

Ophthalmic Dose Compliance Monitor Project Report #9

November 3, 2005

Project Title: Ophthalmic Dose Compliance Monitor

Team Members: Arinne Lyman, Anita Zarebi, Becky Koszalinski, Michael Alexander

Client: Christopher J. Murphy DVM, PhD

Advisor: Wally Block

Date: 10-29-05 to 11-3-05

Problem Statement:

Develop a dose compliance monitor that would record (unknown to the client) when (date and time) a topical ophthalmic medication was delivered. There are several older studies performed in the 80's that used a compliance monitor specifically designed for topical ophthalmic medications, and I am hopeful that we would be able to develop a cost effective improved model. Ideally we would be able to manufacture approximately 10 of these devices for use in studies. It could be as simple as some of the older models that recorded when the top of the bottle was removed and the bottle inverted. Maintenance of sterility of the medication is imperative. The simplest designs would simply provide a thin sleeve that the commercial 5, 15, or 30 ml topical ophthalmic medication bottle slid into. There are many possibilities and I am hopeful that some of your students would find this challenging. These would initially be used in research of patient compliance.

Statement of Team Goals:

1. Problem statement
2. Create first draft of PDS
3. Set up meeting with client
4. Begin to research and develop design ideas
5. Research specs on parts as well as cost and dimensions
6. Continue the design project.
 - a) Research all possible background information.
 - b) Research existing solutions on the market
 - c) Brainstorm in individual teams
 - d) Meet with experts to gain ideas about possible solutions
 - e) Develop possible design solutions
7. Continue to develop final design alternatives
8. Write midterm paper
9. Create power point presentation
10. Discussed possible final design alternative
11. Finalize design
12. Further develop and test prototype
13. Present final design

Summary of Team Accomplishments:

We tested our pressure sensors last Friday only to find that they were not quite what we had in mind. Instead of having the sensing units along the strip, they were concentrated at the head of the strip so it cannot be wrapped around the bottle. We have come up with two solutions to fix this: 1: put these on the crude prototype and research ones that can be used to replace them in the future or 2: Research and order new pressure sensors. We also have been working on making the cap sensor this week and will test that in the lab on Friday. It turned out that the Gyro sensor is not ready for retail so an inclinometer was researched and will be ordered hopefully by Friday for testing next week. The inclinometer senses tilt and we will get one that has readings at 0 and 90 degrees for our prototype. One thing we need to discuss with Wally on Friday is how we are going to represent our results in the final poster presentation. Graphical analysis is best, but for some of our sensors, they are either on or off and cannot be represented graphically. Our team met last night quickly to discuss future plans and as soon as testing of individual components is complete, we will begin to combine them with a PIC chip and program it to our specifications. We definitely hope to have a crude prototype at the end of the semester that at least works in conjunction with two sensors.

Project Schedule:

9/2	Form team, contact client, assign team roles, set up client meeting
9/9	Literature search, create problem statement, begin PDS
9/16	PDS, brainstorming, begin developing designs
9/23	Design research
9/30	Design Research
10/7	Work on mid-semester presentation paper and presentation (oral and power point)
10/14	Mid-semester presentation
10/21	Work on final design (i.e. develop a prototype, testing, etc)
10/28	Continue working on final design
11/4	Work on design
11/11	Work on design
11/18	Continue working on design, start working on presentation
11/25	No Class (Thanksgiving)
12/2	Prepare final presentation and paper
12/9	Final poster presentation
12/16	Hand in report and notebook
12/23	Last day of finals

Activities:

Arinne:

Design Research (2 hrs)
Phone calls (2 hrs)
Testing (1.5 hrs)
Misc (2 hrs)
Team meeting (.5 hrs)
Total: 8 hrs

Anita:

Design Research (2 hrs)

Phone calls (2 hrs)

Testing (1.5 hrs)

Misc (2 hrs)

Team meeting (.5 hrs)

Total: 8 hrs

Becky:

Design Research (3 hrs)

Phone calls (2 hrs)

Testing (1.5 hrs)

Misc (1 hrs)

Total: 7.5 hrs

Michael:

Design Research (3 hrs)

Miscellaneous (3 hr)

Team meeting (.5 hrs)

Total: 6.5 hrs

Team Total Hours for this week: 30 hrs