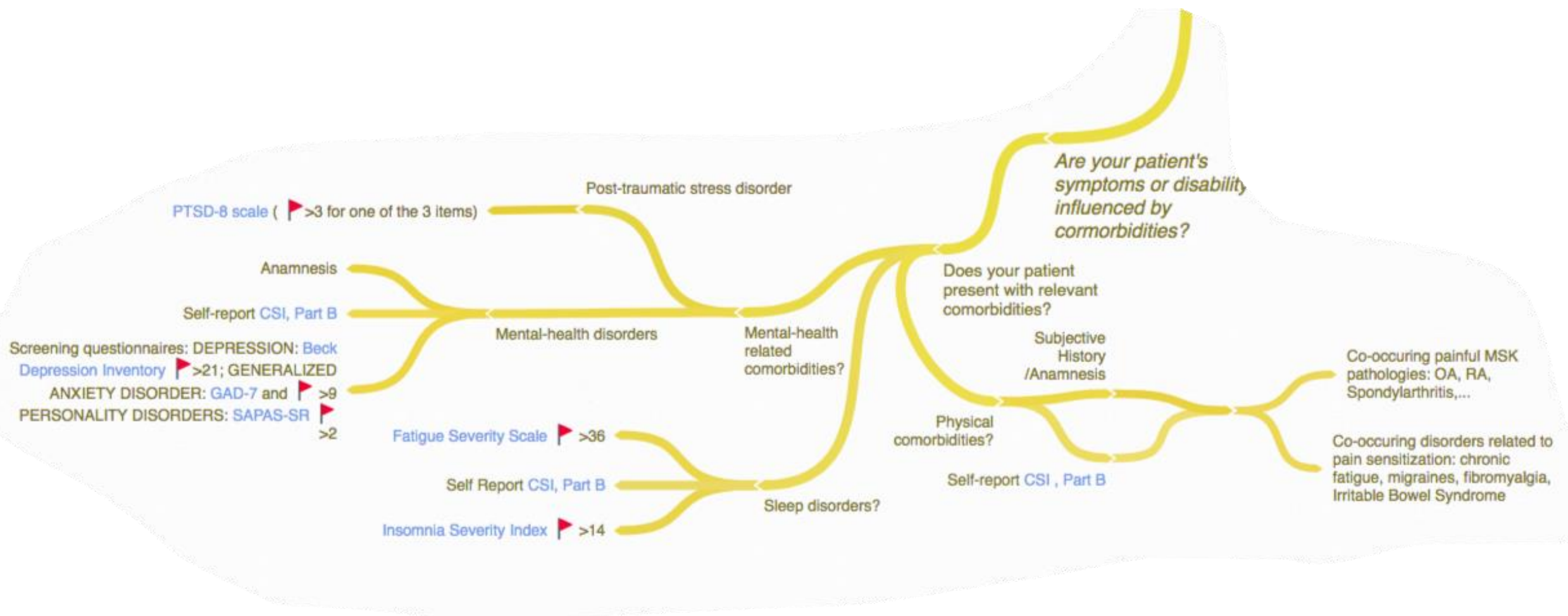
Mental health comorbidities

Disorders of the DSM,
ie: depression, generalized
anxiety, sleep disorders

Physical comorbidities

Painful physical
comorbidities





COMORBIDITY FACTORS

Screen, assess and address!!!

- Painful musculoskeletal comorbidities in LBP are common and worsen the severity of symptoms



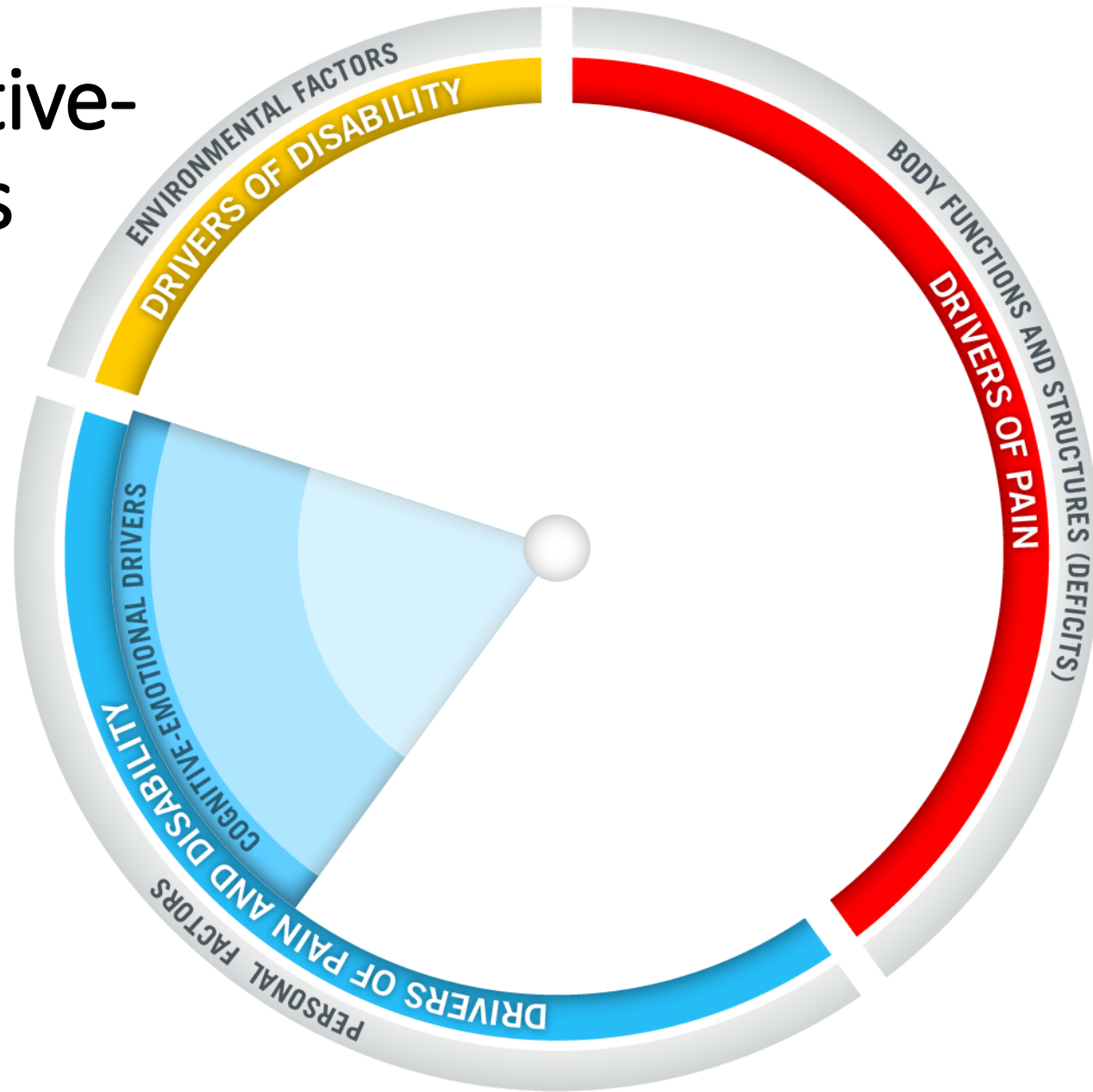
Pain management strategies for paroxysmal pain should be encompassed within your treatment plan, as ***their continuing presence might induce nervous system hypersensitivity***

- Mental health comorbidities:
 - Depression
 - Generalized anxiety disorders
 - Personality disorders
- Patient reported sleep disorders...



