

## THE EFFECT OF COMPRESSION TIGHTS AND DURATION OF TESTING ON CONTINUOUS JUMPING MECHANICAL POWER

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**KEY WORDS:** compression tights, conditioning wear, performance enhancement.

**INTRODUCTION:** In order to improve their performance, athletes seek advancements in technology, such as clothing. Manufacturers of compression tights, advertise that their product adds support to lower extremity musculature, thus may slow the onset of fatigue. Few scientific studies, however, have been conducted to identify how advancements in apparel influence an athlete's performance (Kraemer et al., 1996). The purpose of the present study was to identify the effects of compression tights on mechanical power for continuous jumping. Secondly, the effect of duration on the mechanical power output by using Bosco's method (1983) over 15, 30, 45, and 60 sec time-frames, as well as the interaction between apparel and duration.

**METHOD:** Thirteen females, who were part of a larger study, performed a 60-s, continuous jumping test after a sufficient warm-up. Mechanical power was calculated in accordance with the procedures of Bosco et al. (1983). A 3X4 mixed-design, repeated measures ANOVA examined the effects of apparel condition (two tights: one has extra material to support muscles, & loose shorts) and calculation duration (15s, 30s, 45s, & 60s) on mechanical power output.

**RESULTS:** No main effect was found for apparel condition, a main effect was found for duration, and no interaction effect was identified (see Table 1). As expected, power output decreased with increasing duration (Bosco et al., 1983; Sands et al., 2004).

**Table 1 Mean mechanical power ( $\pm$ SD) for each condition (expressed in W/kg)**

	15-s	30-s	45-s	60-s
Tights 1	11.49 $\pm$ 1.84	10.95 $\pm$ 1.62	10.45 $\pm$ 1.43	9.97 $\pm$ 1.27
Tights 2	11.19 $\pm$ 2.02	10.56 $\pm$ 1.80	10.10 $\pm$ 1.50	9.68 $\pm$ 1.35
Shorts	11.03 $\pm$ 2.22	10.53 $\pm$ 2.02	9.95 $\pm$ 1.72	9.59 $\pm$ 1.51

**DISCUSSION & CONCLUSION:** The results do not support claims made by some apparel manufacturers, but these claims may be aimed at gentle activities, where lower extremity actions are gentler than those seen in maximal jumping. The repeatability of Bosco's mechanical power measure is encouraging, given the lack of a statistical interaction shown in the present study. Neither compression tights nor duration had an influence on the mechanical power of continuous jumping. A 15-s duration appears sufficient for this measure of power and may be used with confidence rather than the more strenuous 60-s duration.

### REFERENCES:

- Bosco, C. et al. (1983). A simple method for measurement of mechanical power in jumping. *European Journal of Applied Physiology*, 50, 273-282.
- Kraemer, W. J. et al. (1996). Influence of Compression Garments on Vertical Jump Performance in NCAA Division I Volleyball Players. *Journal of Strength & Conditioning Research*, 10, 180-183.
- Sands, W. A., et al. (2004). Comparison of the Wingate and Bosco anaerobic tests. *Journal of Strength & Conditioning Research*, 18, 810-815.