Esophageal Stricture Measuring Device

Client: Dr. Reichelderfer
Advisor: Dr. Tompkins
Team Members: William Stanford (Team Leader)
Karissa Thoma (Communicator)
Dan Frost (BWIG)
Allie Finney (BSAC)

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Problem Statement

Esophageal strictures form in the esophagus from built up scar tissue caused by stomach acid entering the esophagus. A previous group designed a device that can measure both the volume of the esophagus at the stricture and the tissue compliance. In the Fall of 2007, a team created a LabVIEW program that was able to measure pressure and volume in real time. The device must now be calibrated for use in procedures. This includes generating curves from esophagi and trying to develop a correlation between stricture size and compliance. With this relationship, it will be possible to warn doctors when they are about to perforate the esophagus. With more research, it may also be possible to produce a stress vs. strain curve to aid in perforation prevention. Once sufficient research has been accomplished, the device will need to be redefined to work in a hospital setting. This will include incasing the sensors and a 5V power supply.

Last Week's Goals

- Develop specific questions for the sensor company and call them with the questions
- Visit the hospital to show Dr. Reichelderfer mid-semester presentation
- Test adhesive on sample connection and determine its strength and amount of adhesive needed
- Continue to work with LabVIEW and the A/D converter

Summary of Accomplishments

The team again called the sensor company on Friday and finally got a hold of the person who could help. He informed the team that the black wire lead needed to be connected to ground, not -5V. The wire guide provided by the company indicated that the black wire needed to be attached to –5V. He also said that the sensor is a one lead output and that only the white wire needs to be attached for the output signal and the green wire is not needed. The team tried this new configuration and the sensor still did not work. Upon recalling the company, they said that attaching -5V to the ground lead should not have harmed the sensor but they would check to make sure and call back. They have yet to call back so the team will need to call them tomorrow. The idea of developing a metal, threaded attachment piece for the pressure sensor was also discussed. The team decided it would be easy to buy a pipe and thread the ends of it so that the pressure sensor and the tube adaptor could be screwed into it. This would greatly increase the maximum seal pressure, eliminating the need for strong adhesives. After obtaining the LabVIEW software from the library and installing the DAQmx software, the appropriate icon appeared

but when placed into the diagram, said that it was not installed. Karissa also installed the software so it may work better on her computer than on William's computer. If the A/D converter can be made to work, and the pressure sensor no longer requires a negative power input, the size of the final device will be greatly reduced as a separate -5V supply will no longer be needed.

Next Week's Goals

- Call company and continue to ask the correct to hook up the sensor as the data sheet provided is wrong
- Write down correct pressure sensor configuration if obtained
- Buy a metal pipe and machine the ends so that they are threaded
- Continue to work with LabVIEW and A/D converter

Difficulties

The team finally managed to get a hold of someone at the pressure sensor company. After telling him the problem with the sensor, he said that he would call back later that day, but never did.

Activities

Name	**Activity**	**Hours**
William Stanford	class time	23
Karissa Thoma	class time	19
Dan Frost	class time	22
Allie Finney	class time	21