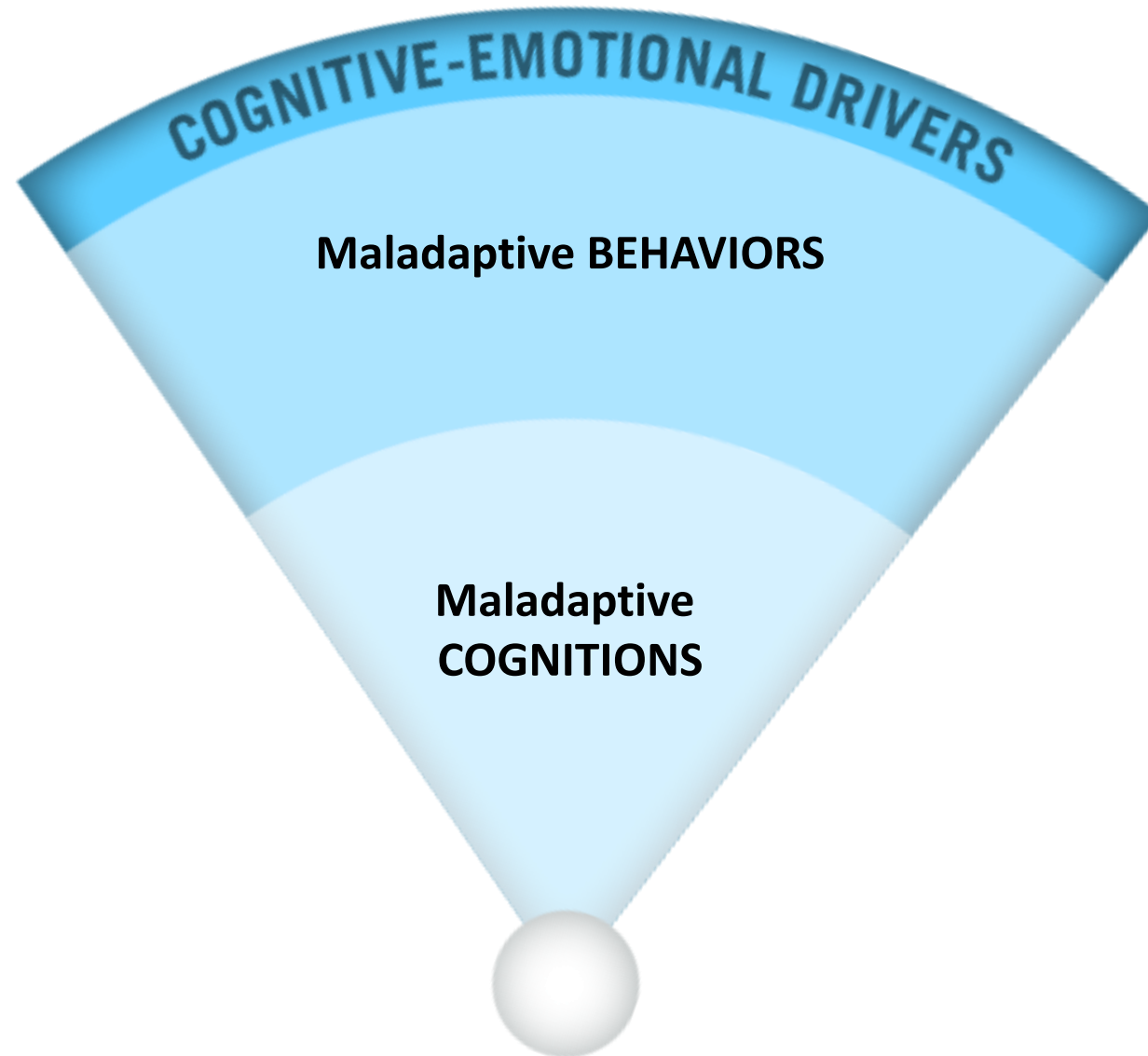
- The treatment implications of chronic pain in the presence of this type of comorbidity are not clearly known, it should influence your goal setting and expectations of improvements, but most importantly, **making sure that these patients receive proper medical attention**

Domain 4: Cognitive-emotional drivers



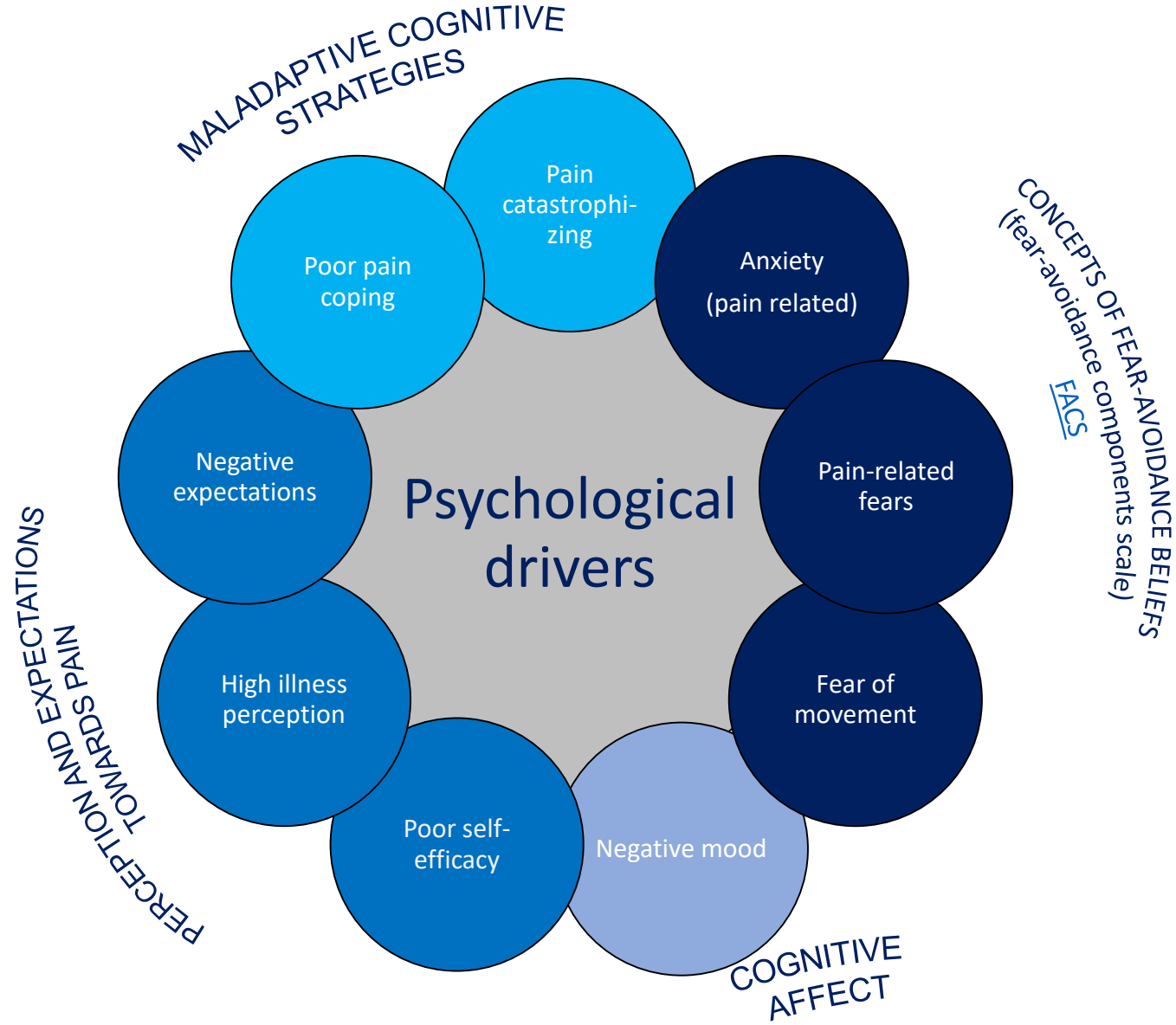
Cognitive-emotional drivers of pain

- As outlined by many studies, maladaptive cognitions and maladaptive behaviors are personal factors that:
 - 1) are clearly linked to enhanced pain perception,
 - 2) are predictors of long-term disability,
 - 3) can explain the transition from acute to chronic pain.
 - 4) can explain the persistence pain in chronic conditions.



