Improving the timeliness and effectiveness of rehabilitation of individuals with chronic musculoskeletal pain

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Maastricht University Leading in Learning!

cir revalidatie

Pain Science in Motion

Disclosure belangen spreker	
Geen (potentiële) belangenverstrengeling	
Andere relatie, namelijk spreker is tevens werkzaam bij het CIR revalidatie	

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Aim

- Increase awareness on predisposing, provoking and especially psychosocial factors maintaining disability and loss of quality of life
- Improve timeliness and effectiveness of treatment for chronic disabling pain
- Role of Fear Avoidance Model and Exposure in Vivo

The problem

- Most treatments based on the biomedical model and mono-disciplinary trying to fix a somatic problem; reduction of pain

Shortcomings disease model OA/RA

- Low correlation biomedical factors - pain severity (Finan et al, Arthritis Rheum 2013, de Rooij et al, J Rehabil Med 2016)
- Model often does not explain discrepancy between chronic arthritis impairments and disability (Cadmus et al. Med Sci Sports Exerc 2010, Morone et al, Pain Med 2009)

Role of non-biomedical factors, e.g. OA/RA

- Medium effect sizes for overall relation between pain beliefs and pain severity, affective distress and functional impairment (Jia and Jackson, J Behav Med 2016)
- Surgical outcomes (arthroplasty) highly associated with catastrophizing (Helminen et al, Clin Rehabil 2016; Burns et al, J Pain Res 2015)

Shortcomings disease model LBP

Example for <50 year old persons of MRI findings showing stronger associations with LBP

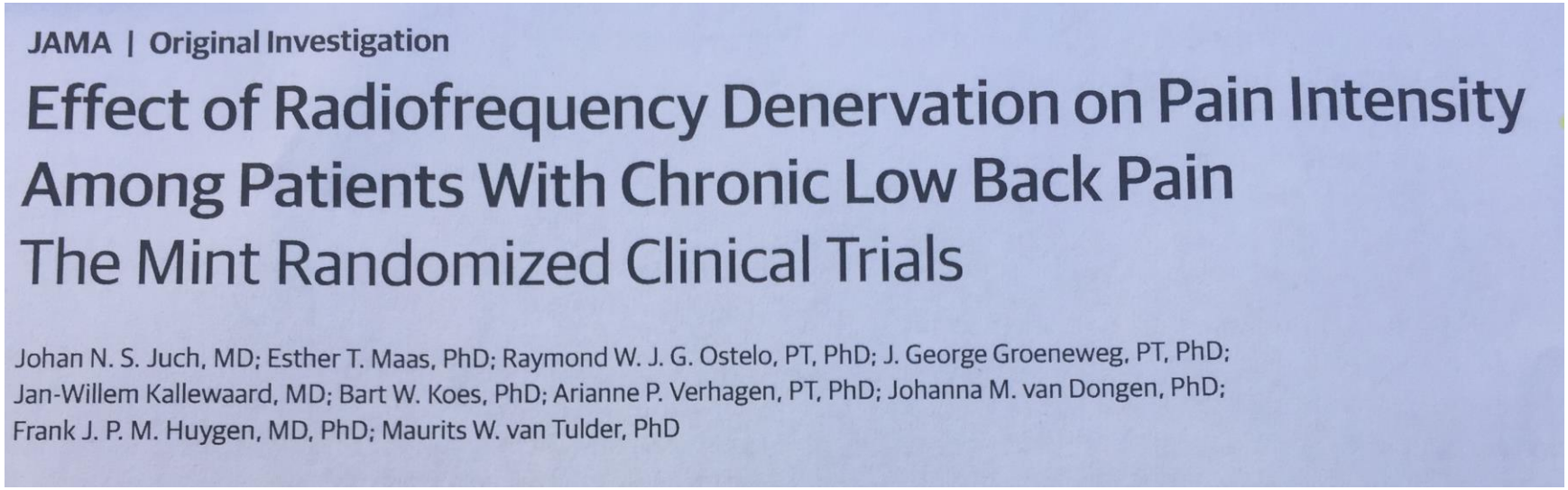
- Disc degeneration OR 2.2 (1.2-4.2), prevalence 34% vs 57%
- Modic changes OR 1.6 (0.5-5.4), prevalence 12% vs 23%
- Disc Bulge 7.5 (1.3-44.6), prevalence 19% vs 42%
- Central spinal canal stenosis 20.6 (0.1 – 798,8), prevalence 14% vs 60%

(Hartvigsen et al, Lancet 2018)

However!

- MRI findings don't moderate specific treatments and no evidence that it improves patient outcomes
  (Jensen et al, N Engl J Med 1994, de Schepper et al, Eur Spine J 2016, Steffens et al, Eur Spine J 2016, Hartvigsen et al, Lancet 2018)

Latest evidence of biomedical oriented treatments



JAMA | Original Investigation

Effect of Radiofrequency Denervation on Pain Intensity Among Patients With Chronic Low Back Pain
The Mint Randomized Clinical Trials

Johan N. S. Juch, MD; Esther T. Maas, PhD; Raymond W. J. G. Ostelo, PT, PhD; J. George Groeneweg, PT, PhD; Jan-Willem Kallewaard, MD; Bart W. Koes, PhD; Arianne P. Verhagen, PT, PhD; Johanna M. van Dongen, PhD; Frank J. P. M. Huygen, MD, PhD; Maurits W. van Tulder, PhD

JAMA 2017:318(1):68-81

Results

- 681 randomized, mean baseline pain intensity 7.1
- Mean difference pain intensity between intervention group and control were
  - -0.18 (95% CI, -0.76 to 0.4) in facet joint trial
  - -0.71 (95% CI, -1.35 to 0.06) in SI joint trial
  - -0.99 (95% CI, -1,73 to -0.25) in combination trial
- Neither clinically relevant changes in secondary outcomes

