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Week 4 Report- Through Feb 15, 2008  
Accessible Incontinence control Device  
Team 8  

**Work Completed**

Over the past week majority of the work completed was doing research and setting up the micro pump to check their efficiency. During the past week I focused my research on understanding how the wireless transmission works in correspondence with the micro pump and the precise voltage needed to operate the micro pumps. I also did collaborative work with my team members in setting up the micro pump to check the ideal voltage, current and flow rate at which the micro pumps will be operating. What we found out is that 3.3 V at 250 ml/min is ideal for our design project. The micro pumps that we will be using are the TMS M100S micro pumps. These pumps were chosen because they are able to function in extreme temperatures and able to perform in a hostile environment. Also the power usage is very small, approximately 0.84 W. These micro pumps are also pretty quiet. What we did find out as a group is that the micro pumps are very sensitive to air bubbles, but since our device is implantable that should not be a problem.

![M100s Micro pump](image)

**Figure 1: M100s Micro pump**

Our team would have preferred to use one micro pump instead of two to operate the artificial sphincter. We thought that reversing the voltage of the micro pump would have reversed the direction of the flow. However, after I contacted the company, I was told that reversing the voltage only reduces the efficiency of the motor. Therefore, if we would like to reverse the flow an additional pump would be needed. The pumps would be connected in series but in opposite directions, i.e. the tubing would connect the outlet of the first pump to the outlet of the second pump. As for the direction of the flow, for the flow in one direction, send power to the first pump. To reverse the flow, switch the power away from the first pump, to the second pump. The figure below shows the set up of the two micro pumps.
Bladder Status

Over the past week Erica and I have also measured the corresponding resistance to the stretch sensor when stretched every 0.25 inches. The resistance of the stretch sensor from 4-7.75 inches ranges from 3.93-13.40 kilo ohms. The stretch sensor doesn’t stretch 100%, but that is not a problem for our design since the distance between the urethra and the around the bladder is known.

Future Work

The future work for this week is to connect the micro pumps in series and to ensure that the direction of the flow will be reversed. Once the urine bag comes in, we should be able to have a more accurate status of the bladder and be able to calculate the corresponding resistance to the volume percent of urine in the bladder.

Project Review

Overall, we have made significant progress from the last week. Zack began programming the LCD screen of the CuTouch, and Erica has been working on writing codes. We will continue the set up for the various parts of our design.

Hours Worked

This past week I have worked approximately 13 hours, which included working on the power point presentation, contacting companies, setting up micro pumps and measuring the resistance of the stretch sensor.