

Persistent low back pain
'core stability training'
or
'focus on *self-management within a
biopsychosocial framework*' ?

Prof Dr Wim Dankaerts



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Wim Dankaerts



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YOUR EXPECTATIONS?

Persistent low back pain
'core stability training'
or
*'focus on self-management within a
biopsychosocial framework' ?*

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Only In America



You can not change beliefs until you change behaviour (Linton 2006)

Definition self-management

“The ability to manage the symptoms, treatment, physical and psychosocial consequences, and lifestyle changes inherent in living with a chronic condition”.



Burden and impact of LBP – is it
going in the right direction? –
growing!

NATIONAL DATA: Worse figures for LBP compared to the global average can be found in Belgium for :

- cost (1.2 billion)
- disability-adjusted life years (1923 years per 100.000 persons)
- point prevalence (18.23%, 2 million Belgians)
- incidence rate (6715 new cases per 100.000/year)

[Lancet, 2018]

- MSK conditions including LBP:
 - major cause for disability pension (35%) and sick leave (27%) in Belgium, with peak numbers occurring between 50-65 years of age [RIZIV].



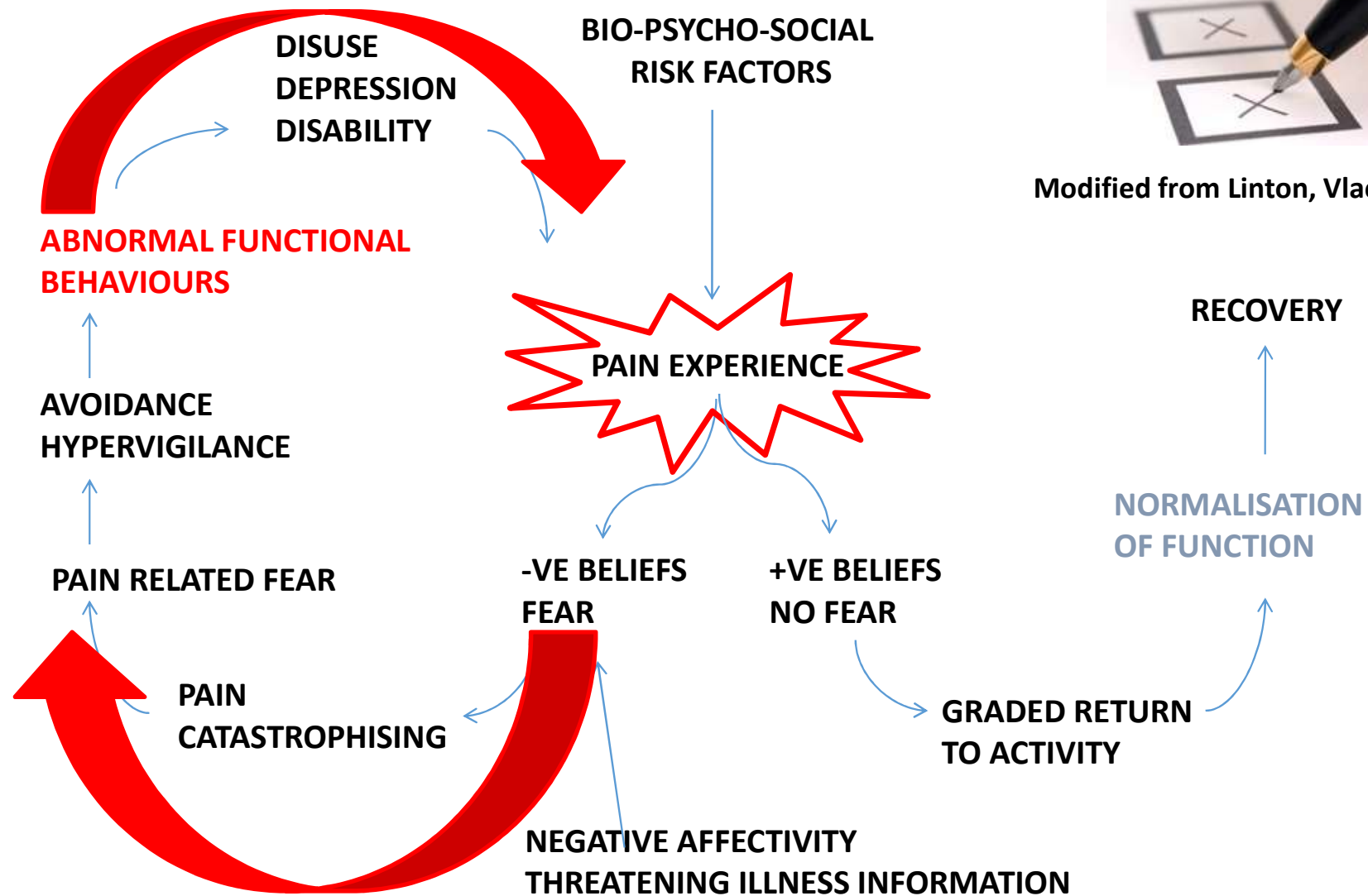
Prof Wim Dankaerts

(NS)CLBP is a multidimensional chronic health disorder

- **interplay** of psychological (e.g. negative beliefs, pain-related fear and emotional distress), social (e.g. life stress) and lifestyle **factors** (e.g. inactivity, poor sleep)
- coupled with **unhelpful behavioural responses** to pain (e.g. protective guarding and avoidance behaviours)
- lead to a **vicious cycle of pain**, distress and disability



Chen et al., 2018; Linton, Flink, & Vlaeyen, 2018; O'Sullivan et al., 2018



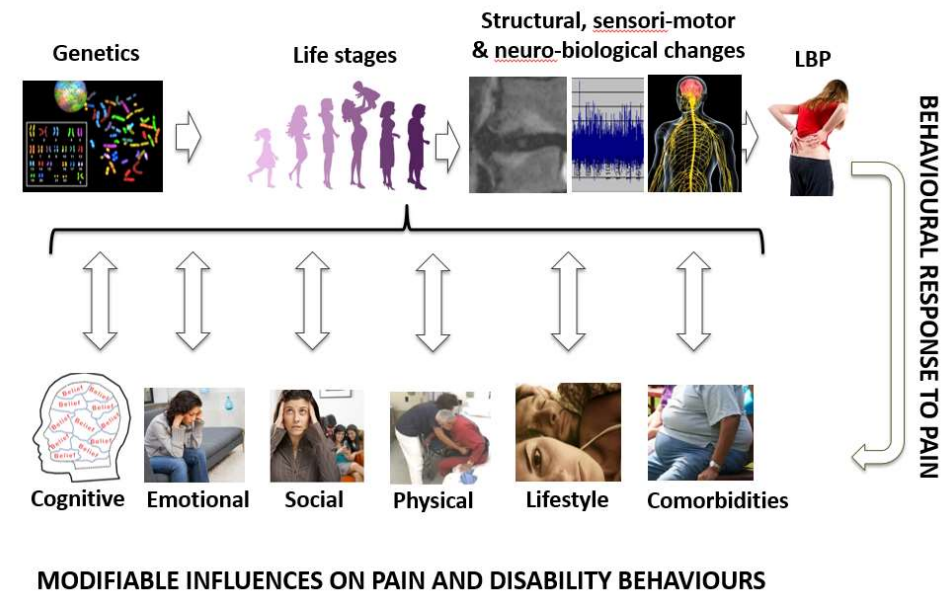
Modified from Linton, Vlaeyen 2005

Different 'cluster of factors' contribute to each pain disorder

(NS)CLBP is a multidimensional chronic health disorder

- A **multidimensional biopsychosocial (BPS) approach** for Mx of NSCLBP is commonly advocated

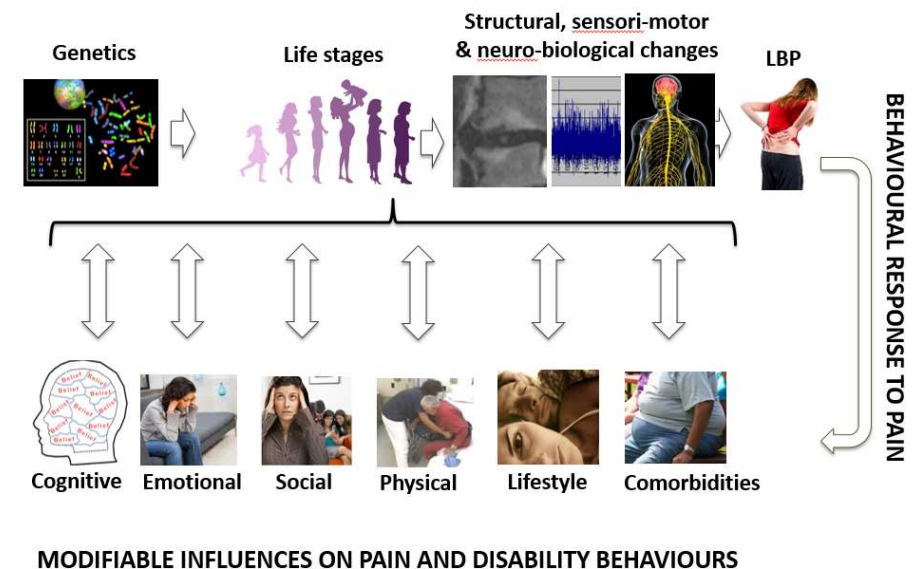
- Foster et al.2018
- National Institute for Health and Care Excellence, 2016



O'Sullivan

(NS)CLBP is a multidimensional chronic health disorder

- calls to manage NSCLBP as a **chronic health disorder**
- through targeting **negative illness perceptions, emotions and behavioural responses**
- in order to help people **self-manage** their problem

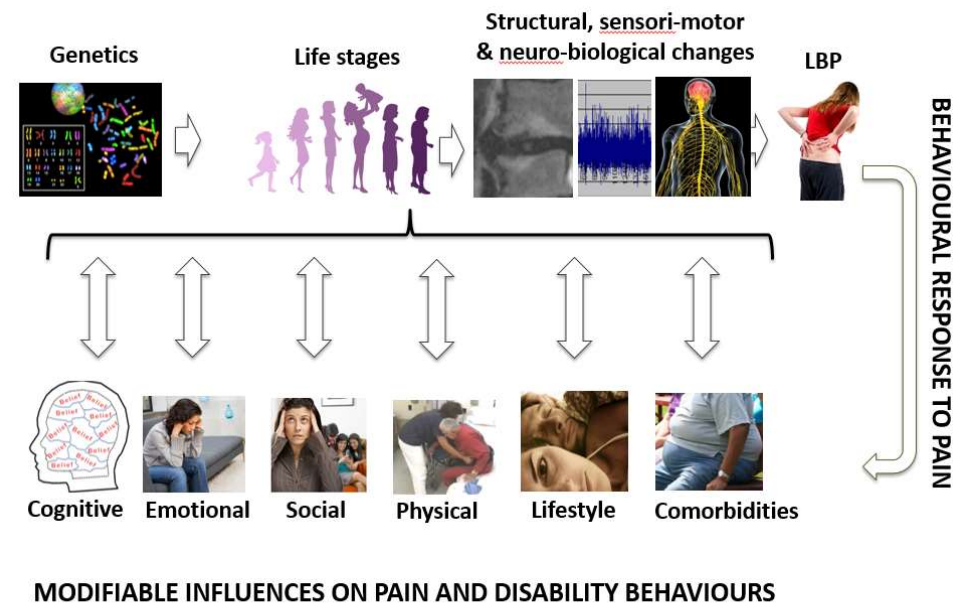


Chen et al., 2018; O'Sullivan et al., 2018.