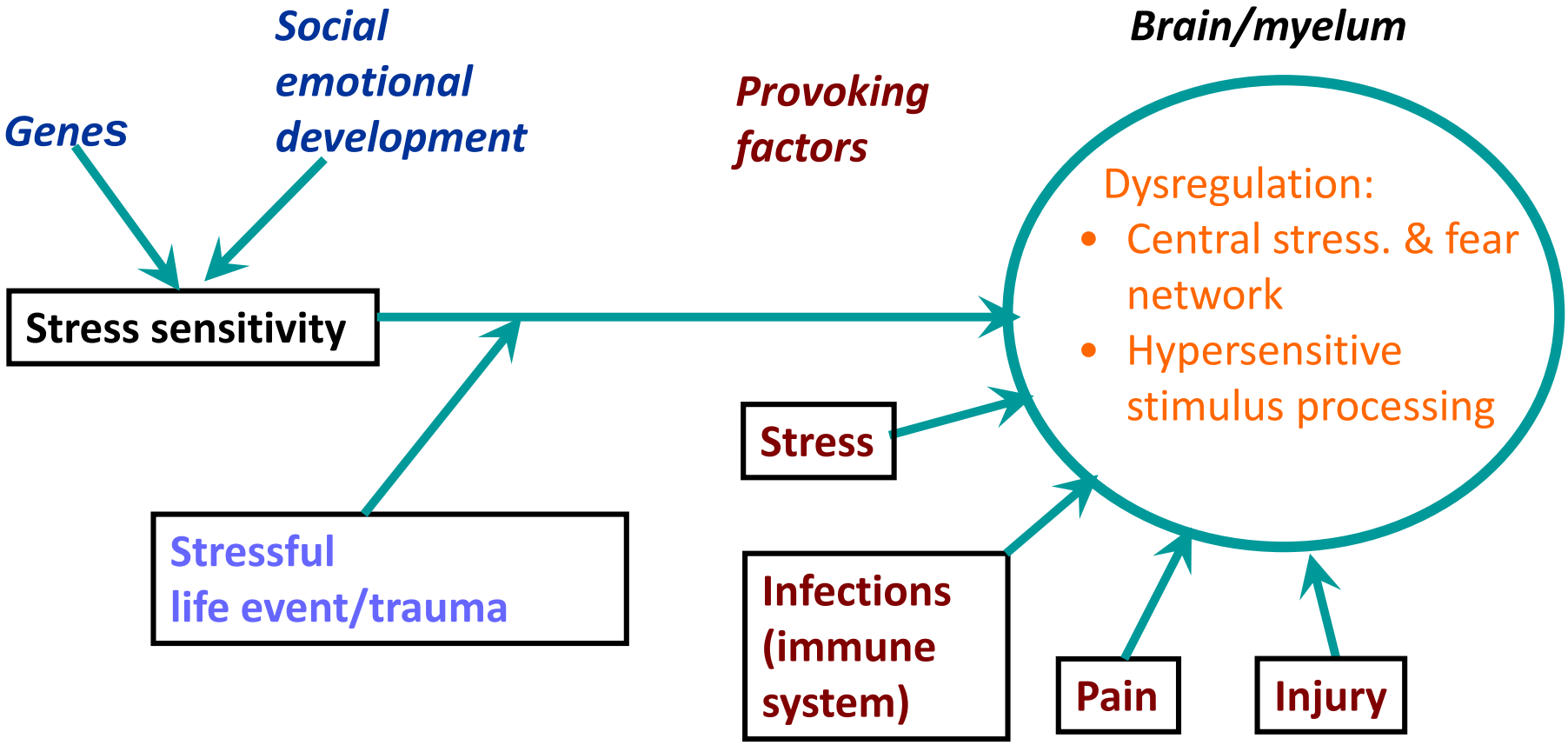
Necessity for another perspective!

- Discern between predisposing, provoking and factors that maintain pain/disability
- Relief of pain is often only partly to be achieved, other goals regarding daily life activities and participation seem more feasible

Necessity for another perspective!

- Treatment should focus on factors important for the persistence of pain-associated problems
- Identify persons at risk of developing secondary disability (bio-psycho-social perspective) ASAP!

Predisposing and provoking factors

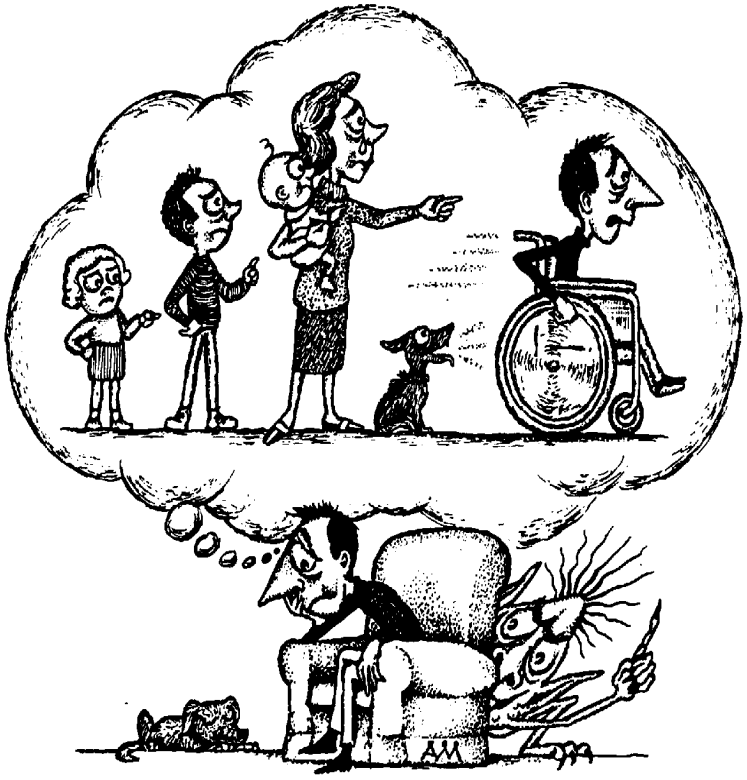


Maintaining factors

"Pain is not good without an audience"

Cognitive factors (yellow flags)

- Attributions
- Misinterpretation of symptoms (catastrophizing)
- Fear (of movement, disability)
- Expectancies
- Depression
- Self-efficacy
- Coping with stress/problems



Work factors (blue/black flags)

- Job satisfaction
- Job decision latitude
- Support of co-workers and boss (Street et al, Work 2015)

- Working conditions (Steenstra et al, Occup Environ Med 2005, Macfarlane et al, Ann Rheum Dis 2009)

