

Functional Exercise Prescription in osteopathy

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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

'Functionise' (?)

22 January 2015 Last updated at 9:12

Exercise advice unrealistic, say experts

By **Shirley Bond**

Health reporter, BBC News



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

This was the 105 exercise weekly target I found the result of some

<http://www.bbc.co.uk/news/health-30515437>

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

Talking the talk and getting off the feet a step early are more likely to protect against heart disease and early death than working out, research shows



Getting "walkaround" messages in the office instead of sitting still could be beneficial, researchers say

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

Kerrick RP 2003 Patients' memory for medical information. *BMJ* 326: 219-22
 McGuire C 1996 Remembering what the doctor said: organization and adults' memory for medical information. *Exp Aging Res*, Oct-Dec, 22(4):403-28.
 Anderson K, Dodman S, Kuperman B, Fleming A 1979 Patient information recall in a rheumatology clinic. *Rheumatol Rehabil*, Feb, 18(2):18-22.
 Holden M, A., Haywood K.L., Pohl, T.A., et al. Recommendations for exercise adherence measures in musculoskeletal settings: a systematic review and consensus meeting (protocol). *Sport Rev*, 10 (2014).

Scott A Lee 2017 The effect of physical activity on mortality and cardiovascular disease in 130 000 people from 17 high-income, middle-income, and low-income countries: the PURE study. *The Lancet* 21 Sept 2017 DOI: [http://dx.doi.org/10.1016/S0140-6736\(17\)31614-3](http://dx.doi.org/10.1016/S0140-6736(17)31614-3)

Specificity



“Practice the task and the body will follow”

From: Lederman E 2022 Functional Exercise Prescription, HandSpring, London

Transfer



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

From: Lederman E 2022 Functional Exercise Prescription, HandSpring, London

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

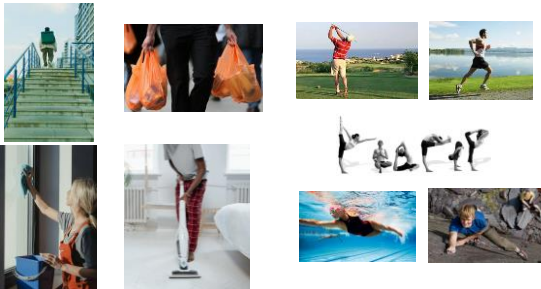
Lederman E. 2010 Neuromuscular Rehabilitation in manual and physical therapies. Elsevier

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



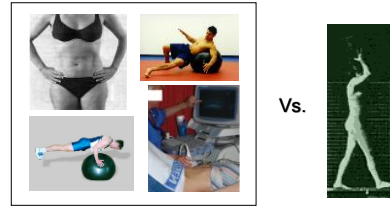
Yamato TP, Maher CG, Tranger AC, Williams CM, Kamper SJ. 2018 Do schoolbags cause back pain in children and adolescents? A systematic review. Br J Sports Med. 2018 Oct;52(19):1243-1249. van Gent C, Dotsis JJ, de Rover CM, Hira Singh RA, de Vet HC. 2003 The weight of schoolbags and the occurrence of neck, shoulder, and back pain in young adolescents. Spine (Phila Pa 1976). 2003 May 1;28(9):916-21.

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

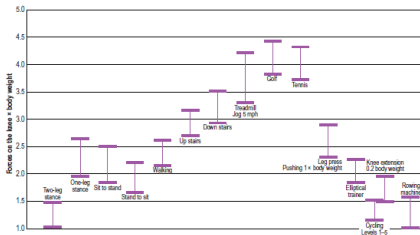


A six-week walk training programme was as effective as six weeks of specific strengthening exercises programme for the low back.

Buchbinder J, et al Loads on a vertebral body replacement during locomotion measured in vivo. *Gait Posture*. 2014 Feb;39(2):750-5. doi: 10.1016/j.gaitpost.2013.10.010. Epub 2013 Oct 19.

Shaydeman I, Katz-Lazar M An aerobic walking programme versus muscle strengthening programme for chronic low back pain: a randomized controlled trial. *Clin Rehabil*. 2013 Mar;27(3):207-14. doi: 10.1177/0269215512462030. Epub 2012 Jul 13.

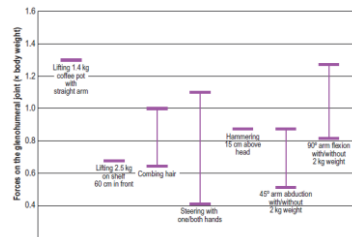
Loading of knee in daily sports activities



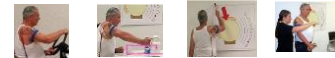
From Ledeman E 2022 Functional Exercise Prescription. Handspring, London

O'Lima DDL, Steakin N, Patti S, Colewell CW 2008 The Mark Coventry Award: in vivo knee forces during recreation and exercise after knee arthroplasty. *Clin Orthop Relat Res*. 2008 Nov;466(11):2605-11. doi: 10.1007/s11999-008-0345-x. Epub 2008 Jun 19. Kutzner I, Heinlein B, Grachev F, Bender A, Rohmann A, Haidler A, Baur A, Bergmann G 2010 Loading of the knee joint during activities of daily living measured in vivo in the subjects. *J Biomech*. 2010 Aug 10;43(13):2584-75. doi: 10.1016/j.jbiomech.2010.03.046.

