Progress Report 1: September 15 to September 21, 2008

Centrifugal Pump Design for Neuroendoscopy

Client: Dr. Joshua Medow, MD, Dept. of Neurological Surgery
Advisor: Professor William Murphy, Biomedical Engineering
Team Members: Jenna Spaeth (Leader)
Kellen Sheedy (Communicator)
Laura Piechura (BWIG)
Holly Liske (BSAC)

Problem Statement

Neuroendoscopy is a surgical procedure that uses endoscopes or tube-like instruments to view the internal surface of the brain. A continuous (non-peristaltic) flow of saline is necessary to visualize and navigate throughout the surgical field. Currently, this continuous flow of saline is created through a pressurized bag; however, key disadvantages such as frequent replacment and variable saline pressures leading to flooding or lack of visibility has prompted this system to be redesigned. Our client, Dr. Joshua Medow, would like to use a centrifugal pump to control this constant flow of saline. The pump that has been chosen was originally designed for cardiac surgery, having a saline flow of 5.0 L/min, much higher than the 1.7 L/min flow required for the brain. Dr. Medow would like us to design the circuitry for the centrifugal pump as to create a negative feedback system to control the saline flow when instruments are inserted and removed from the endoscope during the procedure and to reduce the overall flow rate to the appropriate level.

Last Week's Goals

- Assign team roles.
- Conduct preliminary research on neuroendoscopy and centrifugal pumps.
- Meet with Dr. Medow to discuss the project objectives in more detail
- Set weekly meeting time with Prof. Murphy.

Summary of Accomplishments

- Team roles were assigned and preliminary research was conducted to understand more about neuroendoscopy. However, since our client only provided two sentences of project objectives it was difficult for us to come into our client meeting with a full understanding of what he planned for us to accomplish.
- We met with Dr. Medow on Friday, September 12th to discuss the project objectives. He gave us a brief overview of the project, but was not able to show us the laboratory and centrifugal pump due to time constraints. Some of the main learning from this meeting included:
    - The majority of the materials we will need have been purchased
    - This project has patent opportunity and must be secured
    - Dr. Medow would like to meet with our team weekly
    - We have the opportunity to work in the hospital lab he is currently using
- Kellen communicated with both Dr. Medow and Prof. Murphy to confirm meeting times for this week, both occurring on Friday, September 19th.

The Week's Goals

- The second preliminary meeting with Dr. Medow should provide us with a better grasp on the project, allowing us to move forward with circuit design.
- Dr. Medow would like to meet weekly with our team. This weekly time must be confirmed.

Project Difficulties

Although early in the project, it appears that circuit analysis and design will be our biggest challenge for this project thus far.

Activities

Team Member	Activities	Time for Week	Total Time
Holly	Client and Advisor meetings		
Jenna	Progress Report Client and Advisor meetings		
Kellen	Communication with client and advisor Client and Advisor meetings		
Laura	Client and Advisor meetings		

Project Timeline

*Dr. Medow was comfortable extending our project into two semesters. During the first semester he expects us to have a constructed circuit to make the pump work within the specifications. The second semester is reserved for refining the circuit to optimize the pump.

*Next week an official timeline will be created and included in this report reflecting our expected plan for the first semester.