

## **BME 402 - Heart Phantom**

*Progress Report Week 11 – 4/3/09 to 4/9/09*

### *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:**

- 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

### **Summary of Accomplishments:**

- Received new reinforced tubing.
- Took apart all of the internal tubing so that it could be replaced with the reinforced tubing. When we removed a section of tubing from the heart, a piece of the hard polycarbonate tubing came loose and had to be repaired.
- Disassembled heart chamber to test how easily the septum could be replaced. Decided on a new caulking method for the heart so that septum could be removed and replaced without difficulty.
- Snap grip clamps originally ordered to connect tygon tubing to the polycarbonate did not fit the new reinforced tubing so new snap grip clamps had to be ordered.
- Arranged time with client (Friday 4/9 at 2:45pm) to replace snap grip clamps, meet regarding progress, test new tubing and set up time to test under MRI.

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**Goals next Week:**

- Install new tubing and new snap grip clamps.
- Determine if kinking issue has been resolved by using the new reinforced tubing.
- Discuss progress with client and set up time to test under MRI.

**Project Difficulties:**

- No difficulties this week.

**Activities:**

Date	Person	Activity	Time Spent
4/3/09	Peter	Picked up new tubing from client.	0.5 hr
4/6/09	Team	Disconnected all of the original tubing and repaired loose polycarbonate tubing	2 hr
4/7/09		Disassembled heart chamber and determine the best way to replace septum	1 hr

**Team Hours:**

Weekly..... 3.5 hrs  
 Total..... 60.75 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	x
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 (May 6)	Final Report
	Peer and Self Evals (May 6)	