A multimodal approach for chronic musculoskeletal pain.

Assessment and treatment

Albère Köke PhD, PT

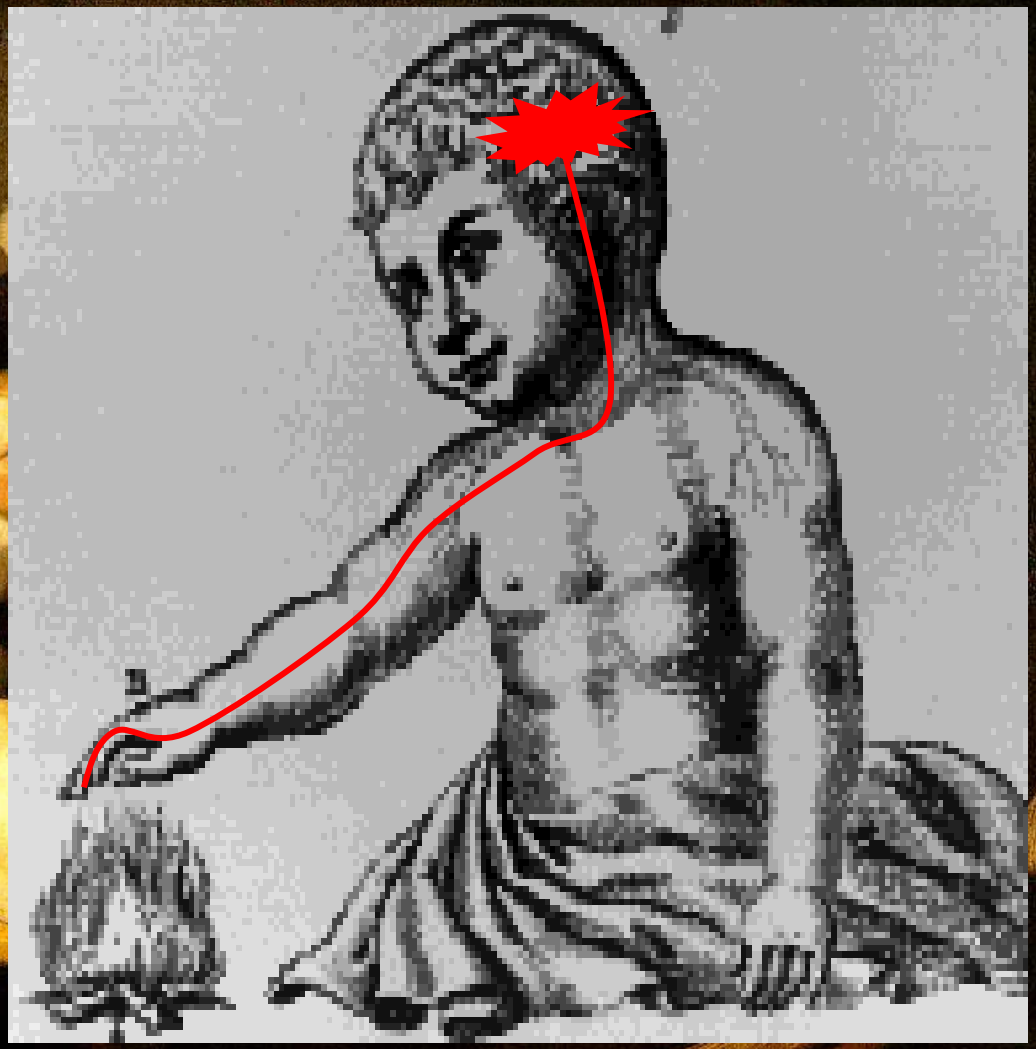
adelante
haal het beste uit jezelf

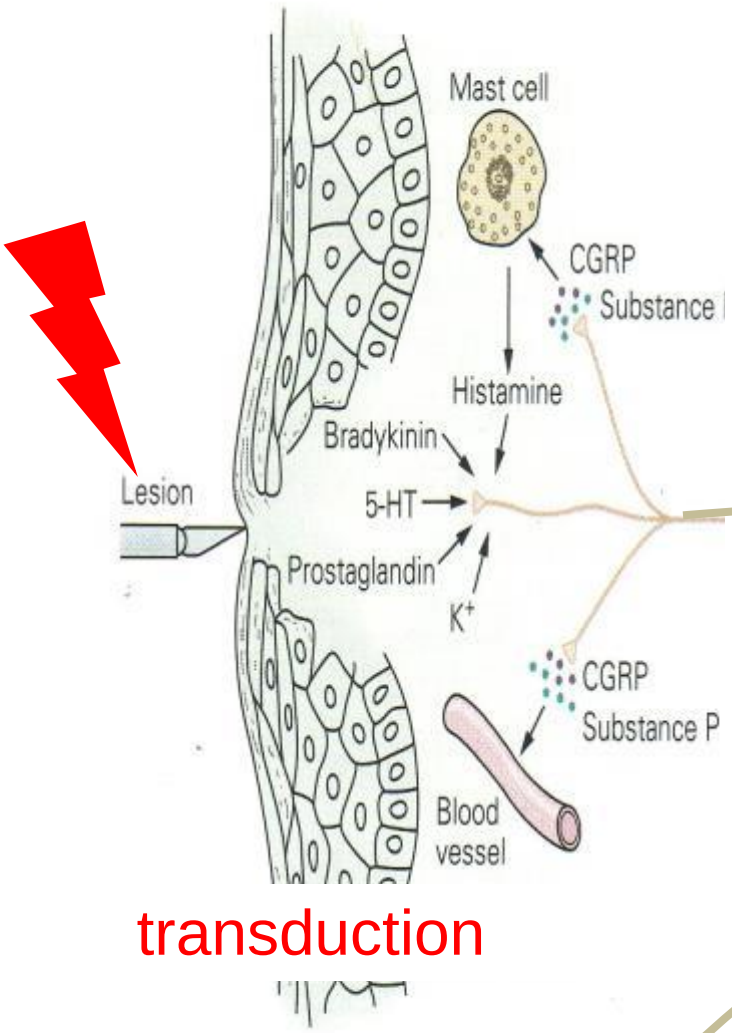
Maastricht University

ZUYD


PAIN

The biomedical model

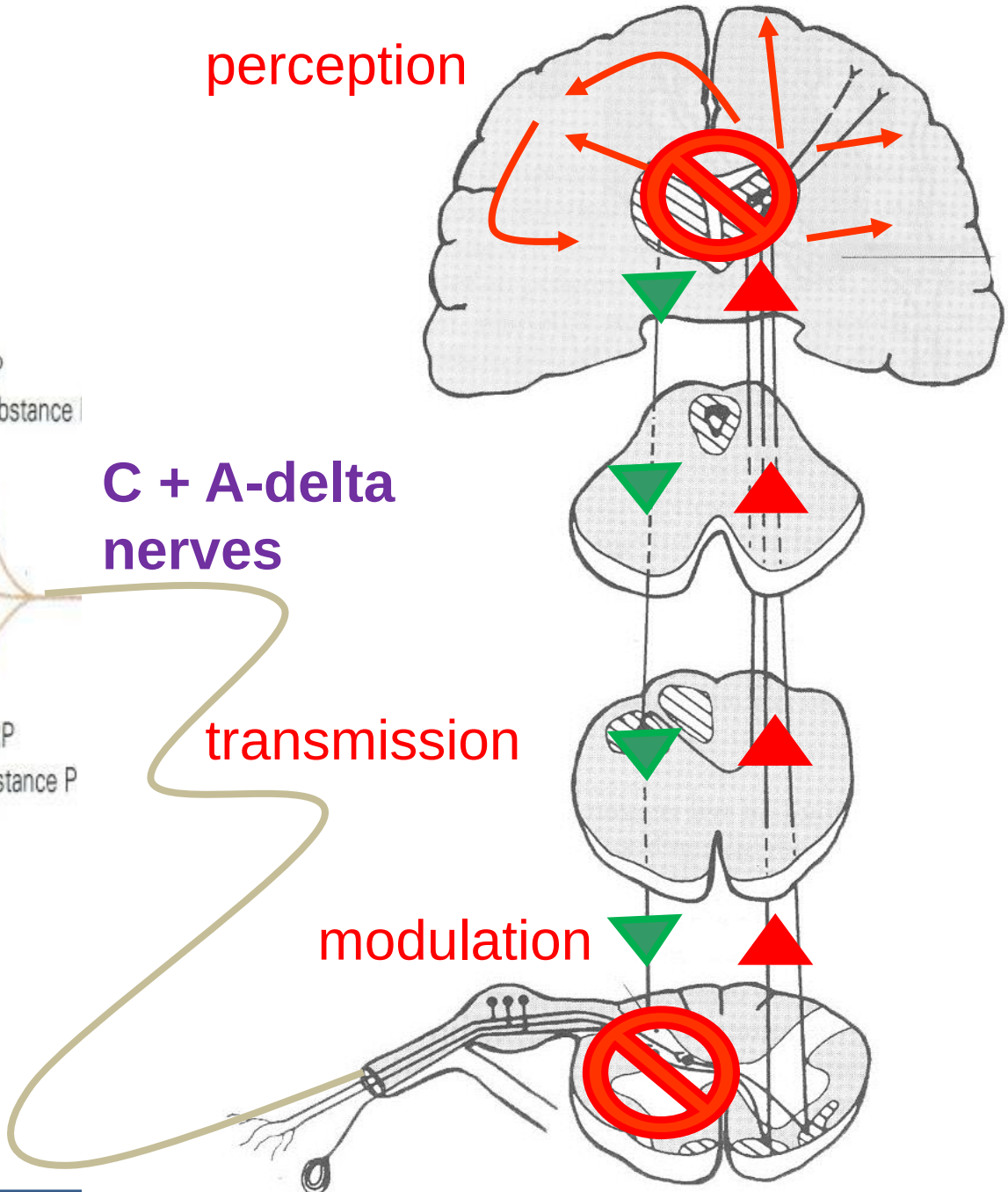




transduction

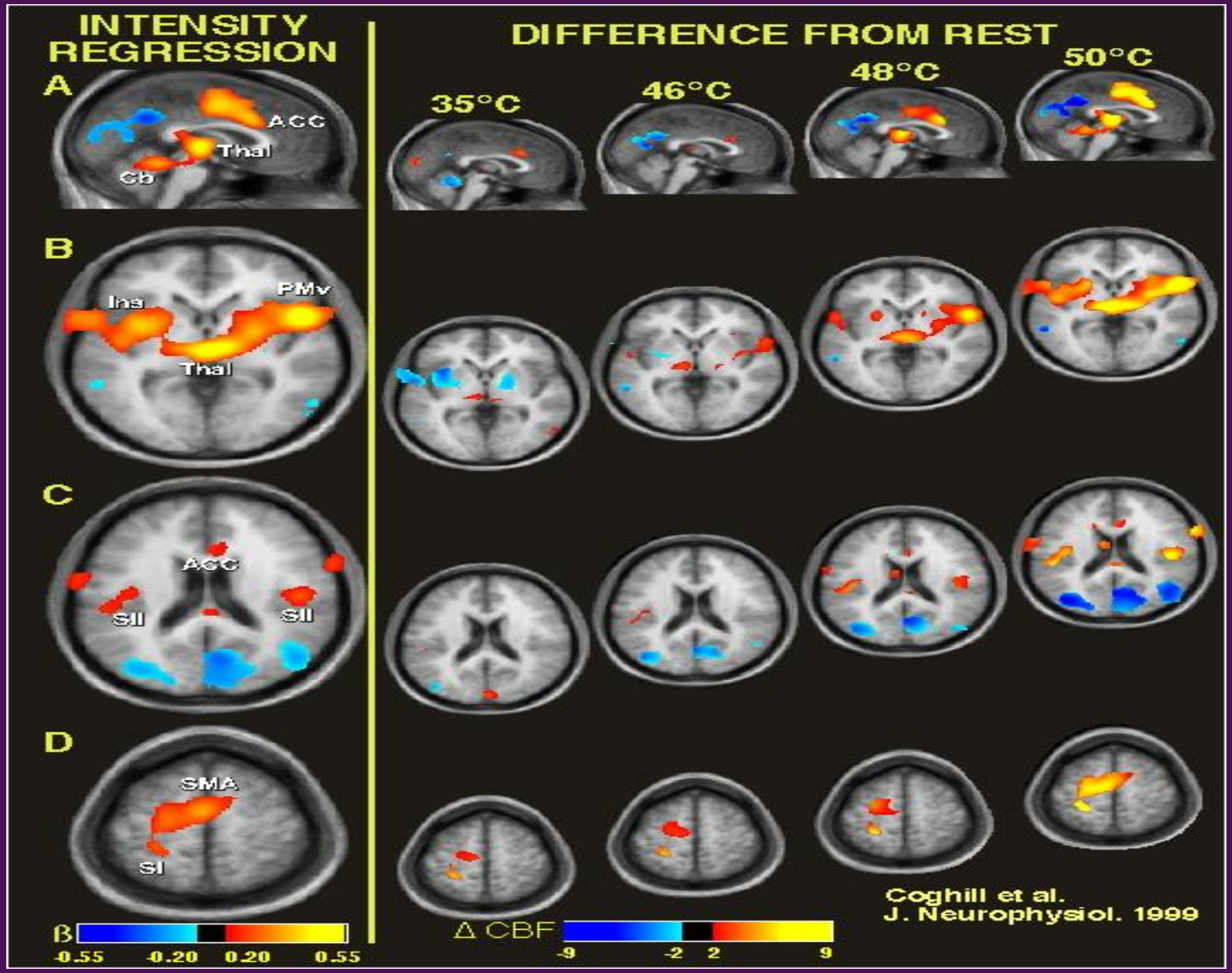
C + A-delta nerves

transmission



perception

modulation


INTENSITY REGRESSION
DIFFERENCE FROM REST
35°C
46°C
48°C
50°C
A
ACC
Thal
Cb
B
Ins
PMv
Thal
C
ACC
SII
SII
D
SMA
SI
β
-0.55
-0.20
0.20
0.55
Δ CBF
-9
-2
2
9
Coghill et al.
J. Neurophysiol. 1999

Pain neuromatrix

6 brain
involved when we feel
pain

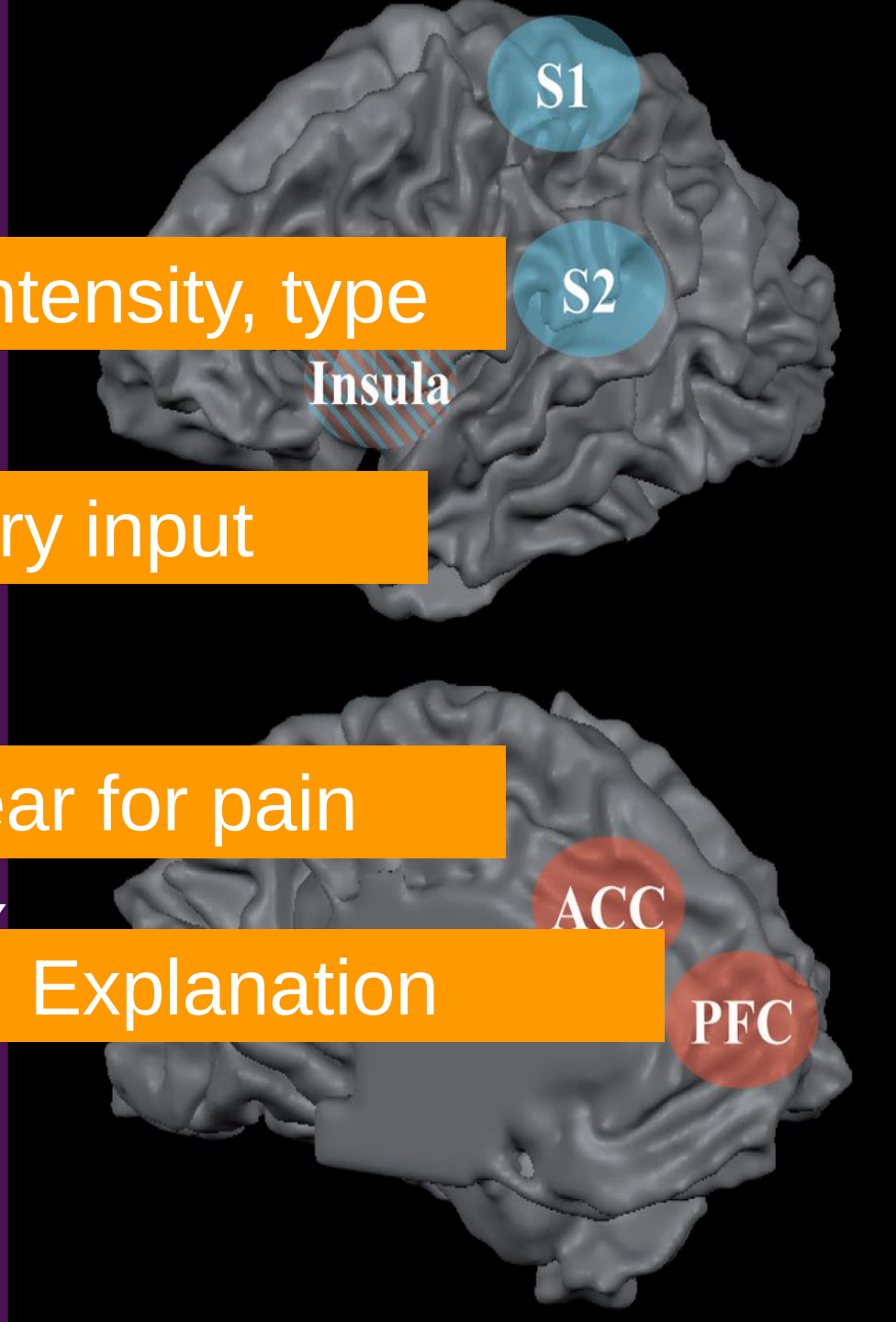
- S1
- S2 secundary somatosensoric cortex
- Insula
- Pre Fr
