

TITLE: Midline Gait Trainer

GOAL: The goal of this project is to provide physical therapists with a safe, effective, and affordable treatment tool for use with ataxic scissoring patients.



ABSTRACT:

Ataxic scissoring gait is a gait abnormality that can arise from various pathologies, such as cerebellar strokes, cerebellar degenerative disorders, and minor spinal cord injuries. The design will prevent an individual from crossing midline during gait training while maintaining the safety of the user and therapist. Our design will be a system of components that must safely and securely attach to standard two-wheeled rolling walkers, greatly reducing the cost and improving clinical integration of the system. We received feedback on design ideas from nineteen physical therapists in the form of a survey and focus groups to narrow and improve upon our ideas. The system will include four attachments addressing each of the treatment elements included in the physical therapy survey: a forearm support, a midline-blocking bar, a sliding mirror, and a weight receptacle. Using research on average anthropometric and biomechanic features of the human body, we performed calculations to ensure the attachment subsystems will be comfortable and compatible with a large range of user body sizes. The majority of the attachments and components will be constructed from Aluminum 6061 because it is lightweight, durable, and will aesthetically make the attachments look like extensions of standard walkers. We have generated detailed dimensions and SolidWorks models of each of the four attachments in our system, as well as developed clinical and engineering based tests in order to gauge to what degree we have fulfilled our objectives for this system. The results demonstrate that many of our design objectives have been met, and that clinicians find our device to be a great improvement over existing technology to treat patients with scissor gait.