# Amputee Advanced Donning Device

**Client:** Mr. Daniel Kutschera

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**Date:** September 12th 2025 - September 18th 2025

## Problem Statement:

During rehabilitation, it is critical for amputee patients to wear a specialized compression garment known as a shrinker. A shrinker aims to shape the residual limb in preparation for prosthetic fitting and prevent post-operative complications like swelling and excessive fluid retention. For application of the shrinker, patients currently rely on basic donning tubes, in which the shrinker is stretched over a plastic tube and pulled over the residual limb. Because shrinkers are designed to apply strong, consistent compression, they can be very difficult to stretch over donning tubes. This challenge is especially significant for elderly patients, who may have limited strength, dexterity, or mobility. This project aims to create an advanced donning device that stretches the garment to the desired diameter using electronics, simplifying shrinker application and eliminating the need for the user to manually stretch the garment.

## Brief Status Update

This week, the team continued preliminary research based on information discussed within the client meeting held Wednesday 09/03. The team began conducting physiological research relating to amputations and the recovery process, competing designs, and relevant codes, standards, and regulations that may be important to note while going through the design process. Finally, the team completed the Product Design Specifications document, clearly establishing the expectations and requirements for the design.

## Summary of Weekly Team Member Design Accomplishments

- Team:
    - Continued preliminary research
    - Conducted a search for codes, standards, regulations
    - Completed the Product Design Specification document

- Carly:
    - Researched patents and standards for medical devices similar to ours
    - Continued research on the biological considerations of the project
    - Completed the PDS
- Eleanor
    - Research amputation recovery/rehabilitation process
    - Researched relevant codes, standards, regulations applicable to the device
    - Completed PDS
- Ava:
    - Begin research on materials to be used for device
    - Complete PDS
    - Research pricing and materials used for current product
- Anna:
    - Completed PDS
    - Continued research on shrinker socks and existing technologies
- Sam:
    - Researched shelf life, operating environment, and ergonomics for PDS
    - Completed PDS

## Difficulties / advice requests

N/A

## Upcoming Team and Individual Goals

- Team:
    - Begin brainstorming design ideas
    - Establish design criteria
    - Produce a design matrix to analyze designs based on criteria
- Carly:
    - Research other devices with similar technology of interest but with varying purposes
    - Begin sketching possible designs and considering what materials we would need
    - Continue to update the project website
- Eleanor
    - Produce a few individual design ideas to contribute to group
    - Contribute in establishing design criteria and producing design matrix
    - Upload necessary information to project website
- Ava:
    - Research specific materials to be used and provide costs
    - Brainstorm design ideas to share with team
- Anna:
    - Continue research

    - Prepare questions for our client and advisor
    - Begin design sketches
- Sam:
    - Come up with design ideas to share with group
    - Work on gathering more research and relevant information that will help the design process

# Expenses

| Item | Description | Manufac-turer | Mft Pt# | Vendor | Vendor Cat# | Date | # | Cost Each | Total | Link |
|---|---|---|---|---|---|---|---|---|---|---|
| **Category 1** | | | | | | | | | | |
| | | | | | | | | | $0.00 | |
| | | | | | | | | | $0.00 | |
| **Category 2** | | | | | | | | | | |
| | | | | | | | | | $0.00 | |
| | | | | | | | | | $0.00 | |
| | | | | | | | | **TOTAL:** | **$0.00** | |

# Project Timeline

| Task | September | | | October | | | | November | | | | | December | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | |
| **Project R&D** | | | | | | | | | | | | | | | | |
| Empathize | | | | | | | | | | | | | | | | |
| Background… | | | | | | | | | | | | | | | | |
| Prototyping | | | | | | | | | | | | | | | | |
| Testings | | | | | | | | | | | | | | | | |
| **Deliverables** | | | | | | | | | | | | | | | | |
| Progress Reports | | | | | | | | | | | | | | | | |
| Prelim presentation | | | | | | 10/3 | | | | | | | | | | |
| Final Poster | | | | | | | | | | | | | | 12/5 | | |
| **Meetings** | | | | | | | | | | | | | | | | |
| Client | | | | | | | | | | | | | | | | |
| Advisor | | | | | | | | | | | | | | | | |
| **Website** | | | | | | | | | | | | | | | | |
| Update | | | | | | | | | | | | | | | | |

## Dates & Deadlines:

- Product Design Specifications: Friday, September 19th
- Design Matrix Criteria: Friday, September 26th
- Preliminary Presentations: Friday, October 3rd
- Preliminary Report: Wednesday, October 9th
- Show and Tell: Friday, October 31st
- Final Poster Presentations: Friday, December 5th
- Final Deliverables Due: Wednesday, December 10th