- Anterior Cingulate Cortex
- Thalamus

Lokalisation, intensity, type

Coding sensory input

Emotions, fear for pain

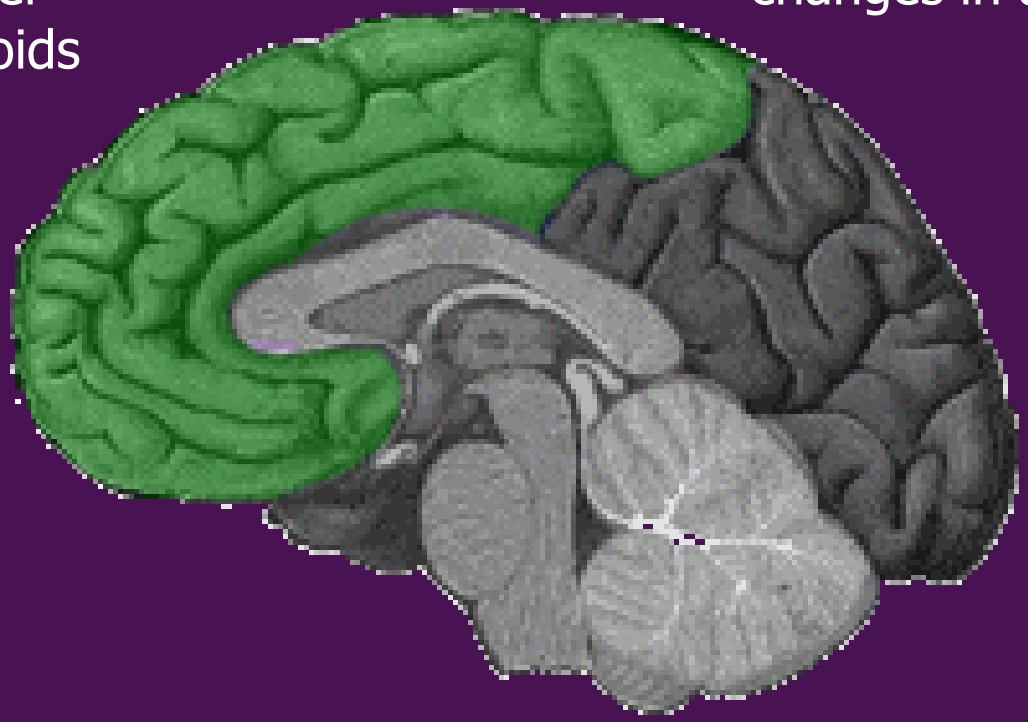
Explanation



Chronic Pain Brain

Biochemical changes
neurotransmitter
endogenous opioids
dopamine
glutamate
etc..

Cortical reorgnisations
changes in activity patterns



Structural changes
gray matter decrease

Chronic pain

Is the endresult of activity is several different areas in our brain

Increased brain activity by:

- (nociceptive) bodily information
- enviromental factors
- beliefs, thoughts
- emotions

Pain as a symptom

Journal of Pain, Vol 10, No 11 (November), 2009: pp 1113-1120
Available online at www.sciencedirect.com

ELSEVIER

Critical Review

How Neuroimaging Studies Have Challenged Us to Rethink: Is Chronic Pain a Disease?

