Background: Obesity is strongly linked to knee OA and is considered a risk factor for both incidence and progression. Obese patients with knee OA tend to walk slower, have shorter step length, cadence and single limb support (SLS). Most obese patients fail to comply with weight-reduction programmes to relief pain and improve function. Several biomechanical treatments for knee OA have emerged with the goal of reducing pain, improving function and halting disease progression. These treatments aim to unload the diseased articular surface by using wedged insoles, foot orthoses, unique shoes or valgus braces. The aim of this study was to examine the effect of a biomechanical, home-based, gait training device on gait patterns of obese patients suffering from knee OA.

Methods: This was a retrospective analysis of 105 (32 males and 73 females) obese patients (BMI ≥ 30 kg/m²) with knee OA. All patients underwent a computerized gait test to characterize spatio-temporal parameters and were asked to complete The Western Ontario and McMaster Osteoarthritis Index (WOMAC) questionnaire and SF-36 Health Survey. Patients were fitted with the biomechanical gait training device and received home-based exercise programme. Patients returned to the clinic for additional assessments of gait patterns and clinical symptoms following 3 and 12 months of therapy. One-way repeated measure ANOVA was applied to determine significant changes over time, P-value was set to P = 0.05.

Results: Significant improvements in gait pattern were found in all parameters after 3 months of therapy with an additional improvement following 12 months of therapy. Gait velocity increased by 11.8% following 3 months of therapy and further improved by an additional 4.3%. SLS of the more symptomatic knee increase by 2.5% following 3 months of therapy and further improved by an additional 1.1%. A significant reduction in pain, stiffness and functional limitation was seen after 3 months of therapy with an additional improvement following 12 months of therapy. Pain decreased by 34.7% following 3 months of therapy and further decreased by an additional 11.0%. Functional limitation decreased by 35.0% following 3 months of therapy and further decreased by an additional 9.7%. Both Physical Scale and Mental Scale of the SF-36 increased significantly following 3 months of therapy and further increased following 12 months of therapy.

Conclusion: Obese patients with knee OA complied with a home-based exercise programme using a biomechanical gait training device. Patients demonstrated a significant improvement in gait patterns and clinical symptoms mainly after 3 months of therapy with an additional improvement after 12 months of therapy. This therapy may help obese patient with knee OA to become active and persist with an exercise programme that will lead them to relieved pain and improved function.

Disclosure statement: A.M. is a shareholder in Apos Medical and Sports Technologies. G.S. is an employee of Apos. R.D. is a shareholder in Apos Medical and Sports Technologies. A.E. is a shareholder in Apos Medical and Sports Technologies. All other authors have declared no conflicts of interest.