Netherlands; [‡] Amsterdam Rehabilitation Res. Ctr. | Reade, Amsterdam, Netherlands; [§] Amsterdam Rheumatology & immunology Ctr., Amsterdam Med. Ctr., Reade, VU Univ. Med. Ctr., Amsterdam, Netherlands; [‖] Jan van Breemen Res. Inst., Reade, Amsterdam, Amsterdam, Netherlands; [¶] Dept. of Hlth.Sci., VU Univ. Amsterdam, Amsterdam, Netherlands; [#] Dept. of Epidemiology and Biostatistics, VU Univ. Med. Ctr., Amsterdam, Netherlands; [††] Inst. for Applied Hlth.Res., Sch. of Hlth.and Life Sci., Glasgow Caledonian Univ., Glasgow, United Kingdom; [‡‡] Dept. of Psychiatry, VU Univ. Med. Ctr., Amsterdam, Netherlands

Purpose: Soft braces (knee sleeves) are recommended in the non-surgical management of patients with knee osteoarthritis (OA). Because of their ease of use, lack of complications and low cost, soft braces are commonly used with the aim to reduce pain and improve physical function. The evidence for clinical effectiveness of soft braces is however limited. Moreover, the level of tightness, at which soft braces elicit their effectiveness has not been studied well, however could be highly relevant for therapeutic outcomes. Thus, the aims of the study were to (i) evaluate effects of a soft brace on self-reported knee instability and confidence, pain and physical function, and to (ii) assess the differences in effects between non-tight and tight soft braces in patients with knee OA.
Methods: A within-subject design was performed, comparing no soft brace versus soft brace, and comparing tight versus non-tight soft brace. A non-tight brace was one size looser than the tight brace. The order of brace type was randomized. Participants of the study attended a single testing session during which they were subjected to walking, with and without a soft brace, on an instrumented treadmill in two testing conditions: level walk and perturbed walk. The outcome measures were: self-reported knee stability and confidence, pain and physical function assessed outside the treadmill with the Get Up and Go (GUG) test and 10 meters walk test. Generalized Estimating Equations (GEE) with exchangeable working correlation matrix for repeated measurements within participants were used to express the relation between intervention and change in outcome measures.
Results: Forty-nine patients from the Amsterdam Osteoarthritis Cohort participated in the study. Wearing a soft brace significantly reduced the risk of self-reported knee instability compared to not wearing a brace during both, level walking (OR (95%) = 0.38 (0.21 0.67)) and perturbed walking (OR (95%) = 0.38 (0.21 0.67)). Wearing a soft brace significantly reduced the risk of lack of knee confidence compared to not wearing a brace during both, level walking (OR (95%) = 0.49 (0.35 0.68)) and perturbed walking (OR (95%) = 0.57 (0.43 0.76)). Wearing a soft brace significantly reduced pain compared to not wearing a brace during both, level walking (B (95%) = −0.60 (0.43 0.69)) and perturbed walking (B (95%) = −0.84 (0.32 0.56)). Wearing a soft brace significantly reduced time to complete 10 meters walk test compared to not wearing a brace (B (95%) = −0.23 (0.70 0.90)). Wearing a soft brace significantly reduced time to complete GUG test compared to not wearing a brace (B (95%) = −0.23 (0.62 0.99)). No significant differences were found in the observed effects between tight and non-tight braces. Results are presented in figure 1.
Conclusions: Within the limitations of the study, which mainly included lack of true blinding, the results indicate that soft braces improve self-reported knee stability and confidence, reduce pain and improve physical function. High quality studies evaluating long-term effects are needed to strengthen the validity of the findings. Future studies are required to investigate the amount of pressure soft brace exerts on skin to elicit the optimal therapeutic outcomes.

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LATERAL WEDGE INSOLES INCREASE ACTIVITY PROFILES IN INDIVIDUALS WITH MEDIAL KNEE OSTEOARTHRITIS

Y.M. Althebaity, M. Granat, A. Liu, R.K. Jones. *Univ. of Salford, Manchester, United Kingdom*

