

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 March 27- April 2, 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 information 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:

- Order materials after gaining approval from Dr. Iruretagoyena at tomorrow's meeting.
- Begin making mold of uterus and cervical canal to be used once materials arrive in the mail.
- Finalize a decision on which method we will choose to support our model and its associated weight.

Accomplishments:

- Met with Dr. Iruretagoyena to discuss our final design option. After gaining input from him, together we decided on a finalized model that will not only satisfy his requirements, but also be able to support itself properly.
- Ordered the Smooth-On EcoFlex silicone and ABS (hard, lightweight plastic) materials required to begin building the model through www.mcmaster.com and www.smooth-on.com. The materials will be delivered to Dr. Iruretagoyena and he will notify us when they can be picked up.

- Met with Greg Gion to discuss how we are going to make the mold in which to pour the Smooth-On EcoFlex silicone into. He has some wax that is easy to mold and manipulate. The box for the model will also serve as part of the mold.

This week's goals: (April 3- April 9, 2009)

- Create a mold of the uterus and cervix to be used when pouring the Smooth-On EcoFlex material. Approve the mold with Dr. Iruretagoyena as to assure the dimensions are to his liking.
- Obtain COE Shop-use certification in order to work in the COE shop.
- Begin manufacturing the exterior casing of the model out of ABS material.

Project Difficulties:

The main difficulty at this point in the semester is designing a way to pour the silicone material into our mold, in order to create the desired model with accurate dimensions, and with a contoured top to simulate a stomach. Getting this correct the first time is crucial, because we do not want to waste materials that have cost our client valuable dollars.

Activities:

Member	Description of Activity	Hours this week	Cumulative Hours
Derek	Wrote Progress report.	0.5	14.0
Mason	Contacted Dr. Iruretagoyena about meeting with him, and ordering materials.	0.5	13.0
Jon	Attended BSAC meeting, contacted Greg Gion about meeting to discuss creating a mold.	1.0	14.0
Andy	Updated website.	0.5	13.0
Entire team	Met with Dr. Iruretagoyena to discuss/finalize the design option. Met with Greg Gion to discuss making a preliminary mold for the model. Held a brainstorming session to finalize exact dimensions and to decide on amount of material to order.	4.0	24.5

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:

- 1 sheet of ABS plastic 24" x 24" x 3/8" thick = \$74.91
- 4 EcoFlex silicone 00-30 trial kits = \$114.68
- Total cost = \$189.59