

# Neurofeedback reduces pain, increases quality of life for cancer patients suffering from chemotherapy-induced neuropathy

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A new study from The University of Texas MD Anderson Cancer Center evaluating the use of neurofeedback found a decrease in the experience of chronic pain and increase quality of life in patients with neuropathic pain.

The study will be presented at the annual meeting of the American Psychosomatic Society, held March 9-12 in Denver, Colorado.

Study lead investigator Sarah Prinsloo, Ph.D., assistant professor Palliative, Rehabilitation, and Integrative Medicine at MD Anderson, identified the location of [brain activity](#) that contributes to the physical and emotional aspects of [chronic pain](#), which allowed patients to modify their own brain activity through electroencephalogram (EEG) biofeedback. EEG tracks and records brain wave patterns by attaching small metal discs with thin wires on the scalp, and then sending signals to a computer to record the results.

"Chemotherapy-induced peripheral neuropathy is very common in cancer patients and there is currently only one medication approved to treat it. I'm encouraged to see the significant improvements in patient's quality of life after treatment. This treatment is customized to the individual, and is relatively inexpensive, non-invasive and non-addictive." Prinsloo said.

Chronic chemotherapy-induced peripheral neuropathy (CIPN) is a common side effect of chemotherapy, often affecting 71 to 96 percent of patients after a month of chemotherapy treatment. Peripheral neuropathy is a set of symptoms such as [pain](#), burning, tingling and loss of feeling caused by damage to nerves that control the sensations and movements of our arms and legs.

Neuroplasticity is the ability of the brain to form new connections and change existing ones. This study demonstrated that [neurofeedback](#) induces neuroplasticity to modulate brain activity and improve CIPN symptoms.

The study enrolled 71 MD Anderson patients of all cancer types; all were at least 3 months post chemotherapy treatment and reported more than a three on the National Cancer Institute's neuropathy rating scale. Study participants completed assessments that determined the brain activity related to their pain, pain perception and quality of life. Those were then randomized to receive neurofeedback, or to a control group that did not receive treatment. Patients in the neurofeedback group attended 20 sessions of neurofeedback training where they played a computer game that rewarded them when they modified their brainwave activity in the affected area. They then learned to modify the activity without an immediate reward from the game.

After treatment was completed the participants repeated the EEG and assessments to determine changes in [pain perception](#), cancer related symptoms and general quality of life. EEG patterns showed cortical activity characterized by increased activation in the parietal and frontal sites compared to a normal population. After controlling for baseline levels, neurofeedback significantly reduced: pain; numbness; intensity and unpleasantness, and reduced how much pain interfered with daily activities.

After [treatment](#), 73 percent saw improvement in their pain and quality of life. Patients with CIPN also exhibited specific and predictable EEG signatures that changed with neurofeedback.

Prinsloo believes the study results are clinically and statistically significant and provides valuable information that will allow for more understanding of [neuropathic pain](#).

A second study was recently funded and will focus exclusively on breast cancer [patients](#) experiencing neuropathy.

Provided by University of Texas M. D. Anderson Cancer Center

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