Irene Tracey* and M. Catherine Bushnell†

A multifactorial health problem

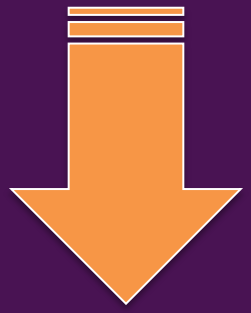
NO CURE for chronic pain!

Interdisciplinary multimodal approach

Multimodal Treatment of Pain Based on Biopsychosocial Approach

Gatchel RJ *et al. Psychol Bull* 2007; 133(4):581-624; Institute of Medicine. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research.*; National Academies Press; Washington, DC: 2011; Mayo Foundation for Medical Education and Research. *Comprehensive Pain Rehabilitation Center Program Guide.* Mayo Clinic; Rochester, MN: 2006.

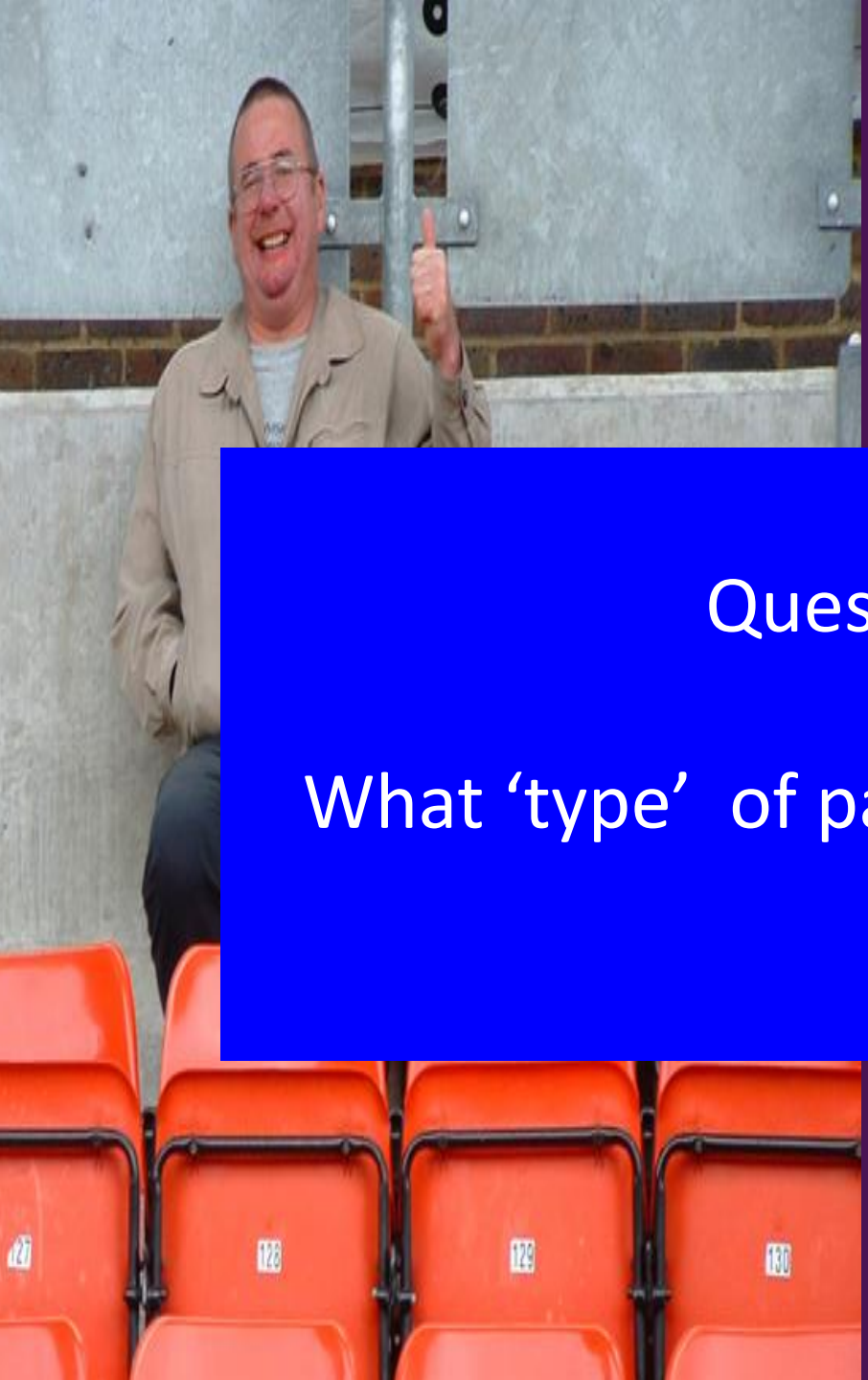
No consensus exist about content, duration and frequency



Large practice variations

due to

Characteristics of admitted patients
Treatment rationale or model used
Type of disciplines present in the team
Expertise of team members
Primary, secondary, tertiary care



Challenge in clinical practice:

, by

for

h

lem,

and under these circumstances?

Question is:

What ‘type’ of patients do you see?

Dutch Dataset Pain Rehabilitation

based on IMMPACT- core set

Generic part

Questionnaires in 8 domains

- Pain –fatigue NRS 0-10
- Disability PDI
- Work participation WIA
- Patients needs COPM
- Physical Functioning SF36
- Mental Functioning SF36, PCS, HADS
- Medical consumption
- Satisfaction treatment and negative consequences of treatment

Severe complex patients in Adelante

Percentage women	70%
Average pain duration	9.5 years
Paid job, most on sick leave	30%
Use of daily pain medication	80%
Generalized pain syndrome	54%
Previous psychological treatment	70%
Previous pain management	85%
Pain severity on average (0-10)	7
Fatigue on average (0-10)	7.5
Pain related disability	60% PDI score > 42
Anxiety scores HADS	80% scored > 8
Depression scores HADS	69% scored > 8

(0–6)

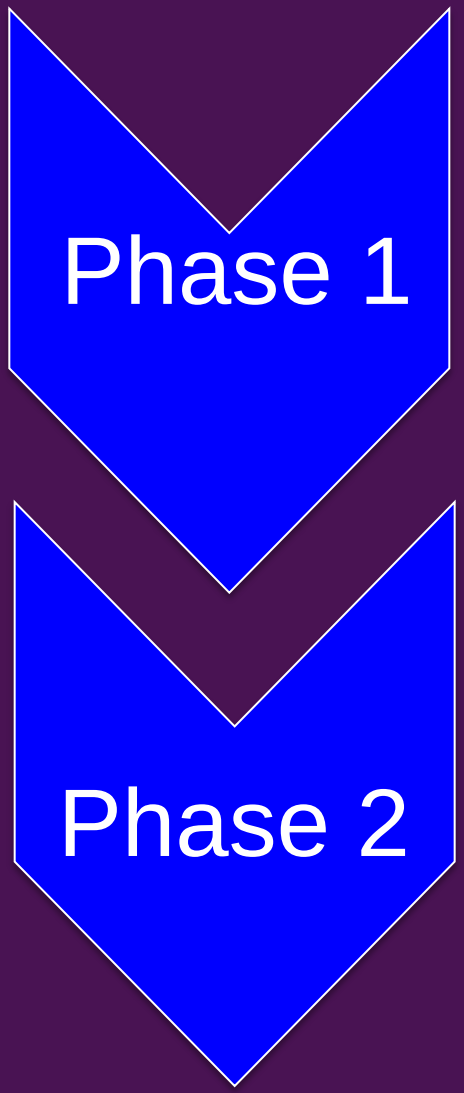
Multimodal Pain Rehabilitation Adelante

Behavorial oriented interdisciplinary treatment program under supervision of rehabilitation physician

The primary goal of multimodal pain rehabilitation is learning patients to cope with pain and pain related disability in order to improve daily functioning despite pain.

Pain reduction is not a primary goal

Assessment phase



Dutch Dataset Pain Rehabilitation

Medical intake by physician

----- First go / no go -----

Multi-screening on pain and pain-related disability

Multi-screening by PT, OT, PS

Standardized approach

Patients demand for help → activity related!

Pain

Activity level and pattern

Beliefs about pain and pain & being active

Emotions

Social Environment

History taken, scores of questionnaires and performance tests

Patients demands for help

Canadian Occupational Performance Measure
COPM

Neutral semi-structured interview

3 most important problems in daily activities the patient wants to improve

Several activity patterns

Table 3
Mean and standard deviations for comparisons between clusters on measures of pain and functioning

M (SD)	Activity pattern clusters			
	1. Avoider	2. Medium cycler	3. Doer	4. Extreme cycler
Pain	7.3 (1.77)	6.78 (2.17)	7.16 (1.82)	8.02 (1.79)
Uptime (h/day)	[illegible]	[illegible]	[illegible]	[illegible]
Depression	13.69 (9.13)		14.23 (11.39)	
Pain-related anxiety	41.90 (20.13)	35.68 (17.23)	31.44 (21.65)	45.76 (19.54)
Physical disability	.17 (.13)	.13 (.11)		
Psychosocial disability	.17 (.15)	.16 (.14)	[illegible]	[illegible]
Acceptance of pain	54.03 (21.43)	64.60 (17.69)	67.73 (24.10)	52.36 (16.52)

AVOIDER

FUNCTIONAL PERFORMER

PERSISTER

MIXED PERFORMER

AVOIDER

ADAPTIVE

EUSTRESS ENDURANCE

DISTRESS ENDURANCE

Note. Overall tests for an effect of clusters were non-significant in the cases of depression and psychosocial disability.

