Kinesio Tape and its Effects on Internal and External Range of Motion of the Shoulder
Renner CM*, Ujino A*, Kahanov L*, Eberman LE*, Demchak TJ*
*Indiana State University

Context
Kinesio tape (KT) is theorized to restore correct muscle function, improve the flow of blood and lymphatic fluid, decrease pain, and correct misaligned joints. Literature indicates that KT improves proprioception, muscle strength, and perceptions of pain, but range of motion, specifically of the shoulder has yet to be assessed.

Intervention:
Testing Protocol:
• Participants will proceed to their assigned group for measurements (Group 1 or 2)
• Three measurements (internal & external rotation)
• Subjects in group 1 (control) will only have measurements taken once
• Group 2 (KT) subjects will have measurements completed, tape applied (Figures 1 & 2) and then re-measure immediately, and will leave with a KT Care Instructions Handout
All subjects before leaving will schedule for an appointment two days later for the three measurements again
• Participants will report back to same location
• Group 1 will re-measure the same as day 1 and complete a post-experiment questionnaire
• Group 2 will re-measure pre and post-removal of KT, and will also complete a post-experiment questionnaire
After completion of measurements and the questionnaire, participants are free to go

Statistical Analysis:
• Descriptive statistics for demographic information and the survey instrument resulting in means, frequencies, percentages and standard deviations
• One-way ANOVA analyzed to identify differences between genders for Rom arc
• 2x2 RM-ANOVA was used to analyze between time and group for Rom arc
• Pearson correlation between mean questionnaire and IR/ER for Group 2
• Significance was set a priori at p<0.05.

Methods
Design: Pretest-posttest randomized-groups.
Setting: Applied Medicine Research Center
Participants: Forty-five healthy participants. (17M, 28F, 21.3±2.8y).
Recruited from the university student body.
Inclusion criteria:
• Between the ages of 18-40.
Exclusion criteria:
• Previous history of shoulder injury/surgery
• Current shoulder pathologies
• Sensitive skin allergies

Outcome Measures:
Glenohumeral Total Arc: The maximum external rotation and maximum internal rotation (approximately 180°).
Glenohumeral Internal Rotation: Shoulders and elbow position starting at 15° abduction and flexion, perpendicular to the ceiling, with maximal internal rotation, palm facing the floor, until scapula begins to rotate or acromion process begins to rise.
Glenohumeral External Rotation: Shoulder and elbow position starting at 90° abduction and flexion, perpendicular to the ceiling with maximal external rotation, palm facing the ceiling, until scapula begins to rotate or acromion process begins to rise.

Perception Questionnaire & ROM:

Kinesio tape (KT) was thought to improve range of motion
Kinesio tape was comfortable
KT was thought to improve pain
KT was thought to improve comfort
A KT Care Instructions Handout was provided
The KT treatment group showed a trend to perform better in self-assessment
Kinesio tape did not have a statistically significant effect on pain or comfort

Table 1: Mean ROM arc measurements for pre and post treatment

<table>
<thead>
<tr>
<th>Day</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>113.4±7.2</td>
<td>77.2±14.2</td>
<td>122.8±16.5</td>
<td>137.6±18.0</td>
</tr>
<tr>
<td>2</td>
<td>106.4±26.2</td>
<td>89.4±21.7</td>
<td>117.7±16.1</td>
<td>121.2±19.1</td>
</tr>
<tr>
<td>3</td>
<td>109.0±15.9</td>
<td>100.8±26.2</td>
<td>127.7±26.3</td>
<td>137.9±26.7</td>
</tr>
</tbody>
</table>

No significant differences between groups for day 1 and day 4

Figure 1. Anterior KT View

Figure 2. Posterior KT View

No significant differences between groups for day 4

Table 2: Mean questionnaire scores for IR & ER

<table>
<thead>
<tr>
<th>Gender</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>3.7±0.5</td>
</tr>
<tr>
<td>Women</td>
<td>3.7±0.5</td>
</tr>
</tbody>
</table>

Correlations from the KT treatment group indicated a poor and insignificant relationship between the mean questionnaire score and IR & ER

Conclusion
• Females displayed a significant increase after KT treatment and returned to normal after KT removal.
• KT may have some beneficial properties while on the patient, but there were no total glenohumeral arc gains after KT removal.
• Although KT use for ROM may not be effective in healthy participants, KT effect on blood flow and pain, which may be the basis for increases in ROM on unhealthy shoulders.