

BME 402 - Heart Phantom
Progress Report Week 10 – 3/27/09 to 4/3/09

Team Members:

Jessica Hause (Co-Team Leader)
Erin Main (Co-Team Leader)
Lacey Halfen (Communicator)
Peter Strohm (BSAC)
Fan Wu (BWIG)

Client:

Orhan Unal

Advisor:

Willis Tompkins

Problem Statement:

This project consists of designing a heart phantom to be used for the initial testing of a new, solenoid-tipped catheter awaiting FDA approval. This catheter will ultimately be used to treat atrial fibrillation under MRI guidance. The transparent phantom will be used to test the maneuverability of the catheter under MRI guidance as well as the high resolution imaging capabilities in the vicinity of the solenoid tip. It will consist of clear tubing of various sizes representing tortuous vasculature leading to a single heart chamber. All “veins” must terminate at one end of the phantom and be sealed so they may be filled with a saline solution in either a static or dynamic state without risk of leaking.

Goals this Week:

- Again test the phantom while connected to the pump to ensure that all leaks have been fixed.
- Determine the best method to remove air from the circuit. We have currently tried venting through the catheter entry point, but another method has come to our attention and we will need to look into this.
- Continue working on a way to solve the issue of kinking in the “pulmonary veins”.
- Arrange a time with client for testing in MRI.

Summary of Accomplishments:

- Re-tested phantom using the pump. All leaks were fixed but we were still having problems with kinking
- Tried to re-cut and re-do the geometry of the vasculature to avoid kinking
- Researched and purchased new tubes with braided reinforcement to avoid kinking
- Spoke with client about testing in MRI.

Goals next Week:

- Receive, cut, and replace tubing in vasculature
- Test the phantom again with the pump connected to ensure that it does not leak and none of the tubes are kinking
- Discuss how to remove air from the circuit

- Test the phantom in an MRI setting

Project Difficulties:

- No difficulties this week

Activities:

Date	Person	Activity	Time Spent
3/27/09	Team	Met with client to re-test phantom using pump.	2 hrs
3/31/09	Erin, Jess & Fan	Tried to re-cut and replace vasculature in a way that avoided kinking in the tubes.	1 hr
3/31/09	Erin, Jess & Fan	Researched parts and put in an order for tubing with braided reinforcement	1 hr
4/2/09	Individual	Brainstormed ways to remove air from the vasculature	1.5 hrs

Team Hours:

Weekly..... 5.5 hrs
 Total..... 57.25 hrs

Project Timeline:

Jan. 18 - Jan.24		Project Selection	x
		Contact Client	x
Jan. 25 - Jan. 31		Individual Research	x
		Client Meeting	x
		Brainstorm	x
		PDS	x
Feb. 1 - Feb. 7		Finalize Design	x
		Order Parts	x
Feb. 8 - Feb. 14		Construction	x
Feb. 15 - Feb. 21		Construction	x
Feb. 22 - Feb. 28		Construction	x
Mar. 1 - Mar. 7	Midsemester Presentations (Mar. 6)	Midsemester Powerpoint	x
Mar. 8 - Mar. 14	Design Notebooks (Mar.11)	Construction/Testing	x
Mar. 15 - Mar. 21	Spring Break	Spring Break	x
Mar. 22 - Mar. 28		Construction/Testing	x
Mar. 29 - Apr. 4		Construction/Testing	x
Apr. 5 - Apr. 11		Testing	
Apr. 12 - Apr. 18	Engineering Expo	Testing	
Apr. 19 - Apr. 25		Testing	
		Poster	

Apr. 26 - May 2	Poster Presentation (May 1)	Poster
		Final Report
May 3 - May 9	Design Notebooks (May 6)	Final Report
	Final Report (May 6)	
	Peer and Self Evals (May 6)	