# MalleoLoc® L/MalleoLoc® L3
## STABILIZATION OF THE ANKLE JOINT DURING SIMULATED SUPINATION BY MEANS OF THE ANKLE ORTHOSES MalleoLoc® L AND MalleoLoc® L3

Gehring D., Lohrer H., Nauck T., Wisler S., Gollhofer A.
Department of Sport and Sport Science, University of Freiburg

In-depth knowledge of the functional stabilization of the ankle joint is a prerequisite for developing prevention measures against typical injuries to the ankle. The analysis of numerous clinical and biomechanical studies reveals two basic principles of joint stabilization: active (the neuromuscular system) and passive (ligaments, joint contact, and joint capsule) functional joint stabilization.
Supination trauma often occurs as a result of a combination of excessive inversion of the ankle and pronounced internal rotation of the ankle. The aim of this study, therefore, was to examine the effect of orthoses on the control of the ankle during walking while simultaneously provoking supination. Specifically, the study intended to investigate the extent to which the ankle joint is stabilized using the newly developed MalleoLoc L and MalleoLoc L3.

### METHODOLOGY

| | |
|---|---|
| Study design: | controlled laboratory study |
| Sample: | n = 20 subjects, age: 22.3 ± 2.8 years, 13 women and 7 men |
| Test orthoses: | MalleoLoc L / L3 (Bauerfeind); Malleo Dynastab Boa (Thuasne) |
| Measurement systems: | 3D motion analysis (Vicon MX) |
| Test method: | By means of a specially designed platform, the ankle's supination movement that is characteristic of a lateral ankle injury was imitated. As such, the subjects stood or walked barefoot with and without an orthosis on the platform, which could abruptly be tilted to result in 24° inversion and 15° plantar flexion. In addition, the subjective feeling of stability with and without shoes when walking and during "agility tests" was recorded. |
| Inclusion criteria: | Athletic, active persons aged "18–35 years" verified unilateral, chronic ankle instability based on the Cumberland Ankle Instability Tool (CAIT score < 25), prior history of recurring ankle traumas |

**MalleoLoc® L**
Orthosis for one-sided stabilization of the ankle

**MalleoLoc® L3**
Adjustable orthosis for one-sided stabilization of the ankle

Source:
Gehring, D., Münch, M., Gollhofer A._
Laborstudie: Nachweis von antisupinatorischen Effekten von Orthesen innerhalb des Verletzungsmechanismus
Orthopädieschuhtechnik_10_26-29_2018

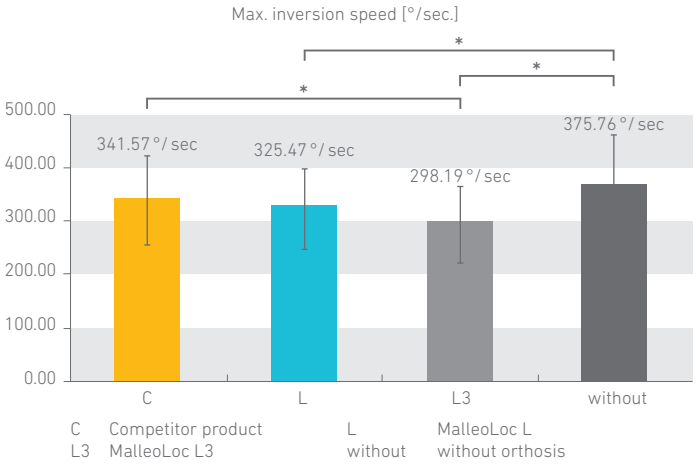
## RESULTS

Inversion is one of the characteristic rotations of the ankle joint when there has been an injury to the lateral capsular ligament structures. This study shows that both the MalleoLoc L3 and the MalleoLoc L showed a significantly reduced inversion speed (-20.6% and -13.4% respectively) when walking compared to when no orthoses were worn. When walking on the tilting platform, the MalleoLoc L3 also showed a significant reduction in the max. inversion angle (-22.1%) and the inversion speed (-43.5%) compared to when no orthoses were worn. The reference orthosis also showed a significant reduction in the inversion angle (-18.7%), but no significant reduction in the inversion parameter compared to the condition in which no orthoses were worn. All three orthoses stabilized the ankle, leading to a significant reduction in the max. internal rotation speed (C: -12.1%, L: -12.1%, L3: -13.1%).

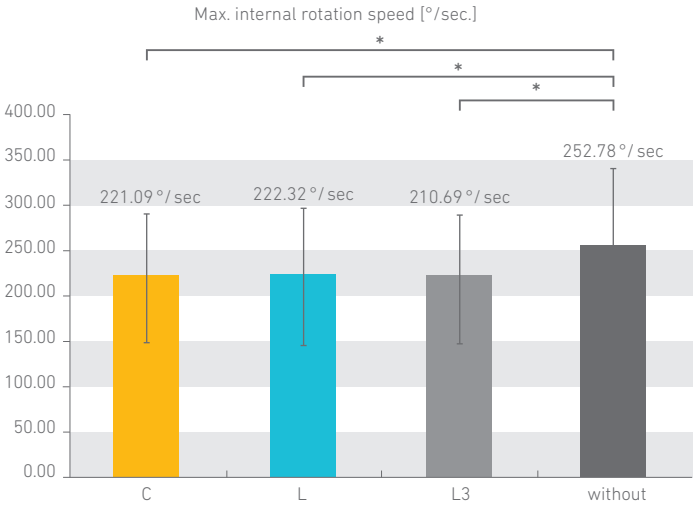
The subjective sense of stability is also an important prerequisite for the patient to safely transition back to normal mobility. The agility test puts more strain on the ankle joint than normal walking due to the required change of direction. In this situation, the MalleoLoc L3 was perceived to have a significantly greater stabilizing effect than the reference orthosis, whilst the MalleoLoc L achieved average stability characteristics. A comparable result was also seen when walking barefoot, whilst the subjectively perceived stabilization in shoes resulted in similar values for all three orthoses.

→ **The MalleoLoc L and L3 increase joint stabilization and secure the ankle joint**
→ **MalleoLoc L and L3 provide a high feeling of stability both with and without shoes**

**Inversion**




**Internal rotation**




**Sense of stability**