



UNIVERSITY OF GOTHENBURG

# The role of exercise in individuals with late effects of polio

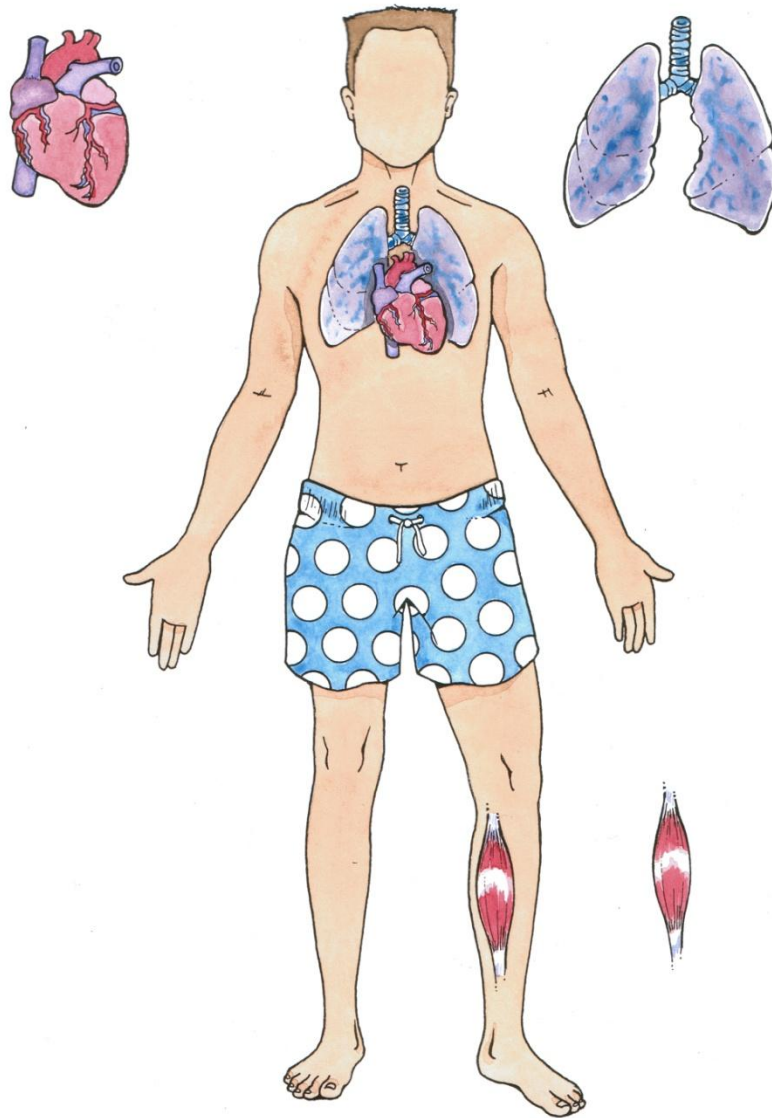
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**Is it recommendable?  
Is it possible?**





# Evidence-based medicine

**Practice  
knowledge**

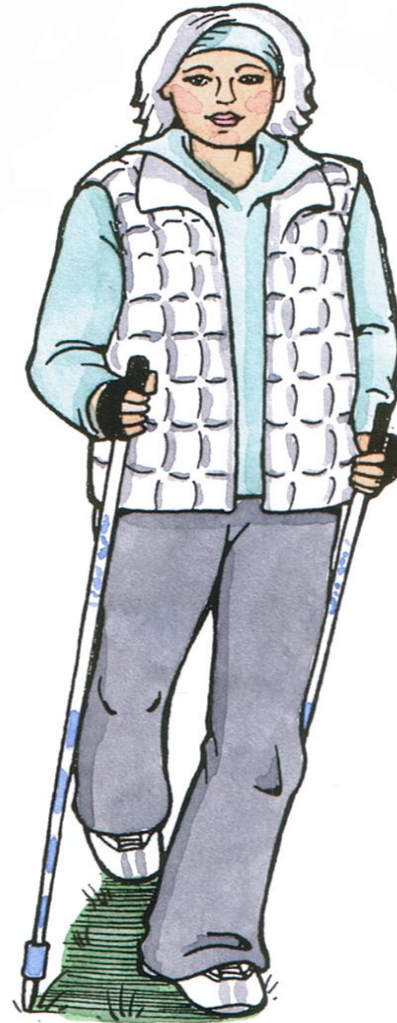
**Patient preferences**

**High quality clinical  
research**

Thus far studies have demonstrated positive effects of physical exercise in individuals with late effects of polio as concerns muscle strength.....



