

# Functional Exercise Prescription

Supporting rehabilitation in movement and sport

Eyal Lederman

Forewords Robert Schleip Wilbour E Kelsick



# Functional Exercise Prescription in osteopathy

Prof. Eyal Lederman DO PhD

# Aim

Help the individual recover their functionality:  
the ability to carry out daily activities  
effectively, efficiently and comfortably

# A clinical example



6 weeks later



# (Some) Problems with exercise management

40-80% forgotten immediately

50% remembered incorrectly

50% will comply but few adhere

The more the information the less remembered

Kessels RP 2003 Patients' memory for medical information. *J R Soc Med.* 2003 May;96(5):219-22.

McGuire LC 1996 Remembering what the doctor said: organization and adults' memory for medical information. *Exp Aging Res.* Oct-Dec; 22(4):403-28.

Anderson JL, Dodman S, Kopelman M, Fleming A 1979 Patient information recall in a rheumatology clinic. *Rheumatol Rehabil.* Feb; 18(1):18-22.

Holden, M.A., Haywood, K.L., Potia, T.A. *et al.* Recommendations for exercise adherence measures in musculoskeletal settings: a systematic review and consensus meeting (protocol). *Syst Rev* **3**, 10 (2014).

# 'Functioncise' (?)

22 January 2015 Last updated at 01:20

## Exercise advice unrealistic, say experts

COMMENTS (215)

By **Smitha Mundasad**  
Health reporter, BBC News



Exercise can help reduce the risk of heart disease, cancer and diabetes

**Researchers say current exercise guidelines are unrealistic and argue that doctors should sometimes advise small increases in activity instead.**

They warn **the 150-minute weekly target** is beyond the reach of some

<http://www.bbc.co.uk/news/health-30915437>

## Get up, stand up: including exercise in everyday life healthier than gym, says study

Taking the stairs and getting off the bus a stop early are more likely to protect against heart disease and early death than working out, research shows

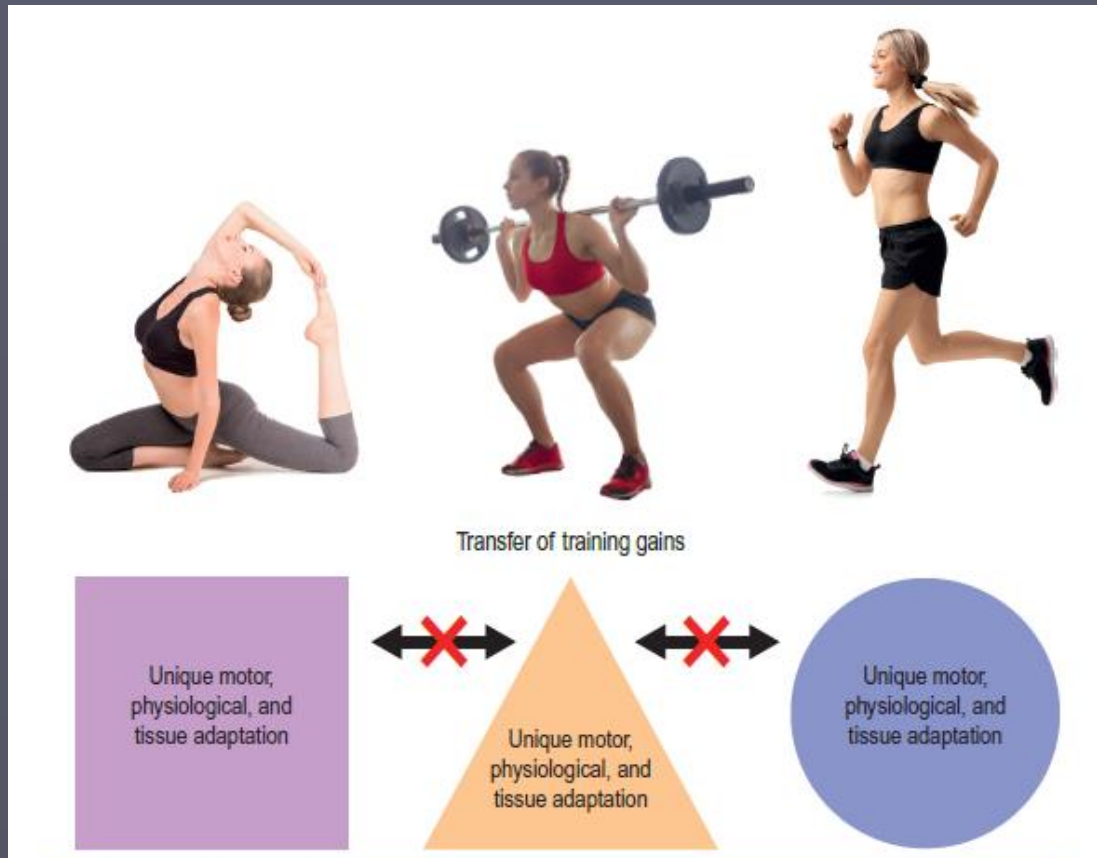


Holding 'walkaround' meetings in the office instead of sitting still could be beneficial, researchers say.  
Photograph: Alamy Stock Photo

Incorporating physical activity into our everyday lives, from taking the stairs to holding "walkaround" meetings in the office, is more likely to protect us from

The Guardian 21 Sept 2017

# Specificity



“Practice the task and the body will follow”

# Transfer



Transfer between dissimilar activities is rare, unpredictable and small in effect



# Constructing a patient centred and recovery specific exercise management

Functional management – patient centred

Process approach – recovery process specific

# Functional management

Functional movement - the unique movement repertoire of an individual

Functional rehabilitation - helping a person recover their movement capacity by using their own movement repertoire (whenever possible).

