

Progress Report Week 10: Week of March 27th to April 2nd 2009

Liver Phantom for MRI Guided Trans-arterial Chemoembolization Simulation

Client: Dr. Wally Block Ph.D. University of Wisconsin – Biomedical Engineering Department
Advisor: Dr. William Murphy Ph.D. University of Wisconsin – Biomedical Engineering Department
Team: Benjamin Engel, Leader
Ryan Carroll, BWIG
Eric Printz, Communicator
Justin Schmidt, BSAC

Problem Statement

Liver cancer treatment can often involve higher, more targeted doses of chemotherapy if delivered directly to the liver. Professor Block's MRI lab is integrating capabilities to guide cancer treatment to the liver using magnetic resonance imaging. Current x-ray treatments significantly over treat the liver because while x-ray can be useful in the visualization of catheters, they can't visualize soft tissue, specifically the tumor. It is proposed to develop a liver phantom that will simulate the arterial vessels of the abdomen as well as the liver in an effort to simulate treatments and train interventional radiologists on the use of the new MRI guided techniques. The project will include adding flow capabilities through the use of a programmable fluid pump to simulate pulsatile flow.

The current coil being used is insufficient for the images needed so a new coil was designed using a circular PVC tube. Because the new coil is circular there are issues with it moving around during the procedures. Also, during the MRI procedures the subject along with the coil is required to be transported to the X-ray to verify the placement of the catheter inside the liver segments. To minimize movement of the subject and coil it is proposed to design a table that securely holds both the coil and subject without significant movement. The table must be compatible with both the MRI and X-ray and be easily transported from one to another.

Week 10 Goals

- Determine what we are going to use as a strap to hold down the coil and is also MRI compatible.
- Update Website
- Finish fabrication of the table so they can begin using it for testing.

Week 10 Activities

Team Member	Accomplishments	Hours	Running Total (Hours)
Benjamin Engel	Build prototype	2	17
Ryan Carroll	Build prototype / MRI table measurements	2.5	15.5
Justin Schmidt	Build prototype / Purchase materials / MRI table measurements	3.5	17
Eric Printz	Build prototype / Purchase materials MRI table	3.5	18

	measurements		
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Week 10 Accomplishments

- We finished the majority of the table with only the bottom support needing to be made
- Our client was unable to use the table during their animal study because of time constraints

Week 11 Goals

- Make the bottom support for the table
- Talk to Ethan about finding time to test our device along with the phantom from last semester

Schedule

Scheduled
Completed
Monday of Required Presentation

	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May
Propose project																
Conduct background research																
Discuss parameters w/ client																
Develop PDS																
Brainstorm/solidify design ideas for initial prototype																
Midsemester presentation																
Order materials																
Construct prototype																
Safety Testing/improvements																
Usability Testing w/ interventional radiologists																
Final Presentation Preparation																
Final Paper																

Project Difficulties

- No difficulties to report thus far

Expenses

- No expenses to report thus far