

**A Comparison of Lower Trapezius and Serratus Anterior Muscle Activation Patterns During Upper Extremity Forward Flexion in Younger and Older Adults.**  
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**BACKGROUND:** Muscle changes associated with aging include decreased muscle mass and strength. These changes could lead to alterations in recruitment patterns of the muscle groups that control upper extremity forward flexion. **PURPOSE:** To compare motor recruitment patterns of scapular muscles between younger and older individuals. We hypothesize that older individuals will need to recruit more motor units for upper extremity forward flexion, compared to younger subjects, as evidenced by a higher percent of the maximal voluntary isometric contraction (MVIC). **SUBJECTS:** Forty subjects of convenience participated in this research study. The younger adult group consisted of 20 male and female subjects ranging from 20-30 years of age. The older adult group consisted of 20 male and female subjects ranging from 60-85 years of age. All subjects completed Shoulder Pain and Disability Index (SPADI) questionnaire prior to participation in the study to ensure that shoulder movement was not limited by pain. A total of 3 older subjects scored 30 or higher on the SPADI questionnaire and were excluded from the study. **METHODS:** Data was collected on all subjects with the Verimed Myoexerciser III system using disposable Blue Sensor surface electrodes. The MVIC was determined for each muscle using the standard manual muscle testing technique per Reese (2005). The subjects were then asked to raise their dominant arm in the direction of forward flexion. Muscle activity was recorded during this motion. Data collected from each muscle was measured and compared between the two age groups. **RESULTS:** The mean percent MVICs were higher in the older adult group for both muscles (mean LT: young= 41.49%, old= 54.50%, and mean SA: young=120.85%, old 152.62%) suggesting a greater percentage of motor units need to be recruited in older subjects compared to younger subjects to complete similar movements. However, there was no significant difference ( $p=.153$ ) in percent MVIC of the lower trapezius or serratus anterior between the younger and older subjects. While the mean percent MVIC was higher for the serratus anterior across both groups (mean SA=136.73% mean LT= 48%), the difference was not statistically significant ( $p=.515$ ). **CONCLUSION:** Results from this study revealed similar patterns of muscle activity in the lower trapezius and serratus anterior during upper extremity forward flexion in younger and older subjects. Limitations of the study include small number of subjects, use of surface EMG, limited EMG activity elicited in the MVIC test position, and a high standard deviation both within and across groups. Recommendations for future studies include exploring recruitment patterns under different load conditions, or in individuals with shoulder pathologies.