- Social security system (Hartvigsen et al, Lancet 2018)

Environmental factors

- Spouse and relevant others (e.g. care provider)
  - Over protective or insufficient support (Romano et al, Behav Ther 2000, Burns et al, Pain 2017)
  - Too much or too little communication about pain (Cano et al, Pain 2012)

Health care providers attitude

- More biomedical orientated clinicians give advice which results in a less active lifestyle (Houben et al, Eur J Pain 2005; Bishop et al, Pain 2008; Darlow et al, Eur J Pain 2011)

Effectiveness

- Cochrane reviews positive for
  - Multidisciplinary treatment of fibromyalgia (Häuser et al, Arthritis Rheum 2009)
  - CBT for chronic pain excluding headache (Williams et al, Cochrane Database Syst Rev 2012)
  - Multidisciplinary treatment for CLBP (Kamper et al, BMJ 2015)

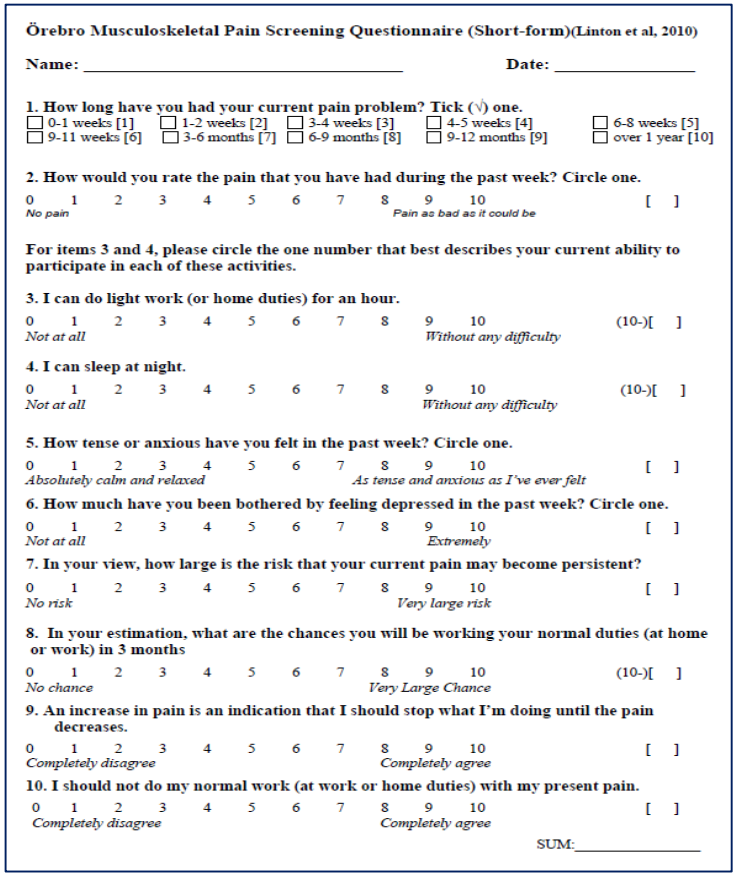
The problem of IMPT

- Moderate effect sizes
- 30-55% shows clinically important improvement
- Relapse (10-70% within 2-10 years) (Turk & Rudy 1991, Volker et al 2017)
- Little attention for prevention of the development and persistence of disability and participation problems

Examples of early intervention

Risk stratified early intervention-I

- ÖMPSQ-SF (10-items)
  - Self perceived function
  - Pain experience
  - Fear-avoidance beliefs
  - Distress
  - Return to work expectancy
  - Score 0-100



Örebro Musculoskeletal Pain Screening Questionnaire (Short-form)(Linton et al, 2010)

Name: _____ **Date:** _____

1. How long have you had your current pain problem? Tick (√) one.

☐ 0-1 weeks [1] ☐ 1-2 weeks [2] ☐ 3-4 weeks [3] ☐ 4-5 weeks [4] ☐ 6-8 weeks [5]
☐ 9-11 weeks [6] ☐ 3-6 months [7] ☐ 6-9 months [8] ☐ 9-12 months [9] ☐ over 1 year [10]

2. How would you rate the pain that you have had during the past week? Circle one.

0 1 2 3 4 5 6 7 8 9 10 [ ]
No pain *Pain as bad as it could be*

For items 3 and 4, please circle the one number that best describes your current ability to participate in each of these activities.

3. I can do light work (or home duties) for an hour.

0 1 2 3 4 5 6 7 8 9 10 (10-)[ ]
Not at all *Without any difficulty*

4. I can sleep at night.

0 1 2 3 4 5 6 7 8 9 10 (10-)[ ]
Not at all *Without any difficulty*

5. How tense or anxious have you felt in the past week? Circle one.

0 1 2 3 4 5 6 7 8 9 10 [ ]
Absolutely calm and relaxed *As tense and anxious as I've ever felt*

6. How much have you been bothered by feeling depressed in the past week? Circle one.

0 1 2 3 4 5 6 7 8 9 10 [ ]
Not at all *Extremely*

7. In your view, how large is the risk that your current pain may become persistent?

0 1 2 3 4 5 6 7 8 9 10 [ ]
No risk *Very large risk*

8. In your estimation, what are the chances you will be working your normal duties (at home or work) in 3 months

0 1 2 3 4 5 6 7 8 9 10 (10-)[ ]
No chance *Very Large Chance*

9. An increase in pain is an indication that I should stop what I'm doing until the pain decreases.

0 1 2 3 4 5 6 7 8 9 10 [ ]
Completely disagree *Completely agree*

10. I should not do my normal work (at work or home duties) with my present pain.

0 1 2 3 4 5 6 7 8 9 10 [ ]
Completely disagree *Completely agree*

SUM:_____

- Good predictor (score >50) of no return to work at different FU-moments (AUC 0.72-0.77)

(Nicholas et al, J Occup Rehab 2018)

