

# Effect of Kinesio® Tape on Stabilization and Strengthening in People with Chronic Ankle Sprains

Dana Shea and Joseph Lucchesi

Florida Gulf Coast University, Department of Rehabilitation Sciences, Fort Myers, FL, USA

## Abstract

**Introduction:** Kinesio® Tape is an elastic therapeutic tape used to promote healing, decrease pain, increase range of motion and increase strength according to its creator, Dr. Kenso Kase. It is claimed to provide treatment by lifting the skin and allowing increased blood flow. The aim of this experiment was to test the effect of KT® Tape on stabilization and strengthening the ankle musculature in those with chronic ankle instability. **Methods:** Two participants completed a provided strengthening program with one subject using the KT® Tape during the workouts to assess the effect. Ankle stability and peak torque of the ankle evertors was measured prior to and following the strengthening program using the Biodex Balance System SD and Biodex Isokinetic Dynamometer. **Results:** The results found that the KT® Tape added to a strengthening regime showed greater increase in peak torque of ankle evertors compared to completing the ankle strengthening program alone. Ankle stability however decreased in both the experimental and control subjects. **Conclusion:** The results of this study indicate that the KT® Tape has a positive effect on muscle strength increasing peak torque of the evertors, compared to strengthening program alone, however the experimental subject had greater decreased ankle stability overall compared to the control subject. This study's results are limited due to small sample size and requires more research to prove results are significant.

## Introduction

Taping procedures are commonly seen in sport and used in rehabilitation of athletes for not only treatment but for enhancing performance as well. Different techniques can allow the restriction or facilitation of movement, or stabilization of a particular joint. Two types of taping techniques are normally used, elastic and non-elastic (Lee et al. 2010). Both have been shown to decrease the chance of sports injury, osteoarthritis, myofascial pain syndrome, pain, swelling, muscle spasms, and increase range of motion and muscle power, as well as correct walking pattern and functionality (Fu et al. 2007, Lee et al. 2010, Williams 2012). The purpose of this study is to examine the effect of Kinesio® Tape on force production in the ankle evertors. According to claims made by Kinesio® Tape, the researchers believe it should increase the strength of the evertors of the ankle thus increasing ankle stability in those with chronic ankle instability.

## Objectives

The purpose of this study is to examine the effect of Kinesio® Tape on force production in the ankle evertors. According to claims made by Kinesio® Tape, the researchers believe it should increase the strength of the evertors of the ankle thus increasing ankle stability in those with chronic ankle instability. Physical therapists could utilize this knowledge to potentially expedite rehabilitation and allow for patients to meet strength goals to return to activity.

## Results

Speed 60 deg/second	Peak Torque (Pre-test)	Peak Torque (Post-test)
Participant 1	4	10
Participant 2	2	3

Ankle Stability Pre-Test	Total	Anterior/ Posterior	Medial/ Lateral
Part. 1	1.1	0.9	0.7
Part. 2	0.9	0.6	0.6

Speed 120deg/second	Peak Torque (Pre-test)	Peak Torque (Post-test)
Participant 1	5	7
Participant 2	3	3

Ankle Stability Post-Test	Total	Anterior/ Posterior	Medial/ Lateral
Part. 1	0.8	0.5	0.5
Part. 2	0.8	0.6	0.4

Part.	% Change: Total Ankle Stability	% Change: Ant/Post Index	% Change: Med/Lat Index	% Change: Peak Torque @ 60°/sec	% Change: Peak Torque @ 120°/sec
#1	-27.7%	-44.4%	-29.6%	+ 150%	+ 40%
#2	-11.1%	0%	-33.3%	+ 50%	0%

## Methods

Two participants with a history of chronic ankle instability completed pre-testing for ankle stability with Biodex Balance System and eversion peak torque of the ankle with the Biodex Isokinetic Dynamometer. After, each participant completed a 4-week ankle strengthening program, with one participant taping the Fibularis longus and brevis before each workout. Then post-program results were taken for ankle stability and peak torque.

## Discussion

The KT® tape did affect the peak torque of the ankle evertors. Both participants had increased peak torque however, Participant #1, who performed the taping before each workout, had greater increases in peak torque in both categories compared to Participant #2, where peak torque was only increased in 1 category. This would suggest that the use of KT® Tape along with a strengthening program does cause an increase in muscle strength when compared to using a strengthening program alone. However, in regards to ankle stability, the increased strength did not have the positive effects that were expected. Both participants had decreases in ankle stability overall and in all measured planes. Participant #1 had a percent change decrease in total ankle stability and in all planes. The percent change decrease was greater in Participant #1 for total stability and ant/post stability, while Participant #2 had a greater decrease in percent change in stability in the med/lat plane. **Overall, Participant #1 had a larger percent change of decreased ankle stability with a larger increase of peak torque of the ankle evertors.** From this results it can be suggested that while the strengthening program and KT® Tape increase the peak torque, the increased peak torque caused a decrease in total ankle stability. This may indicate that stronger ankle musculature may not provide a more stable ankle and may, in fact, decrease stability, creating a higher risk for repeated ankle injury for those with chronic instability.

## Conclusions

KT® Tape does have an effect on strength of the ankle musculature, causing a greater increase in gains in strength when applied with a strengthening program compared to utilizing a strengthening program alone. **However,** the increased strength and peak torque seem to have a deleterious effect on ankle stability predisposing those with chronic ankle instability to increased risk of injury. **Thus, the results did not support the researchers' hypothesis**



Figure 1: Biodex Balance System Set-up



Figure 2: KT® Taping of Fibularis Muscles



Figure 3: Isokinetic Dynamometer Set-up