

# Democratizing Placement of Endoluminal Negative Pressure Devices for Gastrointestinal Leaks

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**Advisor:** Prof. John Puccinelli

**Team:** Simon Fetherston (Leader)  
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**Date:** January 23, 2026 - January 29, 2026

## Problem statement

Currently, large defects in the GI tract (often caused by surgical complications) are treated with surgery. For external wounds, the use of negative pressure wound therapy has become widely used. This therapy, colloquially called VAC therapy, leads to improved healing of superficial wounds. For the past few years, some surgeons have been placing similar VAC devices into the GI tract through the mouth or anus to treat defects in the GI tract. The success of this therapy has been outstanding, with some studies finding that 90% of wounds that would have otherwise required surgery can be closed without making any additional incisions at all. The process of VAC placement is currently labor intensive and requires some skill in manipulating an endoscope, which has limited its widespread use. Development of a streamlined way to deploy VAC therapy into the GI tract would allow more surgeons to use this therapy to heal anastomotic leaks.

## Brief status update

The team has begun preliminary research on endoluminal vacuum therapy and the mechanisms used to place a sponge and apply negative pressure to a defect in the gastrointestinal tract. Research on how the procedure is conducted, what materials are used, and what tools are used is essential toward understanding how to design a streamlined and ergonomic way to deploy VAC therapy. Completing this preliminary research has allowed the team to begin developing questions prior to our client meeting: asking these questions will contribute to the first product design specifications.

## Difficulties / advice requests

The team is currently conducting preliminary research and establishing a need for a streamlined endoluminal vacuum therapy delivery system. Understanding the EVT procedure techniques and the different tools used will be a focus as it is not familiar. Meeting with the client will resolve the difficulty of understanding EVT procedures and help to develop specific design specifications.

## Current design

There is no current design. Further preliminary research must be conducted to understand endoluminal vacuum therapy and the need to streamline a way to deploy the therapy within the gastrointestinal tract.

## Materials and expenses

Item	Description	Manufac-turer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
<b>Category 1</b>										
									\$0.00	
									\$0.00	
<b>Category 2</b>										
									\$0.00	
									\$0.00	
									<b>TOTAL:</b>	<b>\$0.00</b>

## Major team goals for the next week

1. Generate and present a list of background and project goal questions during the meeting with Dr. Shada.
2. Continue background research to understand endoluminal vacuum therapy including the tools and procedure used.
3. Brainstorm design specifications for the PDS using feedback from Dr. Shada.

## Next week's individual goals

- Simon Fetherston
  - Continue researching EndoVAC techniques and methodologies along with the complications that occur during the procedures and with commercially available materials
  - Meet with client to discuss project goals and questions about EndoVAC procedure
  - Establish the societal and economic impact of our design
- Evelyn Mikkelsen

- Brainstorm a list of questions for the client meeting next week
- Continue researching current Endovac procedures
- Work on PDS
- Mariah Smeeding
  - Meet with the client to better understand what direction to move forward in
  - Work on PDS
  - Continue research
- Yeanne Hwang
  - Meet client to ask questions and get understanding about the project goal
  - Work on PDS
  - Research 4 entries

## Timeline

Task	Jan	Feb					March					April				May	
	26	2	9	16	23	1	8	15	22	29	5	12	19	26	3	10	
<b>Project R&amp;D</b>																	
Empathize	X																
Background...	X																
Prototyping																	
Testings																	
<b>Deliverables</b>																	
Progress Reports	X																
Prelim presentation																	
Final Poster																	
<b>Meetings</b>																	
Client																	
Advisor																	
<b>Website</b>																	
Update	x																

Filled boxes = projected timeline

X = task was worked on or completed

## Previous week's goals and accomplishments

- Individual:
  - Evelyn Mikkelsen
    - Reviewed articles and videos provided by client
  - Simon Fetherston
    - Create and organize team documents in a shared drive
    - Review the video provided by the client and conduct preliminary research on EndoVAC therapy
  - Mariah Smeeding

- Contact client and advisor to set up meetings with them and the team
- Reviewed project description and goal of the project
- Yeanne Hwang
  - Reviewed the article and description provided by client
- Team :
  - Form a baseline understanding of endoluminal vacuum therapy
    - Reviewed articles and videos provided by client

## ***Activities***

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Evelyn M	01/24/2026	Review articles and videos on project page	1	1	1
Simon F	01/24/2026	Create and organize team documents in a shared drive	3	3	3
	01/27-28/2026	Researched articles regarding the various EndoVAC delivery techniques and the materials used			
Yeanne H	01/24/2026	Reviewed the article and description provided by client	1	1	1
Mariah S	01/26/26 01/27-29/26	Reach out to client to discuss meeting time Research current endovac therapy articles and current designs on the market.	2.5	2.5	2.5