Extra-functional – a movement pattern outside the individual's movement repertoire



# The life gym

Shared

+

Unique



Which human physical activity is not an exercise?

## **All physical activity is exercise**

Exercise:

The behaviour a person adopts in order to enhance or maintain their physical performance or health

Remedial exercise:

The behaviour a person adopts in order to recover their physical performance or health

# “Displacement” of health and recovery environment



# Mindsets

Exercise



Not exercise?



# Mindsets

Exercise



Not Exercise



# Exercise?

Work



Exercise





# Mindsets

Good weight



Bad weight



# More mindsets

Good healthy forward bend



Bad unhealthy forward bend

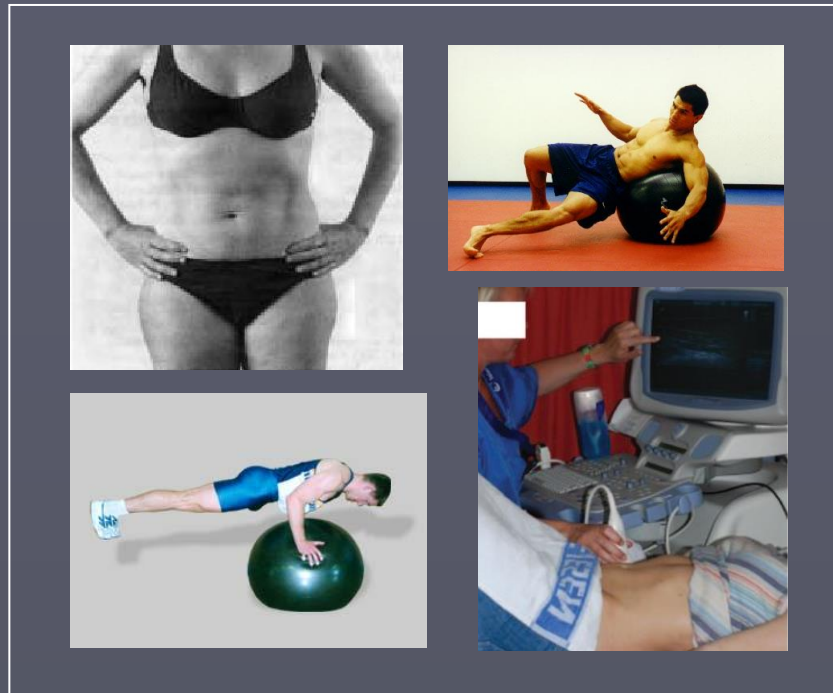


# Loading in locomotion

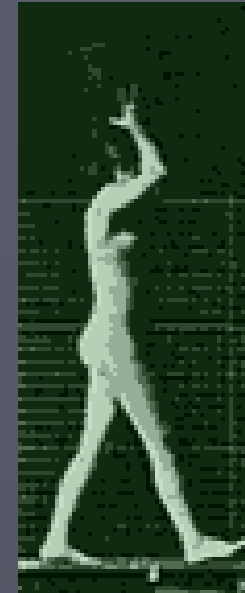
Spinal loading in relation to standing:  
Walking 171%  
Ascending stairs 265%  
Descending stairs 225%



