Summary: “Dynamic Electromyograhpic Analysis of Trunk Musculature in Professional Golfers”

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#  Watkins, Uppal, Perry, Pink, and Dinsay (1996) conducted a study with the objective of identifying a reproducible pattern of trunk muscle activity during the golf swing. Thirteen right-handed male professional golfers participated in the experiment. Telemetric dynamic surface electromyography (EMG) was obtained from the upper abdominals, lower abdominals, left and right gluteus maximus, left and right erector spinae, and left and right abdominal obliques. EMG is a measure of muscle activity which indicates the timing of muscle activation, and the relative intensity of muscle contraction. Each golfer performed four trials consisting of a single swing. The EMG data were synchronized with motion picture photography.

 The golf swing was divided into five segments: *take away*, *forward swing*, *acceleration*, *early follow-through*, and *late follow-through*. EMG levels were presented as a percentage of maximal manual muscle testing (MMT). The abdominal obliques were active for the entire swing and the right obliques were considerably more active during *acceleration* and *early follow-through*. The upper abdominals, lower abdominals, left erector spinae and left gluteus maximus muscles had similar patterns. Activity increased steadily until peaking at *acceleration* and then declining through to *late follow-through*. The EMG signal of the right erector spinae increased to a peak during *forward swing* and then declined. The right gluteus maximus was relatively inactive with the exception of a peak during *forward swing*. Overall, the greatest activity was shown during *forward swing* and *acceleration*.

 Watkins et al. (1990) claim that professional golfers have reproducible patterns of trunk muscle activity. They concluded that the golf swing produces tremendous stresses on the spine and that trunk muscle strength and coordination are vital to all levels of golfers. They also state the need for trunk strengthening exercises for injured golfers oriented toward balance and coordination.

## References

Watkins, R. G., Uppal, G. S., Perry, J., Pink, M., & Dinsay, J. M. (1996). Dynamic electromyographic analysis of trunk musculature in professional golfers. The American Journal of Sports Medicine, 24, 535-538.