

Effects of a Horizontal Bound Post Activation Potentiation Strategy on Sprint Performance in Youth Males

Devin Stephenson & Peter Maulder

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What is Post Activation Potentiation (PAP)?

Post Activation Potentiation (PAP) is an acute enhancement in muscular performance / function as a direct result of its contractile history.

PAP is a strategy implemented in

1. Warmups prior to training to maximise a training stimulus
2. Competition to give athlete's an "edge" over their opponents.

The PAP conundrum

The most common intervention utilised to induce a PAP response is that of near maximal effort heavy resistance loading (HRL).

It has been extensively reported that HRL in the form of resistance exercises such as squats induces positive PAP enhancements of 1.6-2.9% in 10m sprint running performance 4 to 6 minutes post exercise.

Whilst these findings are positive the HRL strategy has limited use in many competitive environments due to equipment logistics.

A growing body of research suggests that low-load ballistic exercises such as high intensity jumping may also provide an effective PAP stimulus, but in a more logistically viable manner for competition environments.

Methods

A two trial (control and Single leg bounding protocol) repeated measure design across two separate days with a minimum of 48 hours and maximum of 7 days permitted between each trial was utilised.

Ten youth males (aged 17 ± 1 year; mass 82.7 ± 11.1 kg; height 182.1 ± 5.6 cm) participated in this study. Participants were free of injury, healthy and were involved with 1st XV level rugby. Participants had 1 to 3 years or regularly supervised strength training experience.

The performance element for this research was measured as 20m sprint time with a 10m split from wireless timing lights. Sprint time (s) was then converted to a velocity (m/s) metric.

