

# The Effect of Kinesio Tape on Scapular Kinematics in Collegiate Baseball Players

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## Background/Introduction<sup>1-3</sup>

- Baseball is a repetitive overhead sport requiring coordinated shoulder movements with great speed and power, placing a high amount of stress on the shoulder complex
- Baseball players' throwing shoulders demonstrate altered scapular kinematics compared to their non-throwing shoulder
- We hypothesize that kinesio tape application will significantly alter the scapular kinematics of the throwing shoulder in collegiate baseball players

## Participants

- 15 current or former Division 2 and 3 collegiate baseball players from Concordia-St. Paul and Hamline University
- *Inclusion Criteria:* Subjects had played collegiately within the last 5 years
- *Exclusion Criteria:* extrinsic conditions or underlying pathology that affects the kinematics of the scapula, recent surgery, referred symptoms, or allergy to adhesive

## Methods/Study Design

- Kinesio tape was applied to the dominant throwing shoulder
- 3D motion of the humerus and scapula were measured using the G4 electromagnetic motion capture system and MotionMonitor software
- Shoulder flexion, abduction, and scapular plane elevation were performed on the dominant arm with then without tape, then once again on the nondominant arm without tape
- Repeated-measures ANOVA and matched paired t-tests

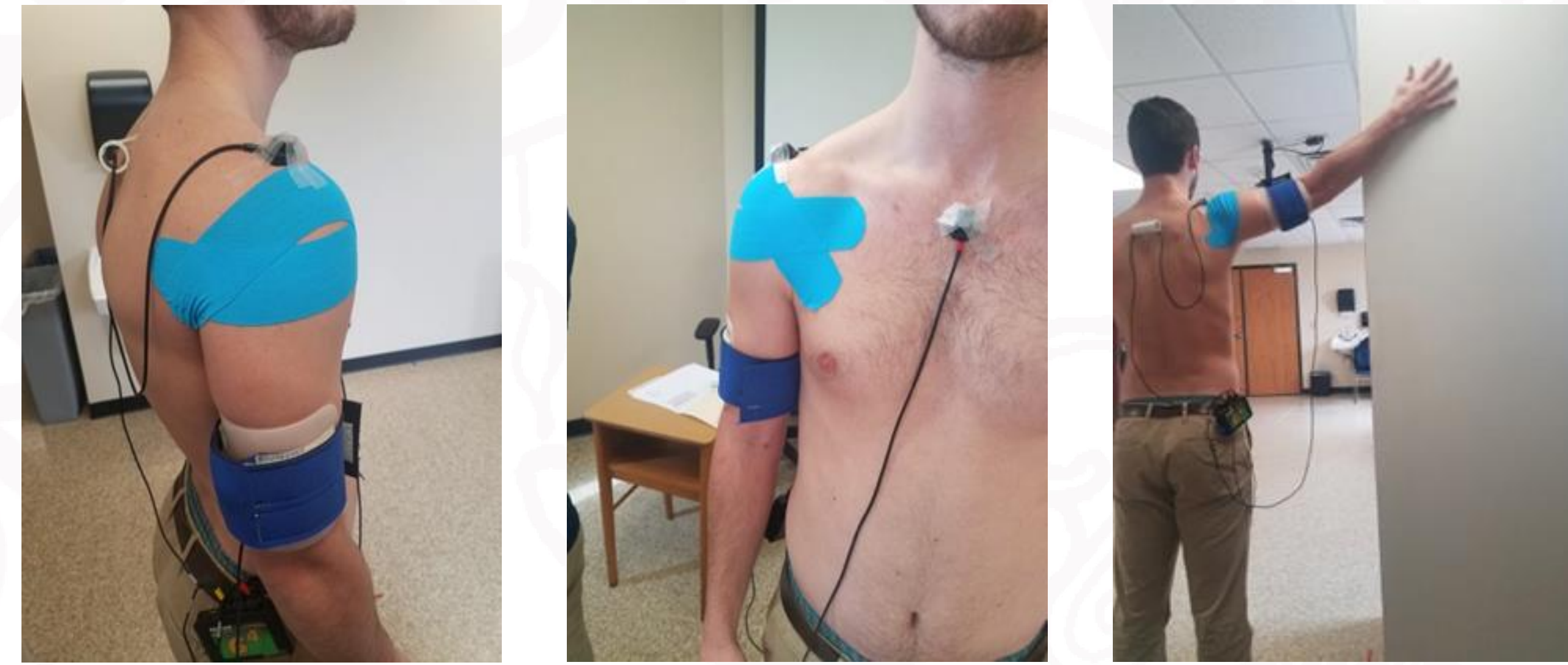


Figure 1: Experimental Setup

## Results

- Fifteen collegiate Division 2 and Division 3 baseball players participated, 12 of which were right hand dominant. Ages ranged from 18-24 an average of 20.9±1.8. No participants were excluded.
- During humerothoracic elevation in the scapular plane, there were no significant differences in scapular motion ( $F = 2.744$ ;  $p=.082$ ). During humerothoracic abduction, dominant arm with KT was statistically significant for change in posterior tilting ( $F=5.939$ ;  $p=.007$ ) (Table 1).
- The results of the matched pairs *t* tests demonstrated that Dominant KT was statistically significant from Dominant No-KT ( $t=-4.656$ ,  $p<.05$ ) and non-dominant (Table 2). This indicated that Dominant KT resulted in increased posterior tilting.

Table 1: Change in Scapular Motion

Arm Motion	Scapular Motion	Average Change - Dominant (degrees ± standard deviation)	Average Change - Dominant Taped (degrees ± standard deviation)	Average Change - Non-Dominant (degrees ± standard deviation)	Difference between planes (degrees)
Abduction	Posterior Tilt	9.105 ± 1.066	12.493 ± 1.262	9.346 ± 1.178	3.39*
	Upward Rotation	18.007 ± 1.861	15.764 ± 1.62	18.356 ± 2.051	2.59
Scaption	Posterior Tilt	4.224 ± 4.346	5.791 ± 4.357	3.876 ± 4.31	1.92
	Upward Rotation	19.145 ± 6.467	17.073 ± 6.721	20.39 ± 6.493	3.32*
Flexion	Posterior Tilt	2.463 ± 5.524	4.34 ± 5.346	2.526 ± 4.609	1.88
	Upward Rotation	20.957 ± 6.506	19.323 ± 6.007	20.437 ± 8.084	1.63

\* denotes analyzed data

Table 2: Paired T-Tests of Change in Scapular Posterior Tilt with Abduction

Comparison	Change (degrees)	p-value
Dominant Taped vs. Dominant	3.389	< .001*
Non-Dominant vs. Dominant	0.241	.849
Non-Dominant vs. Dominant Taped	3.148	.024*

\* denotes statistical significance ( $p < 0.05$ )

## Conclusion/ Recommendations

- KT application resulted in increased scapular posterior tilting of the throwing shoulder during abduction
- Increased upward rotation and posterior tilting contributes to increased subacromial space<sup>4</sup>
- Future recommendations would include further research on symptomatic baseball players

## Clinical Relevance to Physical Therapy Profession and Practice

- The use of kinesio tape is a potential avenue to decreasing shoulder pain in collegiate baseball players based on the loss of posterior tilting associated with subacromial impingement

## References

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