

# The Effects of Ankle Taping on Plantar Pressure and Plantar Force Distribution during Gait.

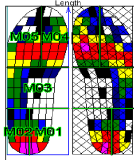
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## Introduction

Ankle taping is used in various sporting activities as a form of protection against lateral ligament injury and has been shown to decrease the incidence of ankle sprain (Norris, 2004). The literature on ankle taping suggests the possibility of taping having a detrimental effect on the lower limb biomechanics which may predispose to injury (Robbins and Waked, 1998). A few studies have investigated pressure change when varying the type of footwear, but none seem to have analysed the pressures and forces applied through the foot when

## Aim

The aim of this study was to investigate the effect of taping on the forces and pressures acting through the foot.



**Fig 1:** Image of Pedar recording showing plantar surface of foot divided into areas of interest (masks) for the analysis of forces and pressures

## Method

The study used a within subject design whereby 22 healthy subjects were recorded during a 10 metre walk in both taped and untaped conditions. Subjects were recorded 3 times in each condition using a computerised 'in-sole' pressure system (Pedar). Force and pressure distribution through the medial and lateral plantar aspect of the foot were measured.



**Fig 2:** Pedar Equipment for data collection; includes laptop<sup>1</sup>, Pedar pen drive software<sup>2</sup>, blue-tooth adapter/receiver<sup>3</sup>, insoles<sup>4</sup>, double Pedar insole cable<sup>5</sup>, cable box receiver<sup>6</sup>, secondary blue-tooth adapter<sup>7</sup>, power supply<sup>8</sup>

## Method (contd.)

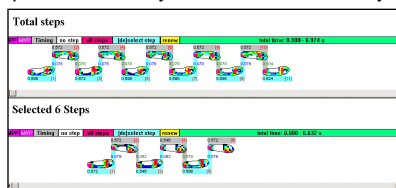
For the taped condition, under-wrap, zinc-oxide and a basket weave technique was applied to the subject's dominant foot whilst it was held in dorsiflexion and eversion.



**Fig 3:** Open basket weave taping

The purpose of recording pressures and forces through the foot over a ten metre distance was to measure any change for each subject between the taped and untaped conditions.

During the ten metres walk, each subjects' steps from start to finish were recorded on the Pedar-c measuring programme. It was necessary to discard steps from the acceleration/deceleration phases of the cycle to maximise validity



**Fig 4:** Pedar-c Step selection process

## Results

Group mean data were statistically analysed using a related t-test. There were no significant differences in any of the measures, when comparing pre and post taping ( $p > 0.1$ ). However, a non-significant trend was identified with regard to both force and pressure through the medial aspect of the foot and pressure through the lateral aspect of the foot where  $p = 0.05 - 0.1$ .

	Force	Pressure
Medial Aspect:	$p=0.072$	$p=0.059$
Lateral Aspect:	$p=0.120$	$p=0.081$

## Conclusion

This study aimed to discover the effects, if any, ankle taping has on the force and pressure distributions through the foot. The mean force and mean pressure were analysed for the medial and lateral aspect of the foot during a 10 metre walk with and without taping applied to the dominant ankle.

The findings of the study show that taping did not have a significant effect on the forces and pressures acting through the foot in 22 healthy subjects. However, due to the indication of a non-significant trend, a repeated study using a larger subject group is warranted in order to determine if taping may indeed be beneficial or potentially detrimental as a result of possible altered foot biomechanics.

## Clinical Implications

> Previous research has focused on the effects of ankle taping on performance and injury prevention. However, this study indicates that a wider range of biomechanical effects should be considered when treating ankle sprains.  
> There is evidence to show that short term ankle taping decreases the incidence of ankle sprains. However careful consideration needs to be given to routine, long-term ankle taping in view of the non-significant trend identified in this study.

## References

- Norris C (2004) *Diagnosis and Management* (3rd Edition) Edinburgh; Butterworth and Heinemann
- Robbins S., Waked E (1998) Factors Associated with Ankle Injury: Preventative Measures *Sports Medicine [online]* 25 (1): 63-72 Available from AMED [accessed on 30 January 2008]

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