

Ophthalmic Dose Compliance Monitor Project Report #11

November 16, 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: 11-11-05 to 11-16-05

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:

The accelerometers have arrived and we will be testing them in the lab and incorporating them onto the bottle Thursday and Friday in the lab. We have already tested the force sensors and determined a threshold value to program into the microprocessor. The cap sensor is giving us a little trouble because of its bulkiness so we may be looking into another option like a Hall Effect sensor that measures a magnetic field when the cap is removed. The microprocessor program is completed and looks like it will work, but we will be testing it over the next couple of days with all of our inputs to see if it can deliver. We are fairly optimistic that we can have a crude prototype after this testing is completed. We have noticed differences in threshold values for the force sensors when the bottle is empty or full of fluid so we may need to take this into consideration when determining the right value.

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:

Product research/ordering (1 hrs)
Lab testing (3 hr)
Misc (1 hr)
Team meeting (1 hr)
Total: 6 hrs

Anita:

Lab testing (3 hr)
Misc (1 hr)
Team meeting (1 hr)
Total: 5 hrs

Becky:

Lab testing (3 hr)
Misc (1 hr)
Team meeting (1 hr)
Total: 5 hrs

Michael:

Microprocessor Programming (8 hrs)
Lab testing (3 hr)
Misc (1 hr)
Team meeting (1 hr)
Total: 13 hrs

Team Total Hours for this week: 29 hrs