(NS)CLBP is a multidimensional chronic health disorder

- **However**, questions persist regarding provision of a broader model of care, including **psychologically informed Mx** for LBP undertaken **by nonpsychologists**

- Bostick, 2017
- Pincus & McCracken, 2013



O'Sullivan

Cognitive Functional Therapy (CFT) for (NS)CLBP

- a personalized behavioural **self-management approach**
- helps people to:
 - make sense of their pain from a biopsychosocial perspective
 - build their confidence to engage with normal movement and activities related to their
- adopt a healthy lifestyle

(O'Sullivan et al., 2018).



Perspective

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J.P. Caneiro, PT, MSc, School of Physiotherapy, Curtin University, and Bodylogic Physiotherapy.

M. O'Keefe, PT, PhD, Sydney School of Public Health, University of Sydney, Australia, and Department of Allied Health, University of Limerick, Limerick, Ireland.

Cognitive Functional Therapy: An Integrated Behavioral Approach for the Targeted Management of Disabling Low Back Pain

Peter B. O'Sullivan, J.P. Caneiro, Mary O'Keefe, Anne Smith, Wim Dankaerts, Kjartan Fersum, Kieran O'Sullivan

Physical Therapy | Volume 98 | Number 5 | May 2018 |
<https://academic.oup.com/ptj/article/98/5/408/4925487>

Prof Wim Dankaerts

*A **paradigm shift** required for
managing a complex
multidimensional multifactorial
problem like back pain.*

What should clinicians do?

A case study



39 years old female – 8 years of persistent low back pain

‘core stability training’ of
focus on *self-management within a biopsychosocial framework* ?

Tell me your story ...

verhaal van 8 jaar
pijn / rugklachten

vele dokters
telkens andere Dx

niets geholpen
geen effect op de pijn



Verschillende diagnosesde oorzaak ?



de klachten

enorme,
enorme
stijfheid
aan de
onderrug

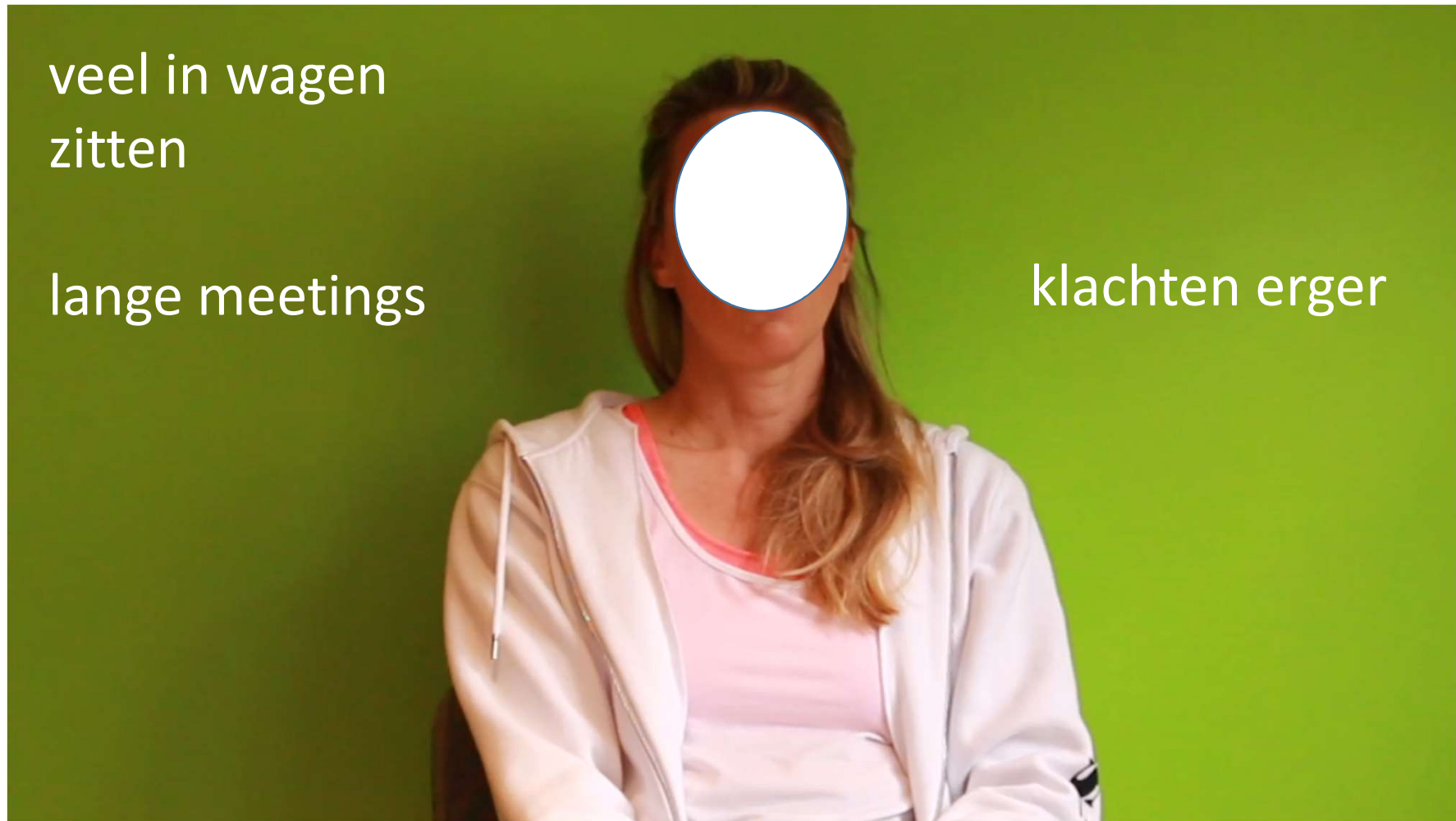
niet
van slapen,
nachten wakker
liggen

pijn, pijn
intensieve pijn

souplesse weg
houten plank



ADL - job gerelateerde provocatie



De oplossing / advies?

iets anders OEI ...
verstijving in mijn hoofd !

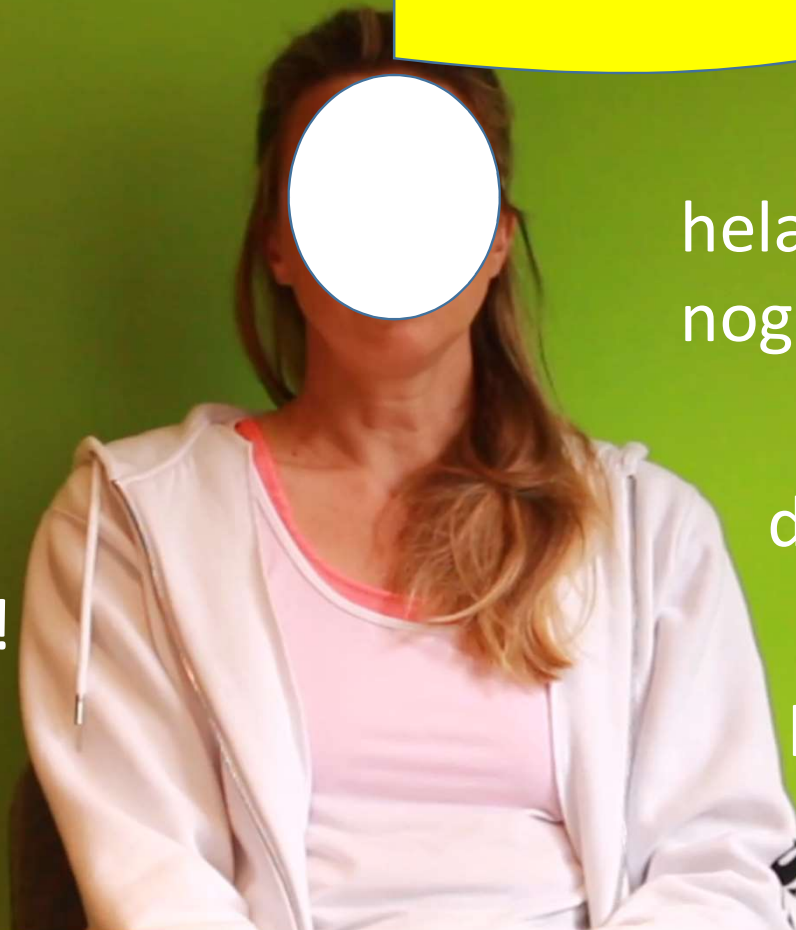
stabilisatie-
oefeningen
the core

2 jaar
+- 2/week
naar de kinesist!

