

# ACUTE SKELETAL MUSCLE HEMODYNAMIC RESPONSE TO A SINGLE PERCUSSIVE THERAPY APPLICATION



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## BACKGROUND

Percussive Therapy is a recently popularized technique that involves the application of percussive massage through a mechanical device with a similar form factor as a jigsaw. The Theragun G3 Pro (Theragun, Los Angeles, CA, USA) is an example of such device (Figure 1). In practice, users often apply percussive therapy as part of a pre-exercise warm up routine in efforts to “prime” the muscle for subsequent activity. A warm-up is in part intended to increase arterial blood flow and therefore, oxygen supply to the muscles involved in the subsequent exercise bout. However, to our knowledge, there is no evidence concerning the impact of a percussive therapy treatment on muscle hemodynamics and oxygenation. **PURPOSE:** The purpose of this study was to examine the acute effects of a single percussive therapy treatment on lower body muscle hemodynamics and oxygenation as measured by near infrared spectroscopy (NIRS).

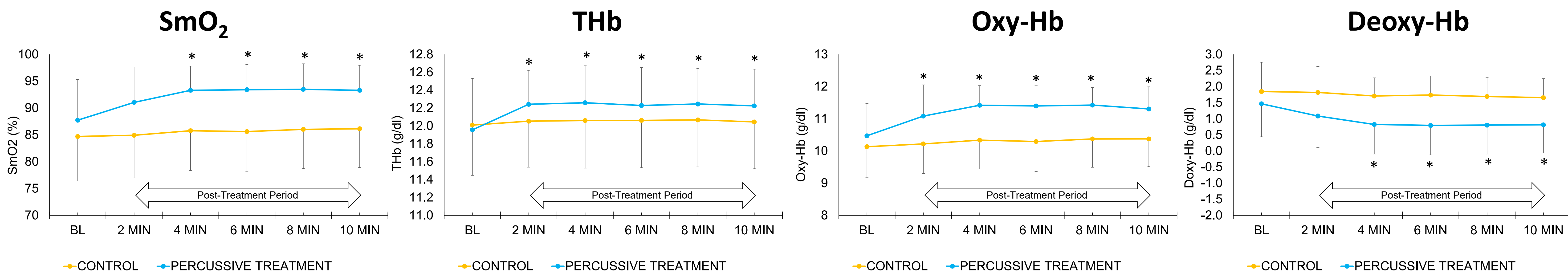
## METHODS

Participants received a 5-minute percussive therapy application using the Theragun G3 Pro (Figure 1) on the quadriceps of their dominant leg after 10 minutes of rest. Skeletal muscle oxygen saturation ( $SmO_2$ ), Total Hemoglobin (THb), oxy-hemoglobin (Oxy-Hb) and deoxy-hemoglobin (Deoxy-Hb) were measured for 5 minutes prior to and for 10 minutes following the percussive therapy application (PT) using near infrared spectroscopy (NIRS)-based muscle oximeters. Concurrent measurements on the contralateral quadriceps were administered serving as the control (CON).



**Figure 1:**  
**Theragun G3Pro**

## RESULTS



There was a significant time x condition interaction for all dependent variables ( $p < 0.0001$ ). The PT condition resulted in a significant increase in  $SmO_2$  from baseline at the 4-, 6-, 8-, and 10-minute post-treatment time points ( $p < 0.003$ ). There was no change in  $SmO_2$  during the control condition. For the PT condition, THb and Oxy-Hb was significantly elevated at all post-treatment time points vs. baseline ( $p < 0.009$ ) while unaltered during the control condition. Lastly, Deoxy-Hb was significantly lower than baseline at the 4-, 6-, 8-, and 10-minute post-treatment time points during the PT condition while no change was demonstrated during the control condition ( $p < 0.003$ ).

## CONCLUSION

A single 5-minute percussive therapy treatment via the Theragun G3Pro acutely impacted skeletal muscle hemodynamics.  $SmO_2$  levels were improved up to 10 minutes post-treatment. These effects were accompanied by an increase in THb, and the rise in Oxy-Hb was disproportionate to the decrease in Deoxy-Hb. Together this may be indicative of increased muscle blood volume and muscle oxygen consumption.

• Hohenauer, E, Deflorin, C, Clijisen, R. Physiological change after Theragun treatment. THIM 2018