

WAKE-UP TO BRUXISM

BRUXISM IS GRINDING OR CLENCHING YOUR TEETH.

SLEEP MONITORING AND PERSONALIZED AUDIO FEEDBACK ON YOUR SMARTPHONE

BRUXISM IS COMMON



¹ 80% of **women** with bruxism have associated **TMJ** disorder
Temporo-Mandibular Joint

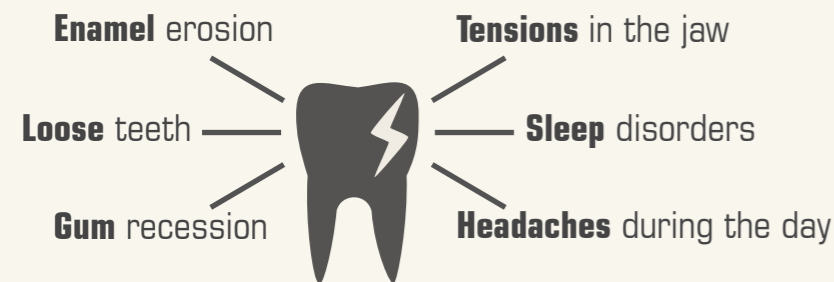


¹ 20% of the **adult** population experience nocturnal bruxism



² 30% of 6 years old **children** experienced nocturnal bruxism

BRUXISM DAMAGES YOUR TEETH

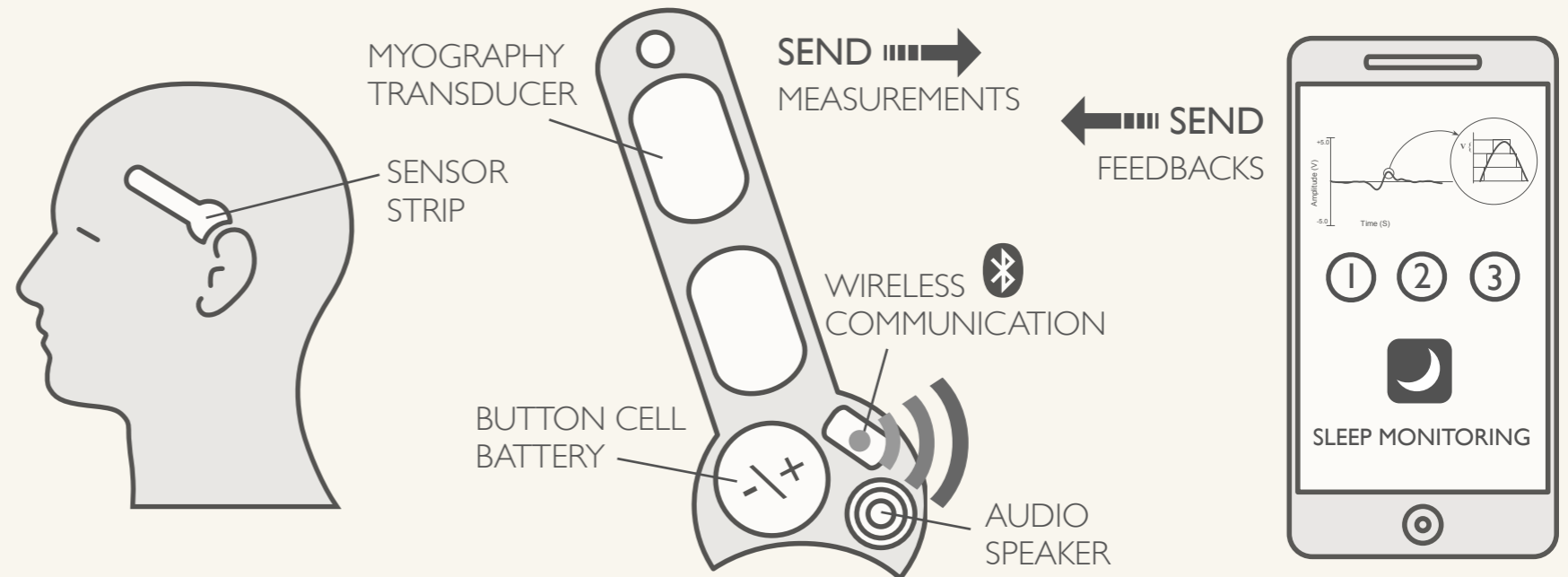


BRUXISM HAS NO TREATMENT

Major **risk factors** before sleep



³ **Being conscious** when bruxism occur is the key to **quitting** this destructive and negative habit.



ELECTROMYOGRAPHY SENSING STRIP ON TEMPORAL MUSCLE

BEHAVIOR AUTO-THERAPY FEEDBACK ALGORITHMS ON SMARTPHONE

RAW SIGNAL ACQUISITION
SENSING MUSCULAR STRAINS



Both normal and bruxism-caused contractions are sent from a simple strip sensor over the temporal muscle.

REAL-TIME SIGNAL PROCESSING
JOURNALING AND REPORTING



Muscle contractions and possibly audio signals are filtered and interpreted for detecting and grading bruxism events.

EXPERT DECISION ALGORITHM
TRIGGERING AUDIO FEEDBACKS



Effective behavior therapy is assisted by adaptive and timely audio feedbacks after significant bruxism events.

[1] Glaros AG., "Incidence of diurnal and nocturnal bruxism." *Journal of Prosthetic Dentistry*, vol. 45, pp. 545-9, 1981 [2] Herrera M., Valencia I., Grant M., Metroka D., Chialastri A., Kothare SV., "Bruxism in children: effect on sleep architecture and daytime cognitive performance and behavior." *Sleep* vol. 29, pp. 1143-8, 2006 [3] Mikami DB., "A review of psychogenic aspects and treatment of bruxism." *Journal of Prosthetic Dentistry*, vol. 37, pp. 411, 1977

WAKE-UP TO BRUXISM

SLEEP MONITORING AND PERSONALIZED AUDIO FEEDBACK ON YOUR SMARTPHONE

Bruxism is the habit of grinding or clenching teeth, often unconsciously at night. 30% of children between five and six year old experienced nocturnal bruxism in their life. The incidence rate is 20% in adults for whom stress and alcohol are important risk factors. It is estimated that over 80% of “clenchers” and “grinders” are unaware of their habit and the problem is often left ignored. Powerful forces are exerted on teeth, gums, and joints. Consequences are sensitive, worn-out, decays, fractures, and loose teeth. Wearing a mouthguard at night is recommended but this does not prevent bruxism and has spurious orthodontic in the long term. **There is a need for being aware of bruxism events for consciously changing this destructive habit; for instance, through behavior auto-therapy.** Previous work tested a biting sensor in the mouth for triggering systematically a wake-up alarm. The number of inappropriate disruptions prevented adoption of the system. A more elaborated and non-invasive solution is using a flexible strip sensor over the temporal muscle, connected to your smartphone for real-time electromyography monitoring, and eventually sending adapted audible feedbacks to the patient in case of severe or frequent bruxism phases. Being conscious when bruxism occur is the key to quitting this destructive and negative habit.