helaas...
nog meer last

demotiverend

heel ongerust



A case study

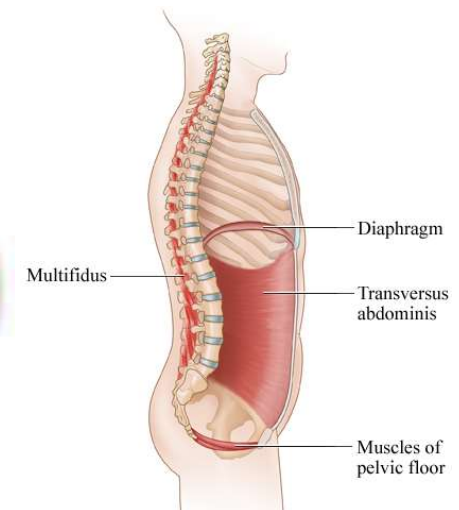
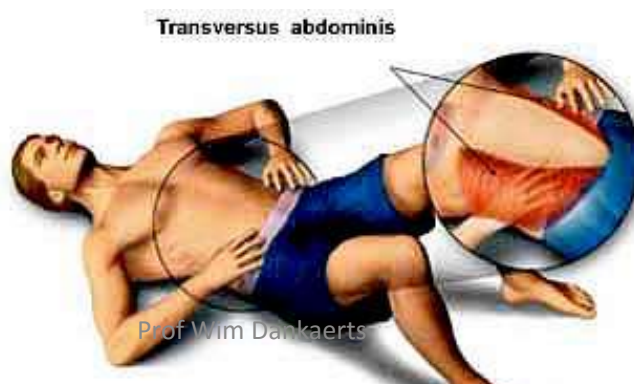
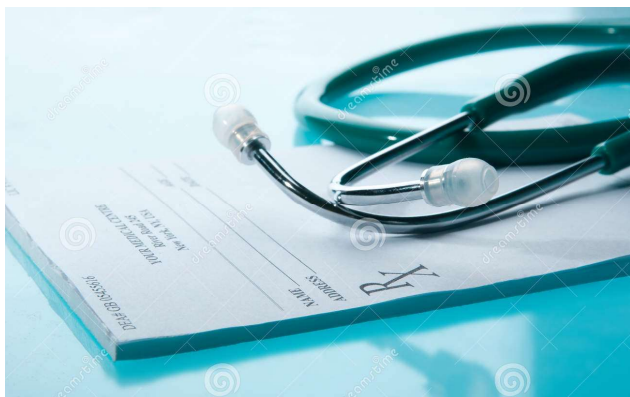


39 years old female – 8 years of persistent low back pain

‘core stability training’ of

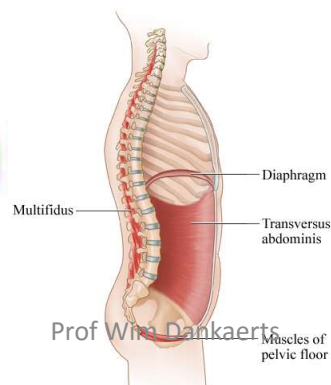
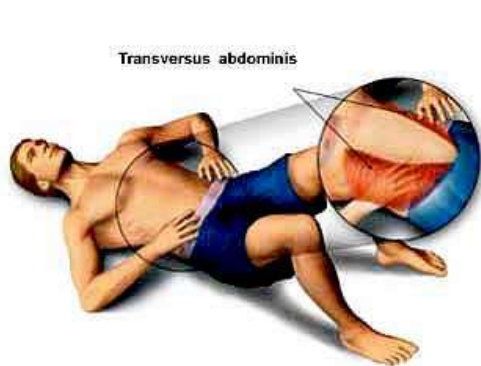
focus on *self-management within a biopsychosocial framework* ?

The TA - LM 'core stability' myth





*Patient managed by her HCP with **core stability** exercises and telling her **bending is bad** for your back*





most people with CLBP require more “core” muscle tone



CLBP patients would benefit from reducing their muscle tone and regaining freedom of normal movement



The TA - LM 'core stability' myth

- 'messages' that go with prescribing core exercises are often unhelpful.
- often 'reinforces protective/safety behaviours' (people in pain already do).
- reason why a person may benefit from core ex's are not what people think.



Do changes in transversus abdominis and lumbar multifidus during conservative treatment explain changes in clinical outcomes related to non-specific low back pain? A systematic review

Arnold YL. Wong, PT, MPhil Eric C. Parent, PT, PhD Martha Funabashi, PT, MSc
Greg N. Kawchuk, DC, PhD



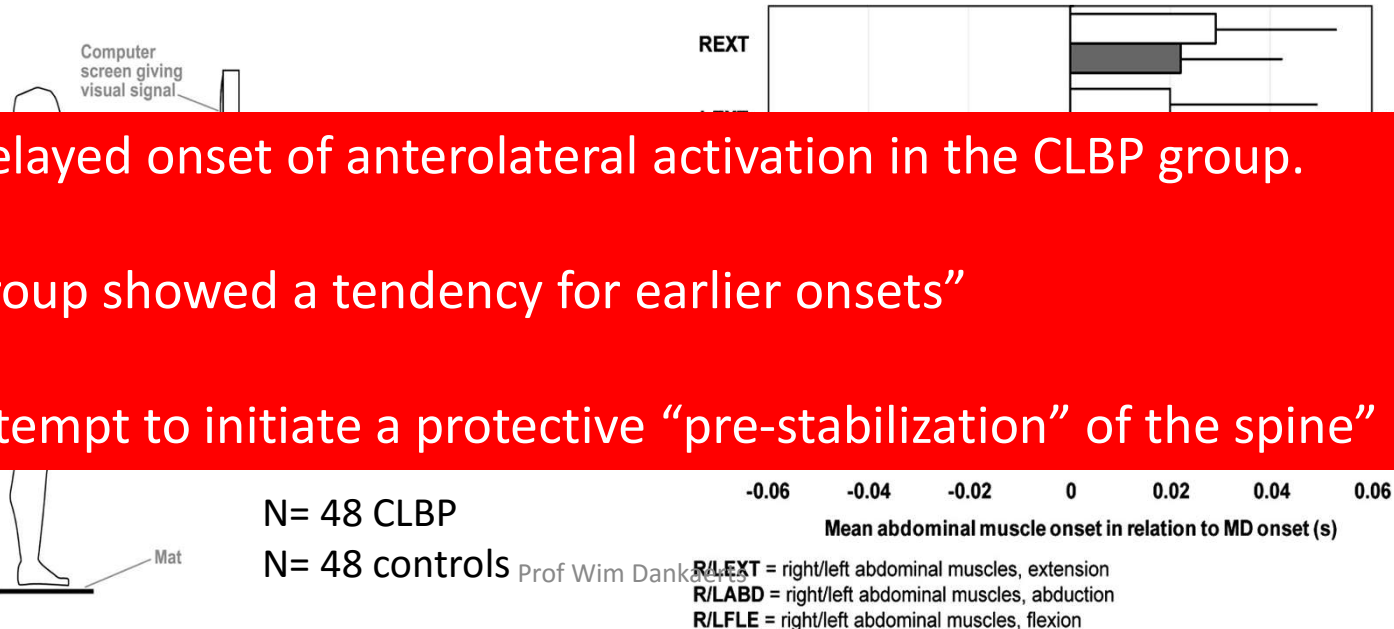
This SR highlighted that changes in morphometry or activation of TrA following conservative treatments tend **not** to be associated with the corresponding changes in clinical outcomes.

The relation between post-treatment changes and clinical improvements remains uncertain.

Journal of Pain 2014 Apr;15(4):377.e1-35

Ultrasound Tissue Doppler Imaging Reveals No Delay in Abdominal Muscle Feed-Forward Activity During Rapid Arm Movements in Patients With Chronic Low Back Pain

Deborah Gubler, MD,* Anne F. Mannion, PhD,† Peter Schenk, PhD,* Mark Gorelick, PhD,† Daniel Helbling, MSc,* Hans Gerber, PhD,† Valeriu Toma, MD,* and Haiko Sprott, MD*



“....no delayed onset of anterolateral activation in the CLBP group.

“CLBP group showed a tendency for earlier onsets”

“ CNS attempt to initiate a protective “pre-stabilization” of the spine”

Study Design. Cross-sectional study.

Objective. Comparison of the timing of onset of lateral abdominal muscle activity during rapid arm movements in patients with nonspecific chronic low back pain (cLBP) and back-pain-free controls.

Summary of Background Data. Rapid movements of the arm are normally associated with prior activation of trunk-stabilizing muscles in readiness for the impending postural perturbation. Using invasive intramuscular electromyography techniques, studies have shown that this feed-forward function is delayed in some patients with low back pain (LBP). Ultrasound tissue Doppler imaging (TDI) provides an ultrasound method for quantifying muscle activation in a noninvasive manner, allowing investigation of larger groups of patients and controls.

side. No relationship was found between the time of onset of the earliest abdominal muscle activity and pain intensity, pain frequency, pain medication usage, or Roland Morris disability scores.