Purpose: Knee osteoarthritis (OA) is one of the most common chronic musculoskeletal disease mainly affecting the medial compartment of the knee joint, causing knee pain, disability and reduced activity level. This reduction in activity level is associated with many health problems such as obesity, diabetes and heart disease. Knee loading, principally the external knee adduction moment (EKAM) has been found to be higher in individuals with Knee OA. Lateral wedge insoles (LWI) are designed to reduce this EKAM with the aim to have a clinical effect. Whereas, reductions in EKAM have been shown, there is a conflict in the clinical results regarding the reduction of knee pain. One of the reasons may be that the when participants are in the comparator insole they receive a placebo effect or the LWI group walk to their respective pain level (their activity profile has increased). However, given the importance of activity level in individuals with Knee OA, the aim of this study was to determine the effect of LWI on EKAM, knee pain and level of physical of activity in one study following an intervention with a LWI, during walking.
Methods: Individuals with confirmed painful medial knee OA (KL grade 2/3) were invited from the University and local hospitals and were randomly allocated to either a 5° lateral wedged insole, or a neutral insole. The insoles were prescribed to be worn all day for 6 weeks. An activPAL™ monitor was placed on their thigh to measure their activity level pre-intervention and at week 5 during the intervention period. The activPAL™ monitor measures time spent in sedentary behaviour (lying and sitting), standing and stepping in addition to cadence and number of steps. The primary outcomes were level of activity, EKAM using 3D kinematic (Qualysis OQUS, Sweden) and kinetic (AMTI, USA) analysis, and knee pain using the Knee & injury osteoarthritis outcome score (KOOS pain subscale). Independent t-tests were performed to test for group differences at baselines. 2 × 3 mixed ANOVA's were performed to determine which treatment was more effective.
Results: Twenty individuals were randomly assigned into two equal groups. There was no difference in the groups in terms of their age (LWI 62.4 yrs (10.4), N 60 yrs (9.2)), mass (LWI 82.5 kg (21.6), N 84.7 kg (17.4)) and height (LWI 174.8 cm (9.4), N 174.7 cm (7.4)). At baseline, there were no significant differences between groups in terms knee loading, knee pain and activity level. All participants completed the trials with no difference in wear time between groups. After six weeks, the first peak of the EKAM was significantly reduced in LWI group compared to baseline ($p = 0.000$) and neutral insole group ($p = 0.008$). There was a significant reduction in pain in both groups (LWI $p = 0.003$, N $p = 0.01$) after six weeks but no change between groups ($p = 0.75$). The volume of activity (total steps & time stepping) significantly increased in the LWI group but not in comparator group. There was an improvement in total steps in LWI group compared to baseline by 23.8% at week 6.
Conclusions: The group wearing lateral wedge insoles demonstrated a change in biomechanical, clinical and activity profiles after six weeks. Whilst there was no difference in terms of pain between the two groups, this is likely to be due to the increased activity that the lateral wedge group undertook. However, with the reduced knee loading with the lateral wedge insole, this is likely to be seen as a positive effect on the individual's health behaviour with no increase in pain. Activity profiles of individuals during interventions give important information and should be collected to complete the profile of individual.

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A CLINICALLY FEASIBLE ASSESSMENT OF PHYSICAL FUNCTION AS A "STRESS TEST" TO IDENTIFY PEOPLE WITH KNEE OSTEOARTHRITIS WHO ARE UNABLE TO BE PHYSICALLY ACTIVE

H. Master [†], T. Neogi [‡], L. Thoma [†], M. Christiansen [†], L.A. Schmitt [†], E. Polakowski [†], D.K. White [†]. [†] *Univ. of Delaware, Newark, DE, USA;* [‡] *Boston Univ., Boston, MA, USA*

Purpose: Clinicians are encouraged to advise patients with knee osteoarthritis (OA) to engage in physical activity as a first-line non-pharmacological treatment. However, clinicians have little ability to discern whether patients have the functional capacity to engage in physical activity. Recommending physical activity to a patient without the functional capacity to do so will simply set them up for failure. The purpose of this study was to identify clinically feasible assessments of physical function that may act as a "stress test" to identify individuals with knee OA who are unable to be physically active.
Methods: We used data from the Osteoarthritis Initiative (OAI). Physical activity was measured with an accelerometer (Actigraph GT1M) worn during waking hours during the 48-month follow-up visit. We defined being physically active as spending 10 or more consecutive minutes/week in bouted moderate-vigorous intensity physical activity (MVPA), defined as activity counts of ≥2,020 by an accelerometer. This definition is consistent with the 2008 Physical Activity Guidelines for Americans; being physically active includes those with 'low activity' and 'meeting activity recommendations'. Those with no bouts of MVPA were classified as inactive. Stress tests of physical function were quantified as: sit-to-stand test (calculated from a 5 repetition sit-to-stand), walking speed (calculated from a 20-meter walk), and walking endurance (calculated from a 400-meter walk). To identify minimum thresholds that would indicate ability to be physically active, we calculated cut-