Central PA SCI Support Group 2 – Assistive Device to Hold Eating Utensils

Overview
The purpose of this project is to design a wearable device that will allow a person who is not able to use their hands to hold common eating utensils such as a spoon or a fork. The current design utilizes a plastic splint attached to the hand and forearm and the utensil is secured in the palm of the hand. The current device is limiting in the amount of eating tasks possible, for example it is difficult to eat liquid food.

Objectives
- Device that allows the user to eat liquid food
- Device that allows the user to cut food with the side of a fork or a knife
- Reduce bulkiness of design
- Allow easy removal and attachment of utensil holder

Approach
- Researched the project and met with the user of the device to discuss objectives and current device
- Concept generation and elimination based on design criteria analysis
- Conducted Finite Element Analysis, Tensile tests and Flexion tests on materials to find the best material to use on the device
- Created CAD models of the final design of the brace and utensil holder
- Created a preliminary and final prototype
- Performed multiple surrogate functional tests on the final prototype
- Long-term functional tests by the user are needed to validate the initial testing

Outcomes
- Created a more versatile device with 3 new eating positions
- Final design allows for 4 times more liquid food to be delivered while eating
- Final design allows for user to now cut with the side of a fork or a knife
- Utensil holder has at least an 8 year lifespan
- Reduced overall bulkiness of device