# Back specific exercise. No better than a daily walking program

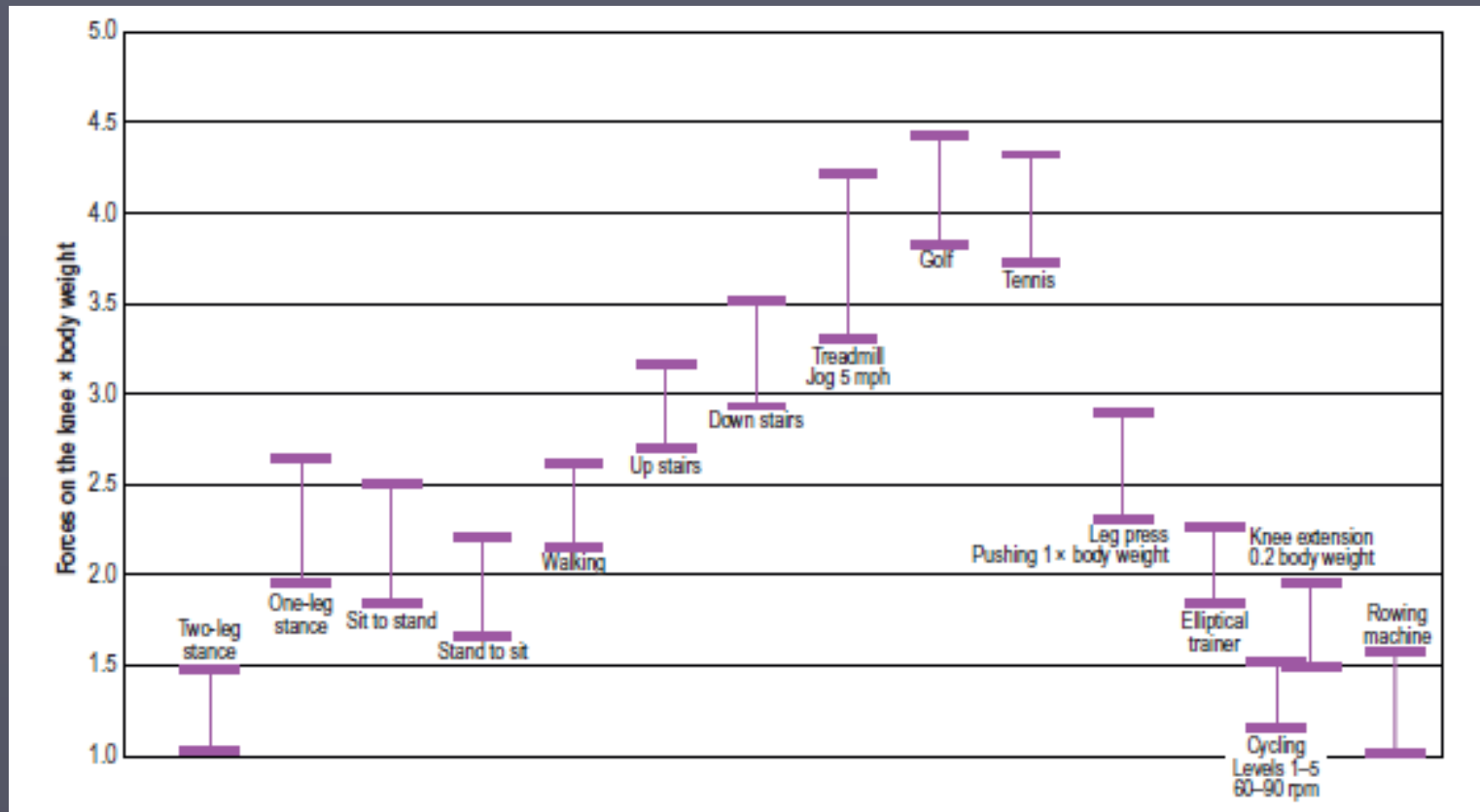


Vs.



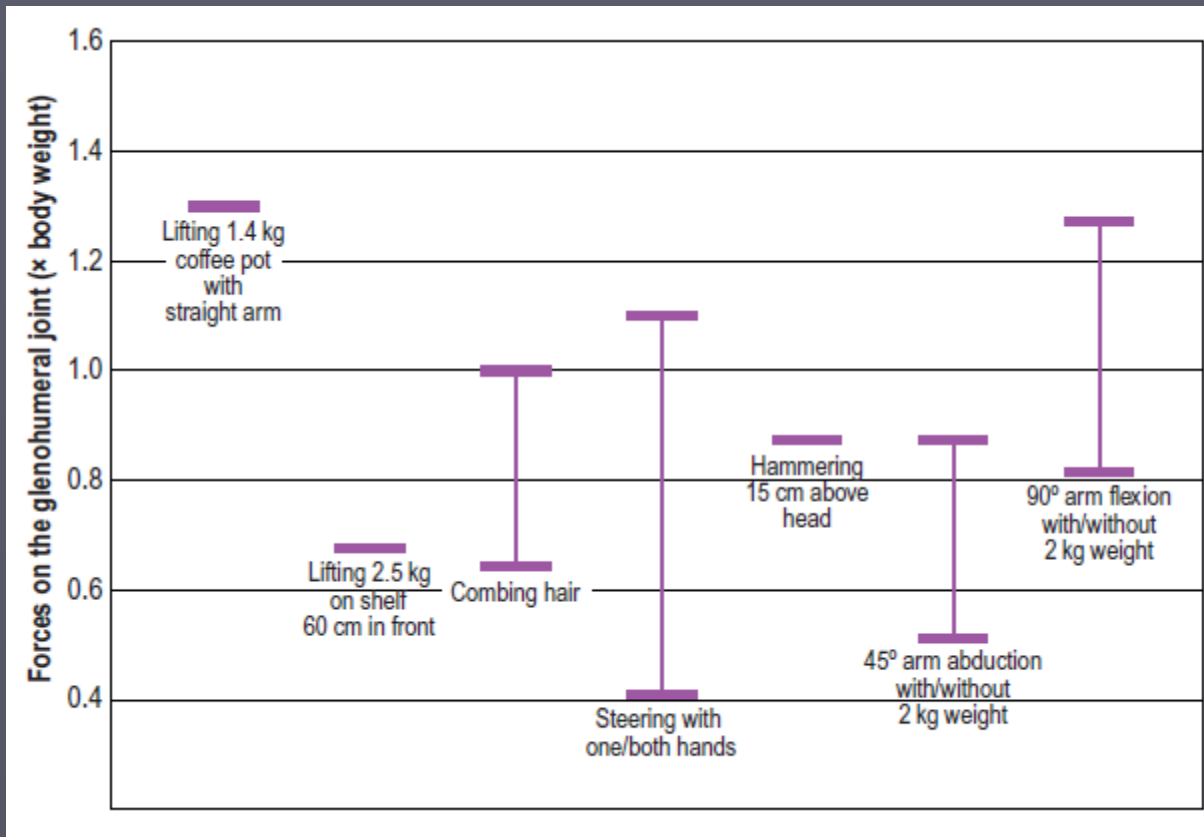
A six-week walk training programme was as effective as six weeks of specific strengthening exercises programme for the low back.