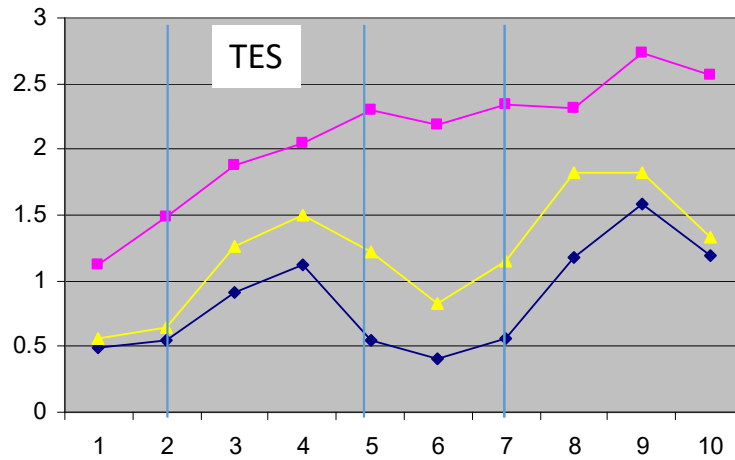
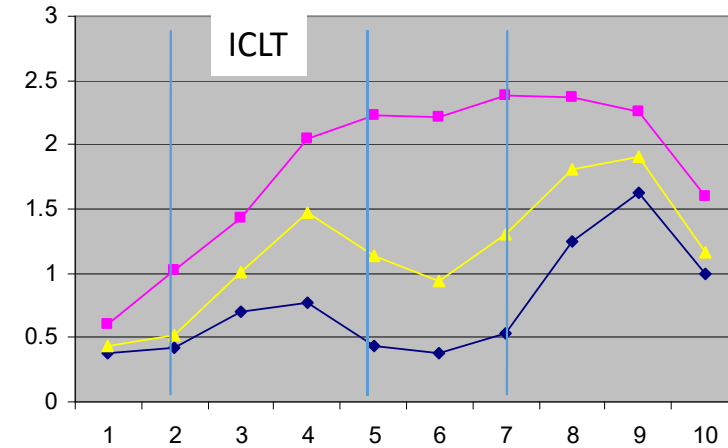
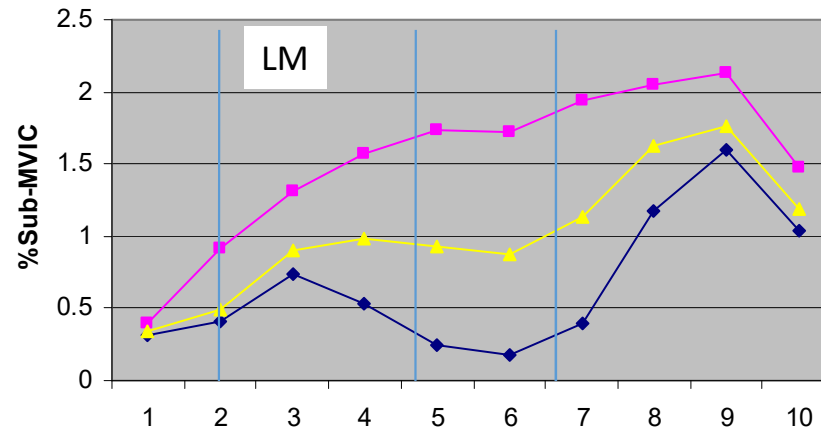
Conclusion. Patients with cLBP did not show a delayed onset of feed-forward activation of the lateral abdominal muscles during rapid arm movements. Earlier activation was observed for one body side compared with the controls. However, the clinical relevance of this finding remains obscure, especially because there was no relationship between the onset of activation and any clinical parameters.

Key words: low back pain, abdominal muscles, feed-forward activity, tissue Doppler imaging, rapid arm movements. *Spine* 2010;35:1506–1513

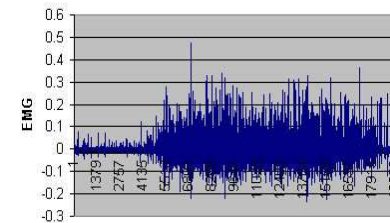
diametrically opposed Hodges et al (1995) findings

Overall, it seems that the role of lateral abdominal muscle feed-forward activity in spine stabilization and in LBP may have been overestimated.

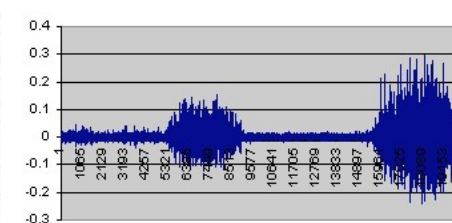
sEMG patterns during forward bending – consistent for all back muscles



CLBP – AEP



healthy control



RESEARCH ARTICLE

Open Access

An update of stabilisation exercises for low back pain: a systematic review with meta-analysis

Benjamin E Smith^{1*}, Chris Littlewood² and Stephen May³

Abstract

Background: Non-specific low back pain (NSLBP) is a large and costly problem. It has a lifetime prevalence of 80% and results in high levels of healthcare cost. It is a major cause for long term sickness amongst the workforce and is associated with high levels of fear avoidance and kinesiophobia. Stabilisation (or 'core stability') exercises have been suggested to reduce symptoms of pain and disability and form an effective treatment. Despite it being the most commonly used form of physiotherapy treatment within the UK there is a lack of positive evidence to support its use. The aims of this systematic review update is to investigate the effectiveness of stabilisation exercises for the treatment of NSLBP, and compare any effectiveness to other forms of exercise.

Methods: A systematic review published in 2008 was updated with a search of PubMed, CINAHL, AMED, Pedro and The Cochrane Library, October 2006 to October 2013. Two authors independently selected studies, and two authors independently extracted the data. Methodological quality was evaluated using the PEDro scale. Meta-analysis was carried out when appropriate.

Results: 29 studies were included: 22 studies ($n = 2,258$) provided post treatment effect on pain and 24 studies ($n = 2,359$) provided post treatment effect on disability. Pain and disability scores were transformed to a 0 to 100 scale. Meta-analysis showed significant benefit for stabilisation exercises versus any alternative treatment or control for long term pain and disability with mean difference of -6.39 (95% CI -10.14 to -2.65) and -3.92 (95% CI -7.25 to -0.59) respectively. The difference between groups was clinically insignificant. When compared with alternative forms of exercise, there was no statistical or clinically significant difference. Mean difference for pain was -3.06 (95% CI -6.74 to 0.63) and disability -1.89 (95% CI -5.10 to 1.33).

Conclusion: There is strong evidence stabilisation exercises are not more effective than any other form of active exercise in the long term. The low levels of heterogeneity and large number of high methodological quality of available studies, at long term follow-up, strengthen our current findings, and further research is unlikely to considerably alter this conclusion.

Keywords: Systematic review, Meta-analysis, Low back pain, Exercise therapy, Core stability, Stabilisation, Treatment, Effectiveness

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Why the change?



Manual Therapy 10 (2005) 242–255



www.elsevier.com/locate/math

Instability – wrong language

The stories of patients

Multi-dimensional nature of pain

Research data

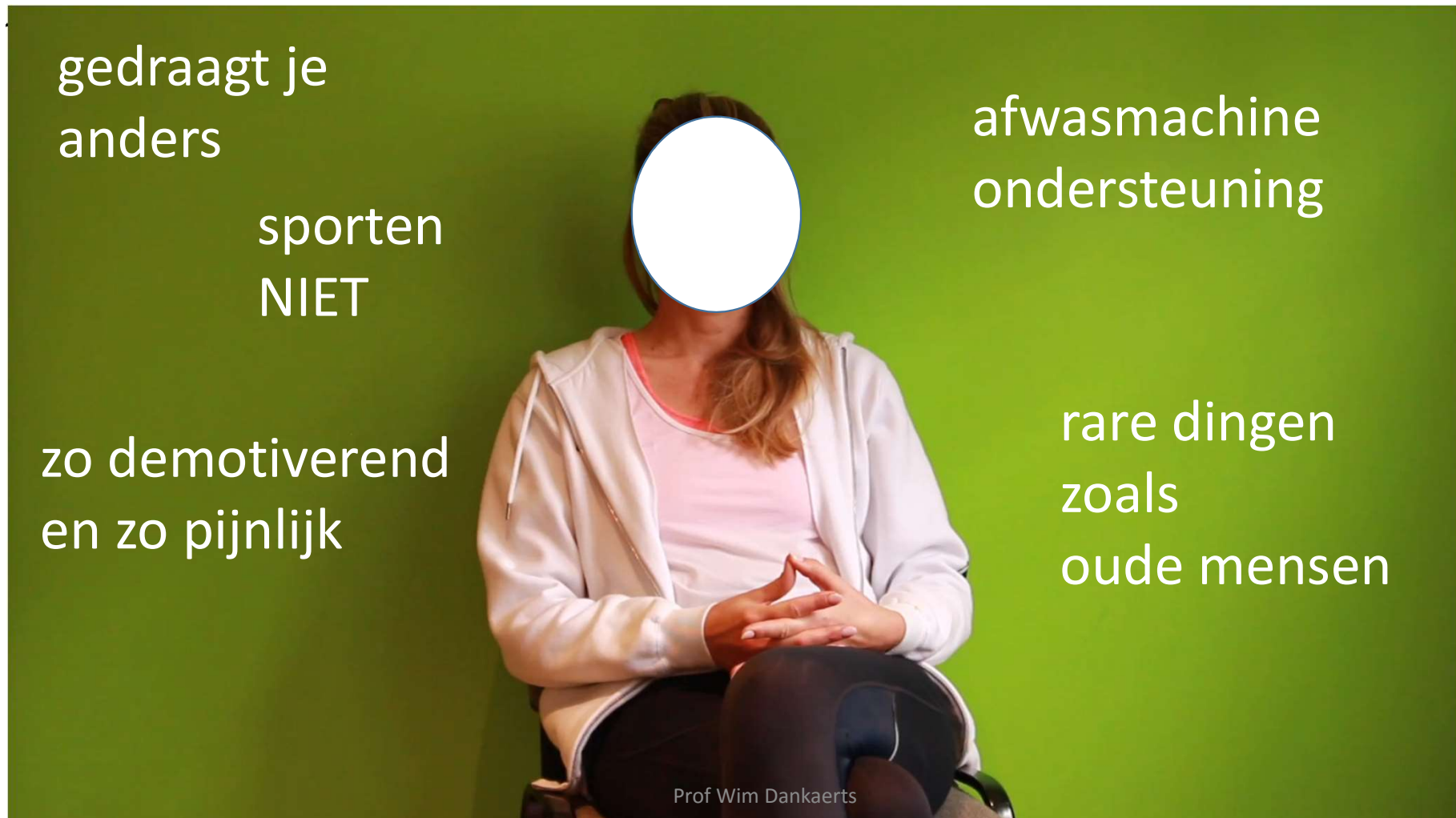
Lumbar movement behaviours: **clinical presentation and** cognitive functional management

P. B. O'Sullivan

School of Physiotherapy, Curtin University of Technology, Selby Street, Shenton Park, WA, Australia

Prof Wim Dankaerts

Avoidance behaviour - Functional pain behaviours





Prof Wim Dankaerts

*Normal movement...what
does it look like?
Its easy and **focus** is **away**
from the body....*



***core stability** exercises
and **bending** is **bad***

Ziekte van Bechterew?

enorm
ongerust

geschrokken

zorgen

collega = ?

hernia / slijtage

gaan opzoeken

wat er fout
kan gaan / fout is



weer eens
proberen

goeie echo's

gewoon doen!

wil per c van
pijn vanaf



dat gaat je leven
beheersen
- **live on hold**

sceptisch

moed
gevonden

CFT approach – exposure with control

oefening van
gemaakt
in mijn hoofd

het mocht
wist wat er was!

vocht in
eindplaten
niet zo ernstig

snel gegaan

veel wandelen

zelfs
gaan joggen!