Shoulder joint loading levels during daily activities

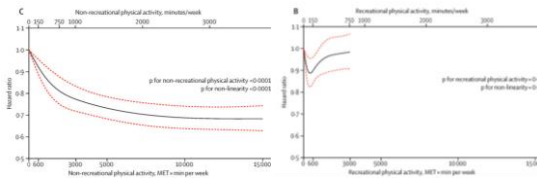


From Ledeman E 2022 Functional Exercise Prescription. Handspring, London



Bergmann G, et al In vivo glenohumeral contact forces—measurements in the first patient 7 months postoperatively. *J Biomech*. 2007;40(10):2139-46. Epub 2008 Dec 15.

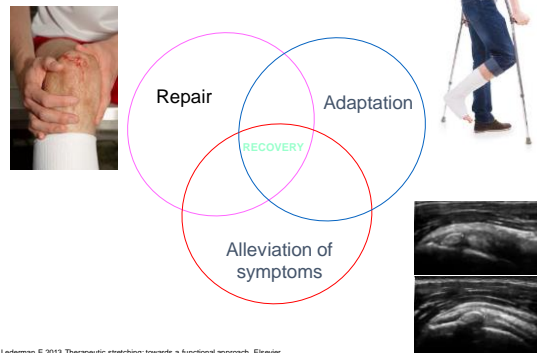
Functioncise, overall mortality and CVD



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

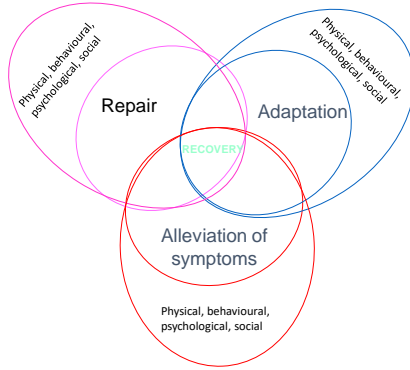
Heer SA, Ho W, Rangarajan S, et al. The effect of physical activity on mortality and cardiovascular disease in 130 000 people from 17 high-income, middle-income, and low-income countries: the PURE study. *Lancet* 2017; **390**: 2643-54

Process Approach



Ledeman E 2013 Therapeutic stretching: towards a functional approach. Elsevier

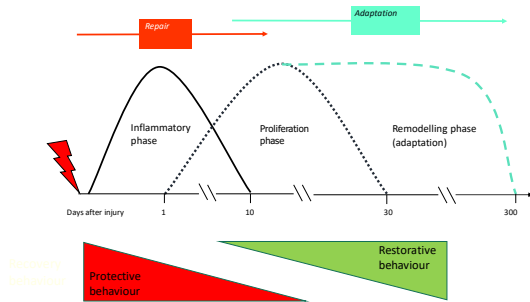
Recovery environments



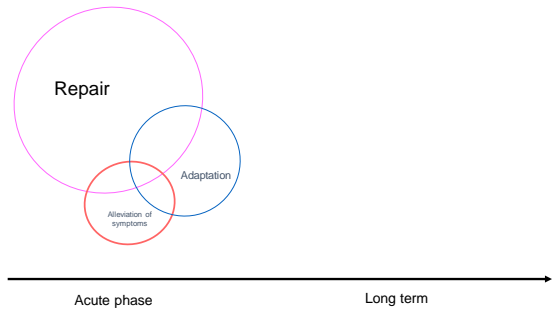
Recovery environments: management considerations

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



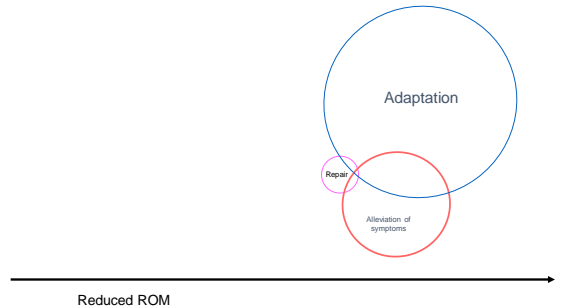
Treatment strategy acute injuries



Consider this management

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

Post immobilisation / contractures



Consider this management

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

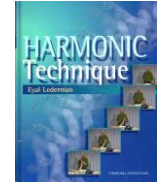
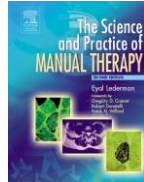
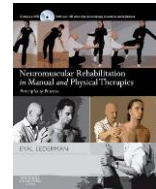
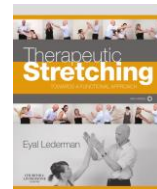
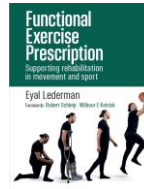
Matching exercise to phases of repair



From Lederman E 2022 Functional Exercise Prescription, HandSpring Publishing, London

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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