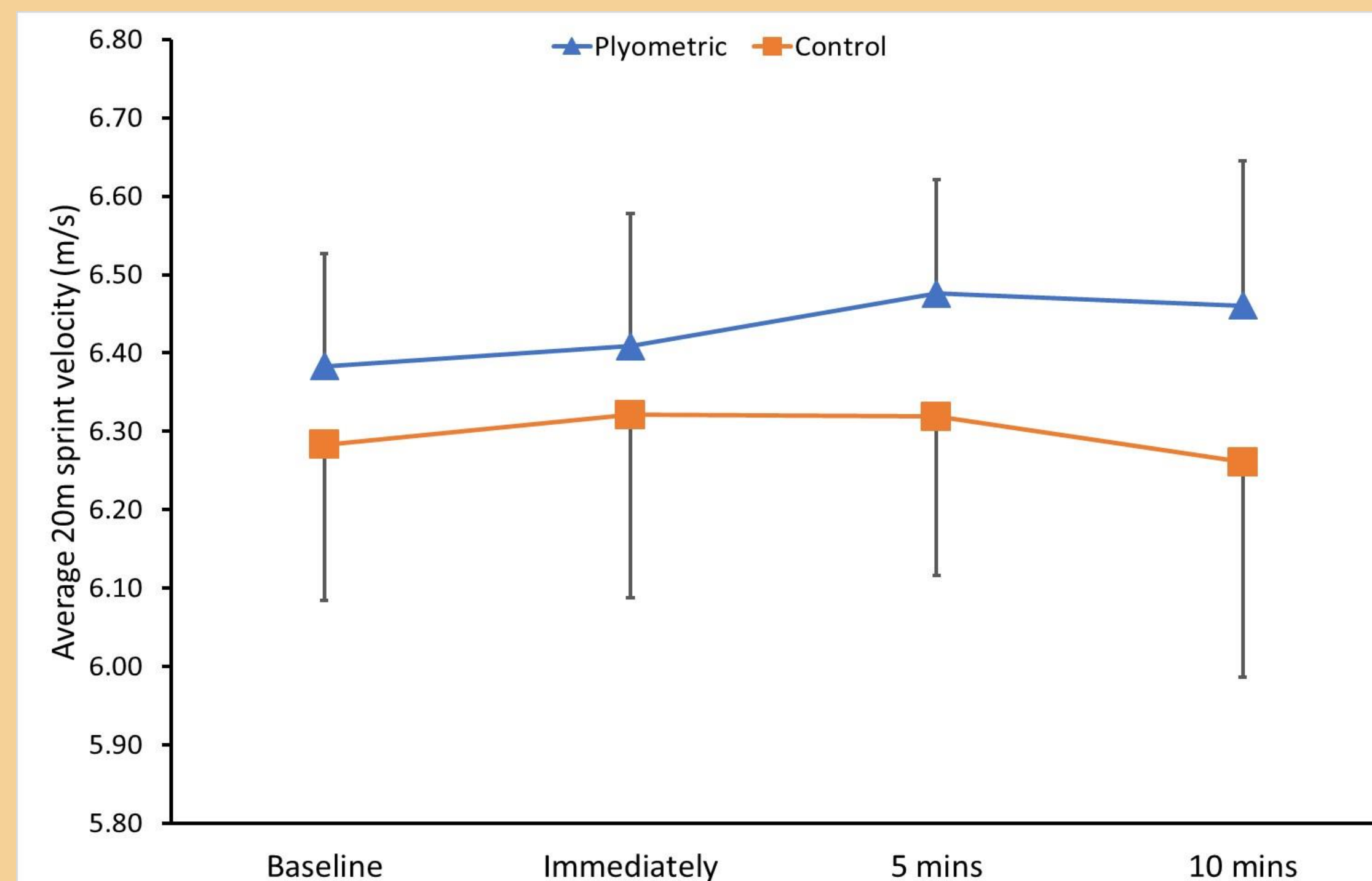
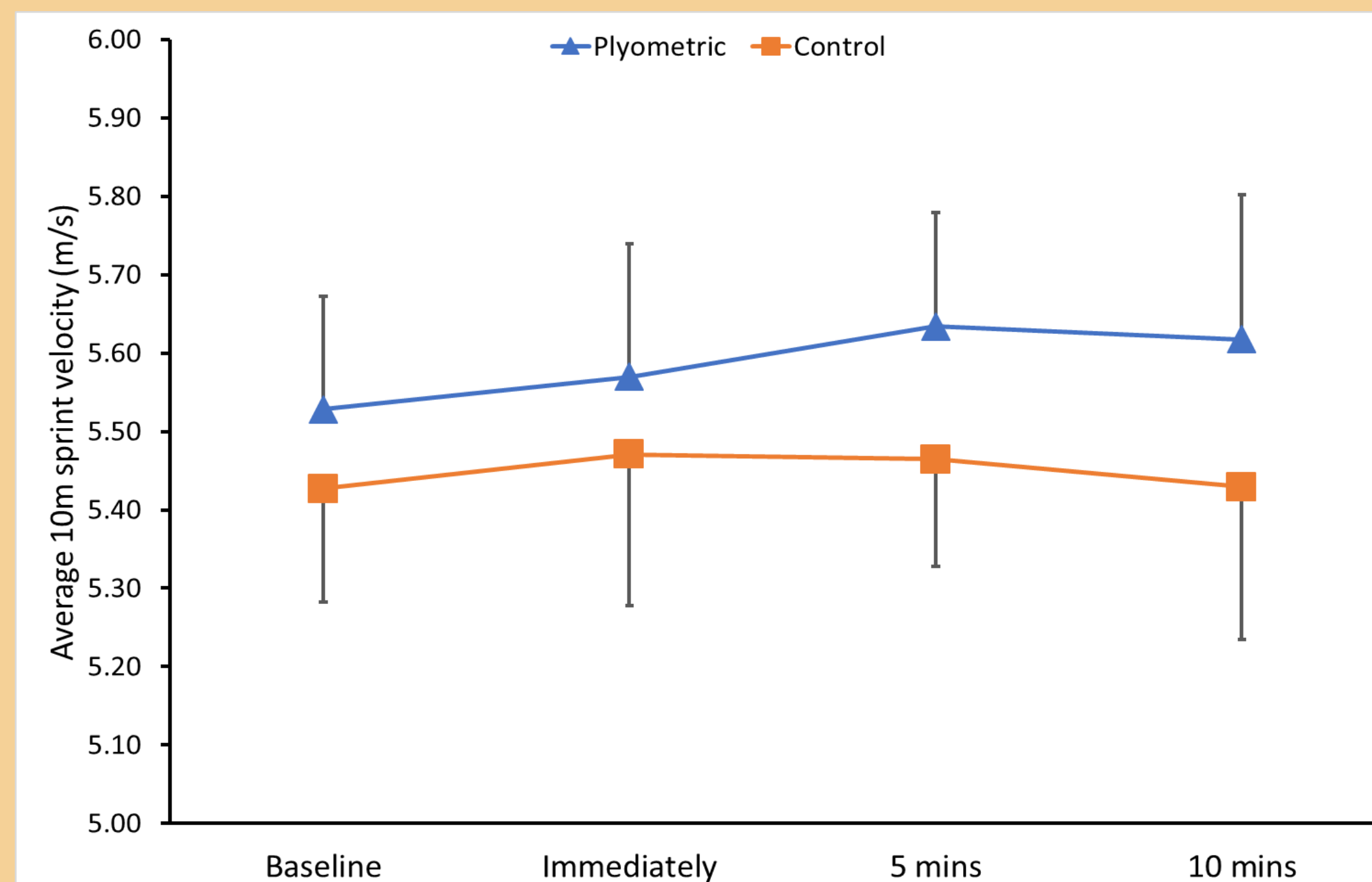
Participants completed one (1) maximum effort 20m sprint followed by a 6 minute rest period.

A 90 second control or intervention was performed followed by retesting of the 20m sprint protocol immediately, 5 minutes and 10 minutes post trial scenario. Passive standing rest was allowed between all 20m sprints.

Dependant on trial the 'control' involved 90 seconds of passive standing rest, whereas, the 'single leg bounding protocol' required participants to complete a maximal effort single leg bounding jump protocol consisting of 3 sets of 3 repetitions per leg alternating legs with 30 seconds passive standing rest between sets and no rest between repetitions.

Research Purpose

This study investigated the acute effects of single leg bounding as a pre-conditioning contraction PAP enhancer on sprint running performance



Main Findings

Performing 3 sets of 3 reps per leg alternating bounds provides a Post activation Potentiation acute enhancement on 10m and 20m sprint performance 5 minutes post bounding for youth males

Specifically:

A 1.9%, $\pm 1.1\%$ increase in 10m sprint velocity is likely

A 1.4%, $\pm 1.3\%$ increase in 20m sprint velocity is likely

Residual enhancements in sprint velocity are still present 10 minutes post bounding