De-threatening information

Pain $\neq$ harm or damage

Backs can be trusted

If it hurts....
relax, breath and
move normally

It's safe to bend

Movement and loading
makes backs strong

Don't brace !

Lifestyle factors are
important





***Good intentions
make the most noise.***

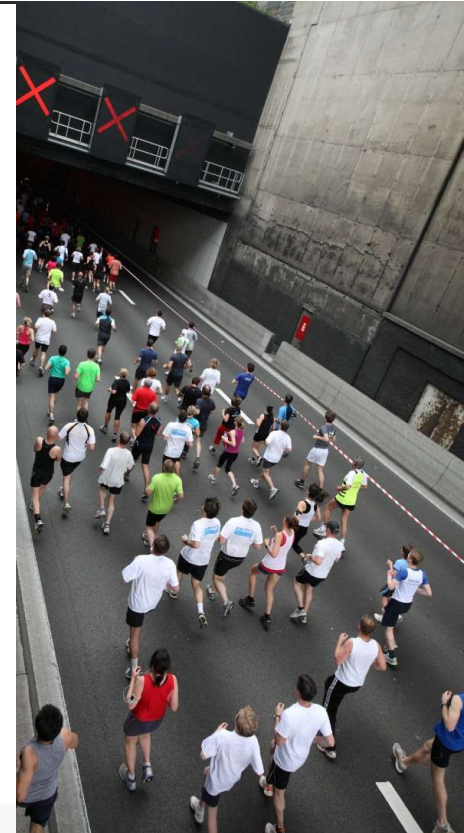
ThePeoplesCube.com





Joggen

Joggen op een harde ondergrond vormt een ware aanslag op je wervelkolom. Als je sportschoenen met een goede schokdemping aantrekt en gaat lopen in het bos, blijf je echter van onheil gespaard. Bouw je looptraining geleidelijk op. Een tip van een fervente jogger met een zwakke rug: als je erin slaagt om je bovenlichaam ontspannen te houden en enkel je benen laat werken, voel je je na een uur lopen beter dan na een uur



Joggen op een harde ondergrond vormt een ware aanslag op je wervelkolom.





START TO RUN



START TO WALK



oefening van
gemaakt
in mijn hoofd

het mocht
wist wat er was!

vocht in
eindplaten
niet zo ernstig



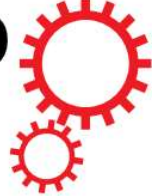
snel gegaan

veel wandelen

zelfs
gaan joggen!

Prof Wim Dankaerts

SCIENTIFIC REPORTS



OPEN

Running exercise strengthens the intervertebral disc

Daniel L. Belavý¹, Matthew J. Quittner¹, Nicola Ridgers¹, Yuan Ling², David Connell^{2,3} & Timo Rantalainen¹

Received: 24 November 2016

Accepted: 07 March 2017

Published: 19 April 2017

There is currently no evidence that the intervertebral discs (IVDs) can respond positively to exercise in humans. Some authors have argued that IVD metabolism in humans is too slow to respond anabolically to exercise within the human lifespan. Here we show that chronic running exercise in men and women is associated with better IVD composition (hydration and proteoglycan content) and with IVD hypertrophy. Via quantitative assessment of physical activity we further find that accelerations at fast walking and slow running (2 m/s), but not high-impact tasks, lower intensity walking or static positions, correlated to positive IVD characteristics. These findings represent the first evidence in humans that exercise can be beneficial for the IVD and provide support for the notion that specific exercise protocols may improve IVD material properties in the spine. We anticipate that our findings will be a starting point to better define exercise protocols and physical activity profiles for IVD anabolism in humans.

Running exercise strengthens the intervertebral disc

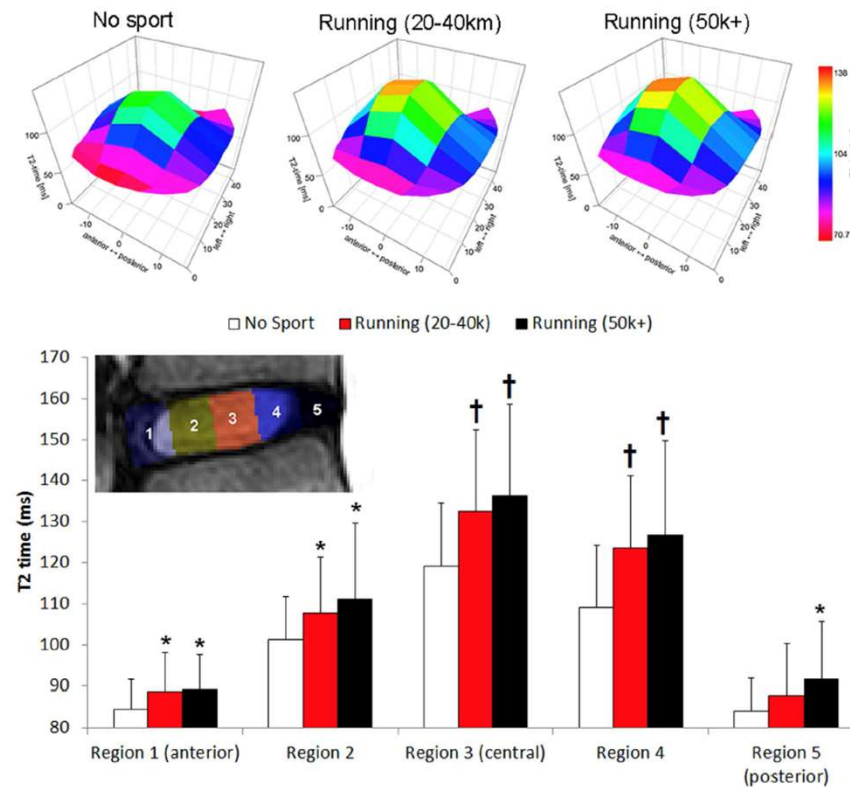


Figure 3. The impact of running on the disc is strongest in the nucleus. Top: 3D plot of mean T2-time across entire IVD volume. Bottom: At the mid-line (sagittal) portion of the IVD the impact of running can be seen to be greatest in the central, nuclear, portion of the IVD. *p < 0.05; †p < 0.01 versus non-sporting group. Greater T2-times indicate¹³ better IVD hydration and glycosaminoglycan content.

Self efficacy

- the confidence a person has in their ability to achieve a desired outcome



"I can't do anything to control the pain"

"I can't function / work with this pain"

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Costa et al 2003



Prof Wim Dankaerts



stijfheid
veel minder

not gone ...
maar veel minder

volledige nacht
slapen

moed

slapen is
onwaarschijnlijk
geneesmiddel

verder doen





intake



sessie 3 (na 6 weken)

Ik kan alles doendas los !



Prof Wim Dankaerts

We blame the patient? “Niemand had moed om alles bij elkaar te leggen”.

BOOS

veel specialisten

heel veel foto's

iedereen
zegt iets
anders

zo hard / lang
gestudeerd

maken niet link met
;(((

ontgoocheling

onnodig
afgezien



Anatomical/structural cause of back pain & bio-
medical / biomechanical management



Are we looking for the right thing?





Do we create the problem?

iatrogenic [ī'atrōjen'ik]

Etymology: Gk, *iatros*, physician,
genein, to produce



Specialistisch advies – Fysische Geneeskunde

06/2017

Wij plannen een afspraak met een kiné gespecialiseerd in bekkens,
die ook de bekkenbodemspieren kan nagaan. Hier zal een actief
oefenprogramma voor thuis worden opgesteld, dat eventueel ook daar of door
een andere kiné zal opgevolg worden.

(kiné voorschrift:

Indien functionele beperking of zwakte graag eerst hier actief op werken.

Indien ok graag gradueel opbouwen van bekkenstabiliserende oefeningen, aan
te leren voor thuis dagelijks te doen. Pas bij goede bekkenstabiliteit

opbouwen naar globale core stability.)

De patiënte wordt ook geïnformeerd over het belang van de oefeningen
dagelijks te doen voor effect.

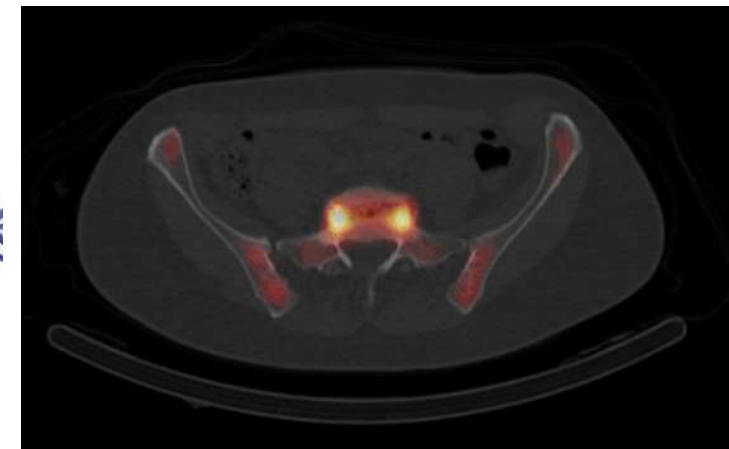
Medische beeldvorming – Botscintigrafie – 12/2018

WHOLE BODY BOTSCINTIGRAFIE MET SPECT/CT (low-dose CT ter
lokalisatie)