Maladaptive COGNITIONS

- Many maladaptive cognitive-emotional factors are known to influence pain perception and disability
- STEP 1: KNOW them !



Maladaptive behaviors

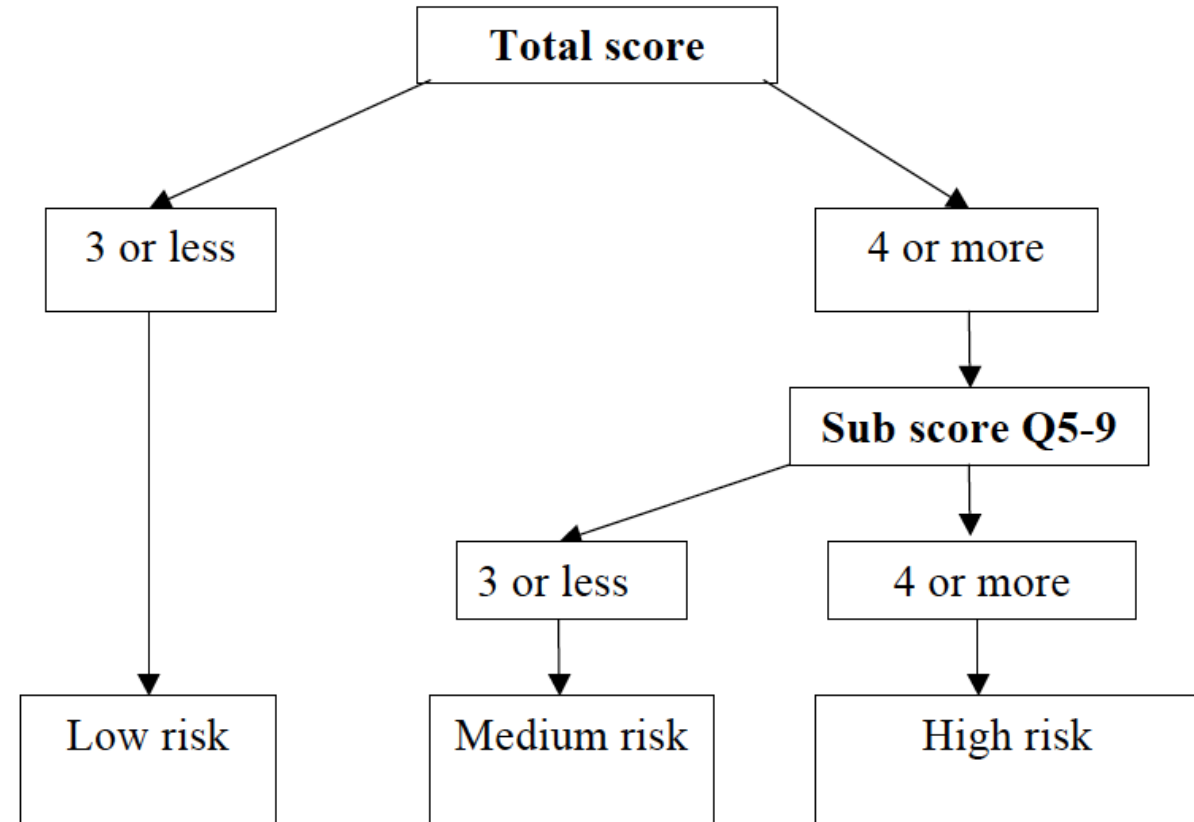
- Maladaptive behaviors, can be manifested in various ways:
 - “communicative” pain behaviors :
 - facial expressions (e.g., grimacing or wincing)
 - verbal/paraverbal pain expressions (e.g., pain words, grunts, sighs, and moans).
 - “protective” or “safety” behaviors :
 - bending/rubbing the back after performing an activity,
 - even completely avoiding to perform a task

When a patient shows maladaptive behaviors, you absolutely need to engage your patient in a behavior change. PTs are fully capable to adapt their approach to induce behavior change with their patients!

The STarT Back Tool Scoring System

STEP 2: use a SCREENING tool to identify if you'll need to focus your approach on addressing these factors – learn more

[Start back screening tool](#)



“Usual care”
(education, address concerns + **self-management**)

“Physio +”
(low-risk + active/functional PT + referral if needed)

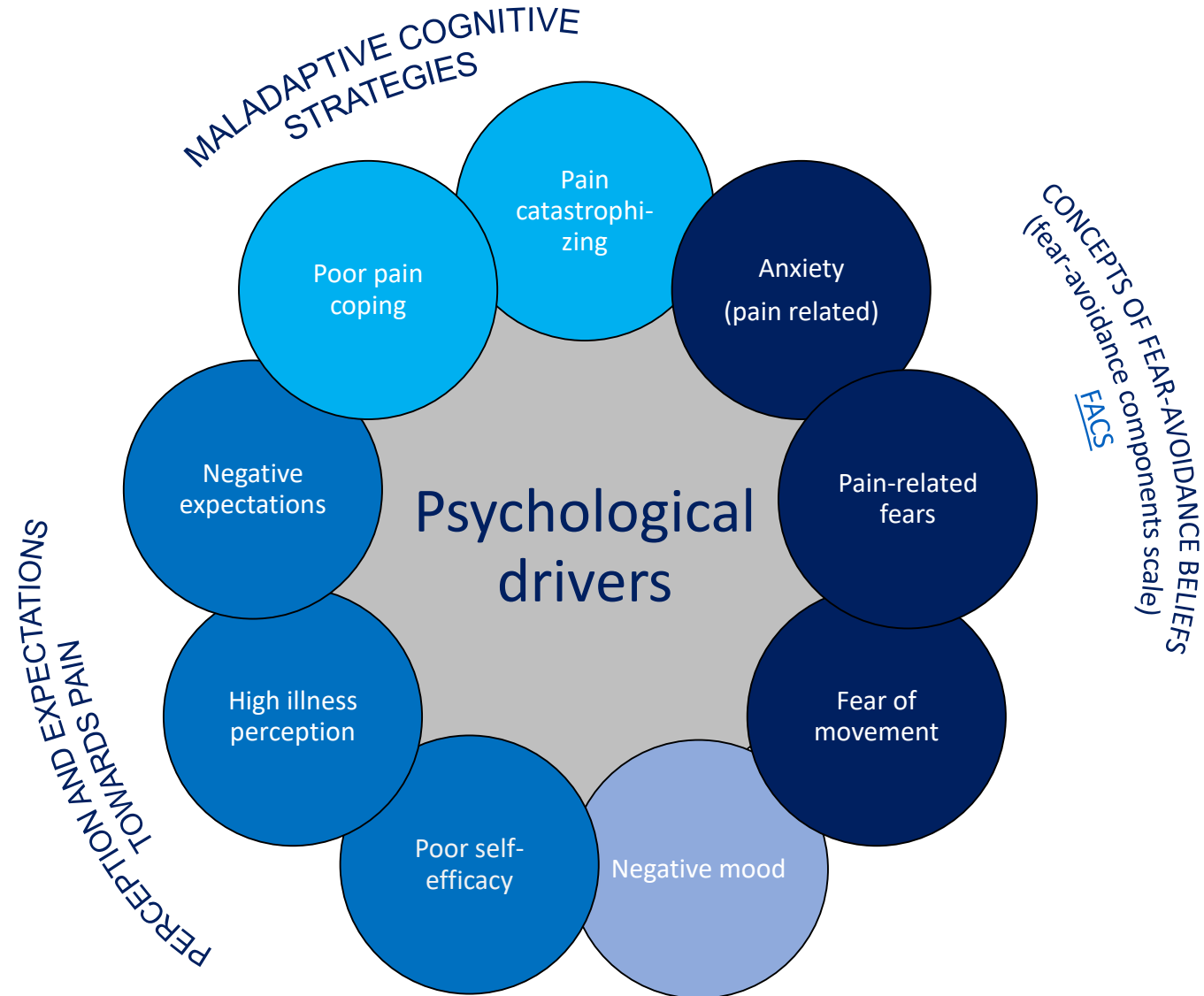
Combined cognitive-behavioral + physical approach
(interdisciplinary rehab)