...as well as general physical activity

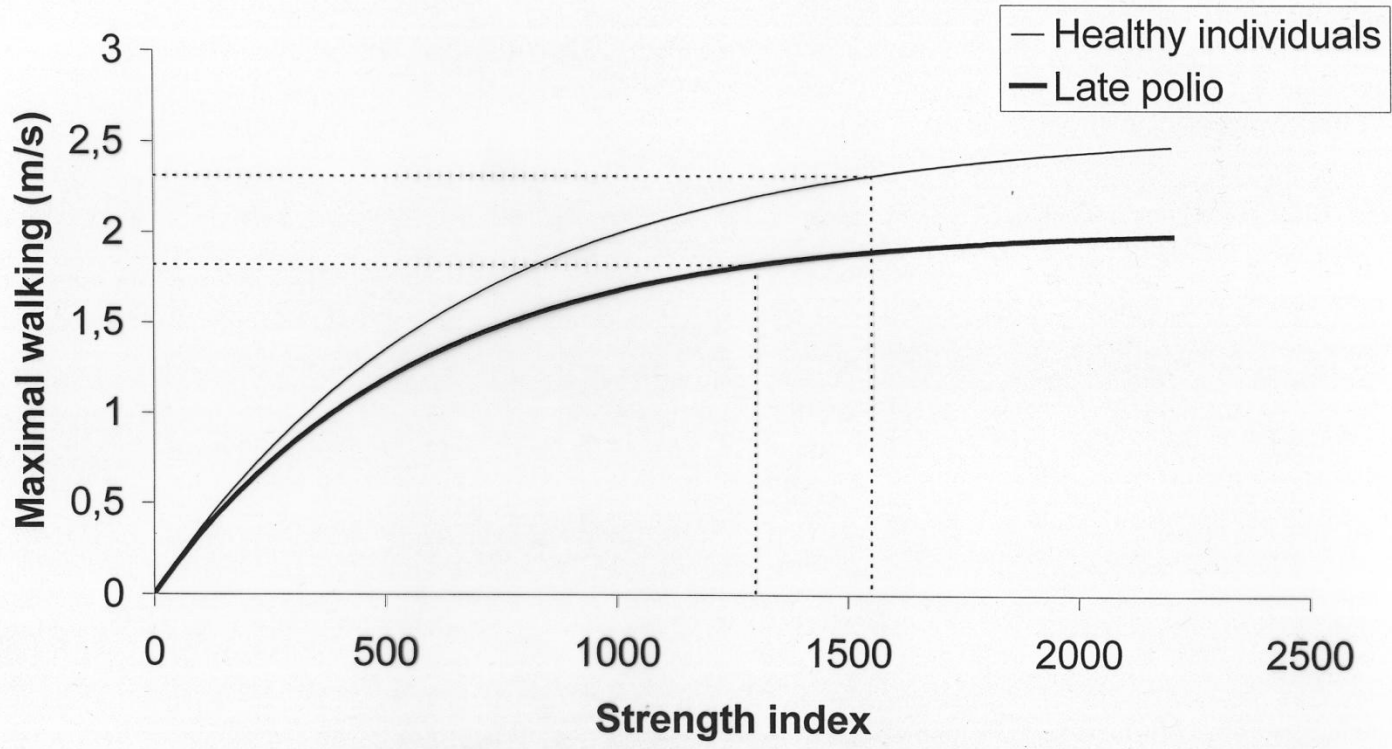


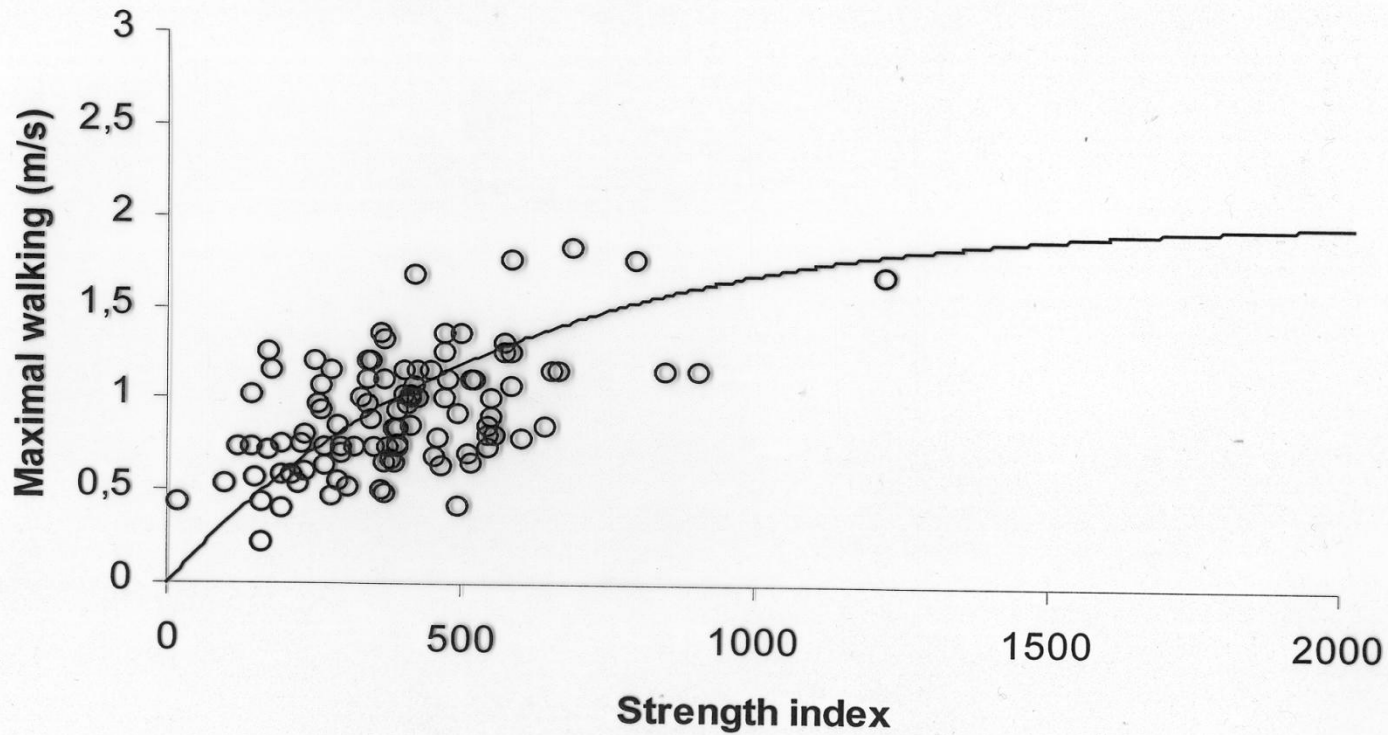
# COMPENSATORY MECHANISMS FOR LOSS OF MOTOR UNITS

- Re-innervation
- Muscle fibre hypertrophy

# Principle aspects on muscle training

Polio Category	Muscle strength	Size of motor units	Size of muscle fibres	Type of Training
Stable	Normal	(+)	(+)	No restriction
Stable	-	++	+	Resistance Endurance
Unstable	-	+++	++	Sub maximal supervision
Unstable	--	+++	+++	Low intensity
Severe atrophy	---	+++	-	No training





# MUSCLE FATIGUE IN POST POLIO

Due to reduced muscle strength, an increased proportion of the maximal force may be used

This leads to increased risk for muscle fatigue

# MUSCLE FATIGUE IN POST POLIO

Prolonged recovery of muscle strength after a sub maximal muscle activation

Increased perception of fatigue even several days after a heavy muscle activation

# Way of exercising recommendable from evidence

Resistance training



Ergometer cycling

Swimming

Basic gymnastics

Walking with poles

Pool exercise



- isometric and isokinetic exercise with maximal resistance during 6 weeks gave an increase in strength of 25-30%
- no adverse effects
- subjective functional benefit for six months

- Low-intensity muscle strengthening program for 12 weeks showed increased strength experience of decreased fatigue.