WISE-study

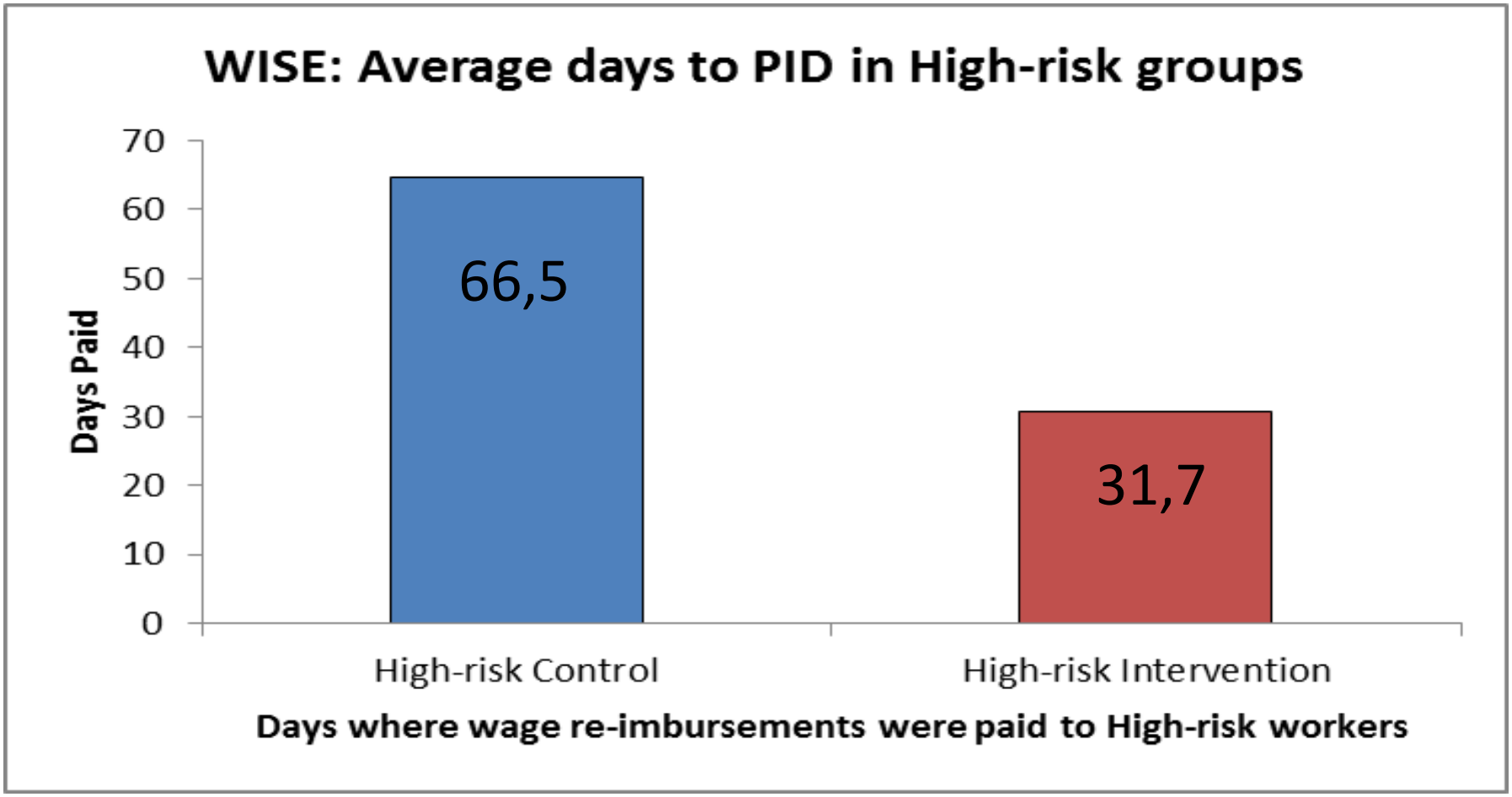
- Injured health workers with significant tissue damage (work related), no surgery needed
- Off work 1-3 weeks
- ÖMPSQ-SF by telephone interview
- Persons with >50 score invited to participate
- Randomisation by hospital & claim MT
- Care as usual; considering psychological and social risk factors only after a poor response to initial treatment (6-8 weeks after the injury)

(Nicholas et al, accepted pending revisions J Occup Rehab)

