Central PA SCI Support Group 2 – Zipper Assistive Device

Overview
The client, Mr. Zern, was in a construction related accident. A full sheet of drywall fell from about 30 feet above him directly on to his shoulder. Mr. Zern suffered a brachial plexus injury and his left arm does not function. One of the hardest tasks for him was to zip up his jacket on his own so the team was tasked with designing a device to help him zip up his jacket.

Objectives
The objective was to create a device that helped the client zip up his coat using one arm. The device needed to be discrete, able to fit inside a coat pocket, universal for different zipper sizes.

Approach
- Meet with the customer to discuss his needs and concerns regarding zipping his coats
- Use the customer needs along with analysis of issues in zipping a coat with one hand to make a detailed list of problems that need to be addressed in our design
- Brainstorming provided the team with many concepts to further consider and explore
- Concept generation allowed the team to explore several methods to solve the problem and generate initial prototypes.
- Being that no other devices existed that were similar to the concepts the team had, there was freedom to fully expand upon the initial prototypes
- CAD designs of the initial prototypes allowed for stress analysis to ensure safety
- The initial prototypes were tested with the client and his feedback allowed the team to streamline the design process
- The top performing prototype was enhanced and a higher level prototype was developed
- The enhanced prototype was again tested with the customers and any concerns or potential downfalls were again discussed and improved upon
- The final design was created and proved to satisfy all customer needs
- The final product was presented to the customer and sponsor, receiving positive overall feedback

Outcomes
- The client can successfully zip his jacket on his own now.
- This project can also be used with other people as well such as stroke patients, veterans of war, and many others.
- The sponsor, Dr. Hills, took several devices to bring to use with stroke rehabilitation patients at Hershey Medical Center.