Pain beliefs and emotions

History taken

Discus scores of PCS, IPQ, HADS

Photo's of daily activties → asking about beliefs and observing emotions

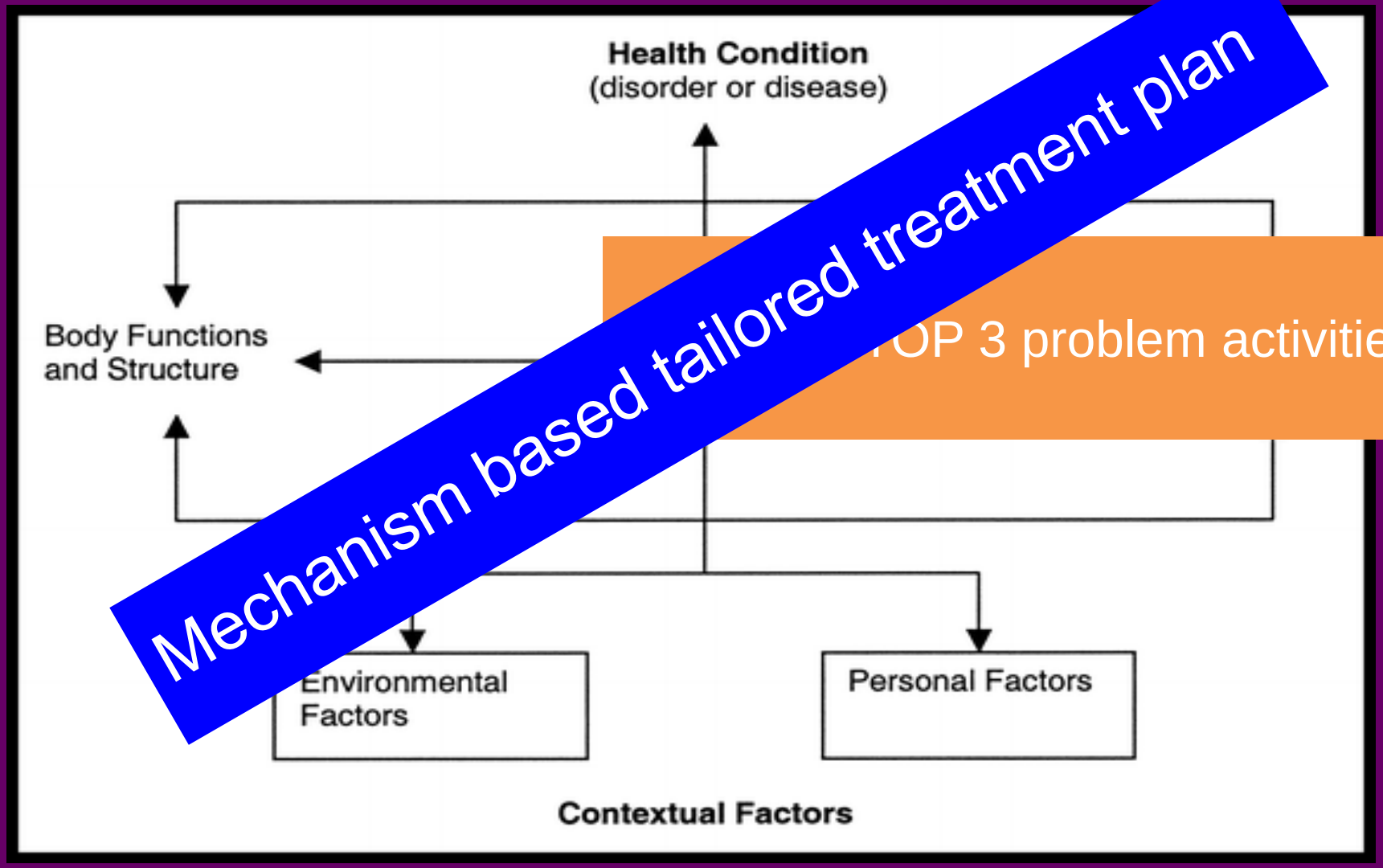
Social environment

Spouse is invited for the screening

Support of spouse /significant other/ collegues etc..

"Pain is not good without an audience"

Problem analysis



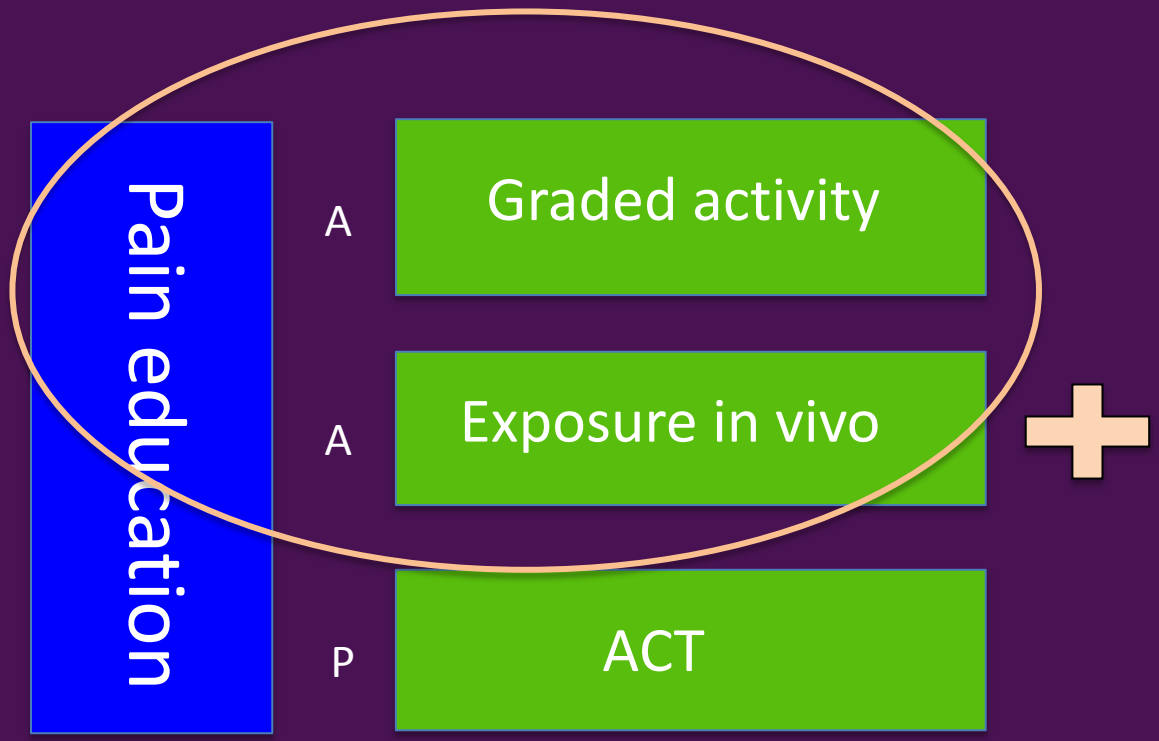
Shared decision

Problem analysis is discused with the patient the same day

Pain education: mechanisms and treatment rationale are explained

Patients is given time (1 week) to consider the proposal

Content Treatment Program

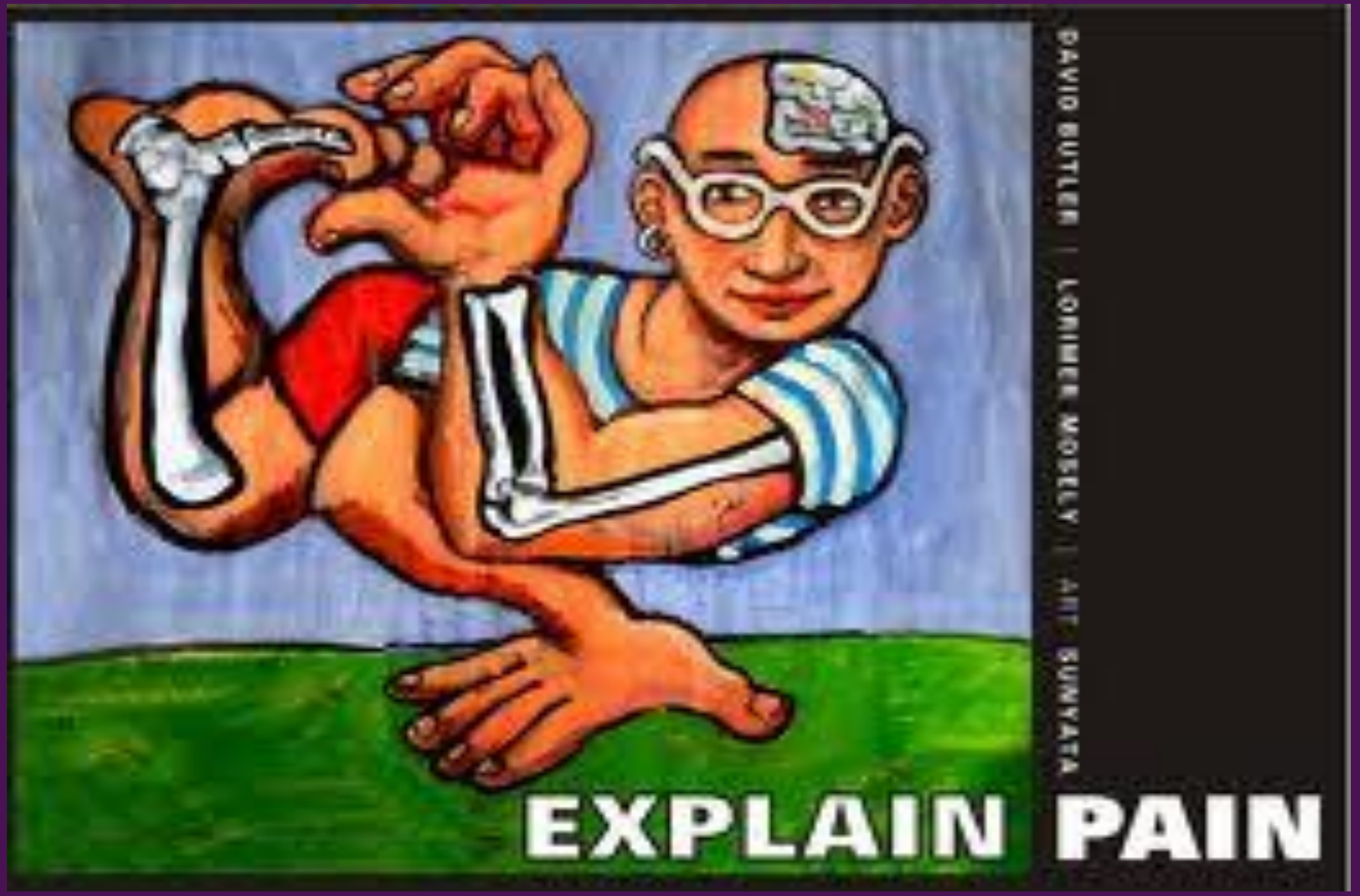


- Physical exercise
- Graded motor imaging
- Sleep
- Return to work
- Partner
- CBT
- MIndfullness
- Stress management
- Pain management