<https://www.keele.ac.uk/sbst/matchedtreatments/>

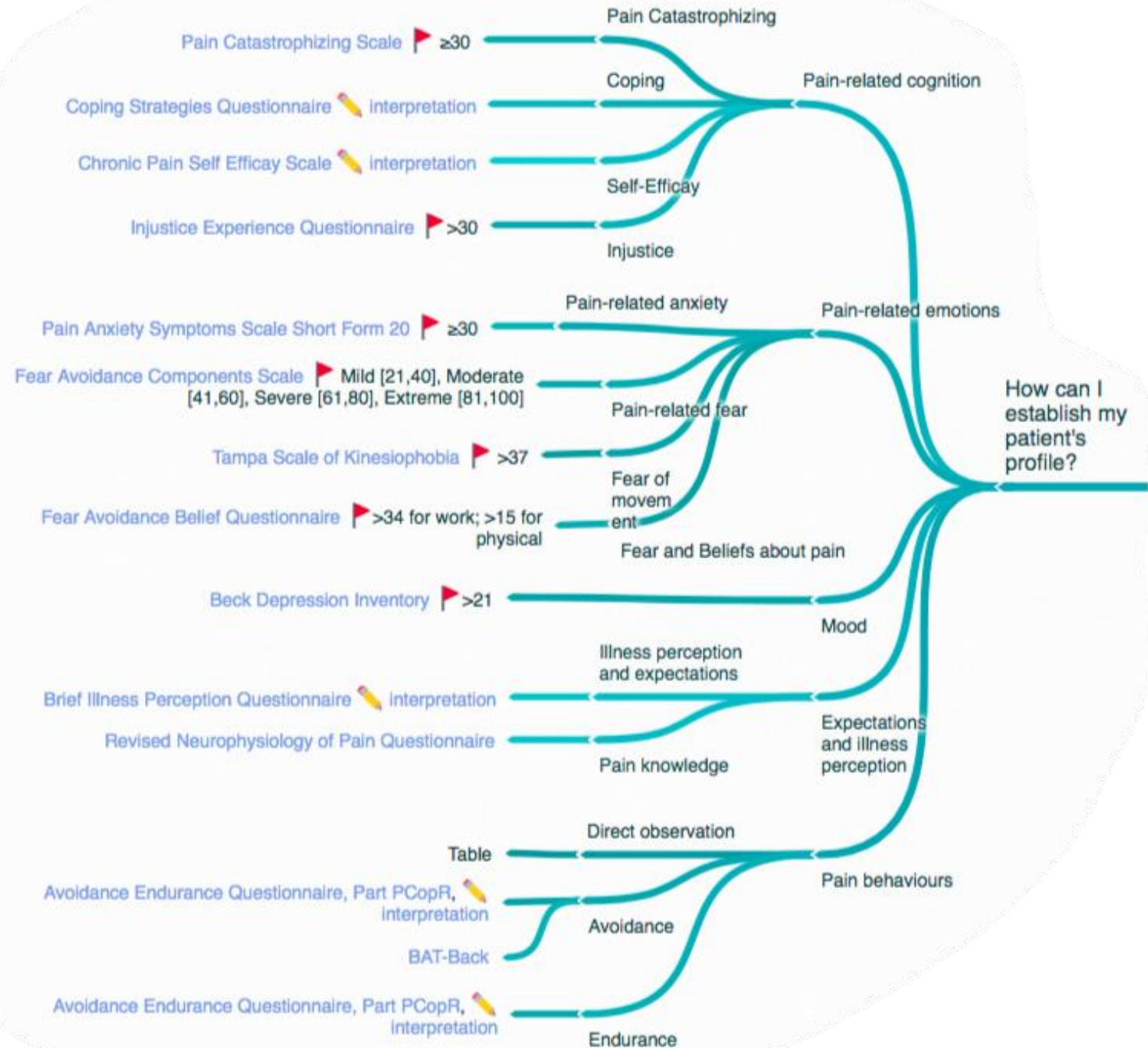
Specific “psychogenic” drivers and their assessment tools



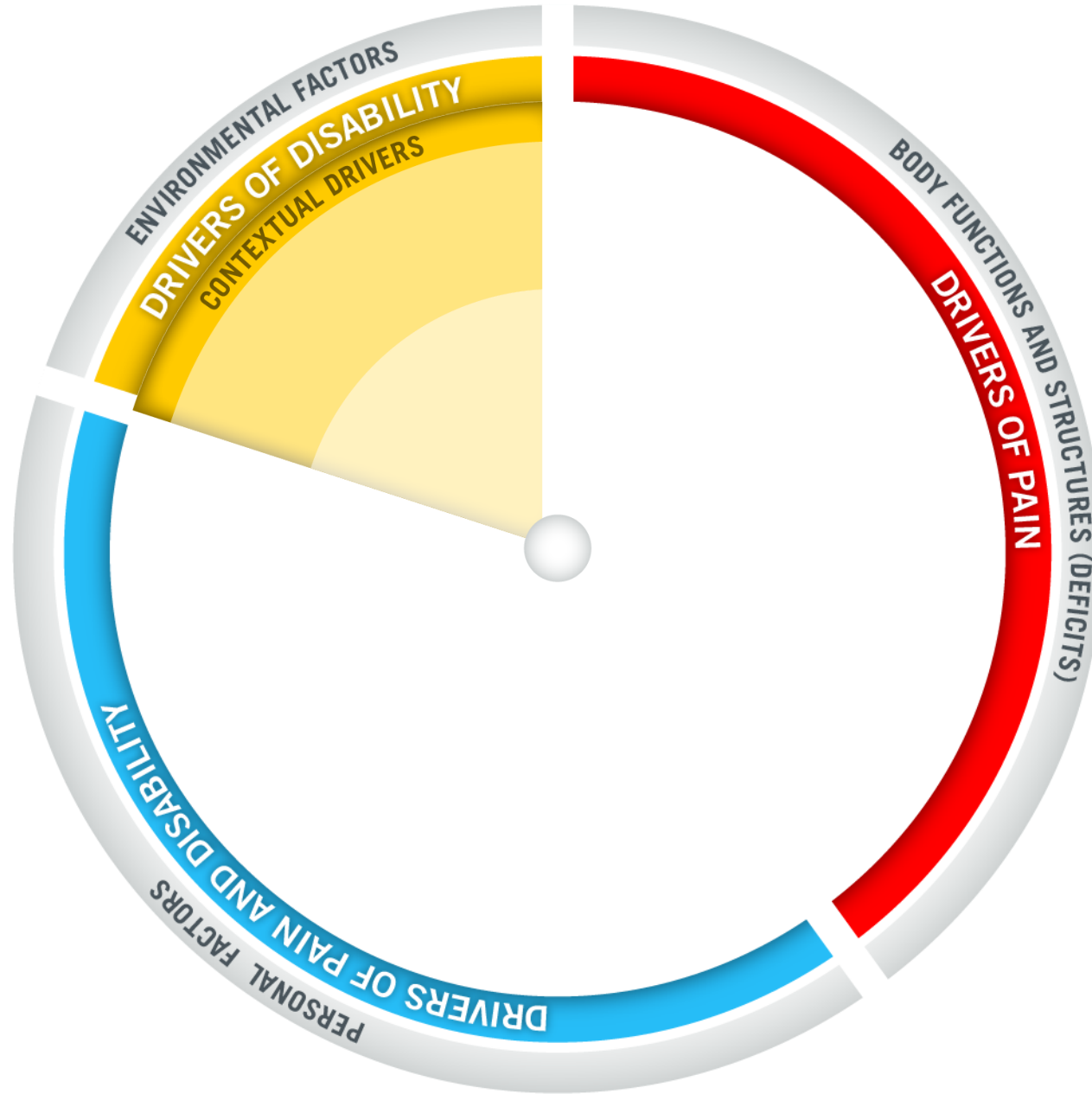
STEP 3: for patients at risk, you might also want to assess specific potential factor with the proper [ASSESSMENT TOOL](#)



STEP 3: for patients at risk, you might also want (or need!) to assess specific potential factor in order to establish your patient's profile...

