Week 7 Report

Work Completed

This week and during Spring Break I have begun to focus on assembling the artificial sphincter and worked on completing the coding for the implantable portion of the device. I have created the circuitry necessary to input the stretch sensor data and create a corresponding volume output. I also created a new test setup for the artificial bladder that we purchased and attempted to use bladder in our simulation.

Programming

This week’s focus was the CB220 programming. I created two circuits for the CB220. One creates a voltage divider across the stretch sensor, which inputs a voltage to the CB220 and thus creates a value that can be converted to an equivalent corresponding volume. The other was a simple test setup to see if the CB220 was receiving the voltage and converting it to a volume percentage. This setup used a sequence of 4 LED’s that corresponded to 25%, 50%, 75%, and 100% when illuminated. The CB220 programming was successful for the most part. We were able to receive the voltage and actually convert it to the correct percentage output. The LED program was not successful for unknown reasons, but this was only being used for a simple test so troubleshooting this portion of the code was neglected.

Figure 1 – CB220
Artificial Sphincter

We received the artificial sphincter and were able to easily connect it to the micro pump. The pump inflates the cuff wonderfully and everything operates smoothly. The only problem was that the cuff is unable to create enough pressure to completely seal off the catheter tubing to prevent water flow. On Friday, March 14, I had a conference call and he informed me that the portion of the urethra where the cuff is actually implanted is nothing like a tube so it will be difficult for us to simulate this function. So a new design will need to be created that will simply allow for the closure of a tube. We are investigating several ideas for this. Alan also informed me that he will be sending me a few implantable balloons for the device that actually regulate the pressure in the device and will actually contract the device once left alone for 3-5 minutes. This was good news as it will allow us to eliminate one of the micro pumps from the system, and simplifying the design, coding, and consume less power.

I will also be looking into creating a portion of the device that will be able to manually deflate the cuff in the event of micro pump failure. I believe we will simply include the manual pump that the AMS 800 uses now, which will only be necessary in the event of micro pump failure.

Future Work

This coming week I will continue to work with the CB220 and Remote Coding. The main focus for this week will be linking the two systems using the blue tooth transceivers. This portion of the devices has been continually been put off due to receiving the necessary parts from AMS and creating a setup for the device. Now that we have all the components necessary for programming we can complete the programming and finally connect the two portions of the design.

Hours Worked

For week 7 and week 8 (Spring Break) I worked a total of 22 hours. Most time was spent programming the CB220 and creating the necessary circuitry for the device.