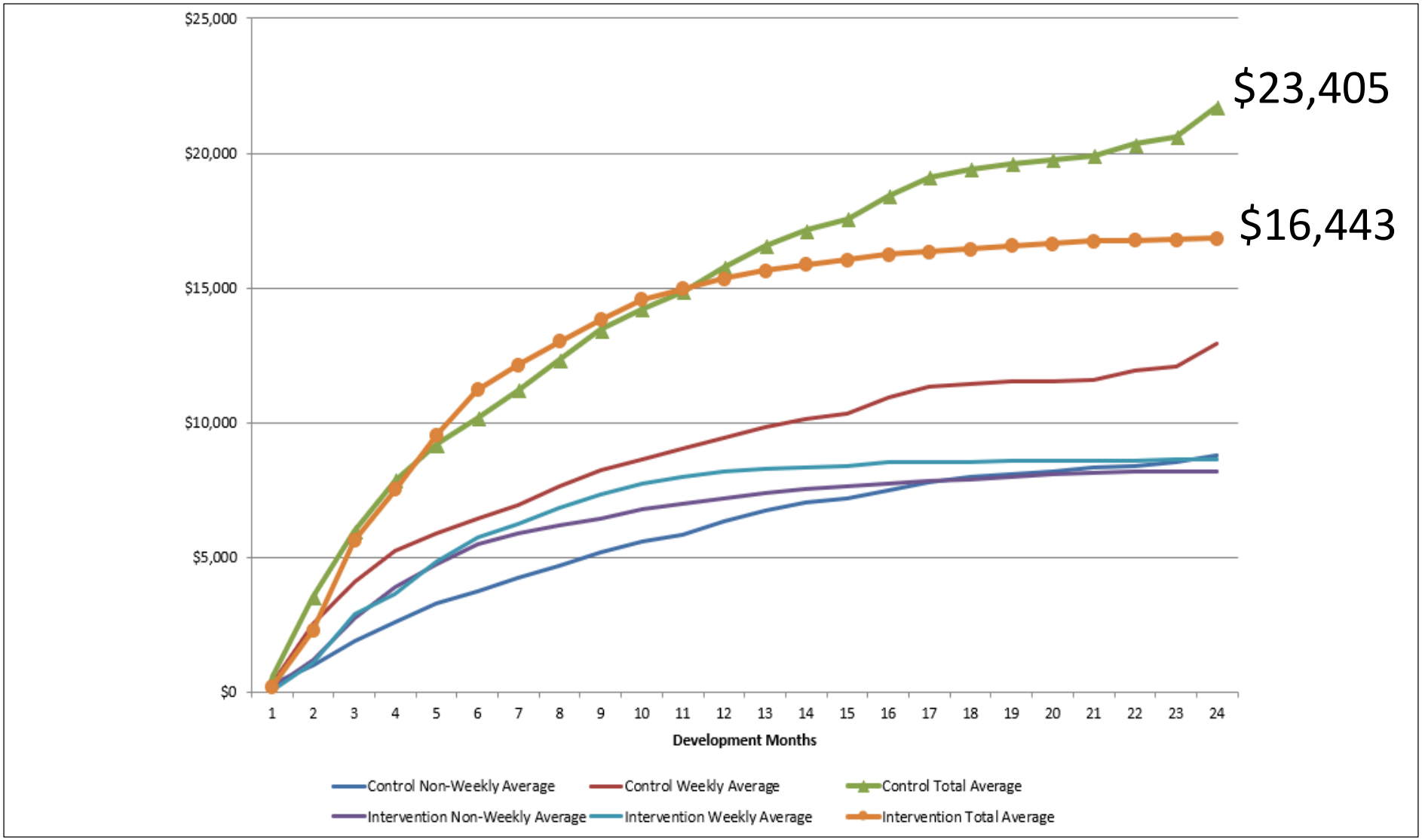
WISE-study experimental intervention

- **All stakeholders** (insurer, workplace, health care providers, injured workers) involved
- Psychological and workplace risk factors targeted within 1-3 weeks
- Immediate contact with RTW-coordinator (week 1-2)
- Assessment by psychologist (week 3-8, 1-6 sessions)

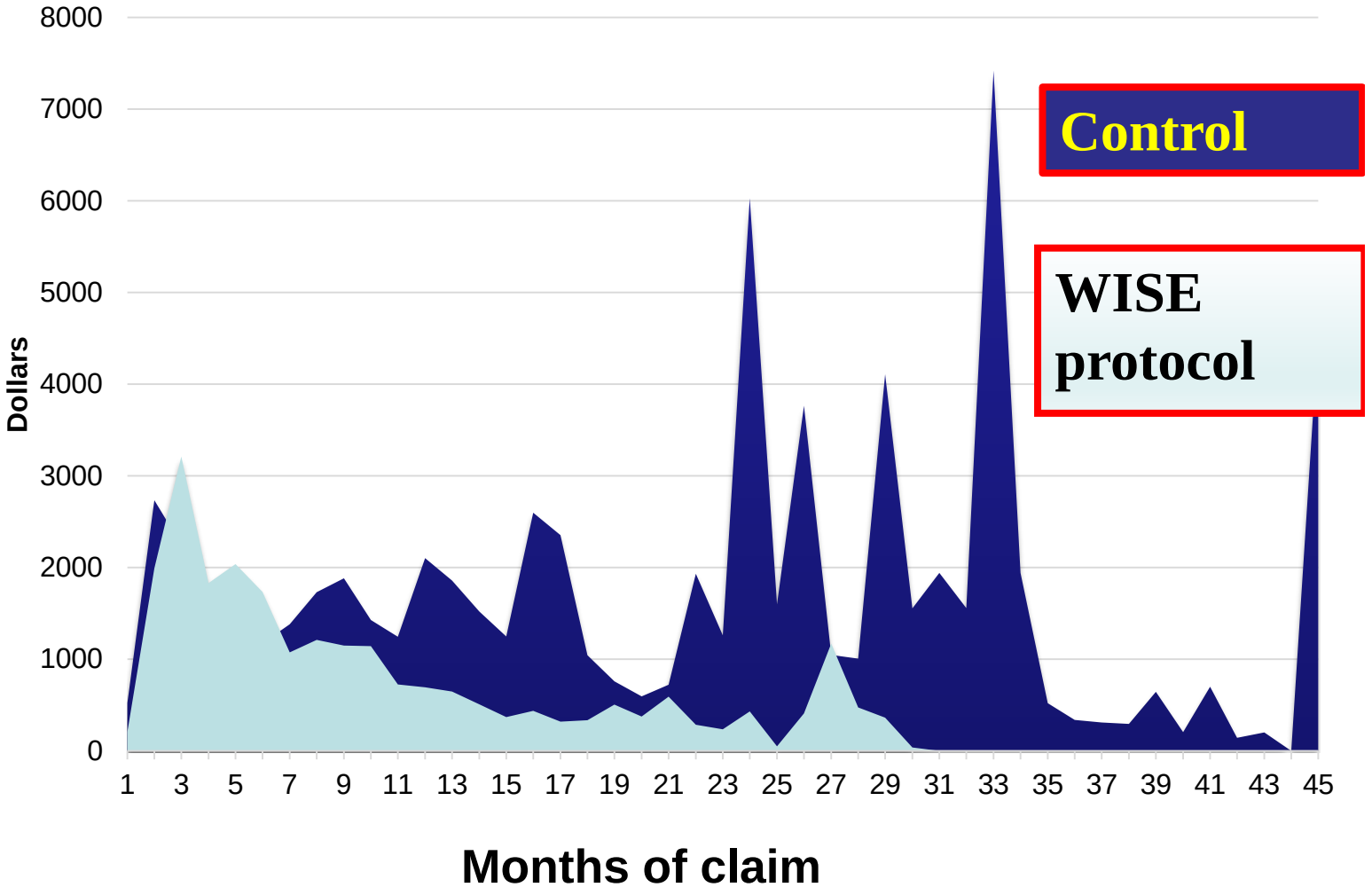
Results 24 months post-injury



Average costs for Intervention and control over 24 months



Average costs for Intervention and control over 45 months



Risk stratified early intervention-II

Journal of Physiotherapy 61 (2015) 157

Journal of
PHYSIOTHERAPY
journal homepage: www.elsevier.com/locate/jphys

Appraisal

Trial Protocol

StressModEx – Physiotherapist-led Stress Inoculation Training integrated with exercise for acute whiplash injury: study protocol for a randomised controlled trial

