

# PROGRAMMABLE MEDICAL DEVICE FOR PATHOLOGICAL TREMOR REDUCTION

## Problem

Pathological tremor is the most common movement disorder and a defining clinical characteristic of essential tremor and Parkinson's disease. Current estimates suggest that essential tremor affects around 25 million individuals worldwide, while Parkinson's disease is expected to impact more than 12.9 million people globally by 2040.

Despite its high prevalence, current treatments to pathological tremor are often invasive, costly, or insufficiently effective.

## Solution

The proposed electronic wearable arm sleeve is capable of delivering personalized peripheral electrical stimulation and is suitable for home-based use, enabling long-term intervention and monitoring.

This system is a non-invasive solution for reducing pathological tremor in a consistent and safe way that can avoid the side effects of direct brain stimulation and potentiate the effects of peripheral electrical stimulation to reduce tremor to more than a few minutes post stimulation.

Preliminary results showed that tremor reduction observed in response to customized peripheral electrical stimulation in patients with essential tremor is mediated by complementary adaptations at two levels of the nervous system: (i) decreased spinal excitability and (ii) reduced descending tremorigenic drive at the supraspinal level.

## State of the invention

A laboratory prototype is currently available.

## Advantages

- Non-invasive alternative for disabling essential tremor refractory to drug treatment.
- The electrical stimulation applied is adaptive, allowing specific stimulation at the appropriate moment during the tremor phase.
- Acute reduction in tremor amplitude with prolonged effect over time.
- Improvement in the patient's functional motor skills.
- Industrial potential for textile development due to the high prevalence of this disorder.

## Protection

European patent application nº EP25382795.

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