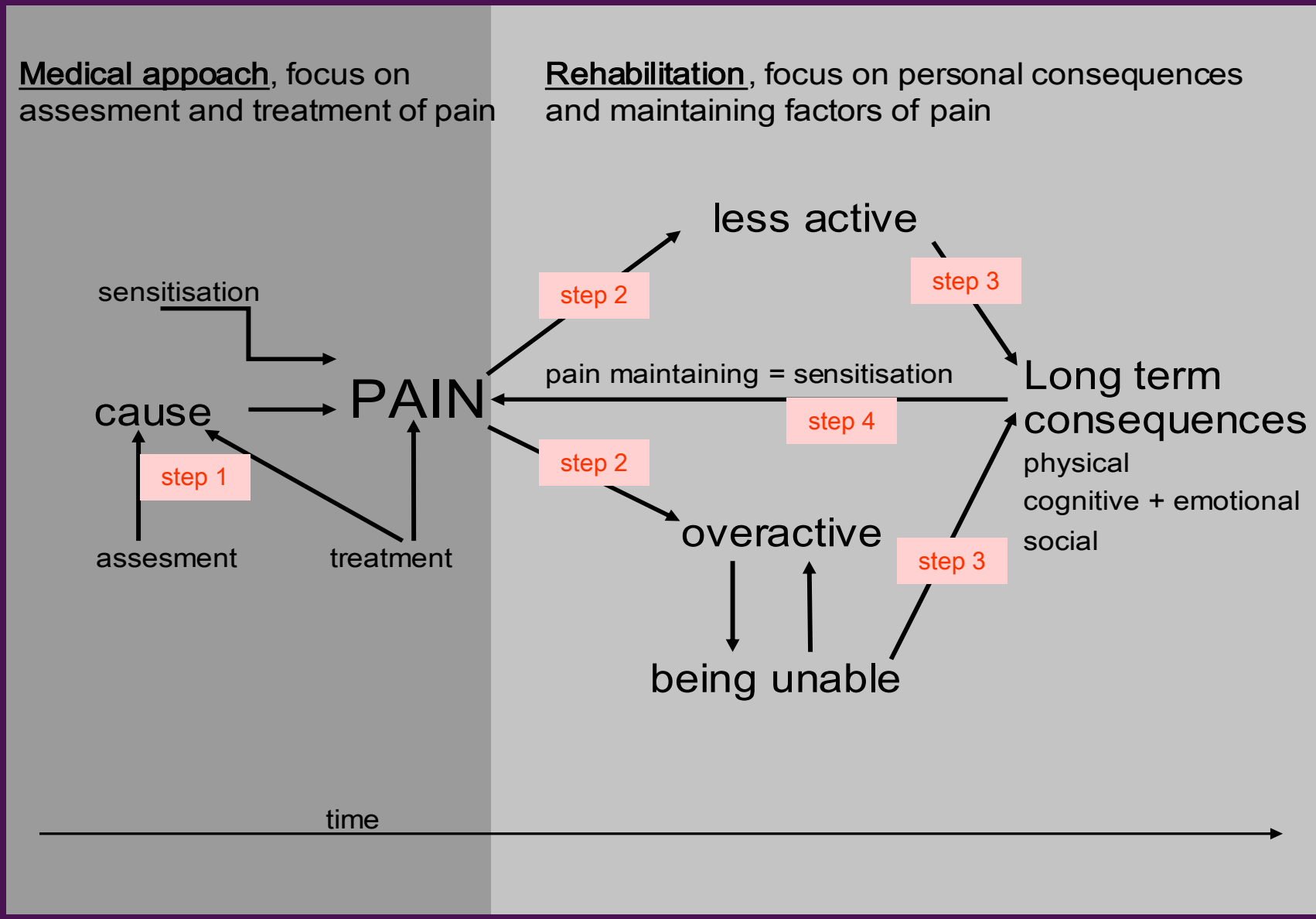
Basic modules

Complementary modules

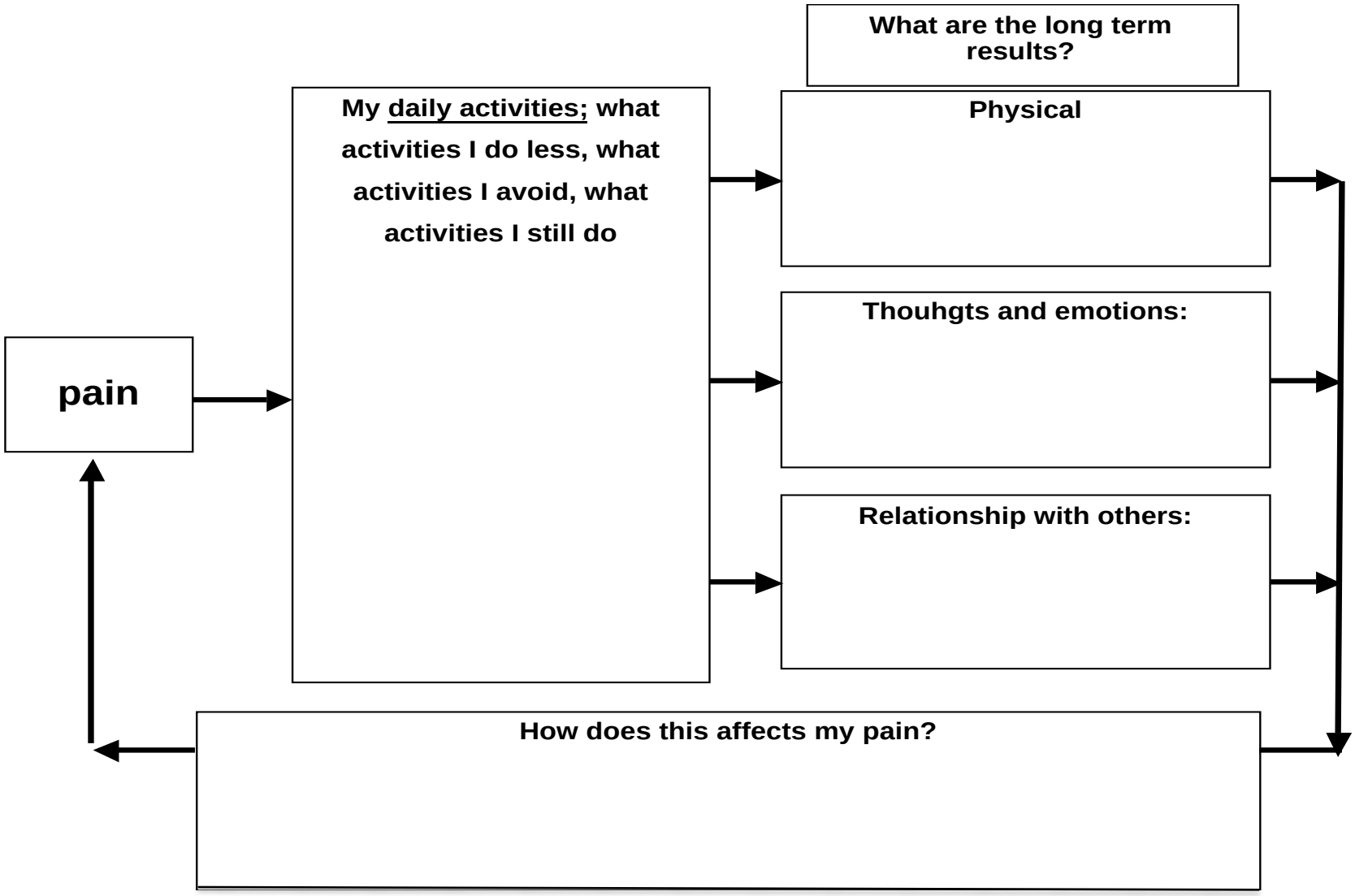
Pain Education



Pain Consequence Model



Homework assignment



Team and patient must have a shared reconceptualization of the pain problem

Pain education is effective

Louw 2016, Nijs 2017

BUT NOT ENOUGH

better understanding of pain and pain related disability is a premise for succesfull treatment

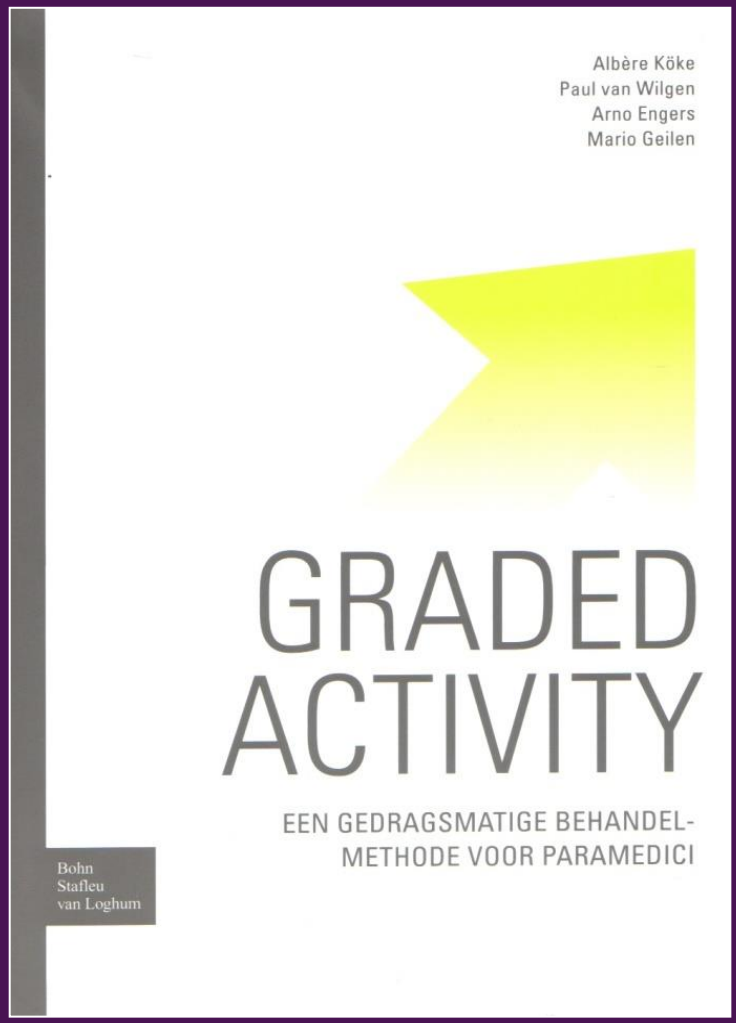
positive expierences by becoming active will change beliefs succesfully on long term

Graded Activity

A therapy form aiming at increasing daily life activities according to a time quoted scheme.

Patient learns to increase and structure his daily life activities independent from pain.

