

An Electromyography Study of Muscular Endurance during the Posterior Shoulder Endurance TestNeil Evans¹ • Emily Dressler, PhD² • Tim Uhl, PhD¹**16b**¹Rehabilitation Science, University of Kentucky • ²Mackey Cancer Center, University of Kentucky

Background: Posterior shoulder muscle endurance has been cited as a cause of shoulder pain. The posterior shoulder endurance test (PSET) shows promise as a clinical measure of shoulder endurance, but the specific muscles being targeted during the task are unknown.

Purpose/Hypothesis: The purpose of this study was to determine if there is a difference in the median frequency slopes of 5 posterior shoulder muscles during the PSET at 90° and 135°. We hypothesize that there will not be any differences in the median frequencies between the muscles instrumented.

Materials and Methods: A total of 30 female subjects (20±2 years) without a recent history of shoulder pain participated in this study. The posterior deltoid (PD), upper trapezius (UT), middle trapezius (MT), lower trapezius (LT), and infraspinatus (INF) were instrumented with surface electrodes to measure median frequency during the PSET at 90° and 135° abduction. A stand-

ardized external torque of 20Nm was used. There was a 15 minute rest between test positions and the order was randomized. The first 20 seconds of the median frequency slopes were used for statistical analysis, and the time to fatigue was recorded. A fixed effect multi-variable regression model was used to investigate the median frequency slopes while controlling for humeral muscle mass, BMI, and position. Tukey-Kramer was used post-hoc for pair-wise comparisons.

Results/Conclusion: The PD (-0.83±0.31) fatigued at a faster rate in females than the LT (-0.53±0.25) (P=0.0031). All the muscles fatigued during the PSET, but the test fatigues the PD during the first 20 seconds sooner in female subjects. This study demonstrates that primary mover fatigues at the fastest rate and should be the target of interventions to increase posterior shoulder endurance.