Pelvic floor Biofeedback Design

Client: Dr. Patrick McKenna, UW Urology Department

Advisor: Dr. Amit Nimunkar

Team: Sam Lines (Leader)

Michael Simonson (Communicator)

Shawn Patel (BWIG)

Andrew Vamos (BSAC&BPAG)

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Problem Statement

Pelvic floor muscle biofeedback systems have been used to educate and train people how to correctly control the process of urination in children and elderly patients. As devices slowly fail or get outdated, a new device and interface system that can be used in conjecture with videogame like training programs is desired. With the completion of a basic EMG biofeedback system, our goal is to continue to improve the functionality of the software while simultaneously designing hardware with commercial standards in mind. This product will be designed and tested so that use in a hospital will be safe for both the hospital staff and the patients.

Last Week's Goals

- Using our goals from Trello we intend to start finalizing parts of the design.
- According to our timeline we are a little behind schedule, so we plan to work hard this week to finalize and start to test our circuit
- With testing of individual parts, and basic construction complete, we will order the last few parts that we will need and begin testing as soon as possible

Summary of Team Role Accomplishments

- Leader (Sam): Selected a design for the DC/DC power supply
- Communicator (Michael): Finished right leg drive and FDA research
- BWIG (Shawn): Researched patient isolation and system isolation
- BPAG And BSAC(Andrew): Finished working block diagram of the system

Summary of Design Accomplishments

- We have selected all of our circuit components and will be ordering the last few parts as soon as we can confirm the last patient safety requirements.
- We have finally figured out right leg drive and will be implementing it into our circuit
- With continued research into standards, we are trying to improve safety and signal quality be isolating the system and the patient

Project Difficulties

- In order to test whether or not the EMG signal is coming from the right muscles, we will try to do a frequency power spectrum analysis to determine how much noise is in the signal and look for characteristics of pelvic floor muscle contraction
- We are not entirely sure what the frequency characteristics of different muscle groups are, so we will have to spend some time researching.
- It has proved very difficult to find exact numbers in terms of patient isolation from wall power. We will continue working on finding this information so that we can order parts.

This Week's Goals

- Finalize our design on a printed circuit board hardware to order our PCB
- Look into the frequency characteristics of different muscle groups so that we can confirm that we are indeed measuring from the correct muscle groups
- Finalize testing protocols with Amit's guidance

Activities

Person(s)	Task	Time (hrs)	Week Total	Semester Total
Sam	Power supply research	2	2	18
Michael	Standards research	3	3	19
Shawn	Patient isolation research	2	2	18
Andrew	Detailed Visio block diagram	2	2	18

Timetable

- Due to the large size of our timeline, I will attach the full excel spreadsheet

Expenses

- No current expenses