# Exercising in group with cycling, walking and resistance exercises

- lower heart rate at submaximal work
- improvement in muscle strength in some muscle groups

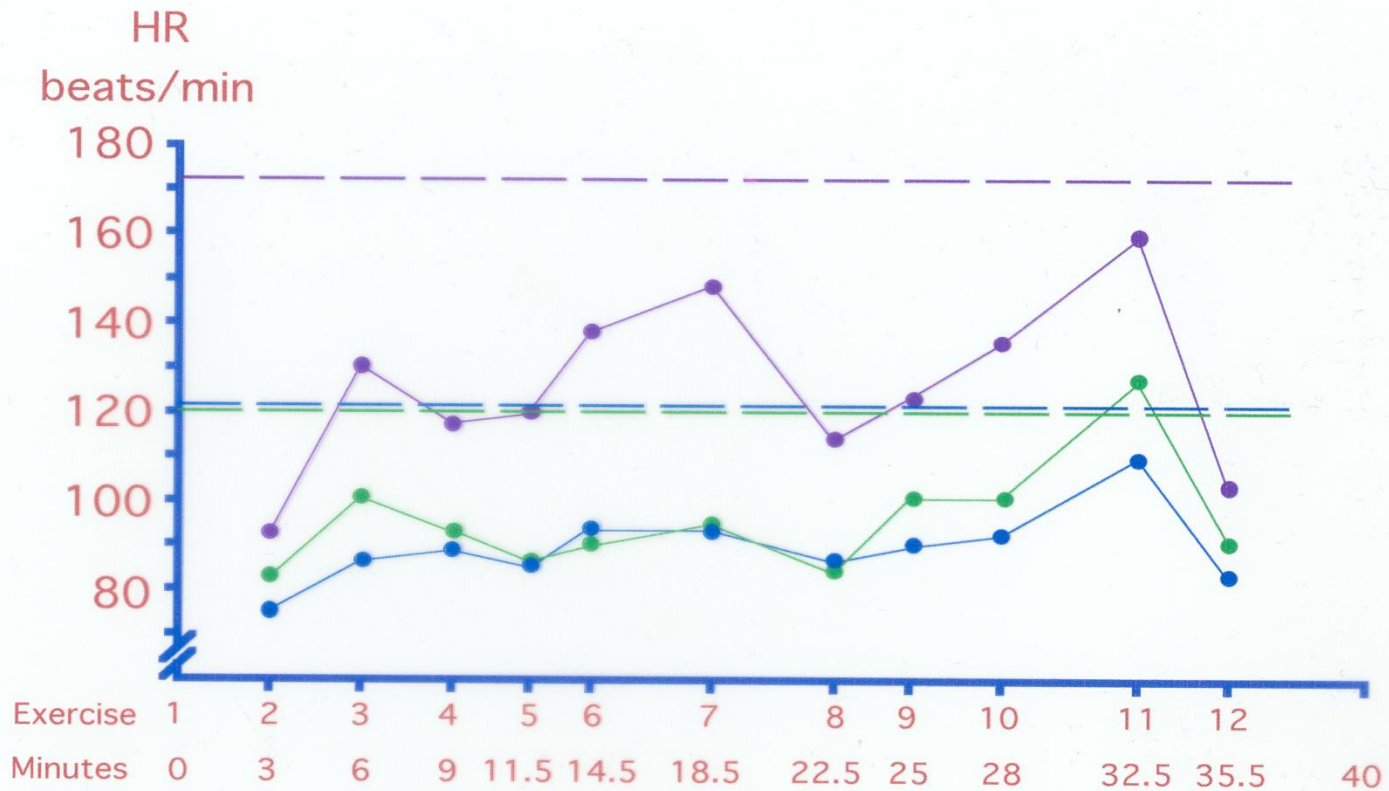
- the same improvement in muscle strength as healthy
- no adverse effects

Positive response was demonstrated from cycling on bicycle ergometer for 16 weeks at an intensity of 70-75% of maximum.

The same capacity for improving as for healthy subjects was considered.

# Dynamic water exercise for 5 months

- lower HR at submaximal level
- less pain in daily life
- positive experiences as well as no adverse effects



A qualitative study showed positive experiences other than the improved physical capacity as

- to get to know oneself 's body
- to develop a more positive attitude to oneself

- Spinning?
- Whole body vibration?
- Walking with poles?

# Planning physical activity/exercise

Polio status

Reduced strength

Individualized

The reactions to training should govern its  
planning

# Changing the activity pattern - pacing

- learn to take pauses
- take a rest after heavy effort
- lower the intensity but extend the total time for activity(ex slower walking, avoid slopes)
- training twice a week is enough

# Overuse

Can appear as increased weakness and tiredness that remains for several days

## To avoid:

- Lower the load in next training session
- Supervise the exercising carefully in the beginning
- Rather several shorter training sessions than one long

Physical exercise and activity should firstly be seen as preventitative (against lifestyle illnesses) and secondly retentive