

# STUDY: Using Cove for One Month Significantly Reduces Stress

## Background

Stress can come from a variety of sources, including work, social responsibilities, and the news. In addition to these external triggers, stress is also linked to events inside the body. A rapid heart rate or growling stomach, for example, can quickly trigger anxiety. The human brain has a special pathway devoted to monitoring the body's internal state; and this process, known as interoception, is deeply entangled with our sense of wellbeing. Indeed, studies suggest that poor interoception may contribute to chronic stress.

In short, when the body feels out of whack, so does the mind. Encouragingly, research shows that certain physical sensations can promote relaxation. A specific kind of light physical contact, known as affective touch, can elicit feelings of calm and social connectedness by interacting with the brain's interoceptive pathway. Building on this research, our scientists set out to create a device that would activate this pathway and reduce stress levels.

## Hypothesis:

We hypothesized that a vibrating device, programmed to generate specific signals, could trigger the brain's affective touch response and decrease stress.

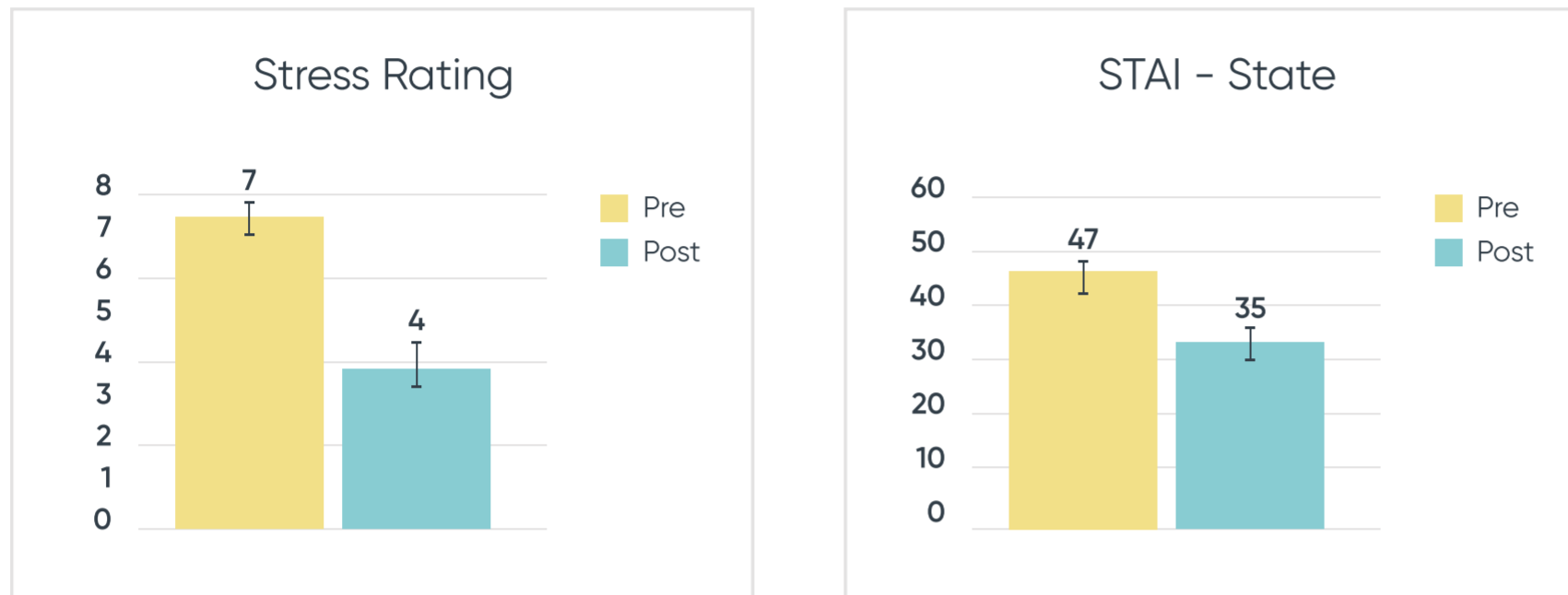
## Methods:

To test our hypothesis, we designed a device that delivers specific light, slow vibrations to the skin just behind the ears. We then invited stressed-out volunteers to test the device for one month. The participants were instructed to use the technology for two 20-minute sessions each day, with the option to add an extra session if they anticipated a stressful event. 17 volunteers, aged 21 to 55, completed the trial.

At the beginning and end of the study, we asked volunteers to rate their stress on a scale of 1 to 10, with 10 indicating the most severe stress. Participants also completed a survey known as the State-Trait Anxiety Inventory, or STAI. This 20-item questionnaire asks participants to rate, on a scale of 1 to 4, how much they relate to statements about anxiety (e.g., "I feel jittery" and "I feel strained"). Answers are then summed to create an STAI score, with higher numbers reflecting greater levels of stress. At the beginning of the study, all participants had STAI scores greater than 39, indicating high stress.

## Results

Participants completed an average of 50 device sessions during the month-long trial. At the beginning of the study, volunteers reported an average stress level of 7 out of 10. By the end, this number decreased to 4, representing a 41% reduction in overall stress. Similarly, the group's average STAI score declined by 24%, from 47 to 35. Participants reported no significant side effects and found the device easy to use.



## Conclusion:

These results indicate that a vibrating device, programmed to generate specific signals, can trigger the brain's affective touch response and reduce stress. These results are consistent with our neuroimaging studies, which show that these same vibrations promote activity in the insula, a critical component of the brain's interoceptive pathway. As such, it is likely that the vibrations reduce stress levels by enhancing interoception.

Though the trial was small, these early results are very promising. Most importantly, participants reported that they benefited from the device, and the group's stress reduction was significant. A larger and more robust clinical trial is currently underway.