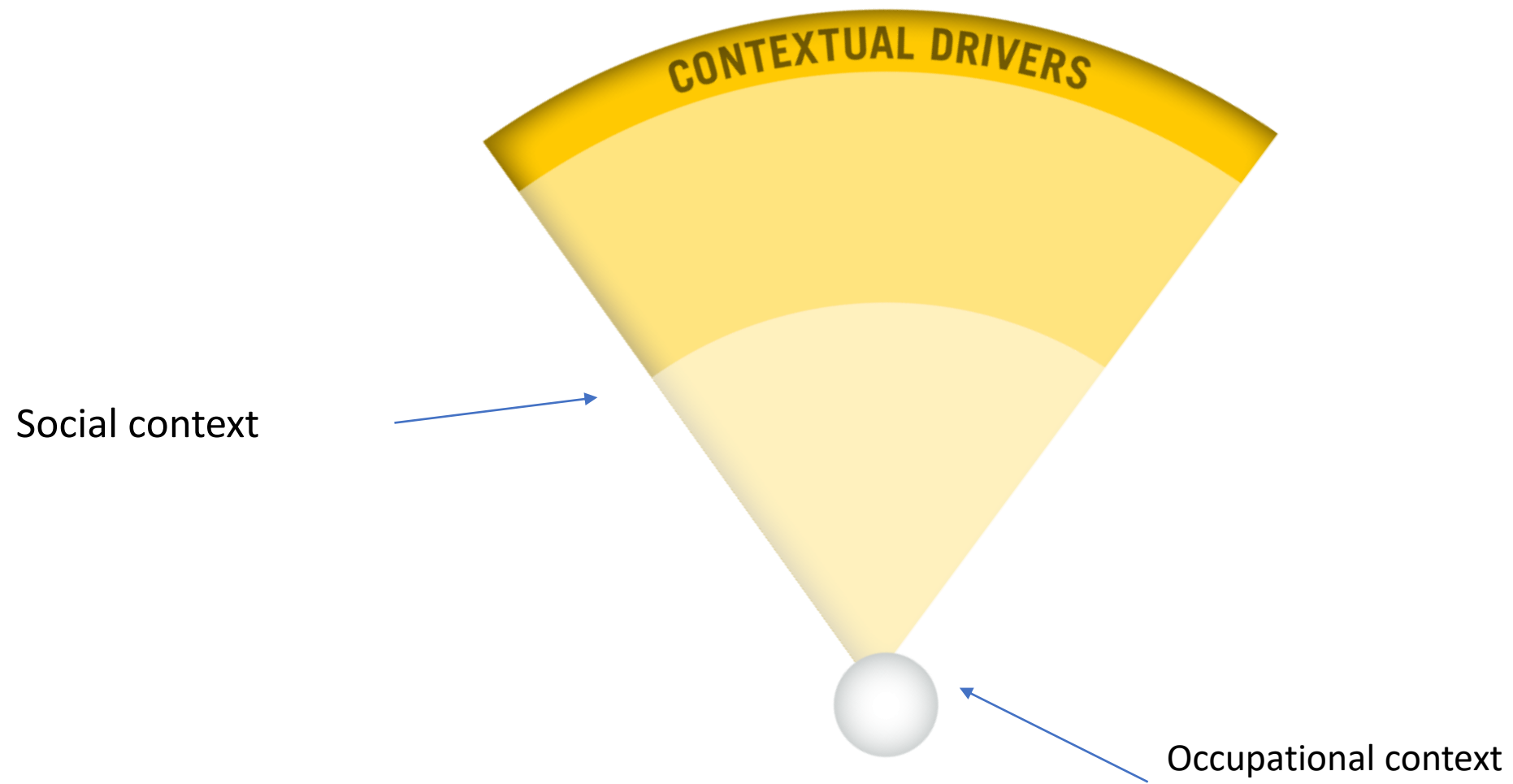


Domain 5: Contextual drivers



Contextual drivers

- The social component of the biopsychosocial model is the *frailest* component of all current CS for LBP and is barely mentioned in practice guidelines, as both are mainly oriented towards drivers of pain.
- Yet, it is one that has a significant influence on outcomes (O'Sullivan 2016)...



CONTEXTUAL DRIVERS

A) OCCUPATIONAL CONTEXT (modifiable)

- Low RTW expectations
- Low Job satisfaction
- Perception of heavy work
- High job stress
- Job flexibility (low...as in non-modifiable work or hours)

B) SOCIAL CONTEXT (harder to modify)

- Poor attitudes of :
 - employer,
 - family
 - health care professionals
- Low access or non-access to care
- Communication barriers

We need to take these factors into consideration...
Besides a comprehensive interview, how can you assess these factors?



How to screen if you'll need to address these?

Source of information

J Occup Rehabil (2016) 26:286–318
DOI 10.1007/s10926-015-9614-1



Clinical Decision Support Tools for Selecting Interventions for Patients with Disabling Musculoskeletal Disorders: A Scoping Review

Douglas P. Gross¹ · Susan Armijo-Olivo² · William S. Shaw³ · Kelly Williams-Whitt⁴ · Nicola T. Shaw⁵ · Jan Hartvigsen^{6,7} · Ziling Qin² · Christine Ha² · Linda J. Woodhouse¹ · Ivan A. Steenstra⁸

Published online: 14 December 2015
© Springer Science+Business Media New York 2015

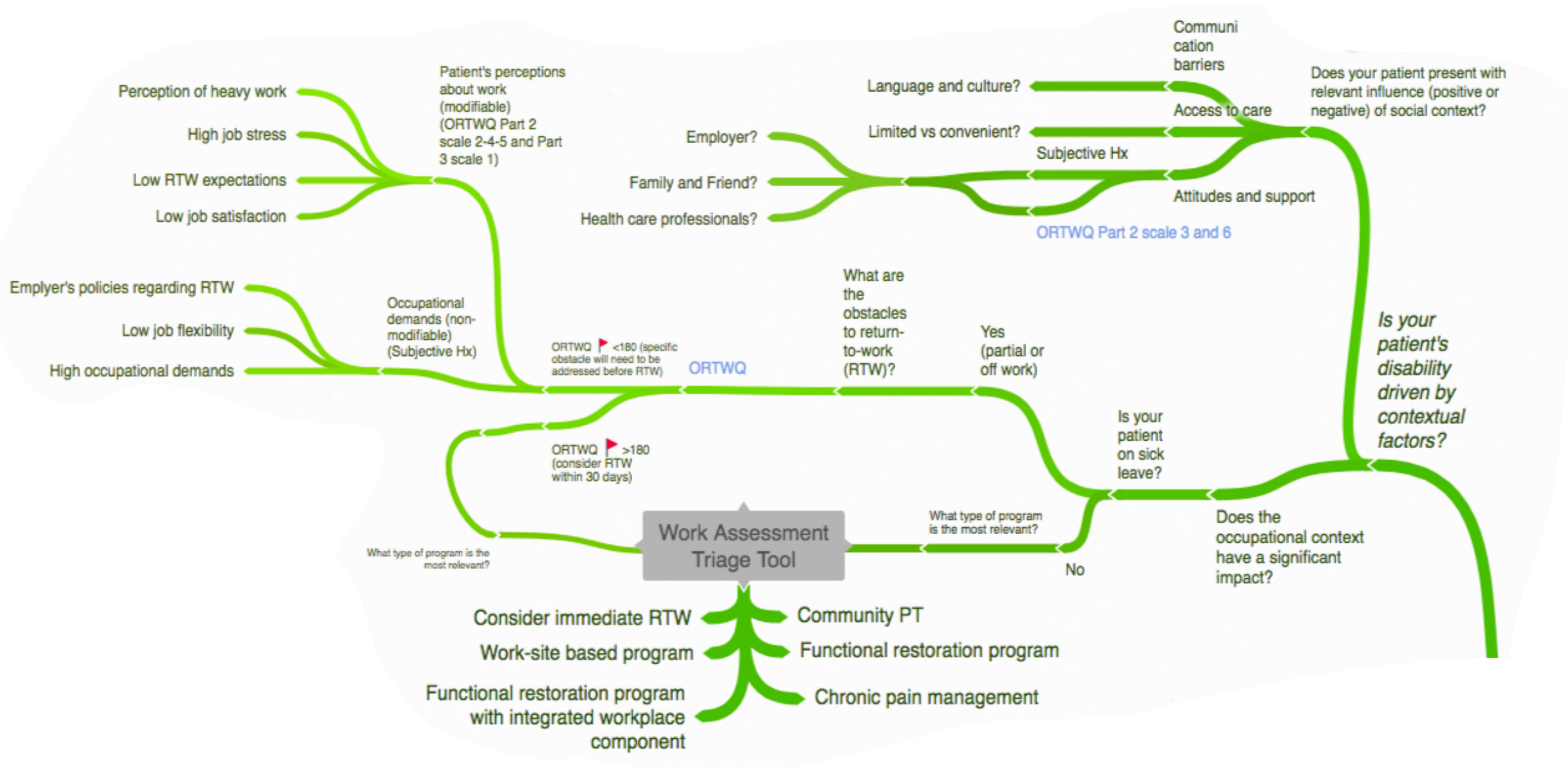
Gross and collaborators found interesting tools...