Carrie Ritchie [a], Justin Kenardy [b], Rob Smeets [c], Michele Sterling [a]

Methods

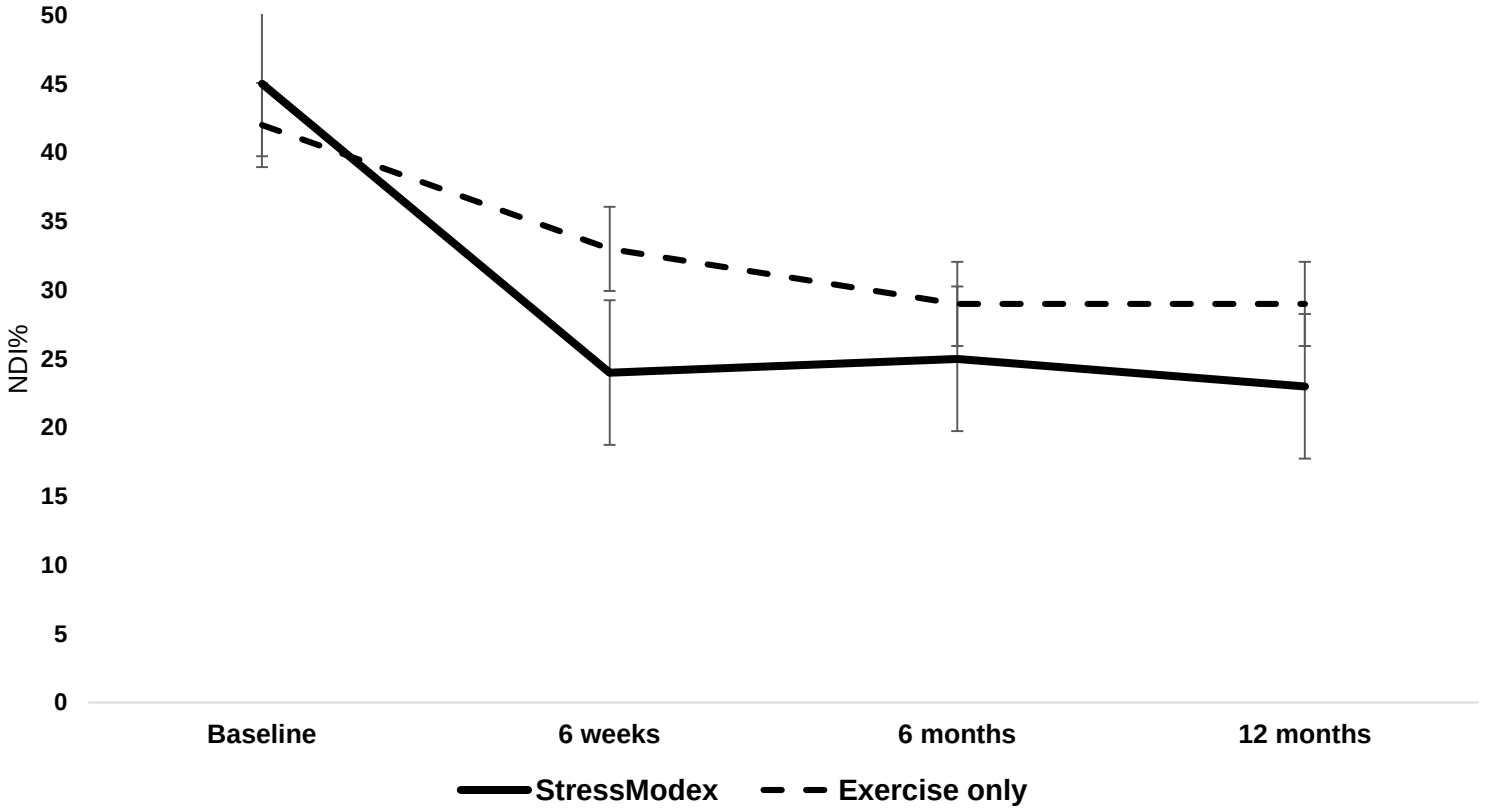
- Whiplash Grade II
- Medium/high risk based on Whiplash Clinical Prediction Rule (Ritchie et al 2013, 2015)

Methods

- Stress Inoculation Therapy plus PT led-exercises (10 sessions in 6 weeks)
  - Identifying and understanding stress
  - Developing skills (relaxation, problem solving, helpful coping self-statements)
  - Applying skills in various stressful situations
- Control: PT led exercises only (10 sessions in 6 weeks)

