Xcite Mini

An At-Home System for Functional Electrical Stimulation

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What is the Xcite?

Strokes are the world's leading cause of disability as they can cause **paralysis**, usually in the form of **hemiplegia** (**impaired muscle function** in half of the body). This can also lead to sarcopenia, or progressive loss of muscle strength.

A common treatment is **functional electrical stimulation (FES) therapy**, wherein motor neurons are electrically stimulated to activate muscles, retraining nervous system operation.

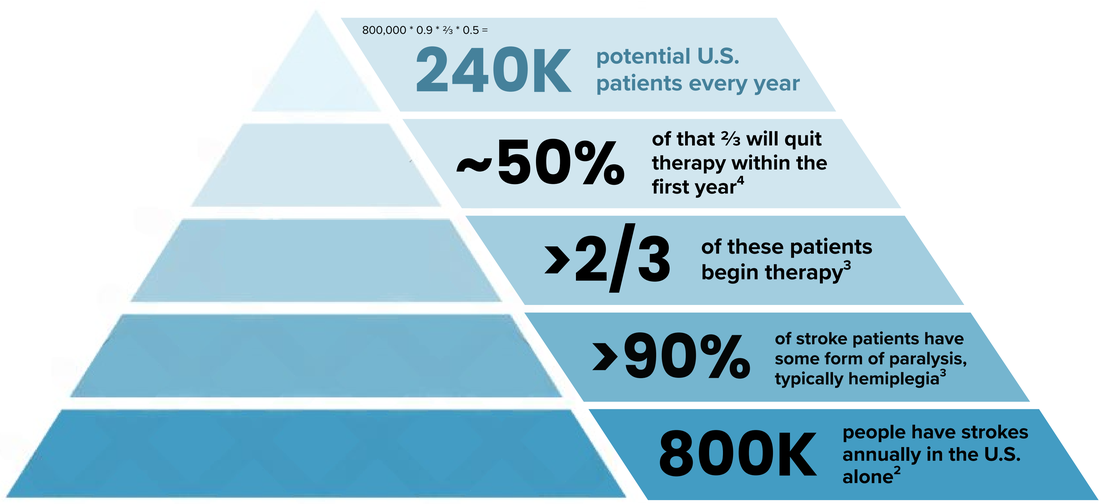
Restorative Therapies, a global leader in FES therapy, has created an **FES device** called the **Xcite** with built-in activities of daily life exercises.

Current Xcite[1]

The Xcite system was designed for **in-clinic use only**, including supported operation with a trained therapist. This means it **does not promote treatment adherence** due to the need for multiple clinic visits per week.

For the elderly population often afflicted by stroke, this can be **expensive**, **time-consuming**, and **burdensome**, especially since most patients rely on caretakers to bring them to appointments. This results in **high therapy dropout rates.** Since benefits from FES are only seen over a period of long-term use, nonadherence to therapy can impact the benefits that patients experience.

Problem Size



Need Statement

Patients with **stroke-related sarcopenia** who have demonstrated benefit from **functional electrical stimulation (FES)** need a **more accessible** method of FES therapy to **increase rehabilitation adherence**.

Xcite Mini Design

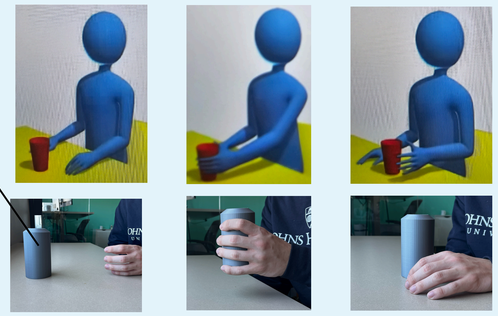
The Xcite Mini design targets stroke patients, providing a **custom controller** that interfaces with the software and can be used to perform **forward reach and grasp** and **pinching** exercises at home.

These exercises were chosen as they are **performed frequently** in-clinic and can be **performed easily** in the absence of a clinician, making patients **more likely to perform them** at home.

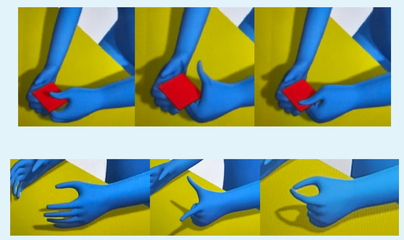
Xcite-modeled reach and grasp exercise

controller

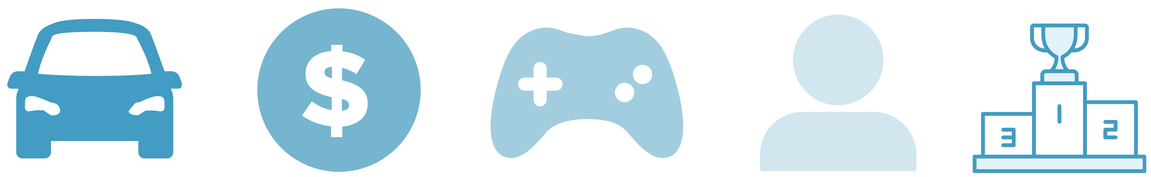
Xcite mini controller, used to ensure proper execution of exercises as well as track patient use and progress



Lateral Pinch and Tip Tripod Pinch



Benefits



Transportation-related costs are reduced[4]

Appointment-related costs are reduced

Portable controller design

Ensure proper excitation of muscles and properly track use and progress without a therapist

Gamified exercises

Acknowledgements

The team would like to thank Ms. Stephanie Huber, Mr. Stas' Skoczylas, Mr. Edward Burkot, and Mr. Michael Duncan for their valuable insights and guidance, as well as the physical therapists at the Kennedy Krieger Institute for providing real-life demonstrations of the Xcite. Thank you to the design studio managers Mr. Cole Pritchard and Mr. Tom Benassi for their continued support and advice.

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