# Loading of knee in daily a sports activities



From Lederman E 2022 Functional Exercise Prescription. Handspring, London

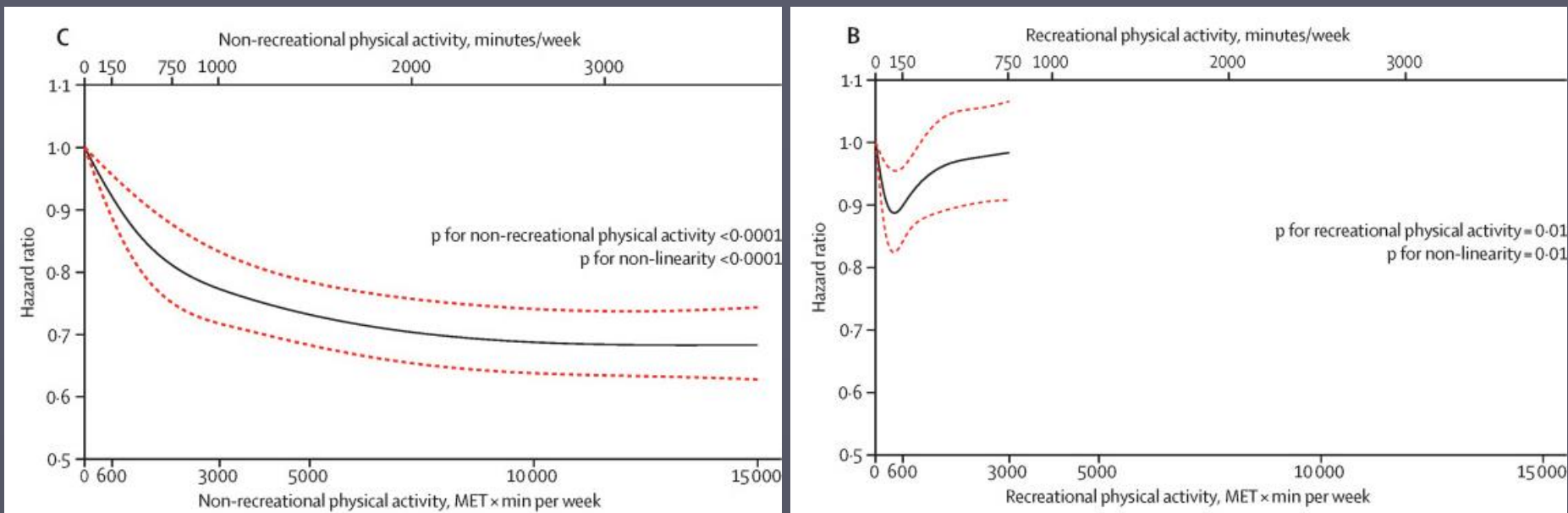
# Shoulder joint loading levels during daily activities



From Lederman E 2022 Functional Exercise Prescription. Handspring, London

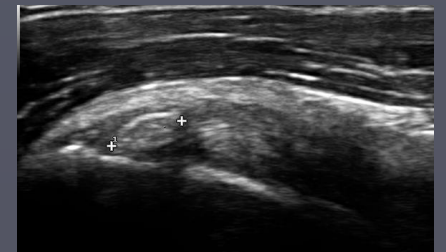
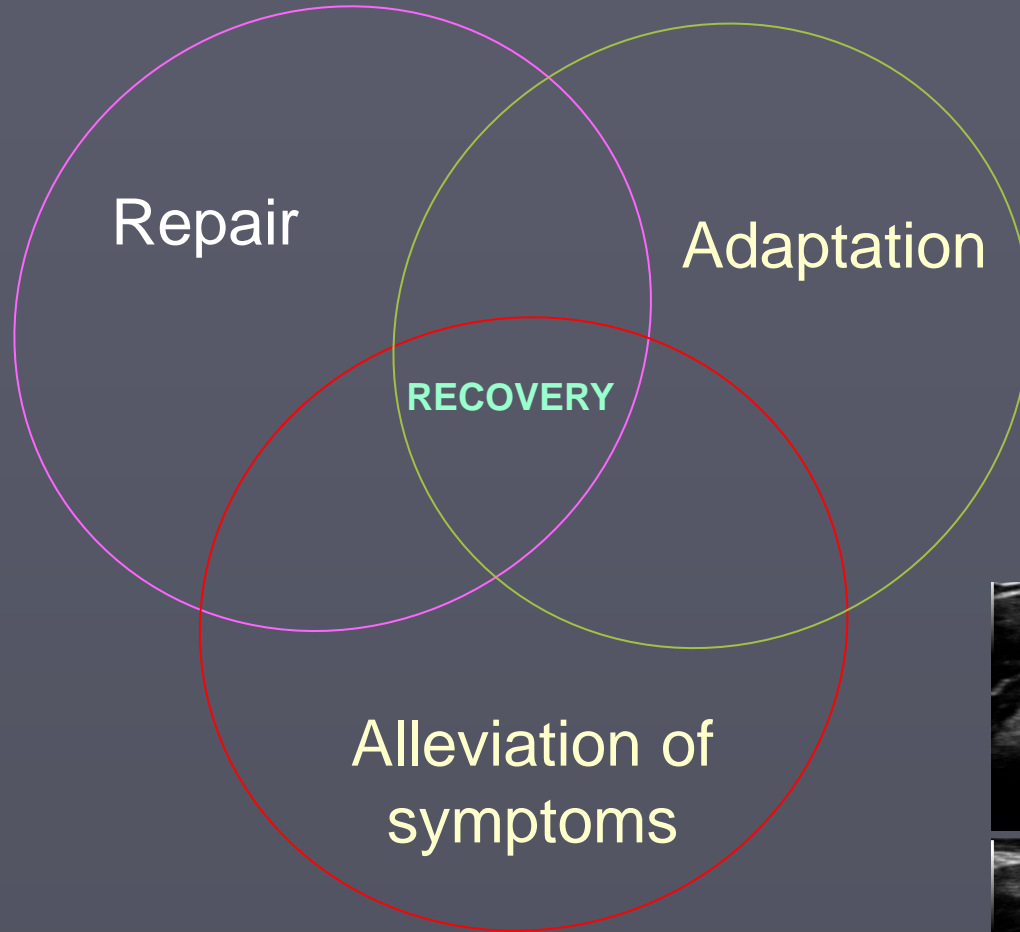


