Problem Statement - Osseointegration is an operation that provides amputees with an easy attachment point for a prosthetic. Osseointegration patients are left with an open stoma around the abutment, meaning it cannot be exposed to untreated water.

Need - Design and manufacture a waterproof cover to be worn during physical activity. The cover shall allow Mike to continue his passion for whitewater rafting and swimming with a prosthetic still attached.

Sponsor - Quality of Life Plus
- Website: [http://www.qlplus.org/](http://www.qlplus.org/)
- QL+ Program Manager: Annemarie Orr

Using a spiral design process, multiple iterations of prototype were created to test subtle differences in designs in order to decide upon a final design for the cover. Different prototypes highlighted the flaws and strengths of different material and sealing options.

Final Cover

Fabric testing with hydrostatic column
Lap shear strength testing of adhesives
Revised silicone cast

Initial submersion test
Submersion testing at SDSU Aquaplex
Water intrusion at seam during testing

We want to acknowledge the professional guidance and instruction from Dr. Scott Shaffar and San Diego State University as well as the opportunity to help those who have served through Quality of Life Plus.

In addition, we would like to thank Annemarie Orr for her guidance and expertise. Thank you to Mike Fairfax and Nick Kimmel for providing valuable feedback and information.