

## EFFECTS OF A NEUROMUSCULAR DENTISTRY-DESIGNED MOUTHGUARD ON MUSCULAR ENDURANCE AND ANAEROBIC POWER

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A mouthguard is an often overlooked piece of equipment that athletes in many sports are required to wear due to the protective elements. However, recent advances in neuromuscular dentistry have led to the development of a mouthguard touted to also enhance performance through optimal jaw alignment. **PURPOSE:** To examine the effects of a neuromuscular dentistry-based mouthguard on muscular endurance and anaerobic power and capacity in competitive athletes. **METHODS:** Anaerobically-trained professional and Division I college athletes ( $N=22$ ;  $M_{\text{weight}} = 86.2 \pm 3.1$  kg) participated in this blinded, crossover design study. Subjects were randomly assigned to order of use of either the experimental (EXP) or traditional custom-fit (CON) mouthguards, which were matched for appearance and material. Subjects first completed a fitting session coupled with a familiarization session to control for practice effects on the anaerobic tests. Fitting for EXP involved 60 min of electrical stimulation to produce lower jaw relaxation. Two separate testing sessions, approximately 7 days apart, followed the initial session. During each condition, participants completed three different performance tests: vertical jump (VJ), bench press with a load equal to bodyweight for maximal repetitions (BP), and a 30s Wingate Anaerobic Test (WAnT). Subjects refrained from training for 24 h prior to each testing session. RM ANOVAs were used for statistical analysis. **RESULTS:** VJ was significantly higher for EXP (EXP =  $67.6 \pm 2.0$  cm; CON =  $65.3 \pm 1.8$  cm;  $P = .003$ ). BP repetitions were not significantly different between conditions (EXP =  $16.1 \pm 1.1$  reps; CON:  $15.8 \pm 1.2$  reps;  $P = .48$ ). Peak power on the WAnT was significantly greater while wearing EXP (EXP =  $11.6 \pm 0.4$  W·kg<sup>-1</sup>; CON =  $11.1 \pm 0.3$  W·kg<sup>-1</sup>;  $P = .038$ ). There were no significant differences in average power during the WAnT (EXP =  $8.5 \pm 0.3$  W·kg<sup>-1</sup>; CON =  $8.4 \pm 0.2$  W·kg<sup>-1</sup>;  $P = .54$ ). **CONCLUSIONS :** A neuromuscular dentistry-based mouthguard appears to enhance peak power output and performance in explosive, short duration bouts of exercise. However, it does not appear to enhance sustainable power output or muscular endurance. There may be some practical value for athletes in power sports.