# Functioncise, overall mortality and CVD



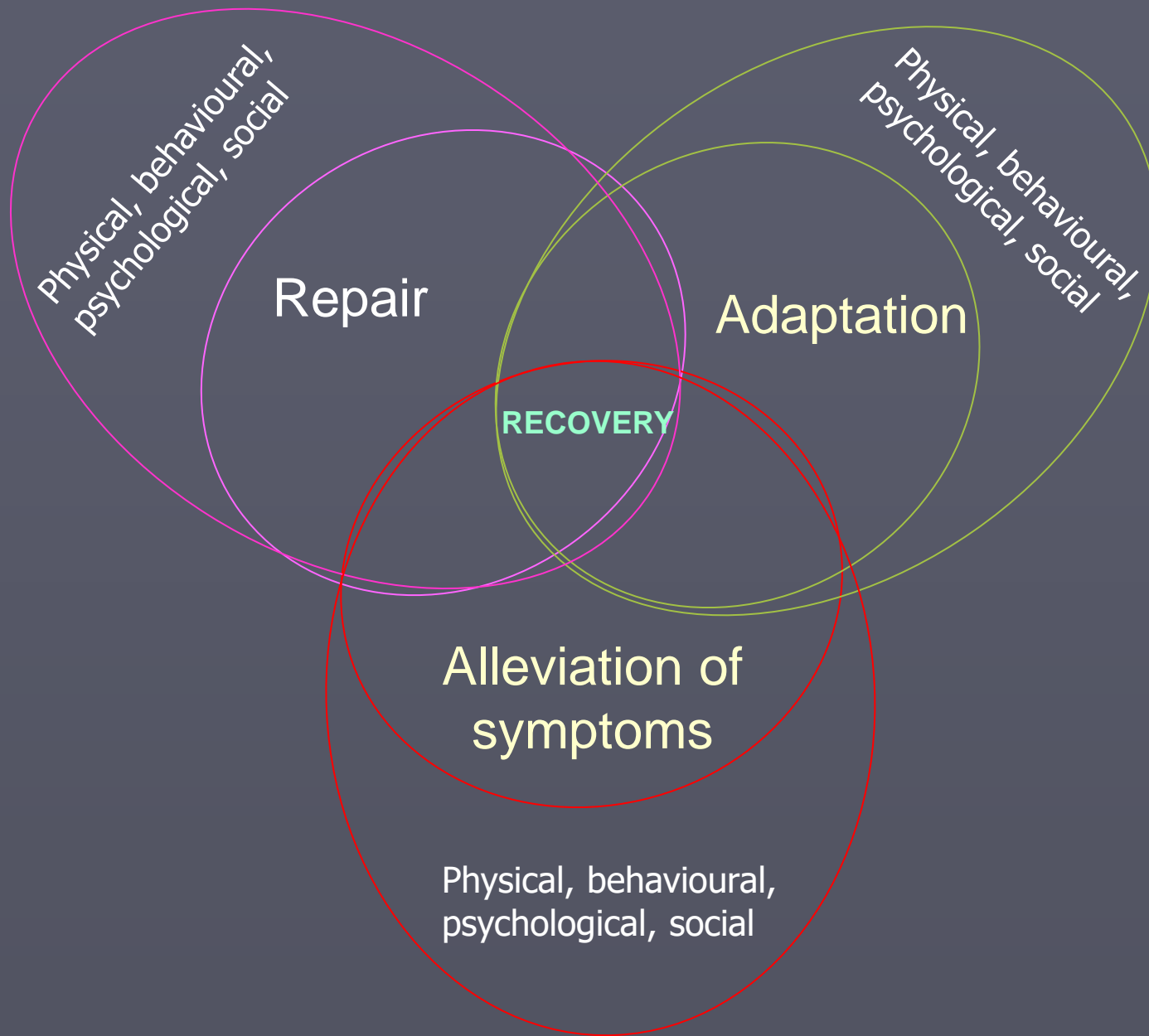
The benefit of physical activity was independent of the type of physical activity (recreational or non-recreational), a range of socioeconomic and CVD risk factors, and was similar in various countries with differing income levels