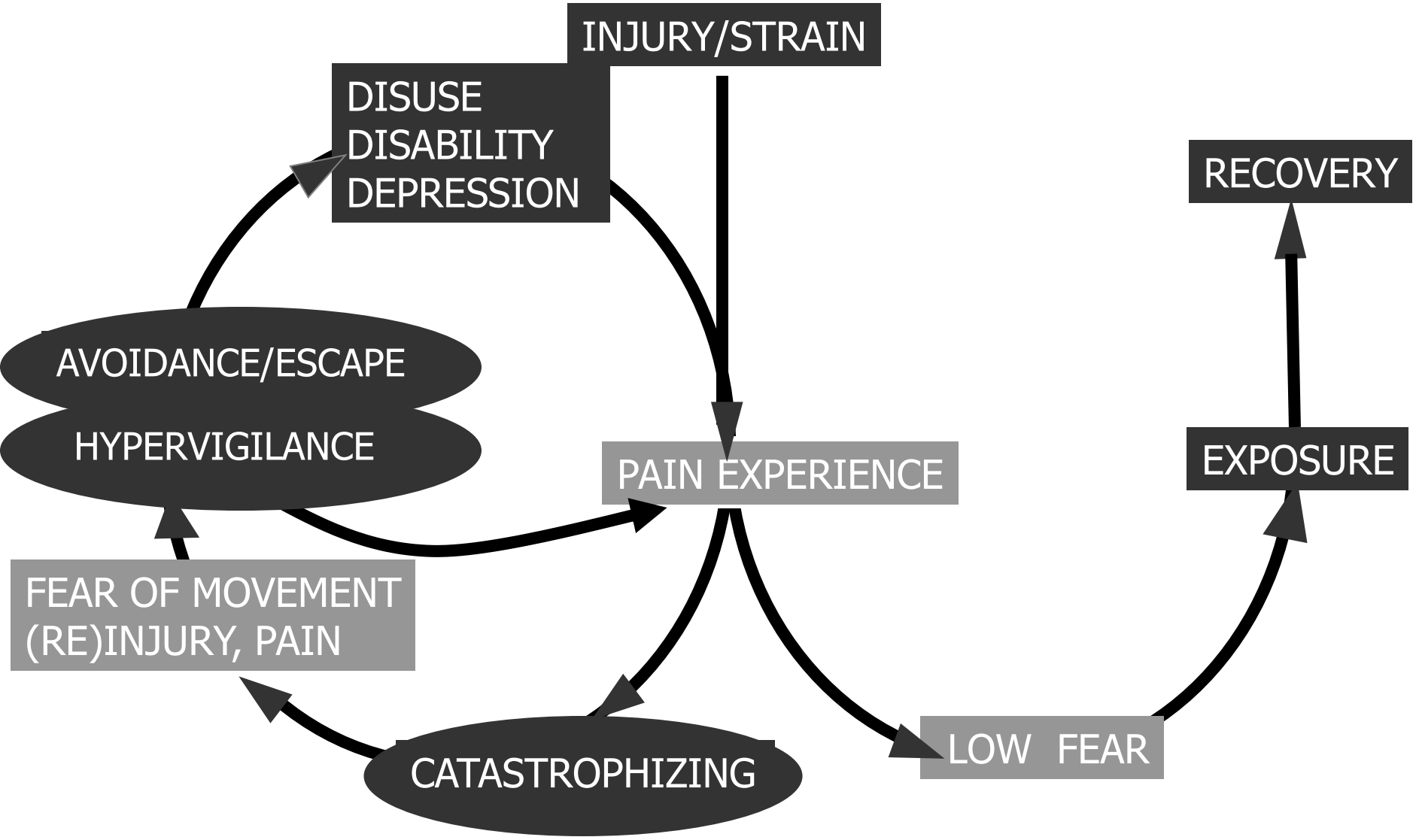
(Sterling et al, Br J Sports Med 2018)

Primary Outcome: clinically relevant effects on disability



	CWE	6 weeks	6 months	12 months
Neck Disability Index	7-10	-10.0 (-15.5,-9,0)	-7.80 (-13.8, -1.8)	-10.1 (-16.3, -3.9)

Fear avoidance model



Vlaeyen. IASP Press, 2003;24:631-650

But some jobs are really dangerous!!

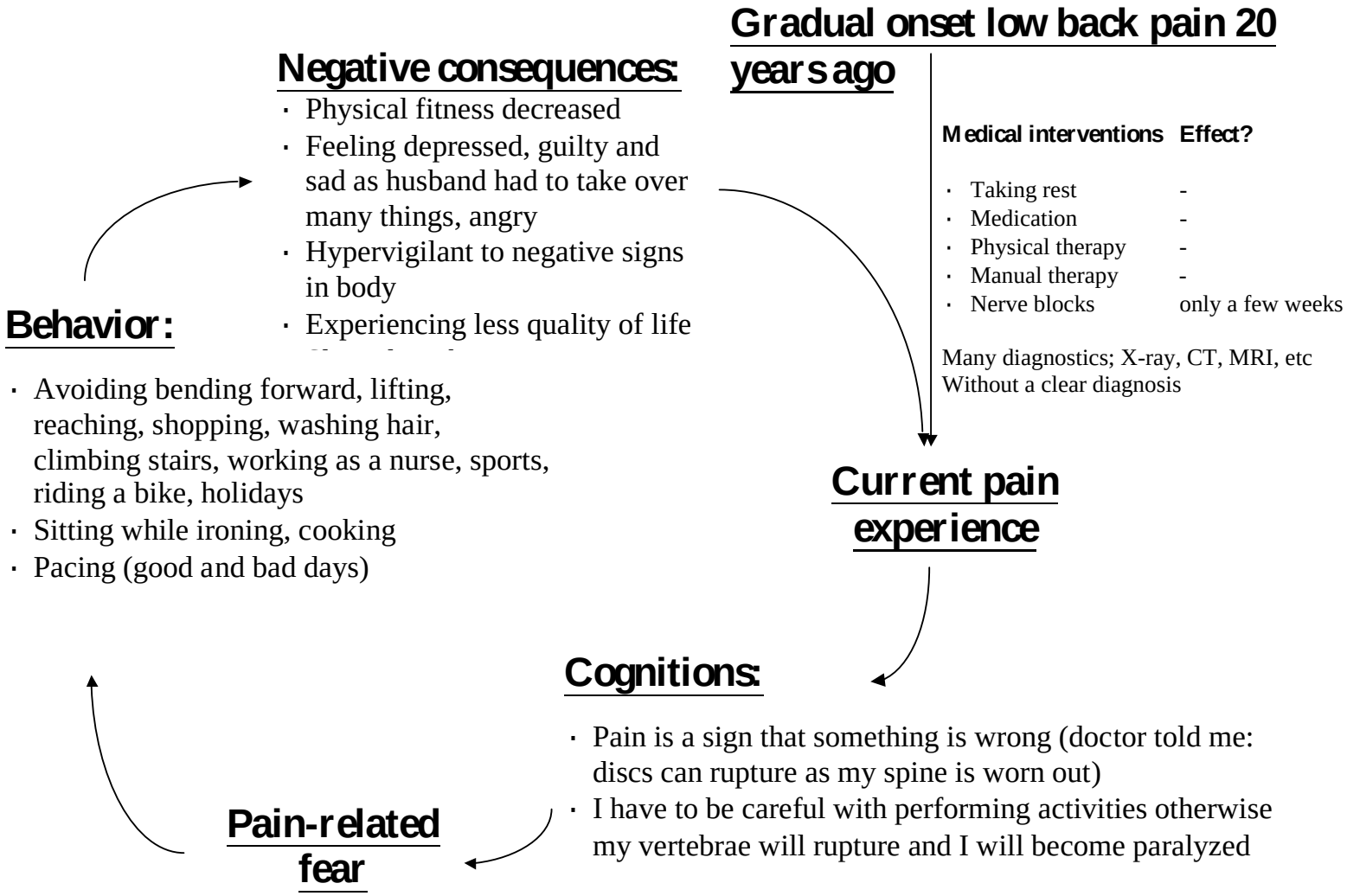
Exposure in Vivo screening

- Mainly focussing on:
  - Fearful cognitions/conditional assumptions; “Feeling pain means damage/harm”
  - How does the patient interpret the results of the performed diagnostic tests?
  - Involving the relevant spouse

