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Inventors

Stephen Lane

Cami Rowan

Alarmel Sira

Kendra Lenz

James Abbas

Contact

Patricia Stepp
pcavines@asu.edu

Non-Invasive Device for Treating Obstructive Sleep Apnea

Obstructive sleep apnea (OSA), a common but dangerous sleep disorder characterized by upper airway obstruction, affects over 12 million people a year in the USA alone. If left untreated, OSA can have serious consequences including high blood pressure, heart rhythm disorders, stroke, diabetes, depression and more. Current treatments for OSA, primarily CPAP machines, are incredibly effective, however, they are expensive, invasive or bulky, prone to user error and uncomfortable. As a result, device compliance for the CPAPs in particular fall below 50% after 1 year.

Researchers at Arizona State University have developed a non-invasive and compact intraoral neurostimulation device that provides therapy to address OSA and treat sleep apnea. The device delivers non-invasive electrical neurostimulation to the motor neurons of the lingual muscles inducing an increase of muscle tone in the tongue, adequately eliminating the blockage and returning normal airflow to the patient. It can also be paired with a respiratory sensor to detect breath rate and occurrence of apnea episodes, such that it can be limited to activation only during apnea episodes to reduce total stimulation time. Further, the device can monitor, record and store data to provide feedback and generate reports for patients as well as physicians.

This novel device provides non-invasive stimulation therapy to address OSA while improving adherence and effectiveness and positively affecting user outcomes.

Potential Applications

- Non-invasive stimulation therapy to address OSA

Benefits and Advantages

- Small, non-invasive and painless
- o Does not cause itching or dry mouth
- Portable – convenient to use daily

- Uses biocompatible materials
- Monitors, records and stores data to provide feedback to patients and physicians
- Easy to set up, operate and maintain/clean
 - o Customizable and programmable settings
 - o Easy and short adjustment period
- Inexpensive – and parts are easy to replace
- Can overpower or bypass nose congestion
- Functions during power outages
- Can survive being dropped
- Durable and long lasting
- When paired with a sensor, total stimulation time can be reduced to an estimated 1-4 minutes for mild to severe OSA cases

For more information about this opportunity, please see

[Lane et al – SBSHE Symposium, page 18 - 2019](#)

For more information about the inventor(s) and their research, please see

[Dr. Abbas' departmental webpage](#)