# Process Approach





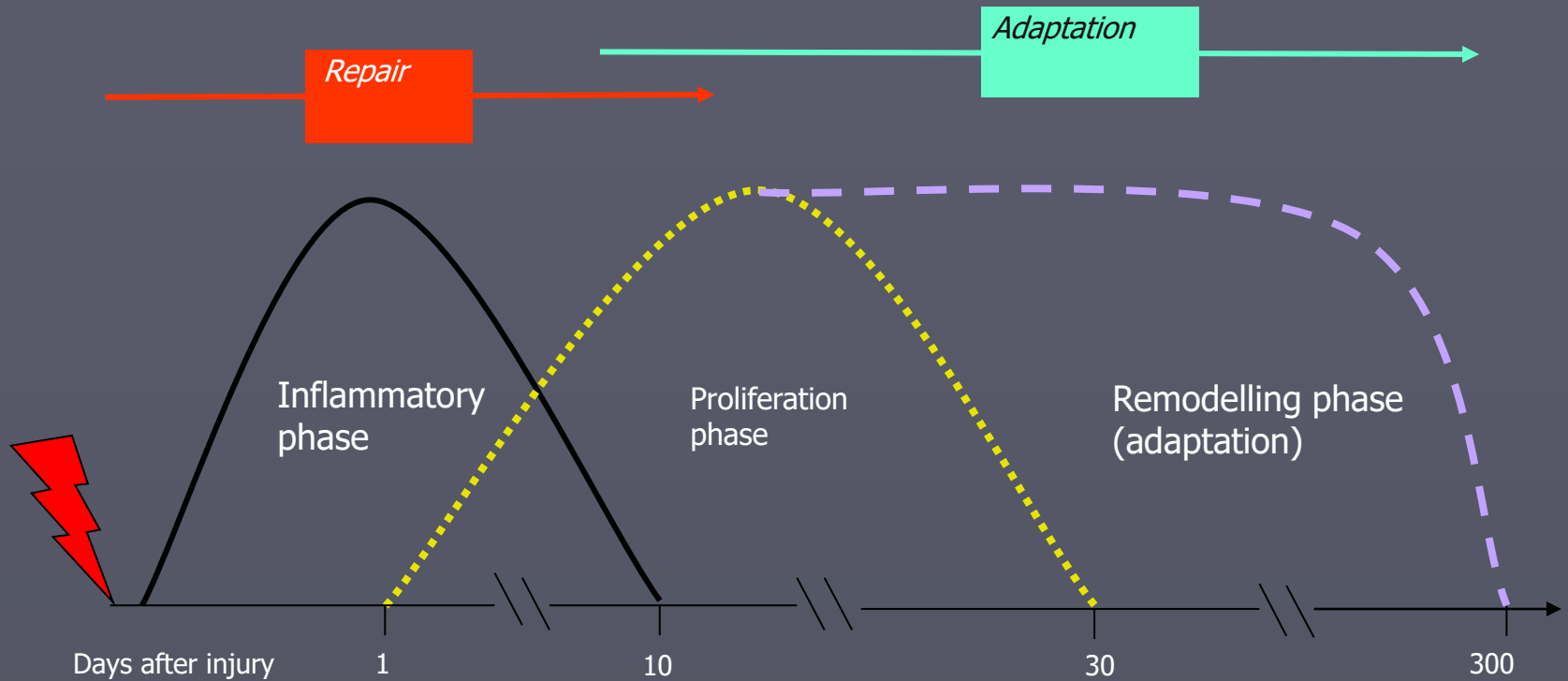
# Recovery environments



# Recovery environments: management considerations

<i>Process</i>	<i>Condition</i>	<i>Specific management</i>	<i>Shared management</i>
<i>Repair</i>	All acute conditions, max 8 weeks: All tissue damage, Joint & muscle sprains, post surgery, blunt trauma, first phase of frozen shoulder,	Moderate cyclical and repetitive loading Applied locally to affected area Gradual loading Pain-free / tolerable movement Can be either active or passive Any movement pattern but preferably functional. Extra-functional is OK	<b>Psychological</b> Ease movement pain related anxieties, catastrophising, support, reassurance, comfort, Sooth and calm Therapeutic relationship - trust, non-judgmental, empathic.. Contextual factors <b>Cognitive</b> Inform Plan Set goals Provide choice <b>Behavioural</b> Support recovery behaviour Raise awareness to avoidance behaviour <b>Physical</b> Functional movement Frequent exposure to activity
<i>Adaptation</i>	All chronic conditions: Post immobilisation contracture, ROM rehab, postural and movement re-education/rehab, CNS damage/rehab, structural/biomechanical change, enhance/recover human performance	Active Task specific whole and goal movement Functional Repetition Overloading Discomfort likely and generally OK	
<i>Alleviation of symptoms</i>	Acute/Chronic pain/discomfort Acute/chronic stiffness	Many treatment modalities may be beneficial depending on patient expectations.. Sleep regulation & relaxation Physically: Active may be better than passive movement Cyclical movement may be better than static approaches Functional or extra-functional	