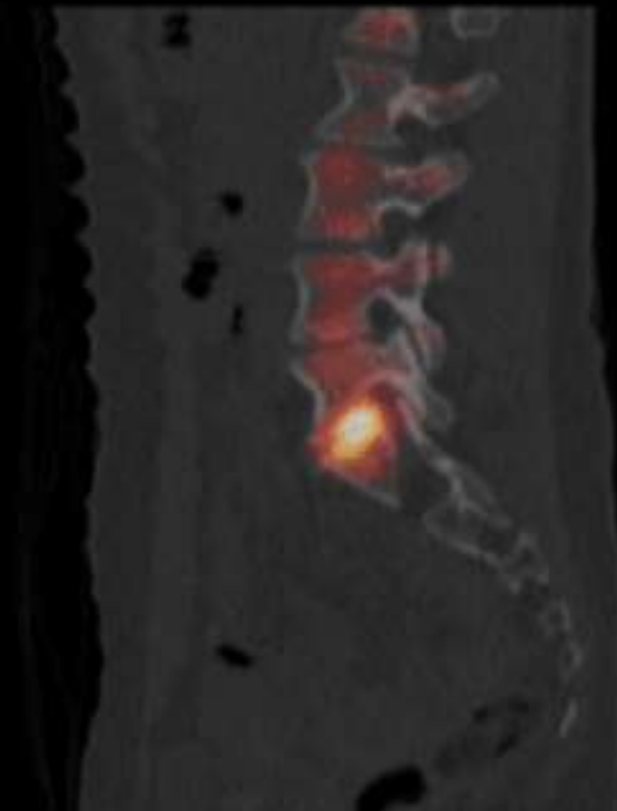
Tracer: 99mTc-HDP

Injectieplaats: linkervoet

1. Duidelijk actieve degeneratieve discartrose thv. L5-S1 met accentuatie zowel links als rechts in de eindplaatovergang.
2. Rustig beeld thv. de heupen. Geen argumenten voor coxartrose noch andere actieve pathologie aldaar.
3. Discrete accentuatie van enkele vingergewrichtjes. Geen argumenten voor echt belangrijk actieve artrose noch artritis.



MBV – Botscentigrafie – 12/2018



Prof Wim Dankaerts

Specialistisch advies – Orthopedisch Chirurg 01/2019

Ik denk dat de hoofdzaak voor haar bestaat uit stabilisatieoefeningen en stabilisatietraining.

Zij kan deze oefeningen maar doet ze niet.

Ik zal haar terugzien ter bespreking van het NMR-onderzoek en de verdere behandeling.

Met vriendelijke collegiale groeten,

Prof. dr.

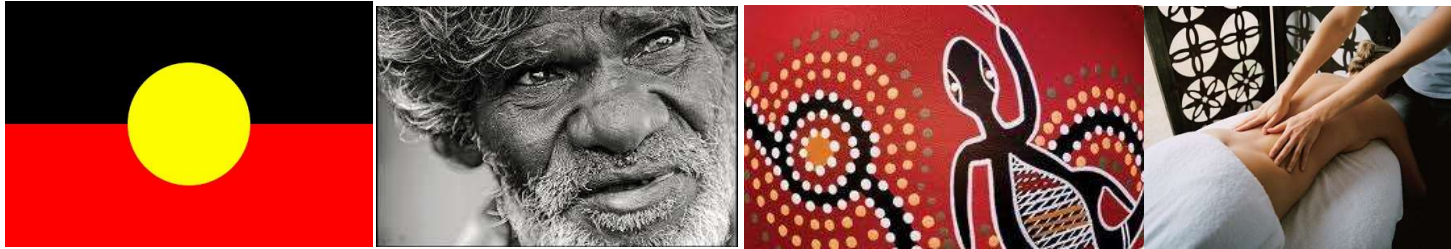
MBV –MRI LWK - 02/2019



Medische beeldvorming –MRI LWK

02/2019

L5-S1: hoogteverlies en dehydratatie van de discus. Discusprotrusie posterolateraal rechts met contact met de durazak en lichte compressie van uittredende wortel S1 rechts. Protrusie zet zich licht intraforaminaal voort nochtans zonder compressie van de uittredende wortel L5. In vergelijking met de opname van 2013 is de toenmalige hernia echter duidelijk afgenomen. tevens lichte interapofysaire artrose rechts



Open Access

Research



Disabling chronic low back pain as an iatrogenic disorder: a qualitative study in Aboriginal Australians

Ivan B Lin,^{1,2} Peter B O'Sullivan,² Juli A Coffin,³ Donna B Mak,⁴ Sandy Toussaint,⁵
Leon M Straker²

ARTICLE SUMMARY

Article focus

- The low back pain (LBP) beliefs of Aboriginal Australians with chronic LBP.

Key messages

- Contrary to previous research negative beliefs, including an anatomical/structural cause of pain and pessimistic future outlook, were common.
- Negative beliefs originated from interactions with healthcare practitioners suggesting disabling LBP may be partly iatrogenic.
- Biomedical-orientated management approaches to LBP are far reaching, highlighting the need for healthcare practitioners to positively influence beliefs as part of LBP care in all settings.

Strengths and limitations of this study

- The use of a qualitative and culturally secure research approach, and extended engagement with participants gave a unique insight into LBP beliefs among Aboriginal Australians and increased the rigour of the study.
- Findings were in line with research in other countries and cultural groups.

Open Access

Research



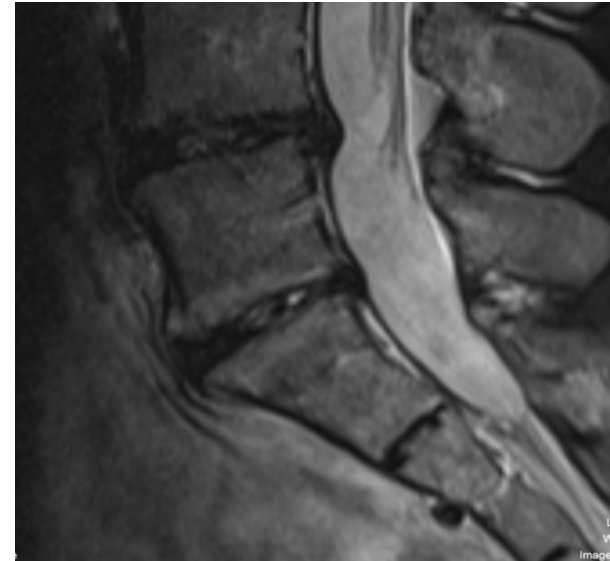
Disabling chronic low back pain as an iatrogenic disorder: a qualitative study in Aboriginal Australians

Ivan B Lin,^{1,2} Peter B O'Sullivan,² Juli A Coffin,³ Donna B Mak,⁴ Sandy Toussaint,⁵ Leon M Straker²

Prof Wim Dankaerts

Burden for society - RIZIV

$$12,28 * 4 = 49,12\text{€}$$

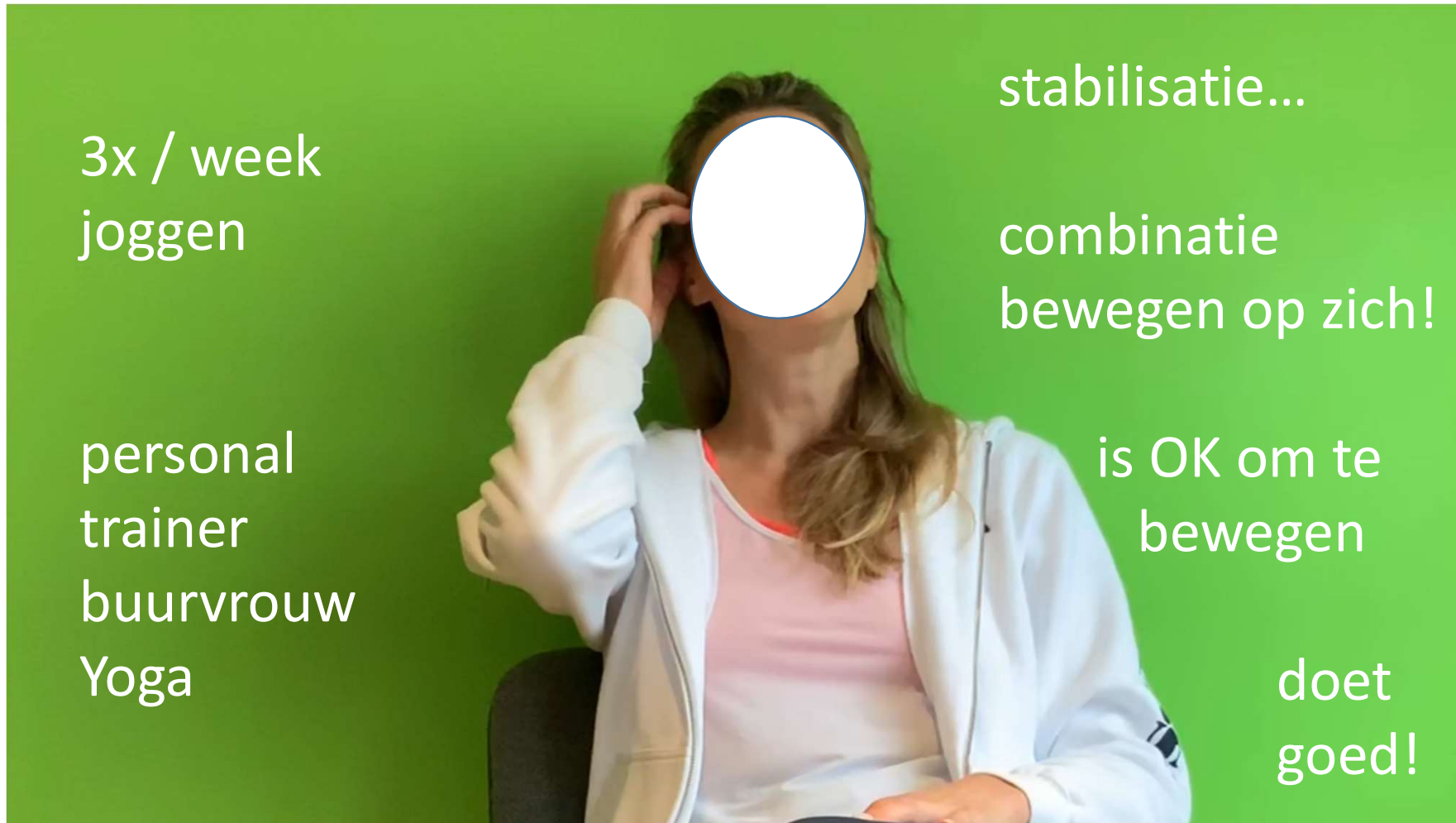


[



]

CFT approach – healthy lifestyle



A case study



39 years old female – 8 years of persistent low back pain

‘core stability training’ of

focus on self-management within a biopsychosocial framework’?