Based on operant learning theories



Pain behavior based on operant conditioning

S → O → R → C

C= Positive-Rewarding or C= Negative=Punishing

Proces of Graded Activity

Pain education

Reinforcers of behavior

Choose meaningful activities - goals

Set up a baseline of chosen activities

Set start level and quotas to goal

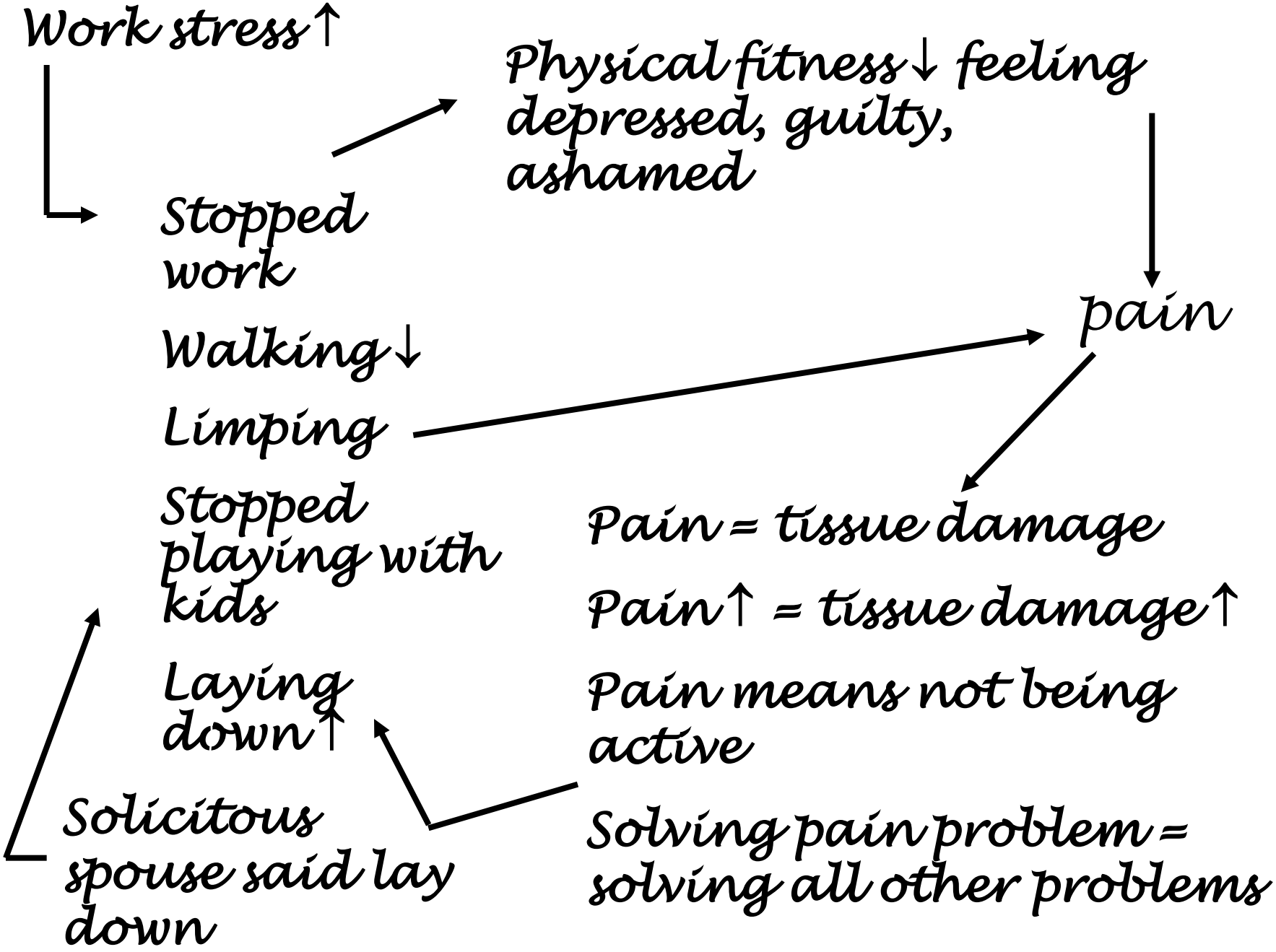
Treatment

Reinforce every step towards the goal

Extinction of pain behavior

Generalization

Anton walking at assesment


Work stress↑
Physical fitness↓ feeling depressed, guilty, ashamed
Stopped work
Walking↓
Limping
pain
Stopped playing with kids
Laying down↑
Solicitous spouse said lay down
Pain = tissue damage
Pain↑ = tissue damage↑
Pain means not being active
Solving pain problem = solving all other problems

Anton's goals

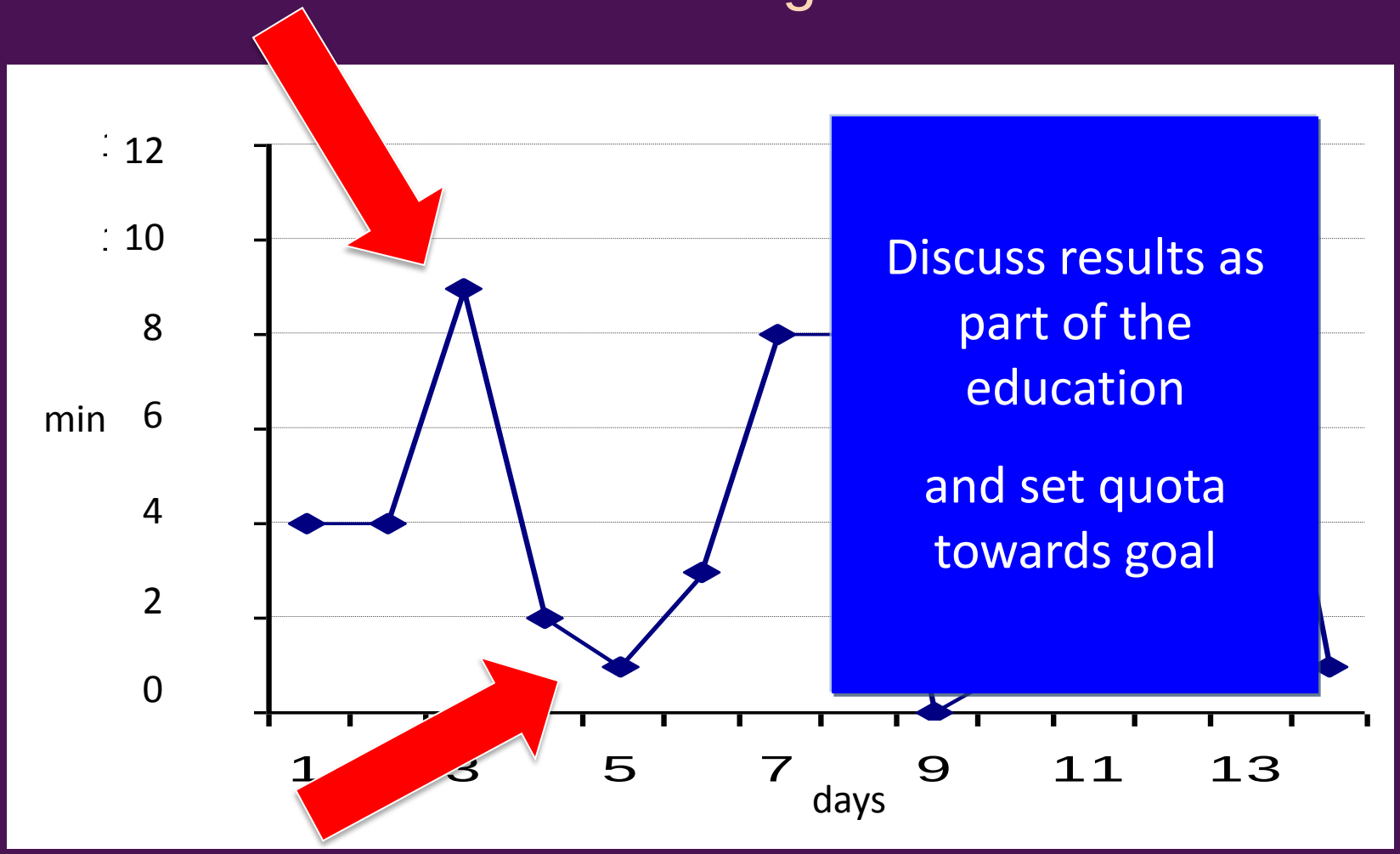
1. improve his walking pattern
2. walk for at least 20 minutes to bring the kids to their school
3. wants to play soccer with his kids
4. return to work
5. ride bike (25 minutes) to go to work

Goals must be:

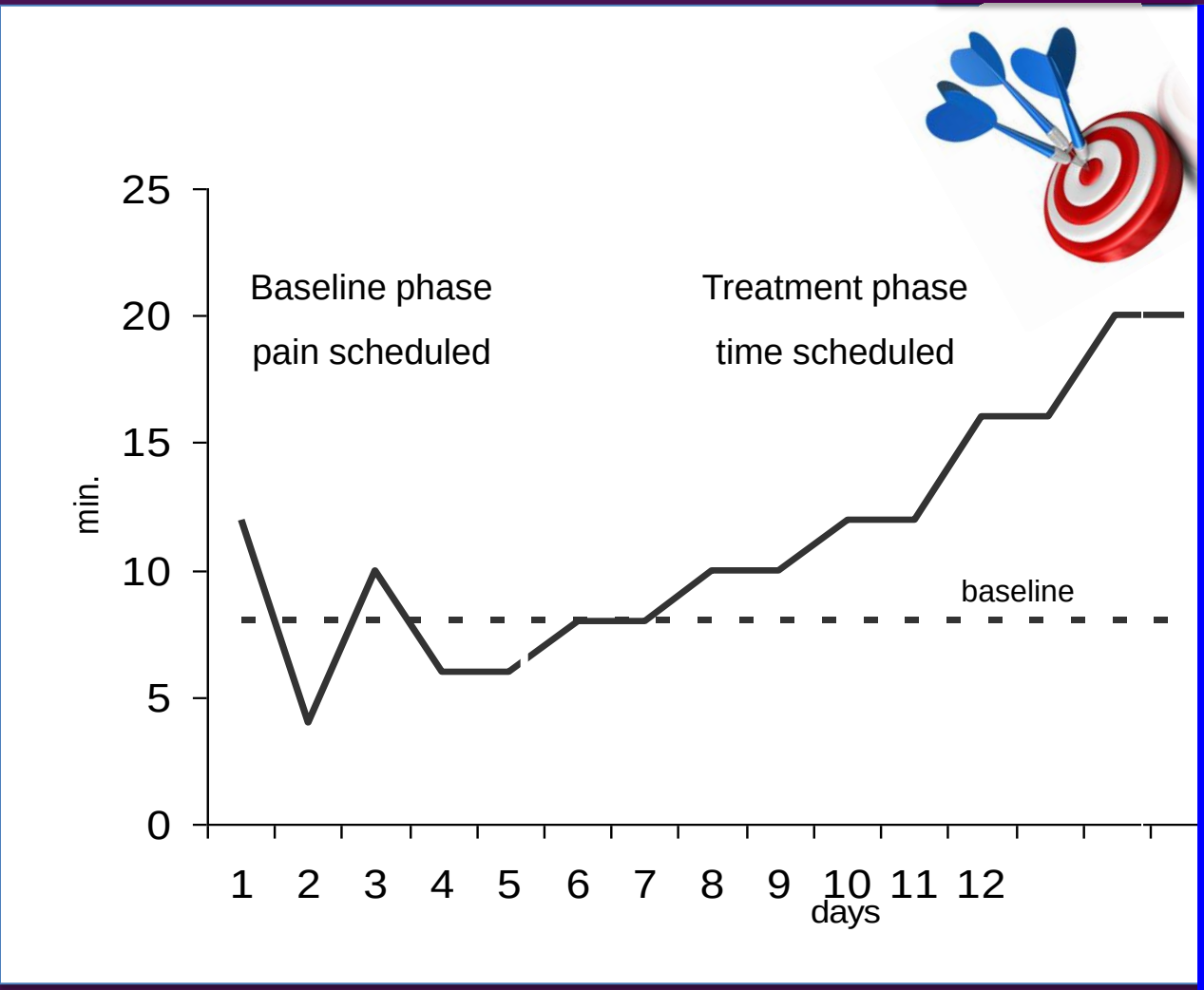
meaningful for the patient (life values)
set by the patient himself
context based
on activity or participation level
achievable but challinging

