Background & Market Research

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Hemiparesis refers to a weakness or lack of mobility in half of the human body. Hemiplegia is a severe form of hemiparesis, in which an individual cannot move one half of the body. Hemiparesis and hemiplegia are not distinct conditions; rather, they are the effect of damage to the nervous system. Thus, these can result from many issues, including head, neck, or spinal injuries, cerebral palsy, or stroke (CDC, 2013 & CDC, 2016).

This team was tasked with designing a lunchbox for a person with hemiplegia. The user has requested that the lunch box be durable, washable, insulated, portable, stable, simple, discreet, and appropriately sized. No lunch boxes have been found on the market that address this specific need (AbleData, 2017). Although none of the lunch boxes researched are specifically geared toward people with hemiparesis, there are a few that could potentially be operable.

One option is a lunch tote bag, with large handles on top and a hook-and-loop fastener. (See **Figure 1**.) The benefits of these lunch tote bags are their portability and insulation. They can easily be carried, and they have an internal insulation layer. The major drawback of this type of lunch bag is usability for someone with hemiparesis. The fastener may be fairly difficult to separate, and the depth of the bag may mean an individual will need to rummage down to find a desired article of food, impacting both usability and stability. This product could be modified to be more usable by implementing a different fastener, such as a magnetic flap or a simple clasp. However, the depth of the bag would remain an issue.

Figure 1: Examples of lunch tote bags with hook-and-loop fasteners. (Photo courtesy of amazon.com)

Another possible option could be a metal lunch box. A box of this type is durable, washable, stable, and relatively simple to use with one hand. Unfortunately, it lacks insulation and aesthetic. An insulative layer of plastic could be lined along the inside of the box, which may reduce space. In addition, the box could be spring-loaded to aid in opening, and it could be equipped with a push button instead of a clasp.

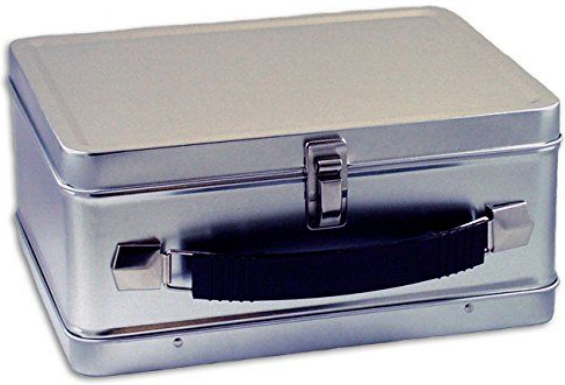

Figure 2: A simple metal lunchbox with a handle and clasp. (Photo courtesy of amazon.com)

A third potential design for the one-handed lunch carrier is the hard-sided cloth lunchbox. (See **Figure 3.**) One of the benefits of this lunchbox is that it is sturdy and durable. Its sides are

rigid and they prevent the lunchbox from being flattened under weight. Unlike the metal lunchbox, the hard-sided cloth lunchbox is not easily dented. Another perk of having this type of lunchbox is is washable. Cloth is a washable material and washing the lunchbox will not damage it. In addition, the cloth lunchbox is also insulated which keeps food warm or cold. One drawback of this cloth lunchbox is that is uses a zipper to be opened and closed. Zippers are very difficult for people with hemiplegia to use. If this design was to be modified and the zipper was removed, this might take away from the insulating ability of the lunchbox.

Figure 3: An example of a cloth lunchbox with hard sides that stay upright. (Photo courtesy of llbean.com)

References

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