My recommendation:

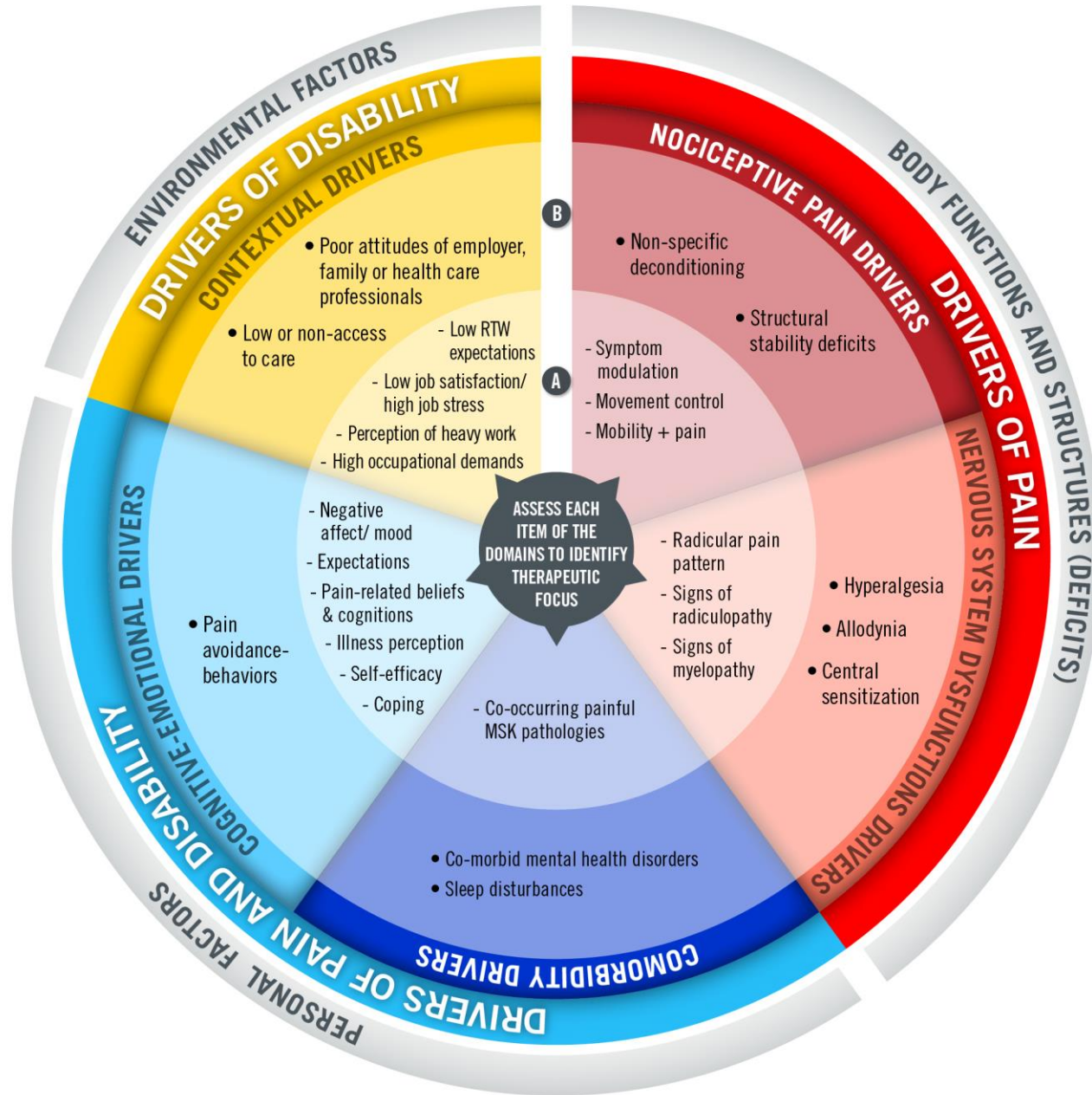
The Work Assessment Triage Tool

- the WATT captures 18 variables related to injury duration, job, working status and availability of modified work
- According to the responses, it suggests best rehabilitation options
- Although at early [stages of validation](#), it appeared more likely than clinicians to recommend treatments supported by evidence.





The Pain and Disability Drivers Management Model



- Can it help to target the problematic domains influencing pain and disability??
- Could it facilitate the integration of a comprehensive rehabilitation program for patients with pain and disability.

Interactive workshop:

Analyze the clinical profile of case studies based on the relative contribution of elements of the different domains of the PDDM.

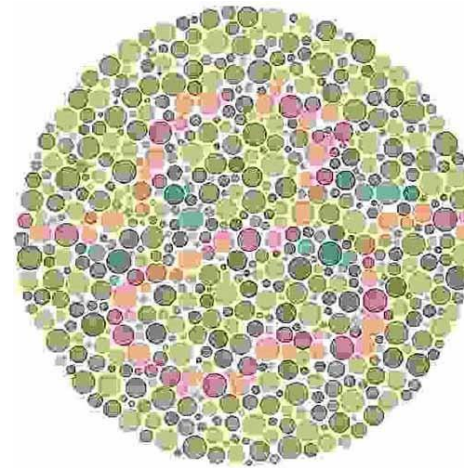
Leader: Geneviève Beaudoin

The role *Physical Rehabilitation Therapists* and *Physiotherapy Assistants* in this approach

- The importance of *team work*
 - for patients and professionals!



