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## Swimmers' Upper Trapezius Activation During Shoulder Abduction Compared to Non-Overhead Athletes

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# KENDRA GRAHAM (Kinesiology)

## Swimmers' upper trapezius activation during shoulder abduction compared to non-overhead athletes

Sponsor: Susan D'Andrea (Kinesiology)

Overhead sports such as baseball, tennis, volleyball, softball and swimming are known to cause rotator cuff imbalances and injuries. These injuries are typically caused by the repeated use of "throwing motion," where the humerus is externally rotated and shoulder abducted and elevated. Previous research has shown that the function of the upper trapezius muscle in overhead athletes is likely to have improper activation (timing, magnitude) during various shoulder motions and/or activities of daily living. Swimmers are especially susceptible to this improper activation due to the use of their upper limbs in a repeated throwing motion. The added resistance of the water during the catch of the stroke intensifies the risk of muscular dysfunction. Unfortunately, research is limited surrounding muscular activation in these athletes and it is unclear how the rigor of swimming affects long-term muscular function. Understanding the muscular function in swimmers will aid not only athletes in better understanding their body, but also coaches and athletic trainers in creating the most effective training programs and injury prevention protocols. Therefore, the purpose of this study is to assess swimming's effect on the upper trapezius activation of these athletes. Shoulder abduction, or shoulder "fly," exercises were performed at a pre-selected and self-selected weight. Surface electromyography sensors were attached to the participant's upper trapezius, bilaterally, in order to measure muscular activation levels. Additionally, motion capture technology was utilized to quantify shoulder and arm position. The results of this study will add to the limited body of knowledge surrounding the competitive swimming and, hopefully, assist exercise professionals and athletes alike in understanding swimming's effects on muscular activation.