Measuring fear: PHODA

- Photograph series of Daily Activities: pictures of activities are rated by patient using a thermometer
- Four versions:
  - Back
  - Upper extremity
  - Lower extremity
  - Adolescents

Education (personalised FA-model)



Behavioral experiment

- Activity is chosen (personal relevance)
- Patient formulates expectations and scores credibility
- Patient performs activity (no safety behavior; as normal as possible)
- Evaluation; re-scoring credibility and discuss expectations (harm, uncontrollability)


CRPS

2016

Research Paper

PAIN®

Expose or protect? A randomized controlled trial of exposure in vivo vs pain-contingent treatment as usual in patients with complex regional pain syndrome type 1

Marlies den Hollander[a,b,f,*], Mariëlle Goossens[a,c], Jeroen de Jong[a,c,f], Joop Ruijgrok[c], Jan Oosterhof[d], Patrick Onghena[e], Rob Smeets[b,c,h], Johan W. S. Vlaeyen[a,g]

Reliable change 6 month FU

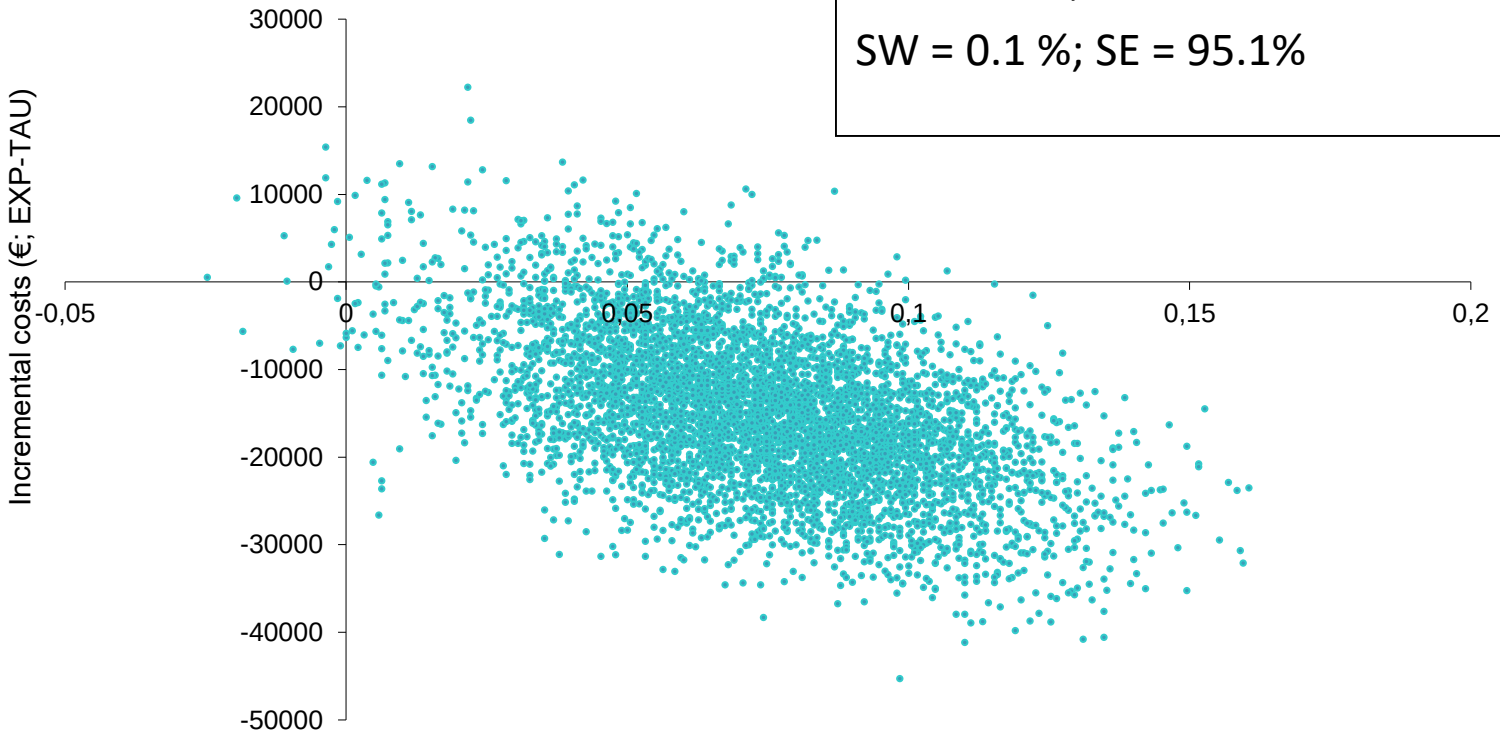
	Proportion reliable change	
	EXP	SPT
Disability (RASQ and WAQ pooled)	0,94	0,18
Pain intensity (NPS)	0,39	0,00
Harmfulness of activities (PHODA overall)	1,00	0,47
Pain catastrophizing (PCS)	0,39	0,06
Physical Health (SF36-PCS)	0,89	0,12
Mental health (SF36-MCS)	0,61	0,06

Cost-effectiveness

Percentage replications in quadrant:

NW = 0.2%; NE = 4.6%

SW = 0.1 %; SE = 95.1%



(Den Hollander et al, Int J Techn Assess Health Care 2018)

Video Exposure in Vivo CRPS-I

Video Exposure in Vivo CRPS-I

Video Exposure in Vivo CRPS-I

Conclusions

- Invest in thorough bio-psycho-social assessment
- Mind your own attitude
- Secondary prevention is worthwhile
- Start ASAP!
- Exposure in Vivo is cost-effective in those who fear additional damage by moving