



Executive Summary



SecuriTray

The SecuriTray was designed to allow stroke survivors with limited use of one arm and with general mobility of the lower limbs to navigate the cafeteria and dining area at the Rehabilitation Institute of Chicago (RIC) with ease.

The basic problem the design addresses is the user's lack of stability when handling a tray with one hand. This problem is amplified due to most users having reduced strength in their functioning arm and an unsteady step due to limited mobility of one or both legs.



Our research narrowed the problem to three categories: self-sufficiency, steadiness, and discreetness. We found that the design must allow the user to be independent while taking advantage of the user's intact and recovering abilities. The device should not require another's assistance to be used successfully.

The primary complaint from users and the client about the current cafeteria trays is that they are too unstable and that drinks tend to spill. This problem is caused by the fact that many stroke survivors are weak in one side of their body and have difficulty balancing. As a consequence, stability of the device became a requirement in order to prevent sliding and spilling. When researching the users' reactions to such devices, we found that one of the most difficult aspects of dealing with a disability is the social barriers that exist in the environment. The device cannot attract attention and should be as invisible as possible in order to allow the user to blend in.

In light of this information, we came up with the following design: the SecuriTray.



The SecuriTray is made to add on to the existing trays at the Rehabilitation Institute of Chicago (RIC) and can be produced from relatively inexpensive parts, providing a cost effective solution. The device is a "self-energizing clamp" that fits onto the tray and increases the force with which it holds on to the tray as the weight on the tray increases. The SecuriTray also features guide wires that fit underneath the lip of the tray to keep the tray from moving back and forth. These wires are coated with a rubber surface to prevent slipping. The design features a soft, comfortable, non-slip handle. A non-slip mat, specifically shaped to fit the trays at RIC, is also part of the package.

These features combine to create a device that is very stable when controlled with only one hand. Once the user knows how to use to the SecuriTray, it is easily attached and detached from the tray. The centered handle and the non-slip mat combine to provide stability while the tray is in motion. The non-slip mat makes it difficult to tip or spill a cup in unexpected situations. Finally, the device is small, containing minimal parts, which addresses the user's desire for a discreet device. The SecuriTray is a simple solution that seamlessly meets several user needs and requirements in a single device.