

# “Effects of gait retraining with auditory biofeedback on biomechanics and ankle joint health in individuals with chronic ankle instability”

## PRACTICAL SIGNIFICANCE

Individuals with chronic ankle instability receiving auditory biofeedback gait training improved their walking gait immediately following a 2-week intervention and retained that pattern up to 1-week.

## STUDY BACKGROUND

Ankle sprains are the most prevalent injury in sports and have the highest recurrent rate which may be contributed to improper walking biomechanics demonstrated by those with chronic ankle instability. To date, the only intervention capable of changing gait is targeted gait therapy which has mainly been examined in single-session or multi-session without retention tests. There is a need to establish an effective gait training intervention and determine retention effects after training has ceased.

## OBJECTIVE

To assess the effectiveness of a 2-week auditory biofeedback gait training intervention on walking biomechanics and talar cartilage characteristics in individuals with chronic ankle instability.

## DESIGN & STUDY

A single-blind randomized controlled trial was conducted in a laboratory setting.

## SUBJECTS

Eighteen adults with chronic ankle instability completed the study and were randomly assigned into the Control (n=7) and auditory biofeedback (n=11) groups.

## MEASUREMENTS

Plantar pressure and center of pressure while walking was collected at baseline,

immediately, and 1-week post intervention. Talar cartilage deformation and echo intensity was measured via ultrasonography before and after walking at each time point.

## RESULTS

The auditory biofeedback group reduced plantar pressure in the lateral foot column and medially shifted center of pressure at immediate and 1-week post compared to baseline while the control group did not change over time. There were no observed changes for talar cartilage characteristics in any group at any time.

## CONCLUSIONS

Targeted gait training with auditory biofeedback is effective at improving walking gait and can be a useful clinical tool. There were no immediate changes in cartilage characteristics but longer follow up periods are needed to understand the potential effects of gait training.

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## PRINCIPAL INVESTIGATOR



**DANIELLE TORP, PHD, ATC**

Danielle Torp, Ph.D., ATC joined the University of Kentucky in July 2021 as a Postdoctoral Scholar in the Department of Athletic Training and Clinical Nutrition. She received a Bachelor of Arts degree in Athletic Training from Azusa Pacific University in 2012 and a Masters of Science degree in Exercise Science in 2015 from the University of Toledo. From 2015 to 2017, she worked as an assistant athletic trainer at Eastern Kentucky University with the Women's Basketball and Men's and Women's Cross Country and Track and Field teams. Dr. Torp earned her Ph.D. in Biology with a focus in Kinesiology from the University of North Carolina at Charlotte in 2021. Her research is focused on developing novel rehabilitation techniques to improve long-term patient care following lower extremity injuries. Primarily, she has focused on implementing biofeedback devices during gait retraining for patients with chronic ankle instability.