

## **Title: Injury Prevention of the Rotator Cuff in Archery**

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**Abstract:** Rotator cuff injuries are among the most common and critical injuries faced by archers, especially in the drawing arm. This paper explores the alignment and movement of the draw side scapula, particularly the importance of maintaining scapular retraction toward the spine as emphasized in the KSL Back Tension technique. Through references to *Total Archery*, *Total Archery: Inside the Archer*, *Biomechanics of Sport and Exercise*, and *Clinical Orthopaedic Rehabilitation*, this study proposes strategies for injury prevention and technical enhancement.

1.     **Introduction** Modern archery requires repetitive and precise movement, making the shoulder joint highly vulnerable to injury. The rotator cuff, a key stabilizer of the shoulder, is especially susceptible to inflammation, tearing, and chronic pain due to improper mechanics and overuse.
2.     **Importance of Scapular Alignment** Proper retraction of the drawing-side scapula toward the spine is essential. According to the KSL Shot Cycle and Back Tension method, the scapula should rotate medially and anchor toward the spine during the setup and holding phases. This alignment ensures the draw elbow is in line with the arrow and reduces stress on the rotator cuff.
3.     **The Principle of KSL Back Tension** The KSL Back Tension technique emphasizes intrinsic movement through scapular engagement rather than external shoulder muscle activation. This not only promotes consistency in shooting but also minimizes unnecessary strain on the shoulder joint. In this movement, the rotator cuff serves a stabilizing function rather than a force-generating one, reducing injury risk.
4.     **Mechanisms of Injury Due to Faulty Mechanics** When the scapula flares outward or fails to retract, the drawing elbow drops below the arrow line. This leads to abnormal angles and imbalanced loads on the shoulder, significantly increasing stress on the rotator cuff. Repetitive stress from poor alignment is a leading cause of overuse injuries in archers.

5. Preventive Training Strategies The following strategies are recommended for preventing rotator cuff injuries:

Strategy	Description
Scapular stability exercises	Strengthen surrounding muscles to support scapular alignment
Use of shot training tools	Utilize devices like the KSL Shot Trainer for repetitive training
Slow-motion video analysis	Identify and correct alignment issues
Scapular awareness during setup	Develop proprioception for proper scapular position

6 Conclusion Injury prevention in archery must be grounded in biomechanical precision. Scapular alignment, as emphasized in the KSL Back Tension method, is not only key to performance but also essential for protecting the shoulder joint. Coaches and athletes must adopt scapula-focused training to support long-term performance and health.

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#### References:

- Kisik Lee & Tyler Benner, *Total Archery: Inside the Archer*
- Kisik Lee, *Total Archery*
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- Case observations from KSL International Archery Academy