Drug-Free Method and Device for Promoting Restorative Sleep

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WARF: P06419US

Inventors: Giulio Tononi

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a drug-free method and device for enhancing sleep quality and efficiency in humans.

Overview

According to the National Institutes of Health, more than 50 million people in the United States have difficulty obtaining sufficient, restful sleep. Physicians, emergency and military personnel have only small blocks of time available for sleep. Many of these individuals use prescription sleep aids; however, sleeping pills are generally ineffective at promoting the most restorative, restful stages of sleep and still require an individual to sleep for approximately eight of every 24 hours, which may not always be possible for these individuals. In addition, sleeping pills are difficult to counteract if a person, such as an on-call physician, needs to be roused unexpectedly.

The Invention

A UW-Madison researcher has developed a drug-free method of enhancing sleep quality and efficiency in humans. The method relies on a device that induces or promotes slow-wave activity in the brain of a resting person through targeted transcranial magnetic stimulation (TMS). Low frequency TMS increases slow-wave activity, which is associated with the restorative aspects of sleep.

In addition to the magnetic stimulator, the device includes EEG electrodes for measuring brain waves. The measurements from the EEG trigger the device to stimulate the brain to produce large slow waves. These waves, which are in every respect similar to the largest ones observed spontaneously in the deepest sleep, keep the person in a profound, restorative sleep. When slow waves fall to normal as detected by the EEG, the brain is stimulated again. This process can be repeated for hours to provide the user with a short, but high-quality period of sleep. When it is time for the user to wake, the device can simply be turned off, or it may shut down after a specified period of time.

Applications

- Improving sleep quality for military personnel, commercial airline pilots, on-call doctors and nurses, emergency personnel and other individuals who have only short blocks of time for sleep
- Treating insomnia

Key Benefits

- Provides a controlled, non-pharmacological method for potentially improving the quality of sleep
- Minimizes sleep deprivation symptoms for such individuals
- Increases sleep efficiency, potentially shortening the amount of sleep required, by promoting or inducing the most restful kind of sleep
- Device may be turned off at any time.
- Users report very little grogginess when stimulation is stopped and they wake up.

- Method is non-invasive.
- EEG electrodes coordinate brain stimulation with natural brain activity.
- May mimic or enhance the natural patterns of deep and light sleep
- Can be flexibly used with other forms of neural stimulation
- The FDA is already considering approval of high-frequency TMS for treating depression.

Additional Information

For More Information About the Inventors

- Giulio Tononi

Tech Fields

- Medical Devices : Neurological devices

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846