

Running head: PAP and 40-yard sprint performance. THE EFFECT OF POST-ACTIVATION POTENTIATION ON SUBSEQUENT 40-YARD SPRINT PERFORMANCE IN HIGH SCHOOL FOOTBALL ATHLETES IN NORTH AMERICA

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(Received October 30, 2021, accepted November 7, 2021)

ABSTRACT

The aim of this study was to evaluate the post-activation potentiation (PAP) effects following weighted sled pulls on standard unloaded 40-yard sprint time in high school football athletes. Twenty-two male athletes (Ages $16.0 \pm .68$ yrs.) were randomized to control (CON) or intervention (PAP) groups and performed a counterbalanced crossover study to evaluate PAP differences. Subjects were grouped according to the skill required for the position they played during a competitive season, mid-skill, and skill. The subjects performed a dynamic warmup followed by four weighted sled pulls (PAP) or moderate jogging (CON) and then performed two 40-yard dash sprints of maximal anaerobic power. Subjects completed control and experimental trials 7-days apart. Repeated measure ANOVA were used to investigate within and between subject differences. When separated by group classifications, a statistically significant difference between mean sprint times for mid-skill and skill was observed at all time points ($p > .001$), but no significant interaction effect for time was observed between groups ($p = .237$). However, whole group responses to PAP yielded a statistically significant time effect over the duration of the study ($p = .001$) and post hoc comparisons revealed statistically significant differences between sprint trial 2_{CON} ($5.38 \pm .418$) and 1_{PAP} ($5.31 \pm .435$), and 2_{PAP} ($5.29 \pm .446$), $p > .001$. We conclude weighted sled preload stimulus coupled with adequate rest recovery enhances acute sprint performance and may contribute to improved speed development training.