Transfemoral Osseointegration
Prosthetic Cover

Team AquaSafe
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Team Members

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Project Overview

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/
- 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

- Latex Seal
- Wool Liner
- Sealing Grommet
- Velcro
- Waterproof Cover
- Assisting Bracket

Testing

- 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

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