

Arterial coupler re-design: Adjustable stent/cuff anastomosis

Client: Dr. Jasmine Craig and Dr. Weifeng Zeng

Advisor: Prof. Justin Williams

Team:

Simon Fetherston (Leader)
Catie King (communicator)
Megan Lee (BWIG)
Lydia Miller (BSAC)
Drew Hay (BPAG)

Date: September 4, 2026 - September 10, 2026

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 status update

This week the team began preliminary research on the project. The team built a foundational understanding of the cardiovascular system and anastomosis procedures. They will meet with the client to discuss the project in detail. This will allow for focused preliminary research and guidance on preliminary design specifications.

Difficulties / advice requests

The team is beginning to navigate the design process. There are no difficulties at the moment. The team needs to meet with the client and to establish a better understanding of the project.

Current design

There is no current design. The team will brainstorm design ideas once design specifications are made.

Materials and 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	

Major team goals for the next week

1. Complete preliminary design specifications
2. Continue developing an understanding of cardiovascular disease
3. Research current anastomosis devices

Next week's individual goals

- Simon Fetherston
 - Work on PDS
 - Research current anastomosis devices
 - Research standards applicable to the design
- Catie King
 - Work on PDS
 - Research more into coupler devices and background of anastomosis
- Megan Lee
 - Begin working on PDS
 - Continue to research existing coupler devices as well as last year's design
 - Begin coming up with design ideas
- Lydia Miller
 - Continue research on existing products related to anastomosis and identify challenges
 - Draft PDS
 - Brainstorm ideas for design matrix
- Drew Hay
 - Draft PDS
 - Begin design creation

Timeline

Task	Sep			Oct					Nov				Dec
	10	17	24	1	8	15	22	29	5	12	19	26	3
Project R&D													
Empathize	X												
Background...	X												
Prototyping													
Testings													
Deliverables													
Progress Reports	X												
Prelim presentation													
Final Poster													
Meetings													
Client													
Advisor	X												
Website													
Update													

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

- Individual:
 - Simon Fetherston
 - Researched anastomosis and how cuff procedures are performed
 - Set up team shared drive and documents
 - Catie King
 - Reached out to client to set up meetings and gain better understanding of expectations and project specifications
 - Started research
 - Lydia Miller
 - Preliminary research on arterial anastomosis
 - Contributed to list of client questions
 - Megan Lee
 - Began researching anastomosis and current coupler devices
 - Prepared for client meeting and came up with questions
 - Drew Hay
 - Began researching current coupler devices and critical engineering specifications
 - Contributed to client questions
- Team :
 - Conducted preliminary and background research on anastomosis and cardiovascular disease
 - Scheduled a time to meet with the client

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Simon Fetherston	09/09/2026	Read an article explaining anastomosis and a paper on how anastomosis was performed	1	1	1
Catie King	9/10/26	- Organized meeting with client to discuss project - Researched a review on coupler devices	1	1	1
Megan Lee	9/9/2026 - 9/10/2026	- Reviewed last year's group preliminary and final reports - Researched anastomosis procedure and current coupler devices	1.5	1.5	1.5
Lydia Miller	09/09/2026 - 09/10/2026	- Lit review for information on anastomosis and existing methods - Contributed to list of client questions	1.5	1.5	1.5
Drew Hay	9/10/2026	- Researched anastomosis procedure overview and current devices - Contributed to client questions	1.5	1.5	1.5