

Project Title: An airway pressure device for use in an MRI machine

Team Members:

Laura Sheehan - Leader
Jon Cappel – Communications
Noelle Simatic – BWIG
Kevin Johnson – BSAC

Client: Victor Haughton, M.D.

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Advisor: Mitch Tyler

Date: 10/28/05 – 11/3/05

Problem Statement: Our client Dr. Haughton is currently studying CSF flow during Valsalva maneuvers performed by children with Chiari I malformations. Current research suggests that CSF flow decreases during Valsalva maneuvers in these patients. The airway pressure device would help monitor the exhalation force exerted by each child during a Valsalva maneuver in the MR suite. Knowing the pressure exerted by each patient in the study would be extremely beneficial for data analysis and accuracy.

Last Week's Goals:

- Obtain client feedback
- Order balloon valve
- Begin prototyping

Individual Goals:

Laura – Progress report, contact Matt O'Brien to obtain microbial filters, prototyping
Jon – Prototyping
Noelle – Work on project website, prototyping
Kevin – Prototyping

Summary of Accomplishments:

- Ordered transducer and transducer connectors
- Obtained pricing information for balloon valve from Hans Rudolph
- Ordered transducer and transducer connector
- Designed a valve to use in place of balloon valve (due to the cost of purchasing a valve)
- Bought parts for valve construction at Hardware Hank
- Drilled and tapped hole in end cap for tubing barb
- Lathed down the air tube to fit mouthpiece
- Drilled four air holes in air tube, used countersink and chisel to smooth edges

- Began lathing of plug and stopper ring

This Week's Goals:

- Obtain client feedback
- Finish constructing the prototype
- Work on signal display
- Start putting together the poster presentation

Project Difficulties: On Friday, we found out that it would cost ~\$400 to purchase a balloon valve. We ended up designing a similar device that will use compressed air and a stopper to close the tube. The stopper will be connected to elastic, so when the compressed air is turned off, the airway will reopen. We are close to finishing the construction of the valve, and it is functioning as we had planned.

Activities:

Laura – Progress report, in-class meeting, valve design meeting, Hardware Hank shopping trip, work in the machine shop: 7 hours

Jon – In-class meeting, valve design meeting, Hardware Hank shopping trip, work in the machine shop: 7 hours

Noelle – Work on project website, in-class meeting, valve design meeting, Hardware Hank shopping trip, work in the machine shop: 7 hours

Kevin – In-class meeting, valve design meeting, Hardware Hank shopping trip, work in the machine shop: 7 hours

Team Total Hours for this Week: 28 hours

Project Schedule for the Remainder of the Semester:

Tasks	November				December	
	4	11	18	25	2	9
Prototyping and Calibrating	■	■	■	■		
Signal Display Work		■	■			
Testing			■	■		
PDS	■	■	■	■	■	
Final Poster Presentation		■	■	■	■	
Meet with Client	■		■		■	
Progress Reports	■	■	■	■	■	■
Website	■	■	■	■	■	■
Final Meeting with Advisor						■

Expenses:

<u>Radio Shack</u>	
12' BNC Coaxial Cable	\$11.99
2 BNC Connectors	\$8.98
Project Enclosure Box	\$4.97

Tax	\$1.47
Radio Shack Total	\$27.37

Omega Engineering

Transducer	\$36
2 Transducer Connectors	\$10
Standard Shipping	\$8
Omega Total	\$49

Hardware Hank

Epoxy	\$4.99
PVC	\$1.29
Tubing Barb	\$.99
Rubber Bands	\$.67
Tubing for Compressed Air	\$8.00
Tax	\$.88
Hardware Hank Total	\$16.82

Running Total	\$93.19
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