Paracervical Block Training Model (PBTM), BME 200/300

Date: 9/11/2025

Client: Dr. Jessica Dalby
Advisor: Professor Randolph Ashton
Team:
Renee Sobania (Co-Team Leader)
Evelyn Ojard (Co-Team Leader)
Ellinore Letts (Communicator)
Abigayle Chapman (BSAC)
Nora Lorentz (BWIG)
Cadence Seymour (BPAG)

Problem Statement

A paracervical block (PCB) is a medical procedure which consists of injecting the tissue where the vaginal wall meets the outer part of the cervix, the cervicovaginal junction, with lidocaine in four locations; 2, 4, 8, and 10 o'clock. This procedure is done to reduce pain during intrauterine device (IUD) insertion and other gynecological procedures. Many women have to endure the procedure without the help of a PCB, or only have access to other less effective methods because of limited provider training and lack of realistic affordable models to practice on. Current task trainers that are used to practice IUD insertions typically do not have a cervicovaginal junction, which is making these models less realistic as you are unable to practice a paracervical block. This results in fewer providers learning proper PCB technique and thus more patients who are unable to have access to this procedure.

Our team is tasked with creating a realistic, reproducible, and low cost model that includes a realistic cervicovaginal junction to simulate PCB injections to train healthcare professionals to make this procedure more accessible. Creating an anatomically accurate model with materials that better simulate the mechanical properties of the female reproductive tissues will allow providers to practice needle placement, injection, and IUD insertion in a supervised safe learning environment. Ultimately, our goal is to improve provider access to learning the PCB procedure and expand patient access to pain management in women's healthcare.

Brief Status Update

During week 1 of our design project, the team focused on doing background research to become familiar with the project and other designs on the market. We scheduled a time to meet with out client Dr. Jessica Dalby on Friday, September 12th for an introduction to the project and initial questions. We had our first team meeting to discuss our initial research and go over a timeline for the semester. We will also have our first Advisor meeting on Friday, September 12th.

Weekly/Ongoing Difficulties

The team has no current concerns with completing the initial background research for the project. However, there are logistical project questions that will need to be addressed in upcoming client meetings and team meetings.

Summary of Weekly Team Member Design Accomplishments

- Team
    - Team members were introduced to one another.
    - Each team member has contributed preliminary research.
    - The team has been in communication to discuss logistics for meeting with the client and advisor for the project.
- Renee Sobania
    - Did initial background research on the paracervical block technique and procedure and the current Task Trainer model on the market as well as its shortcomings.
    - Came up with questions to ask Dr. Dalby during our first client meeting on Friday.
    - Drafted the team's Problem statement based on the initial research and the clients provided documents.
    - Met with the team to prepare for our Friday meeting and discuss our initial research.
- Evelyn Ojard
    - Completed preliminary research on the paracervical block procedure and the current issues as well as reviewed the female reproductive anatomy.
    - Reviewed client's provided documents and links to learn more about the project and understand the problem deeper.
    - Came up with questions to ask the client for the client meeting
- Ellinore Letts
    - Researched basic cervical block procedure, gained high level understanding of current methods, materials and costs.
    - Scheduled meeting times with team members, client and advisor.
    - Brainstormed high level questions to ask the client, with aim of better understanding project requirements.
- Abigayle Chapman
    - Did research on other existing designs for training for medical procedures using cervical models.
    - Conducted research on potential materials for cervical models, taking note of the costs and accessibility of various materials.
    - Came up with questions to ask the client at the client meeting and became familiar with the client's background and profession.
- Nora Lorentz
    - Did some basic research to provide background knowledge on paracervical blocks' impact on reported pain during IUD insertion
    - Added a few initial details to the project website
    - Brainstormed question to ask the client during our client meeting
- Cadence Seymour

    - Researched the standard process for IUD insertion and where the paracervical block comes into play.
    - Came up with some preliminary questions to ask our client about the production of our model.
    - Looked into the other medical alternatives to paracervical blocks and their relative effectiveness.

Upcoming Team and Individual Goals

- Team
    - An initial timeline for the project will be discussed and finalized.
    - The brainstorming process for product designs will begin after the team has an improved understanding of the project scope.
    - Complete the Preliminary Design Specification's paper.
- Renee Sobania
    - Continue to do research on the mechanics of the vaginal and cervical tissue to try to find materials that will be realistic for our model.
    - Begin the Preliminary Design Specifications paper and assign sections to the team.
    - Begin designing and sketching initial design ideas for the cervicovaginal junction based off of the background research.
- Evelyn Ojard
    - Work with the team to divide up the Preliminary Design Specifications (PDS) and complete the section I am assigned to
    - Continue researching for more information on our project and to provide valid sources for the PDS
    - Begin brainstorming and designing initial designs for the PCB Training Model specifically modifying the task trainer to include the cervicovaginal junction.
- Ellinore Letts
    - Polish questions for client meeting on Friday, September 12th.
    - Begin researching material requirements, competing designs, associated costs and biological models.
    - Brainstorm basic design ideas, to create a model for reference.
- Abigayle Chapman
    - Conduct further research on existing cervical training models, considering the flaws and positive features of designs and materials that might be used for our project.
    - Look through the materials provided by the client about the project and familiarize myself with them, and use the information to contribute to ideas for product design.
    - Begin brainstorming product design ideas, sketching ideas, coming up with specific options for materials.
    - Contribute to the PDS and complete which parts I can.
- Nora Lorentz
    - Continue researching more and look specifically into the training models that are currently available

    - Begin formulating ideas for future product designs
    - Work on the PDS alongside my teams
- Cadence Seymour
    - Research more about how the paracervical block works from an anatomical standpoint, as well as get a better understanding of the meaning of a cervicovaginal junction and how it adds to the simplicity of insertion.
    - Brainstorm some ideas for the model kit and start sketching some preliminary designs.
    - Complete my portion of the Preliminary Design Specification (PDS) before it is due.

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Renee Sobania	9/10/25	Initial Background Research	3.5	3.5	3.5
Evelyn Ojard	9/9/2025	Initial Research on Anatomy and Competing Design	4.0	4.0	4.0
Ellinore Letts	9/9/2025	Anatomical and Relevant Background Research	3.0	3.0	3.0
Abigayle Chapman	9/10/2025	Initial Research on Paracervical blocks and existing cervical models/designs	1.5	1.5	1.5
Nora Lorentz	9/10/25	Researched general information on paracervical blocks	1.5	1.5	1.5
Cadence Seymour	9/10/25	Researched basic concepts for the project design	2 hours	2 hours	2 hours

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Background Research	9/17/2025	All	25%	
Product Design Specifications	9/18/2025	All	0%	
Design Matrix Criteria and Design Ideas	9/25/2025	All	0%	
Preliminary Oral Presentations	10/3/2025	All	0%	
Preliminary Deliverables Due	10/8/2025	All	0%	
Final Design Chosen	10/5/2025	All	0%	

Show and Tell (prototype ready)	10/29/2025	All	0%	
Final Poster Presentations	12/5/2024	All	0%	
Final Deliverable Due	12/10/2024	All	0%	

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**	