Baseline

walking



Coaching the patient



Only reward every step towards the goal

Monitor progress → graphics

Provide feedback on performance

No rewarding for pain
Extinction

Action Plan

strong evidence for increasing physical activity and self efficacy Williams 2011

What I'm going to do exactly?
How many?
When? What day, what time of the day?
How many days a week?

Example: "This week I go walking outside (what) for 6 minutes (how much), every other day (how many days) after dinner (when).

Action plan for week nr:
This week I go:

(what)……..
(how much)……..
(how many days)……..
(when)……..

How sure am I that I'll manage this? ? (rate yourself a number between 0-10)
I'm ……. convinced that I will succeed..

Put a cross on each day you finish the action

Comments:
Monday:……...
Tuesday:……
Wednesday:……
Thursday:……
Friday:……
Saturday:……
Sunday:……

Generalization: success on long term

Decrease reinforcements

Conduct action plans in daily situations under different conditions

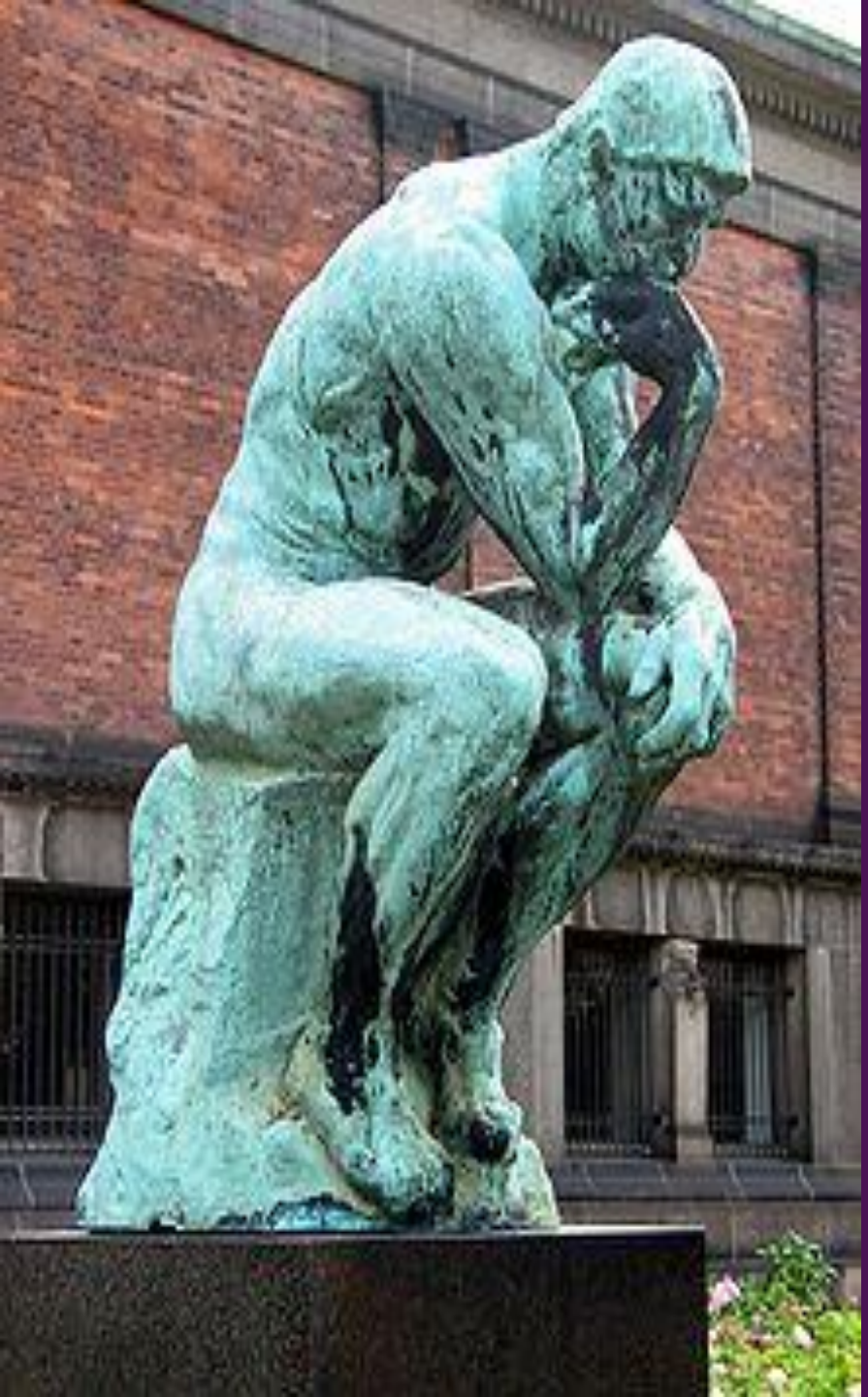
Draw up an inventory of pitfalls

Relapse ≠ failure

Anton walking at end of treatment

“Fear of pain is more disabling than pain itself”

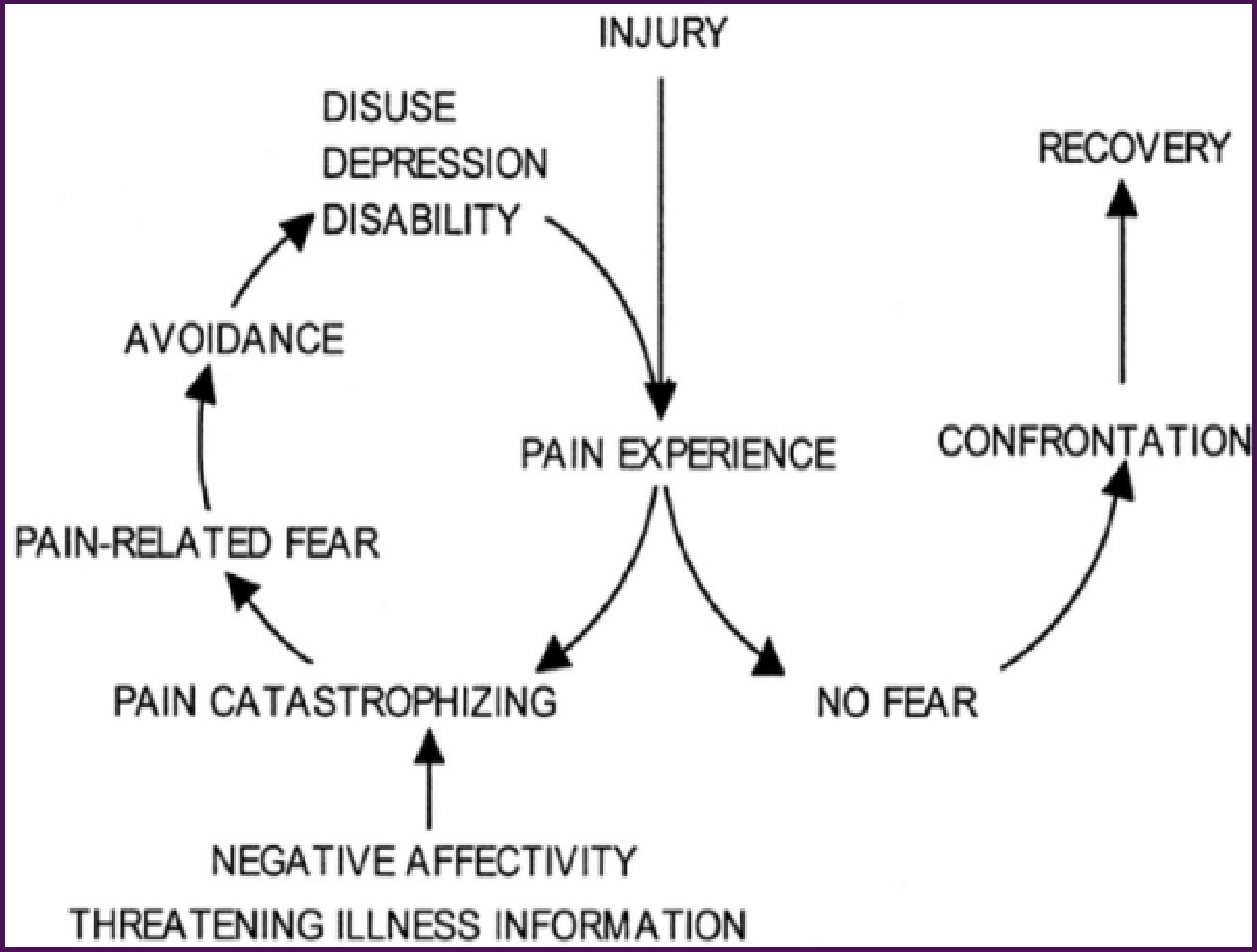
Waddell ‘92



Pain-related fear emerges when pain is interpreted as “catastrophic,”

urging

patients to avoid painful activity or cues that predict pain and increases in pain.


