Fine Needle Aspiration, Project 23

Client: Dr. Frederick Kelcz
Team Members: Kristen Seashore (Leader)
Tu Hoang Anh Mai (Communicator)
Chris Goplen (BWIG)
Jason Tham (BSAC)

Date: 11/17/06 to 11/30/06

Problem Statement: Fine needle aspiration is a biopsy method of collecting tissue samples. The procedure is currently manual and requires repetitive low yield sampling to collect enough viable cells for testing. The goal of our project is to maximize tissue sample size in a single, timely procedure. We propose to develop a device that automates the current biopsy procedure, and tests the sample yield by varying the frequency and needle stroke. The test results will determine the optimal operating frequency at various stroke lengths to provide a maximum cell yield. The automation of the device will reduce operating time, cost and discomfort for the patient.

Restatement of Team Goals: Order parts, begin patent work, revise final design, and begin construction.

Individual Goals for Next Week:

Kristen Seashore: Finish prototype construction, finish testing, finish poster.
Chou Mai: Finish building and testing.
Chris Goplen: Finish building prototype, testing, and poster.
Jason Tham: Finish prototype construction and testing.

Summary of Accomplishments:

- The team met in class on Friday and discussed plans for final design construction and ordering materials.
- The team met at Jason's house on Sunday and built an initial prototype model out of Lego's. The model was successfully (to the best of our knowledge) able to aspirate an orange and apple. We also went to a hobby shop to look for small motors.
- The team met on Tuesday at Wendt Library to research materials to purchase. We also went to RadioShack and purchased two small DC motors to use in our prototype.
- The team met on Wednesday to finalize gears and bearings, and ordered them online to have after Thanksgiving Break.
- Kristen, Chris, and Chou met on Tuesday afternoon to go to Menards and purchase the remaining materials to construct our prototype.
- Kristen, Chris, and Jason met on Wednesday night to begin constructing our prototype. Chris and Jason stayed at ECB to continue working on building after Kristen left.

- Chris and Chou met today to work on prototype construction. Kristen joined them, and Jason will be joining later to hopefully help complete construction this evening.

Statement of Team Goals: Finish construction of the prototype, complete testing on phantom tissues, and begin/finish our final poster.

Project Schedule: This week we will finish the construction of our prototype. We will also begin and finish testing on phantom tissues using Jell-O, etc. Our poster will be completed and we will practice our presentation for the Final Poster Session next Friday.

Difficulties: We had some difficulties choosing a material and a design for the adjustable wheel. However, we were able to drill holes to adjust the radius of a gear to use for the wheel. Hopefully this will work well in testing!

Activities:

11.17.06	Team met in class and discussed plans for construction, ordering Parts and final design	2 hrs
11.19.06	Team met at Jason's house to construct primary prototype out of Lego's, research parts to order, and visit hobby stores	5.5 hrs
11.21.06	Team met at Wendt to research parts to order and went to RadioShack to purchase small DC motors	4 hrs
11.22.06	Team met in ECB to order gears and bearings	1.5 hrs
11.27.06	Chou: Constructed phantom tissues for testing	45 min
11.28.06	Kristen, Chou, Chris: Went to Menards to purchase other materials	2 hrs
11.29.06	Kristen, Chris, Jason: Began construction at ECB	1.5 hrs
11.29.06	Chris, Jason: Worked on prototype construction at ECB	3 hrs
11.30.06	Kristen: Worked on progress report	45 min
11.30.06	Chris, Chou: Worked on prototype construction at ECB	2.5 hrs
11.30.06	Team worked on prototype construction at ECB	TBD

TOTAL HOURS THIS WEEK 23 hr 30 min

Project Time Line:

TASK	S. 8	S.15	S.22	S.29	O.6	O.13	O.20	O.27	N.3	N.10	N.17	N.24	D.1	D.8
Project Design														
Research	X	X	X	X										
Brainstorming				X	X	X								
Designs					X	X	X	X	X	X				
Prototyping										X	X	X		
Testing												X		
Final Design												X	X	
Deliverables														
Progress Reports	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Midsemester							X	X						
PowerPoint							X							
PDS		X	X	X	X	X	X	X	X	X	X	X	X	X
Final Presentation														X
Design Report														X
Meetings														
Client	X			X		X				X		X		
Team	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Professor		X	X	X	X	X	X	X	X	X	X	X	X	X
Website			X	X	X	X	X	X	X	X	X	X	X	X

Expenses: TBD

Task Delegations/Time Lines:

Tasks	*Member*	*Date Due*
Research		
FNA	all - more Chou	1-Dec
Biopsies/Tissues Tested	all - more Kristen	13-Oct
Tissue/Needle Forces	Kristen, Chris	13-Oct
Current Devices (why fail?)	Chris, Jason	13-Oct
Related Devices	all - Jason	13-Oct
Needle types	Chou	13-Oct
Clinical procedures	Jason	13-Oct
Sample collection testing/procedure	all - more Kristen	13-Oct
Patents	Chris, Jason	13-Oct
Materials for prototypes	all	13-Oct
Construction/Testing methods	all	10-Nov
Designs		
Brainstorming	all	13-Oct
Alternate Designs (3)	all	13-Oct
Design Matrix	all	13-Oct
Prototyping		
Set up checking account	all	ASAP
Research materials	all	3-Nov
Order materials	all	17-Nov
Build prototype	all	17-Nov
Testing/Build phantoms	all	24-Nov
Revise prototype	all	1-Dec
Deliverables		
Mid - PowerPoint	all	20-Oct
Mid - Paper	all	25-Oct
Notebooks	all	25-Oct
Final - Poster	all	8-Dec
Final - Paper	all	15-Dec
Progress Reports	all	every week
PDS	all	often