A multi-dimensional Clinical Reasoning Framework for LBP disorders”



Communication style is critical in forming a relationship

- ‘**Listen** to the story’ – let patient speak – direct them in a gentle manner to unravel and *make sense of the story* and to form a clear clinical picture....”tell me your story...”



Why is their life on hold?

- “I **do not understand** it”.

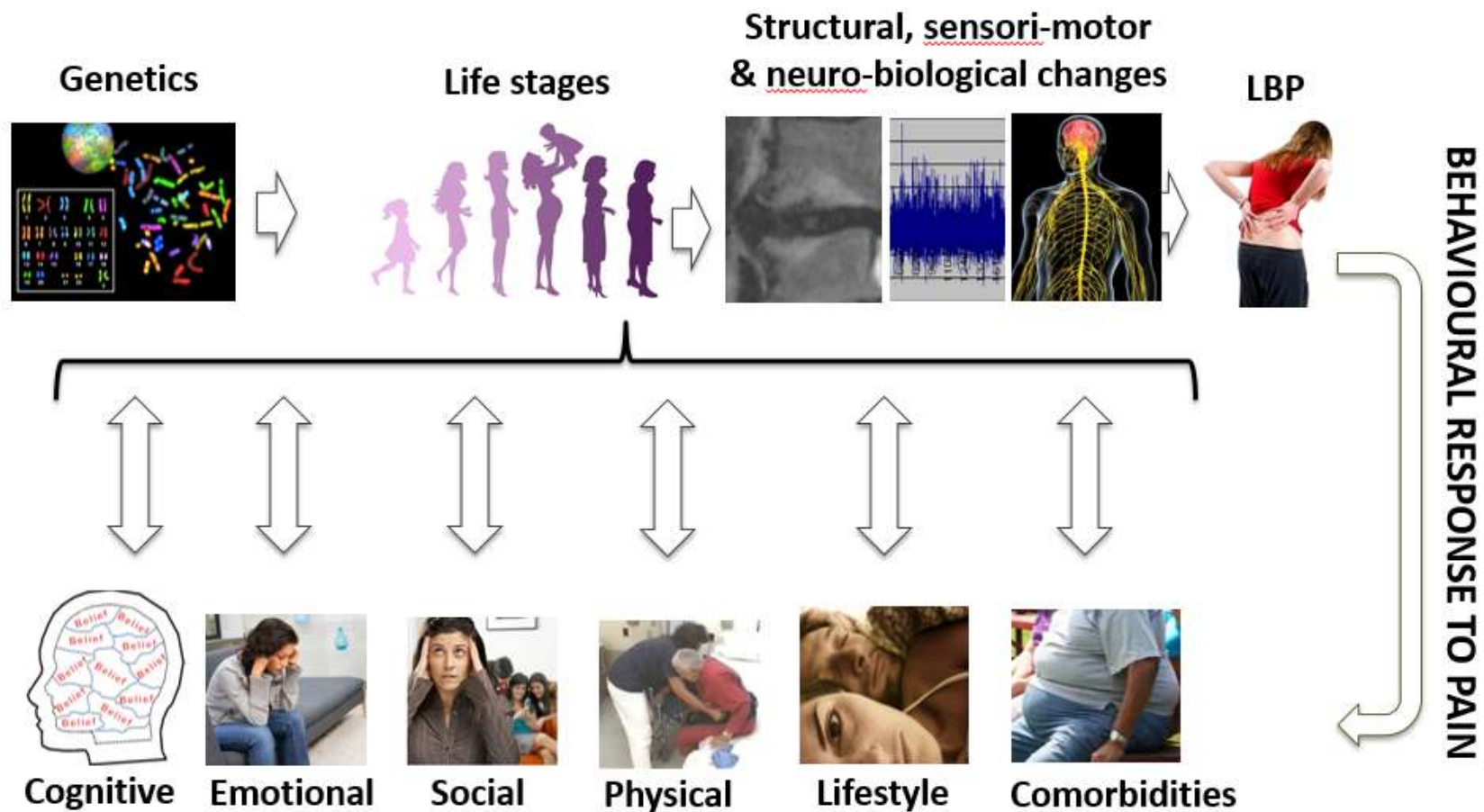


- I can **not control** it”.



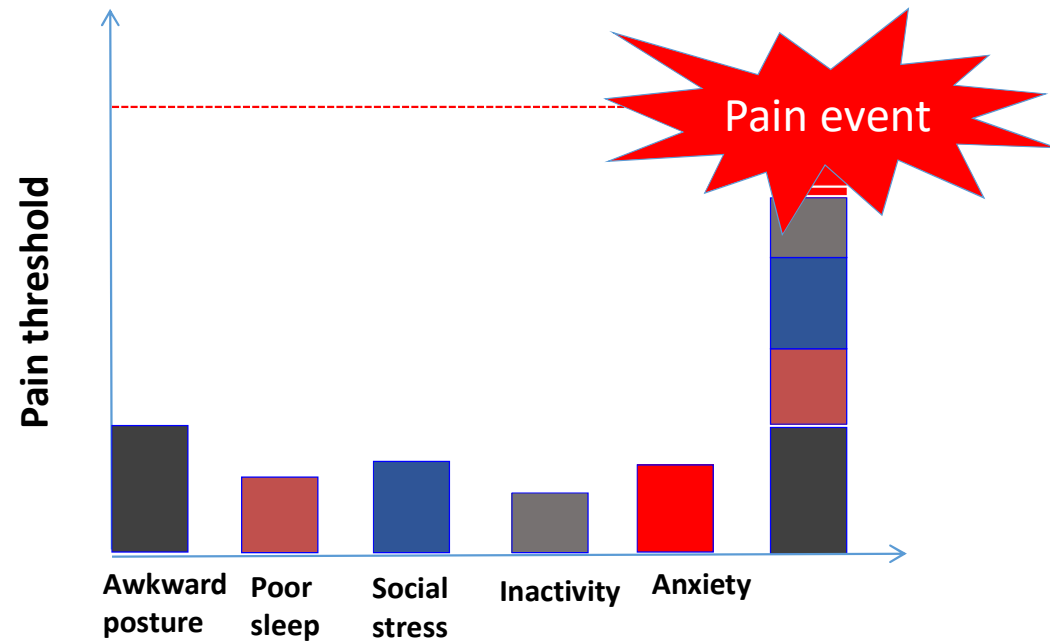
- I can **not do things** in live that give me meaning”.





MODIFIABLE INFLUENCES ON PAIN AND DISABILITY BEHAVIOURS

Cumulative factors and pain





Manual Therapy

Volume 20, Issue 1, February 2015, Pages 138-147

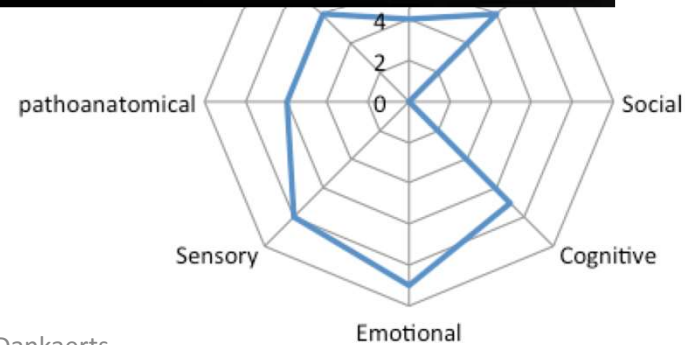
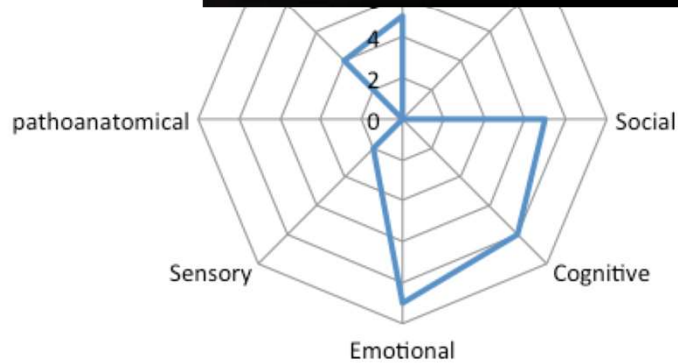
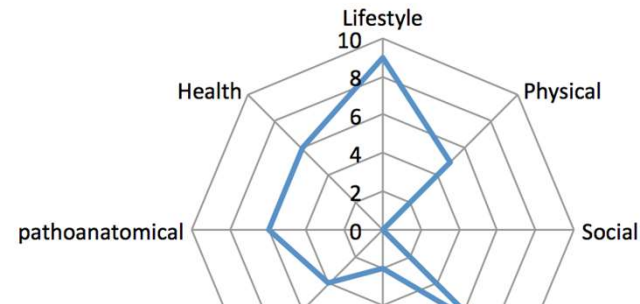
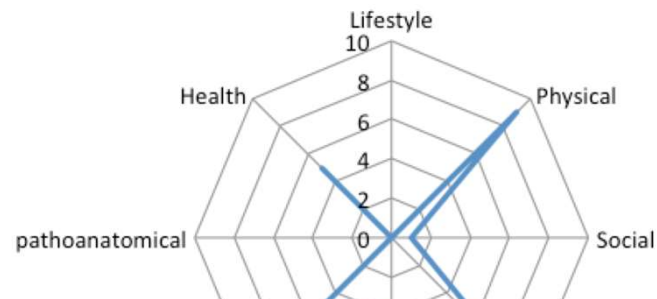


Original article

Multidimensional pain profiles in four cases of chronic non-specific axial low back pain: An examination of the limitations of contemporary classification systems

Martin Rabey  , Darren Beales, Helen Slater, Peter O'Sullivan

Dealing with complexity - multi-dimensional profiling



Prof Wim Dankaerts

Rabey et al Man Ther 2014

What is a Cognitive Functional Therapy (CFT) approach?

Why is their life on hold?