- The importance of your *observations*



Explanations regarding the rating scale

- <https://www.dropbox.com/s/0g1mxq3wvz5xybj/Pain%20and%20Disability%20Driver%20Rating%20scale%20%28Beta%20version6%29.docx?dl=0>
- Underlying principle:
 - The score of one domain does not mean its
 - For each domain, higher score = « therapist will have to work harder to achieve good outcomes...maybe suggestive of multi or interdisciplinary approach »

Using the tool (scale), please try to establish the profile (rate each domain) for each case

Details for PollEverywhere

- On your smartphone:
 - text “yannicktousi232” at number 37607
 - Open browser: pollev.com/yannicktousi232
- On your laptop or tablet
 - Open your internet browser (Safari/Chrome) at this address:
pollev.com/yannicktousi232

Practical integration of the model into practice CASE #1

- John Smith: 42 yo mechanics
 - Pain in low back + L leg, nociceptive, mild (2-6/10), disturbs his sleep
 - Centralization of symptoms with repeated lumbar extension ex's
 - Radiculopathy ??
 -  endurance in both legs (due to pain??)
 - Marked weakness L dorsiflexors
 - 5'8" 245lbs (high BMI)
 - Had a MRI: *"it says on the reports that there's a big disk bulging at L4-5"*
 - He reports that his mood is good 😊
 - He does not see the day when he'll be ready to return to work, although his employer is willing to accommodate him
 - Start Back questionnaire – see next slide

The Keele STarT Back Screening Tool

Patient name: John Smith Date: November 1st 2018

Thinking about the last 2 weeks tick your response to the following questions:

	Disagree 0	Agree 1
1 My back pain has spread down my leg(s) at some time in the last 2 weeks	☐	☒
2 I have had pain in the shoulder or neck at some time in the last 2 weeks	☒	☐
3 I have only walked short distances because of my back pain	☒	☐
4 In the last 2 weeks, I have dressed more slowly than usual because of back pain	☐	☒
5 It's not really safe for a person with a condition like mine to be physically active	☒	☐
6 Worrying thoughts have been going through my mind a lot of the time	☐	☒
7 I feel that my back pain is terrible and it's never going to get any better	☐	☒
8 In general I have not enjoyed all the things I used to enjoy	☒	☐

9. Overall, how bothersome has your back pain been in the last 2 weeks?

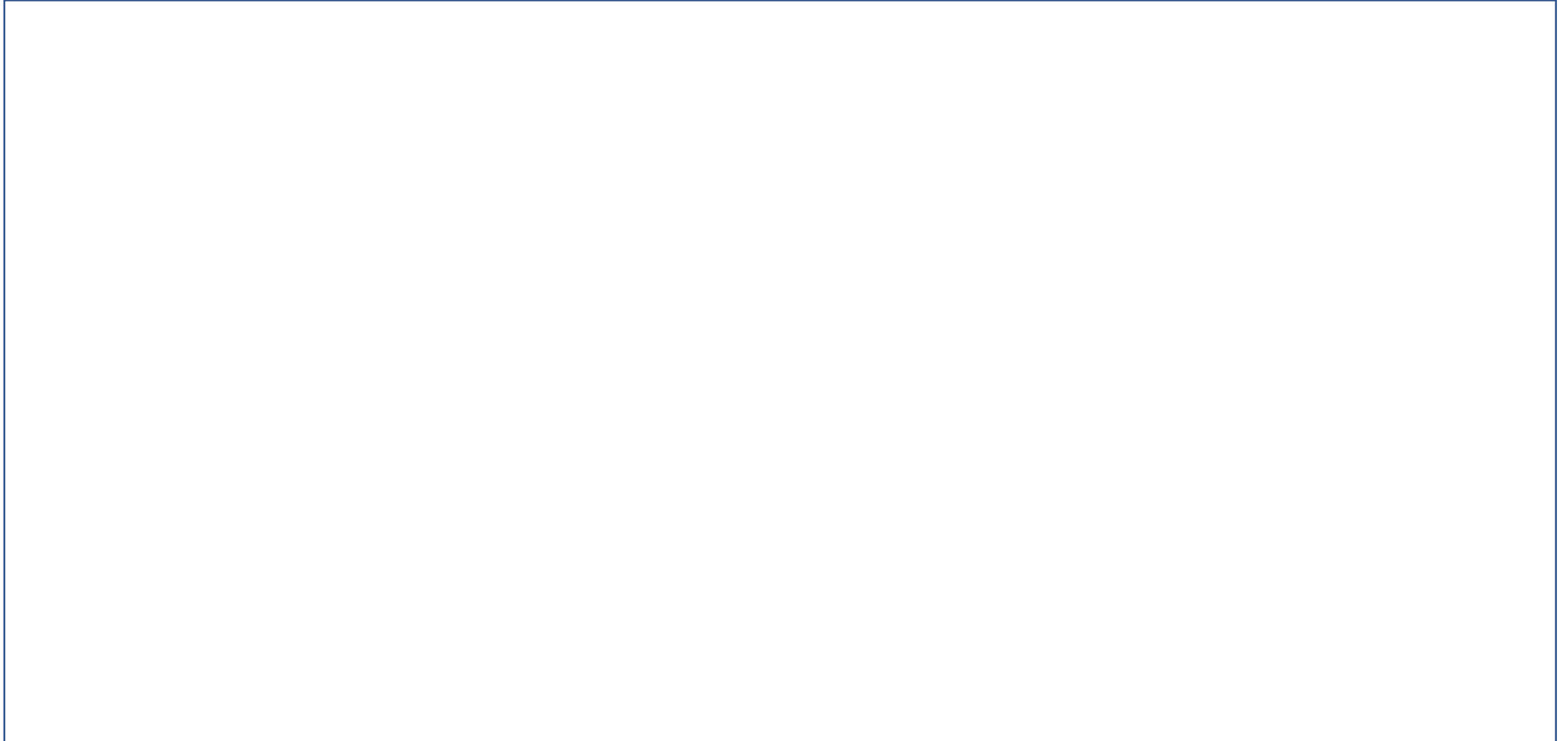
Not at all	Slightly	Moderately	Very much	Extremely
☐	☐	☐	☒	☐
0	0	0	1	1

Total score (all 9): 6 Sub Score (Q5-9): 3

Domain	Score for this patient
Nociceptive	0123
Nervous system dysfunctions	0123
Comorditities	0123
Cognitive-emotional	0123
contextual	0123

Focus treatment on the most important drivers of pain, not only the painful symptoms

■ John Smith



Which of these treatment approach would you engage into first?

Self-manangement
strategies

Reassurance/Education

McKenzie (direction
specific exercises)

Graded activity

The main idea here...

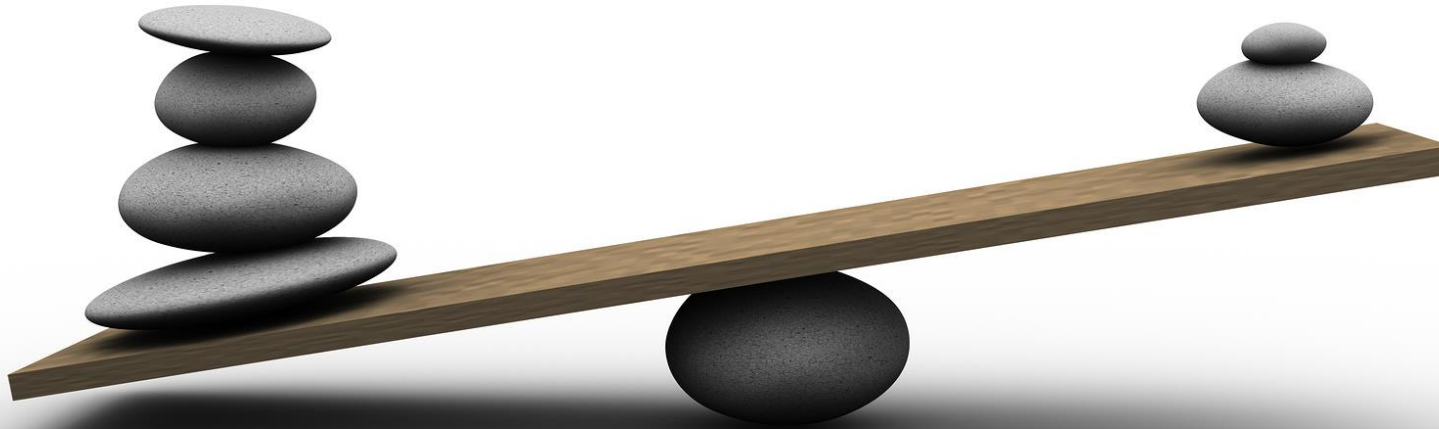
SYNERGY
 $1+1>2$



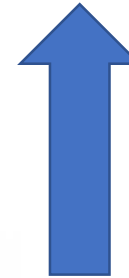
Reduce the taught that
pain is a threat

Increase the **CONTROL** that
patient has on his pain

Less fear...