# Phases of repair

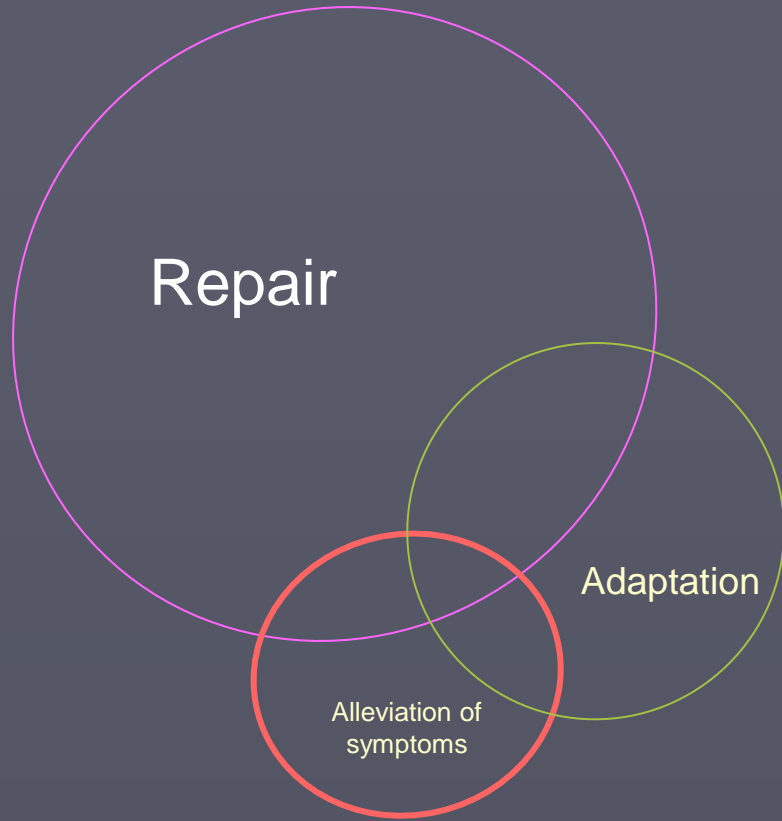


Recovery  
behaviour

Protective  
behaviour

Restorative  
behaviour

# Treatment strategy acute injuries



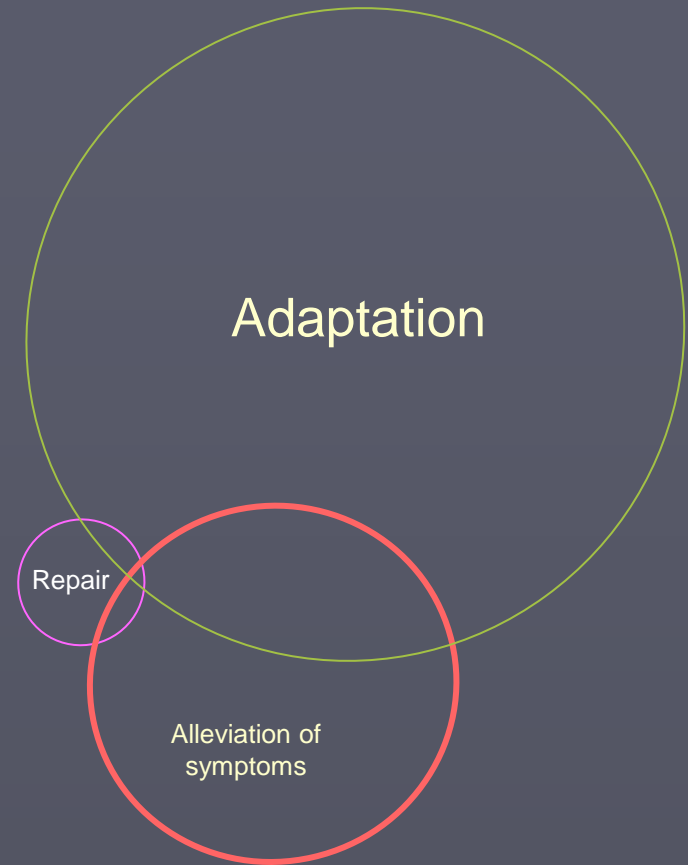
Acute phase

Long term

# Consider this management

<i>Process</i>	<i>Condition</i>	<i>Specific management</i>	<i>Shared management</i>
<i>Repair</i>	All acute conditions, max 8 weeks: All tissue damage, Joint & muscle sprains, post surgery, blunt trauma, first phase of frozen shoulder,	Moderate cyclical and repetitive loading Applied locally to affected area Gradual loading Pain-free / tolerable movement Can be either active or passive Any movement pattern but preferably functional. Extra-functional is OK	<p><b>Psychological</b> Ease movement pain related anxieties, catastrophising, support, reassurance, comfort, Sooth and calm Therapeutic relationship - trust, non-judgmental, empathic.. Contextual factors</p> <p><b>Cognitive</b> Inform Plan Set goals Provide choice</p> <p><b>Behavioural</b> Support recovery behaviour Raise awareness to avoidance behaviour</p> <p><b>Physical</b> Functional movement Frequent exposure to activity</p>
<i>Adaptation</i>			
<i>Alleviation of symptoms</i>			

