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Clinical Information

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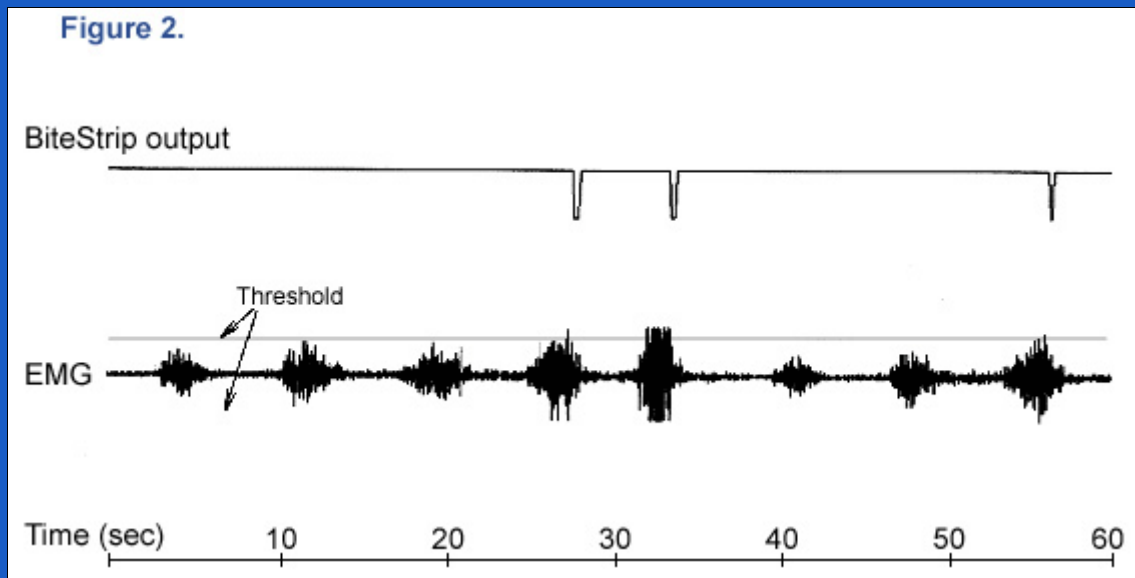
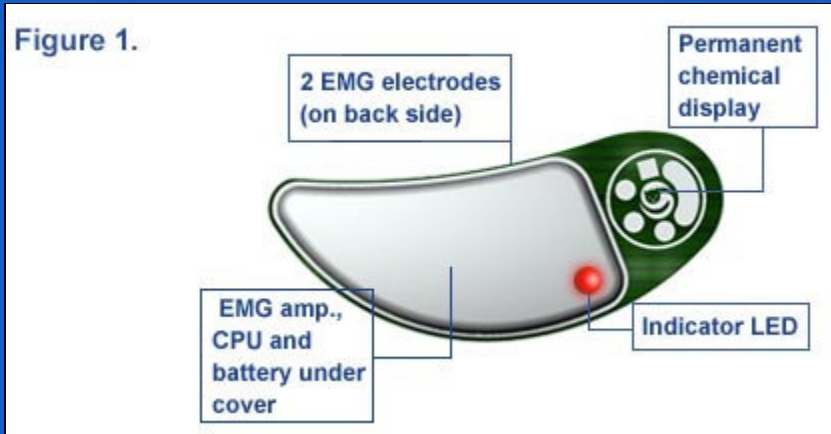
Introduction: Sleep Bruxism is characterized by the involuntary grinding and clenching of teeth during sleep. Symptoms include tooth wear, temporomandibular joint (TMJ) dysfunction, chewing difficulties, headaches and daytime sleepiness. Based on a large survey, the prevalence of bruxism in the adult population is estimated at 8% (1), however, as many individuals may be unaware of this condition, the prevalence is most likely to be higher. Bruxism is diagnosed based on clinical examination of the teeth, complaints of jaw and masticatory pain, and reports by the bed partner of the grinding noise. Patients suspected of bruxism are not routinely referred to the sleep laboratory. Thus, clinical and experimental data is scarce, and there is no widely accepted "gold standard" for a definitive, objective diagnosis. We present a novel home monitoring device for the detection of bruxism.

Methods: The BiteStrip is a miniature single-use electronic device designed as a front line screener for bruxism (figure 1). It is comprised of three EMG electrodes and an amplifier to acquire masticatory muscle signals, a CPU with real time software, which detects and analyses EMG patterns, a permanent chemical display which presents the outcome in the morning, a light emitting diode (LED) and a lithium battery. All elements are integrated on a single flexible substrate. At bedtime, patients are instructed to attach the device to the cheek over the mandible, to activate it and to perform a series of maximal strength clenching and grinding activities, in order to establish an individual threshold for the nighttime monitoring. The device must be worn for at least 3 hours of sleep. In the morning, patients deactivate the device, and wait for approximately 20 minutes for the bruxism index (number of bruxing events per hour of recording) to be displayed. We present the preliminary testing of the device with comparison to masticatory muscle EMG recorded concomitantly on either cheek in the sleep laboratory.

Results: Figure 2 displays a segment of the recordings. Output of the BiteStrip is displayed above the masticatory muscle EMG. Note that the BiteStrip detects only those EMG bursts, which exceed the individually predetermined threshold.

Conclusions: The BiteStrip is a viable, promising device for the detection of bruxism. Further testing and validation on a large population of bruxers is underway.

References: Lavigne, G.J. and Montplaisir, J.Y. Restless legs syndrome and sleep bruxism: prevalence and association among Canadians. Sleep 1994; 17(8):739-43.



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