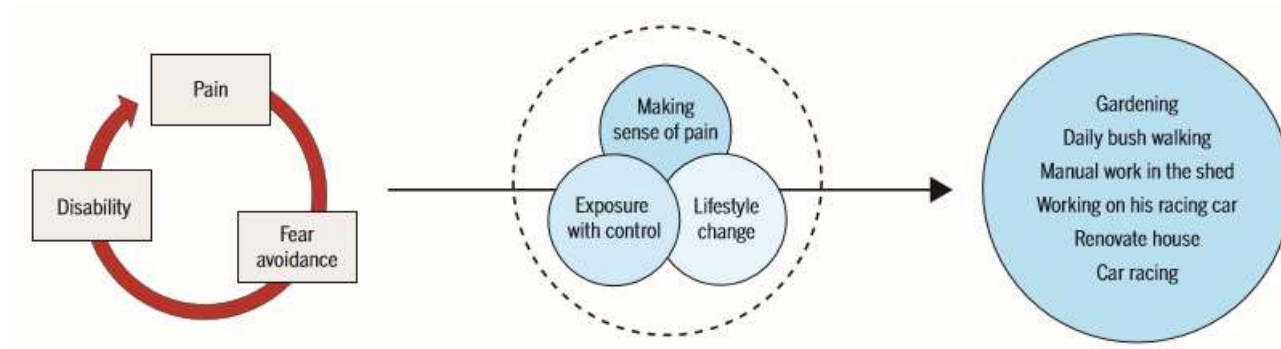
- “I do not understand it”.



- I can not control it”.



- I can not do things in live that give me meaning”.



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Revised: 17 February 2019

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DOI: 10.1002/ejp.1399

ORIGINAL ARTICLE

EJP
European Journal of Pain

WILEY

Cognitive functional therapy in patients with non-specific chronic low back pain—a randomized controlled trial 3-year follow-up

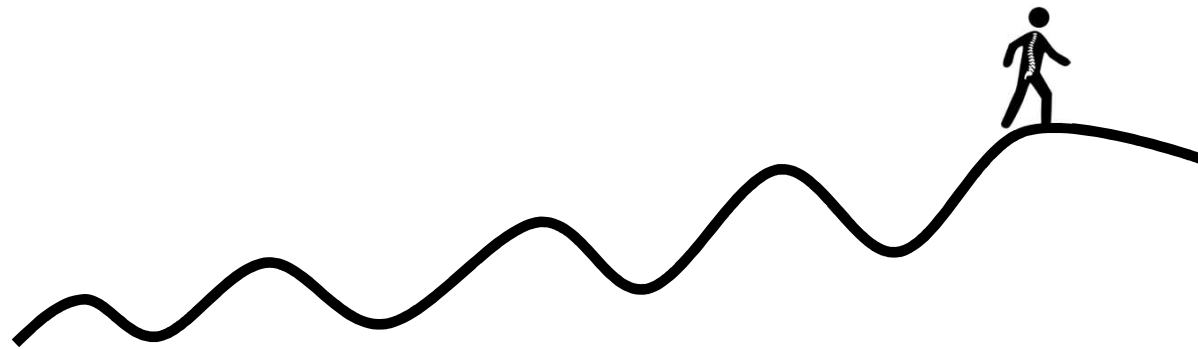
**Kjartan Vibe Fersum¹ | Anne Smith² | Alice Kvåle³ | Jan Sture Skouen^{1,4} |
Peter O’Sullivan²**

Findings support long-term benefits of a individualized behaviourally orientated intervention that targets pain beliefs, functional restoration and lifestyle factors.

Prof Wim Dankaerts

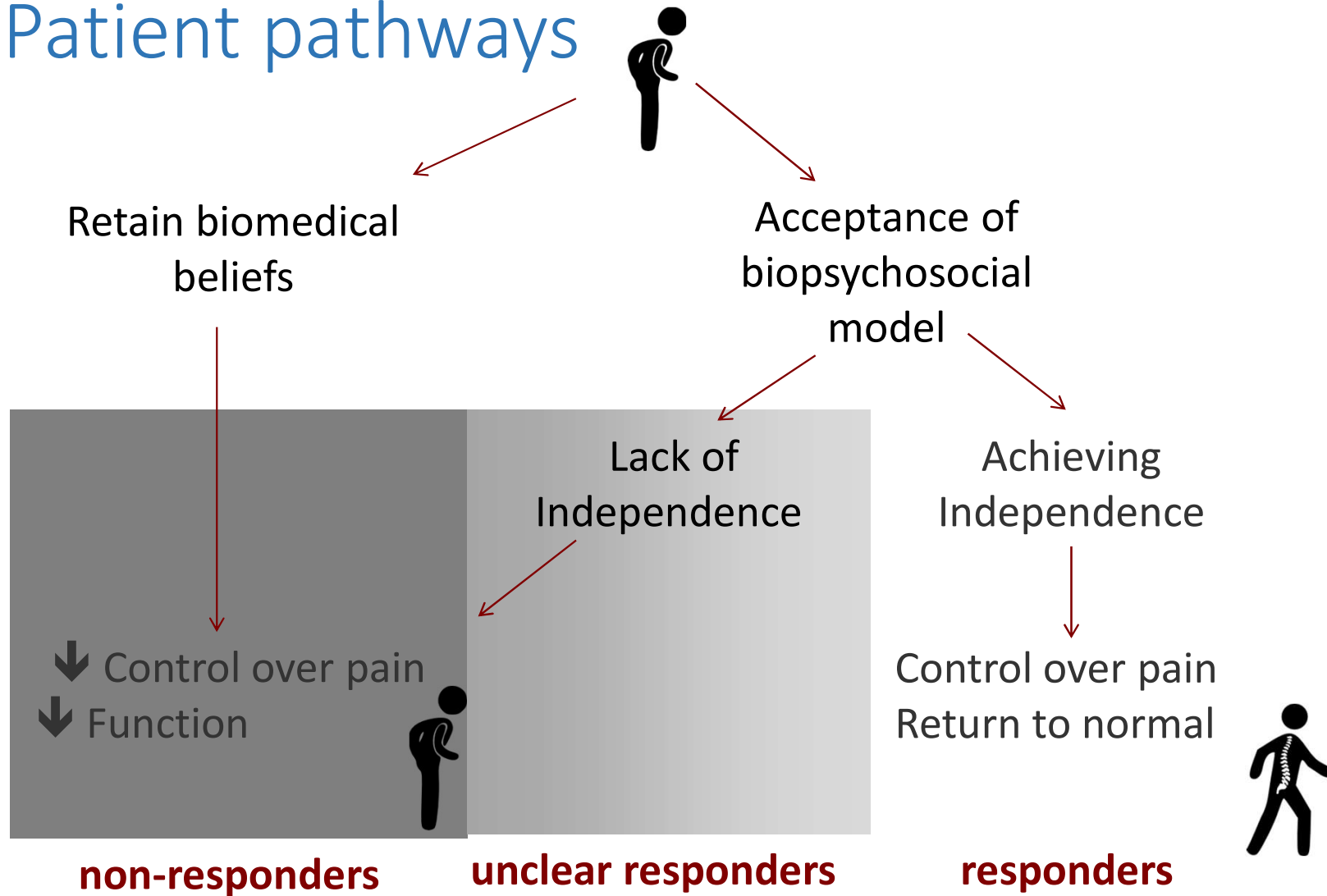
Patient pathways

- Qualitative research identified that people who positively respond to CFT report a change in their pain beliefs towards a **biopsychosocial understanding** of their pain, enhanced **pain control** strategies and **self-efficacy** to achieve **independence** in engaging in **valued activities**



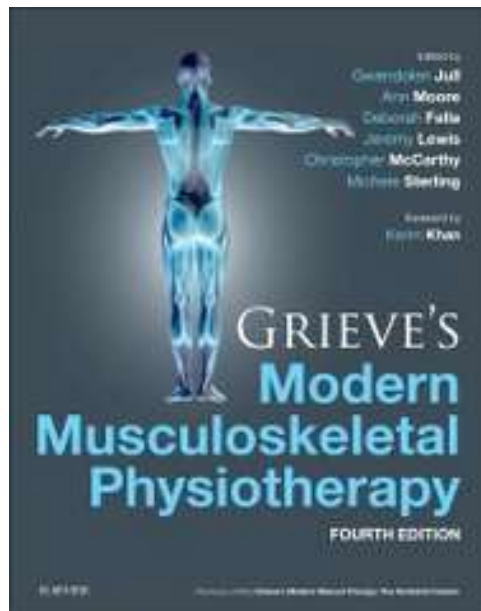
Bunzli, McEvoy, Dankaerts, O'Sullivan, & O'Sullivan, 2016).

Patient pathways



Additional reading & online resources

1. Physical Therapy , Vol 98, #5 , May 2018 – Cognitive Functional Therapy: An Intergrated behavioral Approach for the Targeted Management of Diasabling Low Back Pain - O'Sullivan P., et al.
2. Grieve's Modern Musculoskeletal Physiotherapy – CH 45.2:
Multidimensional approach for the targeted management of low back pain - O'Sullivan P., et al.
3. www.pained.com



CHAPTER 45.2

MULTIDIMENSIONAL APPROACH FOR THE TARGETED MANAGEMENT OF LOW BACK PAIN

**Peter O'Sullivan • Wim Dankaerts •
Kieran O'Sullivan • Kjartan Fersum**

Prof Wim Dankaerts

OPEN ACCESS

Perspective

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M. O'Keeffe, PT, PhD, Sydney School of Public Health, University of Sydney, Australia, and Department of Allied Health, University of Limerick, Limerick, Ireland.

Cognitive Functional Therapy: An Integrated Behavioral Approach for the Targeted Management of Disabling Low Back Pain

Peter B. O'Sullivan, J.P. Caneiro, Mary O'Keeffe, Anne Smith, Wim Dankaerts, Kjartan Fersum, Kieran O'Sullivan

Physical Therapy | Volume 98 | Number 5 | May 2018 |
<https://academic.oup.com/ptj/article/98/5/408/4925487>

Prof Wim Dankaerts



www.pain-ed.com

As clinical researchers we realized that there was a need to **translate the scientific evidence** about pain to both the public and health care practitioners. By **bridging this gap** we want to dispel some of the common myths about chronic pain and provide hope for change.



Prof Wim Dankaerts



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