# Post immobilisation / contractures

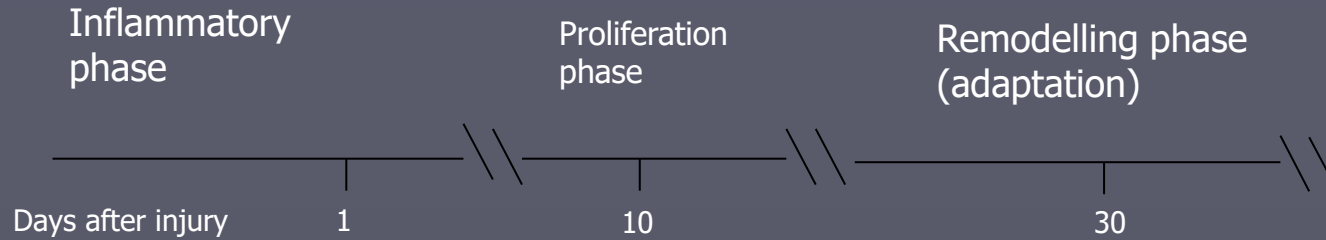


Reduced ROM

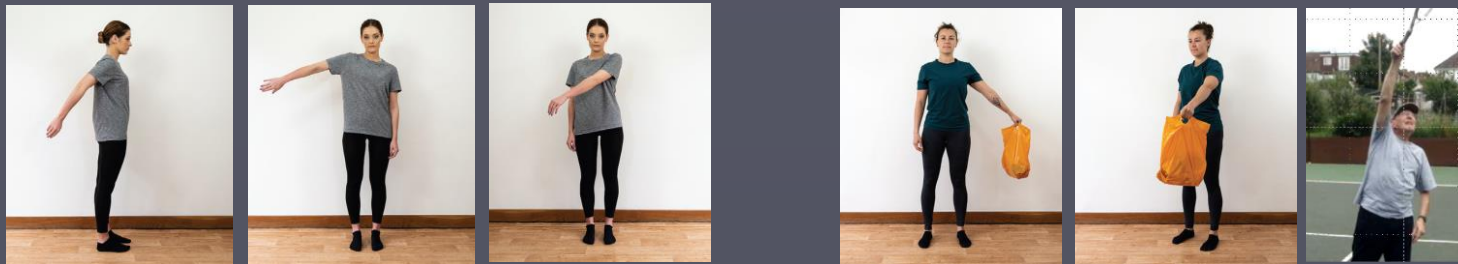
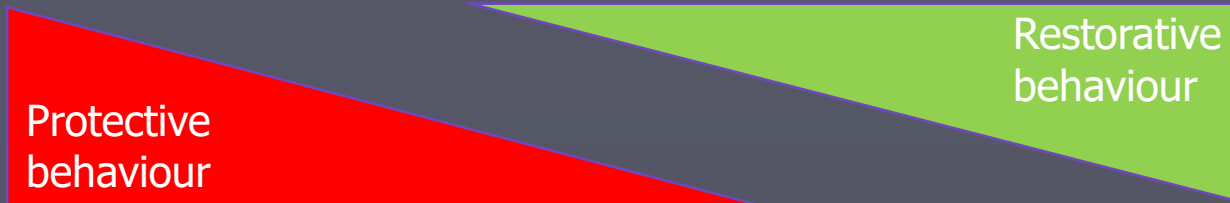
# Consider this management

<i>Process</i>	<i>Condition</i>	<i>Specific management</i>	<i>Shared management</i>
<i>Repair</i>			<p><b>Psychological</b> Ease movement pain related anxieties, catastrophising, support, reassurance, comfort, Sooth and calm Therapeutic relationship - trust, non-judgmental, empathic.. Contextual factors</p> <p><b>Cognitive</b> Inform Plan Set goals Provide choice</p> <p><b>Behavioural</b> Support recovery behaviour Raise awareness to avoidance behaviour</p> <p><b>Physical</b> Functional movement Frequent exposure to activity</p>
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<i>Alleviation of symptoms</i>			

# Matching exercise to phases of repair



## Recovery behaviour





# Summary

- Identify and work towards the patient's functional goals
- Construct the management from the patient's own movement repertoire
- Identify the recovery process/s associated with the patient's condition
- Match the movement challenges to support the recovery process

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Workshop:

FUNCTIONAL EXERCISE PRESCRIPTION IN MOVEMENT AND SPORTS REHABILITATION: beyond the strength and conditioning model

Dates: 3 Oct 2023 (Zoom 7 - 9pm) & 7 Oct 2023 practical workshop (9:30 - 5:00 pm)

Venue: BCOM, London

Find out more: [www.cpdo.net](http://www.cpdo.net) / [cpd@cpdo.net](mailto:cpd@cpdo.net)