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 20- March 26, 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:

- Get in touch with Greg Gion about which materials from Smooth-On we plan to use, and also to gain his insight on the urethane rubber or hydrogel material for supporting the model.
- Contact Dr. Ernest Madsen of the Department of Medical Physics at UW-Madison to see if he has any feedback/ideas about where we are going with the design of the model.
- Order materials after meeting with Greg Gion, and gaining permission from Dr. Iruretagoyena.

Accomplishments:

- Contacted Greg Gion about ordering materials. He gave us a website that we can order the materials from directly. We are also planning on meeting with him next week sometime so we can begin designing a mold/cast for our model.
- Contacted ATS laboratories about their tissue mimicking materials, and unfortunately they were of completely no assistance to us.

- Contacted Dr. Iruretagoyena about meeting with him to discuss our final design choice and material purchasing. We are scheduled to meet with him Friday, March 27.
- Held several brainstorming sessions to discuss how we want to go about supporting our model. Final decisions will be made after meeting with Dr. Iruretagoyena on Friday.

This week's goals: (March 13- March 27, 2009)

- 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.

Project Difficulties:

The main difficulty at this point is figuring out a way to have the model support itself under its own weight. Since the best performing material under ultrasound imaging (EcoFlex) is not very dense, the model may collapse on itself if not supported properly. Figuring out how to compromise for this will be essential to the success of this project. Additionally, how we support the model dictates how we are going to go about building it. At this point, the only definite manufacturing we can do is manufacturing of the uterus and cervical canal out of the EcoFlex material. This will begin as soon as the materials are ordered and arrive in the mail.

Activities:

Member	Description of Activity	Hours this week	Cumulative Hours
Derek	Wrote Progress report, contacted ATS laboratories and CIRS laboratories about tissue mimicking material	1.0	13.5
Mason	Contacted Dr. Iruretagoyena about meeting Friday March, 27th.	0.5	12.5
Jon	Attended BSAC meeting, contacted Greg Gion about ordering materials	1.0	13.0
Andy	Updated website	0.5	12.5
Entire team	Held two brainstorming sessions	1.0	20.5

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:

There are currently no expenses to report.