The WALK-study, Walking ALteration for Knee Osteoarthritis,
A proof of concept study on gait parameters and clinical outcome.

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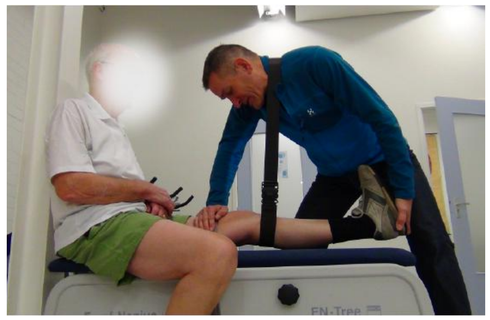
WALK programme

The WALK gait retraining programme aims to regain knee extension, and implement this increased range of motion in the gait pattern. This decreases the period of quadriceps activity during mid stance period of gait, and reduction in tibiofemoral forces. This aims to reduce OA symptoms.

Passive extension mobilisation



Active extension exercises

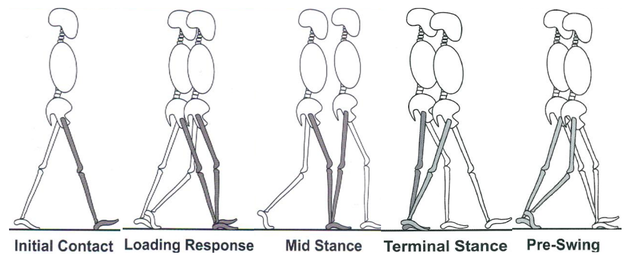
Integration of regained function in gait pattern

Introduction

Knee osteoarthritis (OA) results in various biomechanical changes in the gait pattern. Perry classified the gait cycle for gait analysis (figure 'gait cycle'). In healthy subjects, extension of the knee occurs in the early mid stance phase, allowing the quadriceps muscles to relax.[1] Knee OA patients frequently have an extension deficit,

When the knee does not reach full extension during gait, increased and prolonged activation of the quadriceps muscles and prolonged co-contraction of the quadriceps and hamstrings muscles occurs.[2] This results in increased tibiofemoral loading,[3] on an already damaged articular surface.

Gait cycle [1]



Study objective

Evaluation of the effect of the WALK gait correction programme on functional and gait parameters in early knee osteoarthritis

Methods

Study population:
Patients presenting at our outpatient with symptomatic and mild to moderate (KL1-3) structural knee OA, an extension deficit of 5 degrees or more, without ligament instability were included in our study.

Intervention:
The WALK gait correction program consists of passive and active extension exercises and functional gait retraining on a treadmill, with feedback by the physiotherapist.

Measurement
At baseline, 6 and 12 weeks Range of Motion and functional performance measures were assesed.

	Baseline	3 months	p-value*
Range of Motion			
Passive Flexion	124.9° (+/-3.1)	128.6° (+/- 2.7)	0.008
Passive Extension	10.3° (+/-0.7)	5.0° (+/- 0.9)	<0.001
Functional performance measures			
30 sec chair stand test (repititions)	14.2 (+/- 0.7)	16.9 (+/-0.8)	0.001
40 m. fast paced walk test (sec)	27.7 (+/-0.8)	25.1 sec (+/-0.6)	0.002
Timed up and go test (sec)	6.0 (+/-0.2)	5.3 (+/-0.2)	0.001

** Paired Samples t-Test*

Patient characteristics

Baseline Characteristics N = 30	
Male / Female	18 / 12
Age (years)	63.8 (+/- 9.0)
BMI *(kg/m²)*	26.5 (+/- 4.2)
Smoking *(yes / no)*	2 / 28
Co-morbidity leading to additional impairment *(yes / no)*	1 / 29

Conclusion

Patients undergoing the WALK programme had significant reduction in passive extension, and clinically relevant increase in functional outcome.

For further evaluation a RCT is planned

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References:
1. *Perry J, Burnfield JM. Gait Analysis. Slack; 2010. p.*240-245, 551
2. Hubley-Kozey et al. *Cl. Biomech. 2009;*24(5)407–14
3. Steele et al. Gait & posture,2012;35(4)556–60

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