

Chorionic Villus Sampling- Transcervical Model

Client: Dr. Jesus Iruretagoyena

Advisor: Professor Kreeger

Team Members: Derek Klavas (Leader)
Mason Jellings (Communications)
Jon Mantes (BSAC)
Andy LaCroix (BWIG)

Week of February 13- February 19, 2009

Problem Statement:

Chorionic villus sampling is a prenatal diagnosis procedure that involves extracting placental tissue from the uterus of a pregnant woman in her first trimester of pregnancy. This tissue contains the same genetic informational as the unborn fetus. Testing thus allows chromosomal abnormalities and genetic defects to be diagnosed early on in the gestation period. The current, and most difficult, method for chorionic villus sampling requires a catheter to be inserted through the woman's vagina and into the cervix (also known as the transcervical approach). However, doctors and residents currently do not have a model to simulate female anatomical structures and practice the transcervical method. The goal of this project is to develop a realistic and affordable model that precisely replicates the anatomy of a pregnant woman, is constructed out of ultrasound permeable materials, and can be repeatedly used to practice the transcervical approach.

Last week's goals:

- Research materials that are known to be "ultrasoundable"
- Continue researching existing devices that may help us with materials or design layouts
- Continue to brainstorm ideas for design matrix
- Get in contact with someone from Meriter Hospital that can assist us with ultrasound testing

Accomplishments:

- We were able to get in contact with Dr. Iruretagoyena to decide how we should handle purchasing materials. He would like for us to notify him of what we are to purchase, then wait for approval by his budget committee, purchase the material(s), and have him refund us at the end.
- Dr. Iruretagoyena also told us that anytime we would like to test material under the ultrasound device we may just contact him and he will take care of getting that set up for us.
- Obtained contact information for Dr. Droste in case we need assistance from her throughout the design process.

- Contacted Professor Osswald from the Polymer Engineering Center for some possible rubber materials that thought would work well under ultrasound waves. He told us to search for materials such as elastomers, polyisoprene, polybutadiene, and polychloroprene.

This week's goals: (February 20- February 26, 2009)

- Obtain sample rubber materials (listed above) from the polymer engineering center and begin testing those materials for their feasibility under an ultrasound and also to determine if they possess a humanistic "feel".
- Continue brainstorming ideas for design matrix
- Update Dr. Iruretagoyena on how the project is coming along. See if he has any feedback or additional input on the ideas we are currently exploring

Project Difficulties:

The major difficulty we are dealing with right now is selecting a material to use for the uterus and cervix of our model. This material is critical to the outcome and success of this project, so it is important we make the right decision. There is minimal literature on previous work done to construct a model of this nature and to be used for this purpose, so we must rely on our own creativity and intuition, as opposed to the knowledge of experts in the field.

Activities:

Member	Description of Activity	Hours this week	Cumulative Hours
Derek	Individual research, contacted Professor Osswald, wrote PDS	1.5	8.5
Mason	Individual research, contacted Dr. Iruretagoyena about purchasing materials	1.0	7.5
Jon	Individual research, attended BSAC meeting	1.5	8.0
Andy	Individual research	1.0	8.0
Entire team	Met with Professor Kreeger on Friday February 13 th . Brainstormed ideas after the meeting. Met as a group Thursday February 19 th to brainstorm ideas about material selection.	2.0	6.0

Project
Timeline:

Tasks	February				March				April				May	
	6	13	20	27	6	13	20	27	3	10	17	24	1	8
Meetings														
Advisor														
Client														
Product Development														
Research														
Brainstorming														
Design Prototype														
Order Materials														
Manufacture Prototype														
Testing														
Deliverables														
Progress Reports														
PDS														
Midsemester Powerpoint														
Final Poster Presentation														

Expenses:

There are currently no expenses to report.