INJURY
DISUSE
DEPRESSION
DISABILITY
RECOVERY
AVOIDANCE
PAIN EXPERIENCE
CONFRONTATION
PAIN-RELATED FEAR
PAIN CATASTROPHIZING
NO FEAR
NEGATIVE AFFECTIVITY
THREATENING ILLNESS INFORMATION

Exposure in Vivo

Exposure aims at improving functional ability by reducing the perceived harmfulness of activities

Assumption is that when individuals expose themselves to painful movement they can readjust their expectancies about the associations between movements and increased pain

Based on other exposure treatment

Proces of exposure in vivo

Personal hierachy of movements/activities that are threatening using PHODA

Medical education
Personalized fear avoidance model

Treatment; exposure in vivo and behavioral experiments

PHoDA

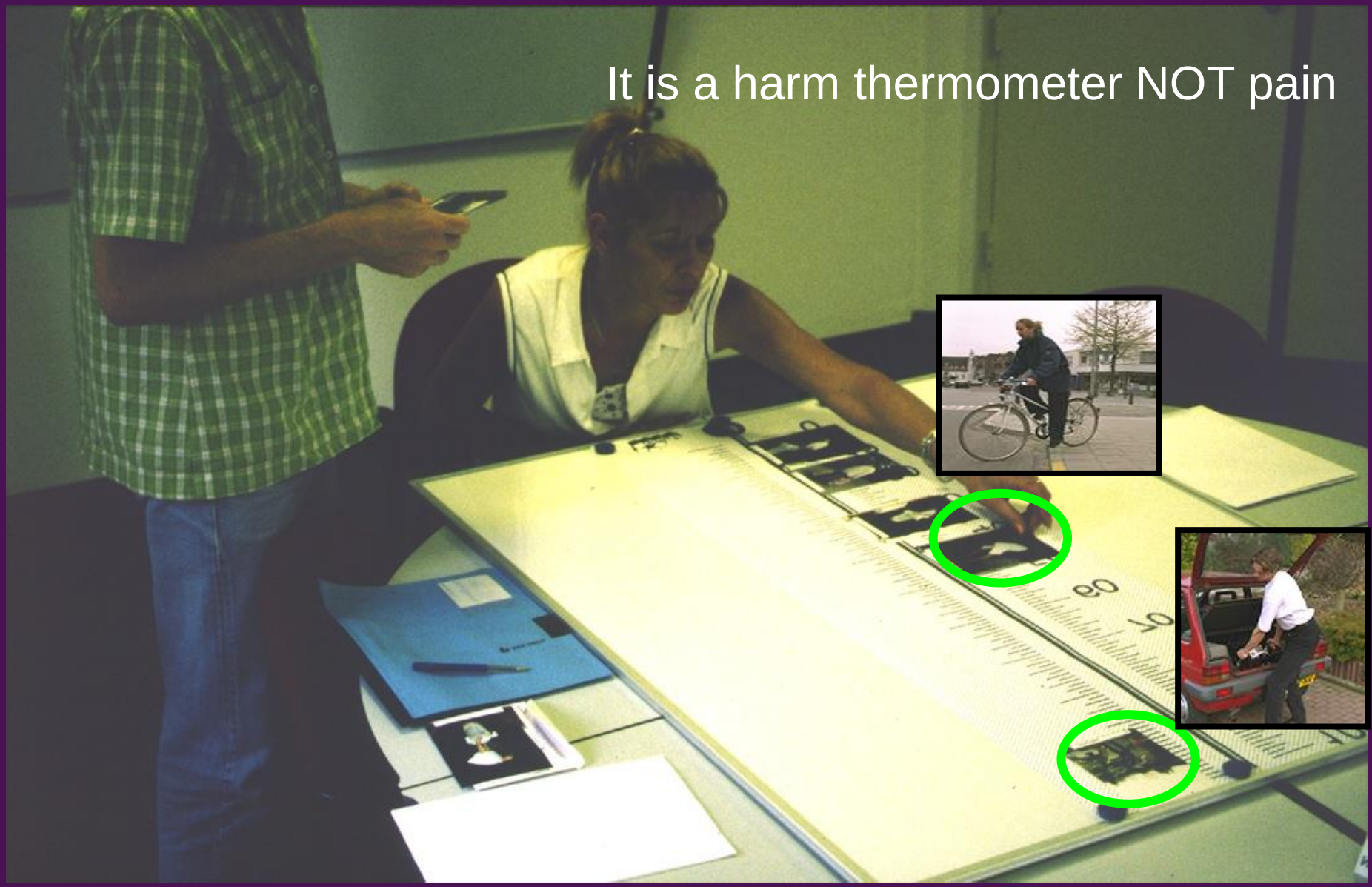
Photograph series of daily activities

low back, neck, shoulder upper extermity, lower extremity


DIESEL


Bouwen aan een nieuwe toekomst

Establish a fear hierarchy



Medical Education

by rehabilitation physician

Biomedical pathology versus functional abilities

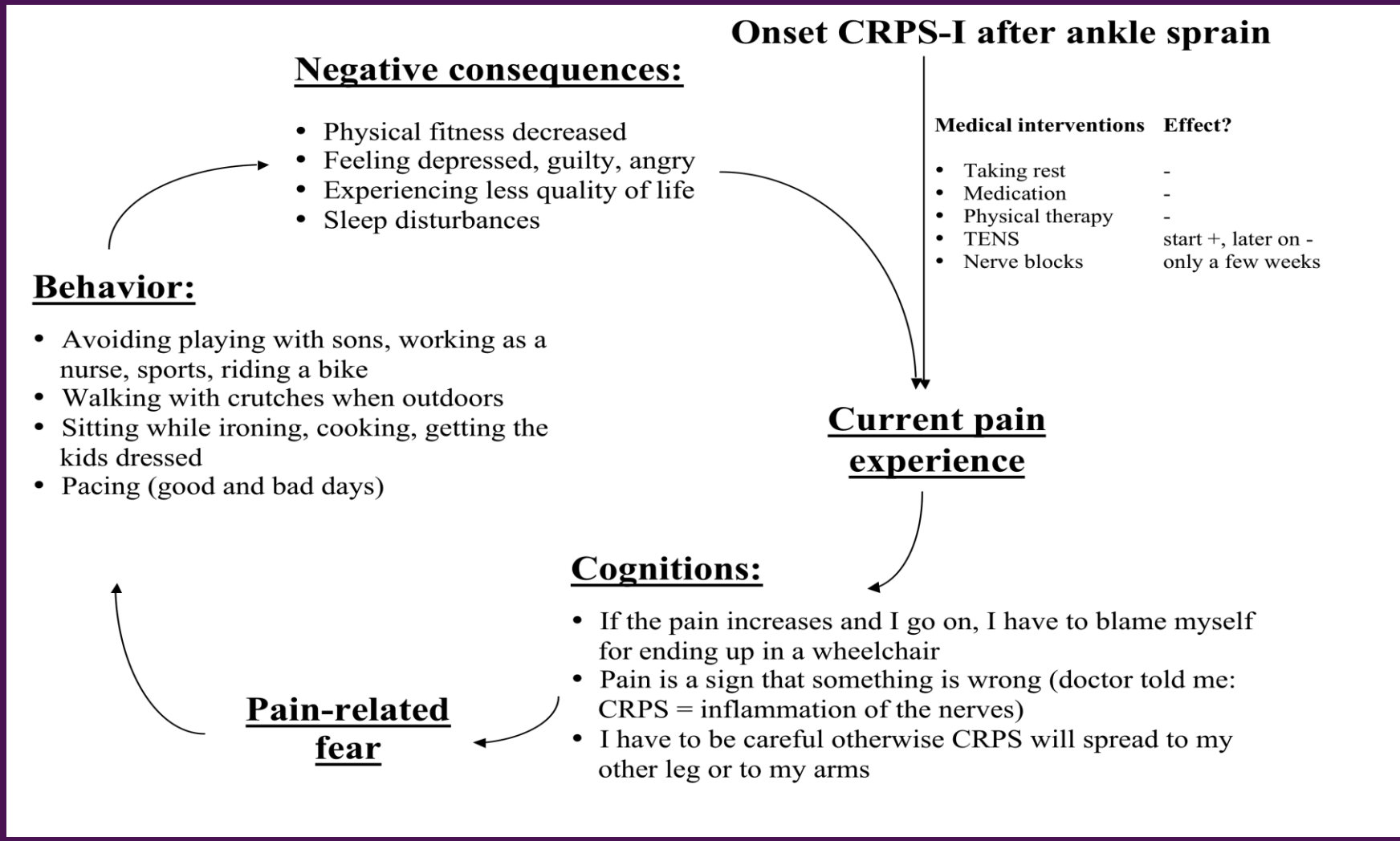
Discuss results of diagnostic tests in the past

Provide message that moving/ being active is SAFE

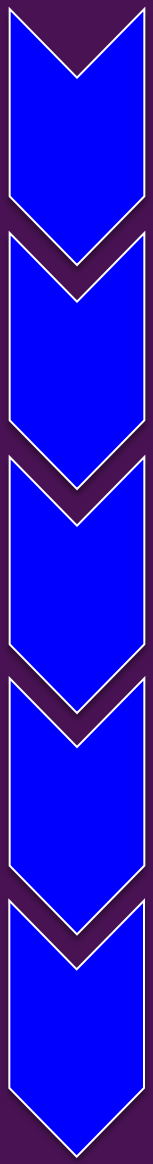
Preparing patient for exposure

Education part 2

personalized fear avoidance model



Exposure with behavioral experiments



Activity is chosen from PHODA → personal relevance

Patient formulates expectations about what will happen when they execute the activity → psychologist

Physical therapist shows activity

Patient performs activity, without safety behavior, as normal as possible

Evaluate and discuss expectancies and repeat the activity

The more specific the better

Sometimes you have to improvise

Homework

Do these activities at home: the more specific the situation the better

Next session performance at home is discussed

Usefull for long term consequences/expectanties e.g.“ as I lift that box I cannot do anything the rest of the day”

Effectiveness

GA and GE are both effective treatments for pain related disability (Macedo 2010)

GE is more effective as GA in reducing fear avoidance beliefs (de Leeuw 2008, de Jong 2009, 2013)

GA is more effective than usual care in patients with very low levels of daily activities and low feelings of control (Veenhof 2006)

GE is more effective than pain contingent physical therapy in CRPS (den Hollander 2017)

Effectiveness of multimodal treatment

In general more effective than monodisciplinair treatment (several systematic reviews of RCT's and clinical studies)

BUT → effect sizes are small to moderate

Long term results are questionable

Summary and Conclusion

Pain is a complex multifactorial problem

A multimodal treatment is the best option

However best content, duration and frequency of treatment is still unknown for an indiviual patient

Questions for the future

What works best for whom?

Could BIG DATA help us?

Thank you for listening