Better control...



Graded activity
Reassurance/Education

Specific exercises (directional preference)
Self-management strategies

Practical integration of the model into practice CASE #2

Steve Goldfinger: 49-year-old welder

- Currently at work but on modified (light) duty
- pain located in the low back and posterior aspect of both thigh (lancinating); worst with walking - has stopped all physical activities outside of work
- Also pain in his upper back and neck along with sleep disturbances,
- Pain intensity between 2-6/10; painDetect = 15 (mixed)
- CSI questionnaire = 42/100 (moderate)
- No directional preference
- Segmental hypomobility upon manual testing ...but full ROM and no change in his symptoms.
- concomitant “severe” bilateral knee OA pain
- Shows pain behaviors in the clinic (grimaces, guarding)
- Has poor expectations regarding recovery; awaiting MRI results: feels anxious about that... Thinks its never going to go away... And worst than ever

The Keele STarT Back Screening Tool

Patient name: Steve Goldfinger Date: November 1st 2018

Thinking about the **last 2 weeks** tick your response to the following questions:

	Disagree 0	Agree 1
1 My back pain has spread down my leg(s) at some time in the last 2 weeks	☐	☒
2 I have had pain in the shoulder or neck at some time in the last 2 weeks	☐	☒
3 I have only walked short distances because of my back pain	☐	☒
4 In the last 2 weeks, I have dressed more slowly than usual because of back pain	☒	☐
5 It's not really safe for a person with a condition like mine to be physically active	☐	☒
6 Worrying thoughts have been going through my mind a lot of the time	☐	☒
7 I feel that my back pain is terrible and it's never going to get any better	☐	☒
8 In general I have not enjoyed all the things I used to enjoy	☒	☐

9. Overall, how **bothersome** has your back pain been in the **last 2 weeks**?

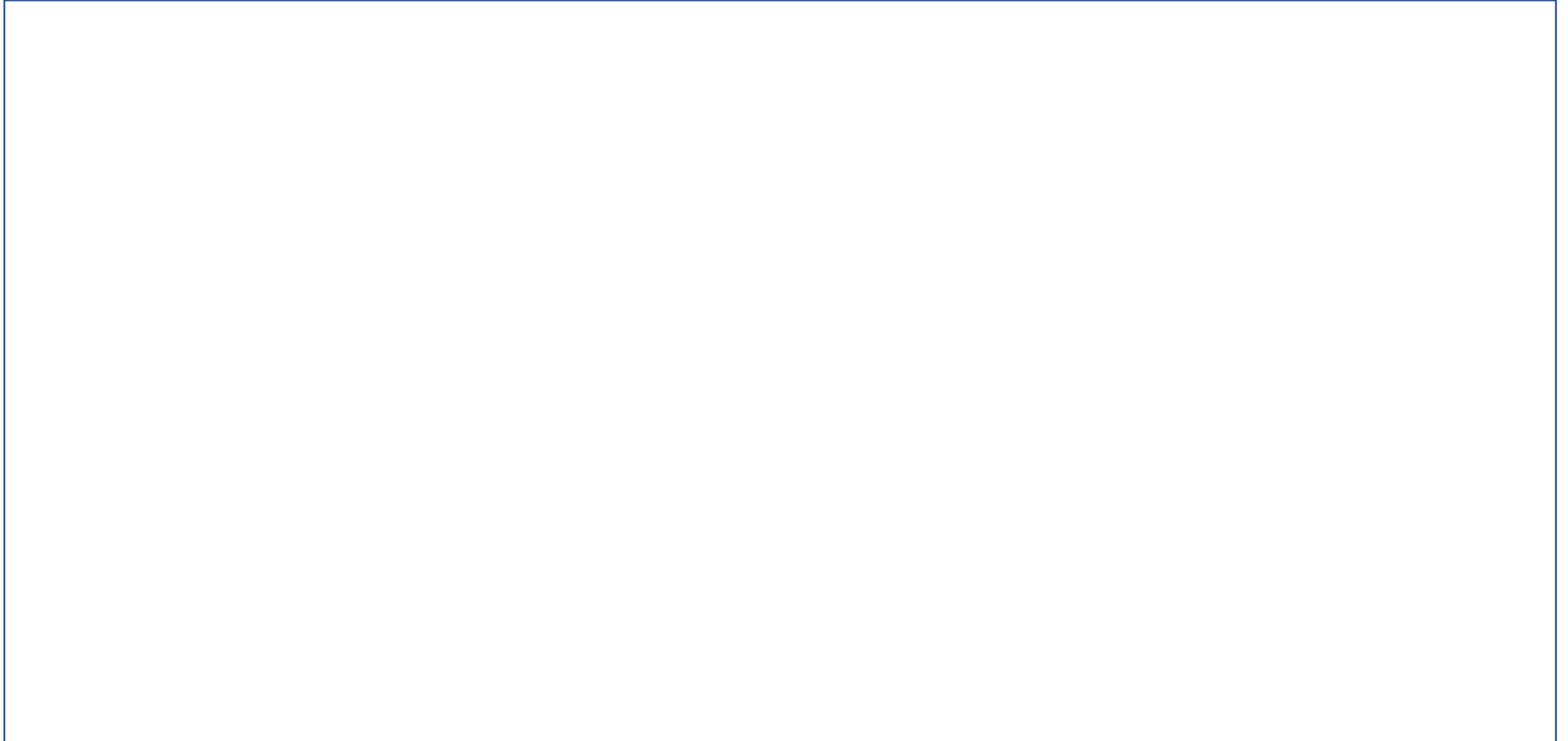
Not at all ☐ 0
 Slightly ☐ 0
 Moderately ☐ 0
 Very much ☒ 1
 Extremely ☐ 1

Total score (all 9): 7 Sub Score (Q5-9): 4

Domain	Score for this patient
Nociceptive	0 1 2 3
Nervous system dysfunctions	0 1 2 3
Comorditities	0 1 2 3
Cognitive-emotional	0 1 2 3
contextual	0 1 2 3

Focus treatment on the most important drivers of pain, not only the low back pain

■ Steve Goldfiner



Does it make sense?



What would you do with this patient?

What are the most appropriate treatment approaches at this time? (rank them in order according to the main problematic domains):

Generic aerobic exercises (...exercice-induced analgesia)

Manual therapy (segmental hypomobility)

initiate Pain neuroscience education (high CSI... better start now!)

Back specific exercises (core stabilization) + walking program (it's a given)

Pacing/gradual exposure (he going to have to get moving ...better do it slow)

provide tips to implement relaxation techniques into his daily routine (stressed about MRI results)

Nothing until MRI results are negative (better be safe than sorry)

Which questionnaire might help you identify which cognitive-affective components that are problematic?

BECK (depression) **A**

HADS (anxiety and depression scale) **B**

TSK (kinesiophobia) **C**

FABQ (beliefs) **D**

Revised Illness Perception
Questionnaire adapted for Work
Disability (IPQR – WD) **E**

- <http://grit.recherche.usherbrooke.ca/en/home>

Conclusion

What are the advantages of this integrative model and implications for rehabilitation ?

- Inspired on the ICF framework, adopted by the PT profession more than 15 years ago
- It is mechanistically driven and reflects the multiple domains driving pain and disability
- It has the potential to allow the therapist to appreciate the relative contribution of each domain driving pain and disability, while providing clinicians with specific targets on which to focus their treatment approach

Conclusion

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PERSPECTIVES

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Thank you for your attention...

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