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Spinal Cord Stimulation for the Attenuation of Chemotherapy Induced Painful Neuropathy and Increased Chemotherapeutic Efficacy

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Chemotherapy-induced peripheral neuropathy (CIPN) is a common dose-limiting toxicity of cancer treatment that often presents with debilitating pain, yet no effective preventative or treatment strategies exist. This cancer-related pain condition has been estimated to impact 30% of patients at 6 months after their last cancer treatment. The current opioid crisis intensifies the need to develop new cancer pain treatments. While the number of cancer survivors has significantly increased with advancements in modern medicine, survivors are often unable to maintain a functional daily life due to severe pain from CIPN. To improve the quality of life of cancer survivors, this proposal will examine spinal cord stimulation (SCS) as a promising non-pharmacologic strategy for CIPN pain and enhancement of chemo-efficacy. SCS is a minimally invasive device that has been utilized for decades to treat a number of other chronic pain conditions; however, it has not been well studied for cancer-related pain conditions such as CIPN. Through a broad array of neuroscience and cancer research techniques, we will reveal the links between the immune system, CIPN, chemo-efficacy, and SCS. A better understanding of these biological patterns may lead to the development of a new treatment for painful CIPN, optimization of an established pain treatment for a new indication, improved cancer treatment outcomes, and improved quality of life in cancer survivors.