

## **Genioglossus Stimulation via a Mouthpiece and Effect on Respiratory Rate During Steady State Exercise**

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**Abstract:** Research has cited decreases in respiratory rate (RR) with mouthpiece (MP) use during exercise. Theories suggest that this lowering of RR is due to placement of the mandible and/or tongue, elicited by the design of the MP on the user. Thus, the purpose was to assess the effect of a MP which has been customized to stimulate the genioglossus and determine its effect on RR in subjects during steady state running. Current data includes 6 aerobically fit subjects (4=M, 2=F) of varying ages (19-22). Subjects were fitted with a custom lower MP that stimulated the genioglossus, resulting in placement of the tongue on the mouth floor during exercise. Subjects performed a 5 minute warm up, a 3 minute walk, a steady state run of 10 minutes at 65% of heart rate maximum, a 5 minute cool down, another steady state run of 10 minutes and a final 5 minute cool down while wearing a mask that was connected to the metabolic cart. RR was assessed between conditions while subjects breathed through their mouths, with noses pinched. Results found significant decreases in RR with MP vs no MP use (MP = 24.70 BPM, No MP 27.98 BPM, 10 minute). The importance of mandibular placement has been cited as a key role in the opening of the pharyngeal area, thereby enhancing breathing mechanics. Research has identified that the placement of the genioglossus can lower breathing rate. Thus, initial results from this study suggest the genioglossus MP lowers RR during steady state running.