Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis
Progress Report 1: 9/11/2025

Client: Dr. Jasmine Craig
Advisor: Prof. Darilis Suarez-Gonzalez
Team:

- Leader: Allison (Ally) Rausch
- Communicator: Jackie Behring
- BWIG: Sofia Decicco
- BPAG: Arshiya (Ria) Chugh
- BSAC: Daniel Pies

Problem Statement: Microsurgical arterial anastomosis is a cornerstone of reconstructive surgery, enabling tissue transfer and limb salvage. Current techniques are highly time consuming, technically demanding, and are highly dependent on surgeon expertise. Suturing vessels as small as 1 mm can take even the most experienced surgeons 30-60 minutes, extending operating times and jeopardizing tissue viability. Existing stent-based approaches introduce complications by contracting the vessel lumen and lack adaptability across the wide range of vessel diameters encountered in clinical practice. There is a critical need for a biocompatible, adjustable, and easy-to-use device that can reliably reduce operative time while maintaining vessel integrity and minimizing complications.

Brief Team Status Update: The team met with the client on Wednesday (09/10/2025) to gain a holistic understanding of client expectations, project guidelines, and desired outcomes. We began outlining the Product Design Specifications (PDS) and discussed initial design pathways. The team began researching relevant biomaterials, mechanics, and device feasibility.

Summary of Weekly Individual Design Accomplishments:

- Allison (Ally) Rausch:
    - Reviewed project background materials and familiarized myself with arterial anastomosis challenges and existing coupling devices.
    - Prepared for the client meeting by outlining potential questions to ask.
- Jackie Behring:
    - Set up and prepared for client meeting by organizing initial questions about project specifications.
    - Researched background information regarding microsurgery and anastomosis.
    - Followed up with client to set up future meetings and send over summarized meeting notes.
- Sofia Decicco:
    - Complete preliminary research to get familiarized with topic
    - Identify questions for the first client meeting
    - Redefined problem statement based on notes from initial client meeting
- Arshiya (Ria) Chugh:
    - Conducted preliminary research on anastomosis to understand microsurgery and the procedure.
    - Collaborated with the team to develop client questions to clarify goals and project requirements.

Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis
Progress Report 1: 9/11/2025

- Daniel Pies:
    - Begin preliminary research on materials used in anastomosis microsurgeries.
    - Collaborated with team in developing directing questions for preliminary client meeting.

Weekly/Ongoing Difficulties: No notable difficulties.

Upcoming Team Goals: Next week, the team's focus will be on finalizing the PDS to clearly define performance criteria, constraints, and success metrics. The team will also continue researching existing devices and surgical methods to inform and support design direction.

Upcoming Individual Goals:

- Allison (Ally) Rausch:
    - Contribute to refining and submit the PDS.
    - Further review literature on arterial coupling devices and summarize findings in LabArchives.
- Jackie Behring:
    - Continue to research to add to Lab Archives.
    - Refine research to align with client specifications.
    - Complete the PDS and address any concerns or questions with clients.
- Sofia Decicco:
    - Continue to add research to Labarchives and understand project goals.
    - Start drafting preliminary design specification document.
    - Start brainstorming sketches of design ideas to present to clients.
- Arshiya (Ria) Chugh:
    - Continue project research to define and refine key objectives.
    - Review patents and standards to develop a product design specification.
    - Evaluate competitor products to identify limitations and opportunities for differentiation.
- Daniel Pies:
    - Continue research on biomaterials and procedures.
    - Being brainstorming preliminary prototypes for anastomosis recoupling.
    - Contribute to team PDS to establish clear goals for project progress.

Project Timeline

Project Goal	**Deadline**	**Team Assigned**	**State of Completion**
Initial Research	9/8	All	The team will continuously research throughout the semester.

Arterial Coupler Re-Design: Adjustable Stent/Cuff Anastomosis
Progress Report 1: 9/11/2025

Product Design Specification (PDS) Draft	9/19	All	
Design Matrix Criteria and Design Ideas	9/26	All	
Preliminary Oral Presentation	10/3	All	
Final Design Selection	10/10	All	
Poster Presentations	12/5	All	

Expenses

Item	**Description**	**Manufacturer**	**Part Number**	**Date**	**QTY**	**Cost Each**	**Total**	**Link**
Component 1								
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL:								**$0.00**