# SURFACE ELECTROMYOGRAPHY REVEALS DIFFERENT RELATIVE ACTIVATION PATTERNS AMONG SOME OF THE EIGHT MUSCLES EMPLOYED WHILE PERFORMING THE KETTLEBELL SNATCH

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## INTRODUCTION

The Kettlebell (KB) is no longer a novel resistance training implement; KBs are now commonly utilized in various strength and conditioning facilities across the country. Little empirical research, however, has been done looking at individual activation patterns for various KB exercises. The KB Swing Snatch is a commonly performed exercise.

## METHODS

Fourteen male resistance-trained, but kettlebell naïve, undergraduate subjects completed the Swing Snatch using a self-selected 8-10 RM load. Trial sessions consisted of subjects performing 5 repetitions of the Snatch. EMG was used to assess the muscle activation of the biceps brachii (BB), anterior deltoid (AD), posterior deltoid (PD), erector spinae (ES), vastus lateralis (VL), biceps femoris (BF), contralateral external oblique (EO), and gluteus maximus (GM) during the lift using surface electrodes. The EMG was normalized using maximal voluntary contractions obtained from manual muscle testing. This was a cross-sectional study where the subjects were measured one time in order that eight individual muscle activation patterns could be compared.

## PURPOSE

This study was designed to look at the individual relative contributions of select upper, lower, and core muscles during the KB Swing Snatch.

## RESULTS

$\alpha$ was set at 0.05 and a Bonferroni correction was employed. Repeated measures ANOVA on mean EMG data revealed a difference between the muscle activation patterns for the Snatch ($F_{7,91}$=3.084; p=0.006). Subsequent pairwise comparisons revealed the muscle activation of the AD (47.12 ± 20.95%) and BF (45.24 ± 21.65%) were greater than the EO (20.71 ± 7.72%). There were no significant differences for PD, BB, ES, VL, and GM..

## Practical Applications

Our data confirm that the KB Snatch is a whole-body exercise and that the muscles of the anterior shoulder and the lateral aspect of the hamstring group may be especially challenged.

## PICTURES
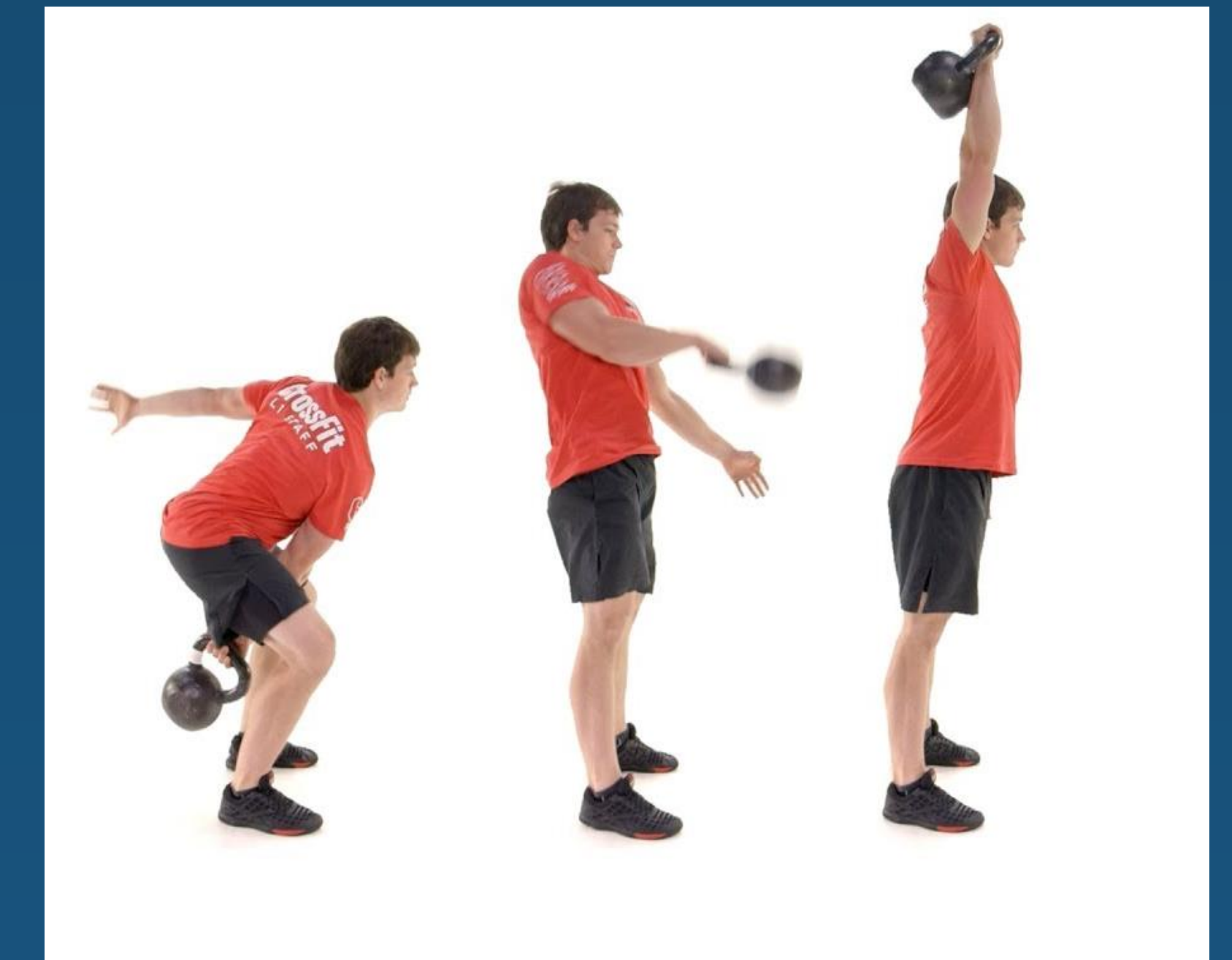




## CONCLUSIONS

The KB Swing Snatch is an excellent exercise that simultaneously challenges various muscles with an emphasis on the AD & BF.