

Calibrated Eye Dropper

Week 13: April 17, 2009 – April 23, 2009

Team: Sarah Switalski – Co-Leader
Michelle Tutkowski – Co-Leader
Brooke Sampone – Communicator
Jim Mott – BWIG
Eamon Bernardoni – BSAC

Client: B'Ann Gabelt
UW Dept. of Ophthalmology and Visual Sciences
UW School of Medicine and Public Health
Phone: (608) 263-5125, Email: btgabelt@wisc.edu

Advisor: Pamela Kreeger
Assistant Professor, Biomedical Engineering
Phone: (608) 890-2915, Email: kreeger@wisc.edu

Problem Statement:

A lab in the Department of Ophthalmology and Visual Sciences needs a device to accurately and efficiently deliver 5 μ L drops of experimental drugs into the cornea of the eye for glaucoma therapy testing in animals. Currently, the client uses standard micropipettes which deliver exactly 5 μ L drops, but this method is time consuming, poses a danger to the safety of the animal and makes drop placement difficult. The objective is to optimize accuracy, efficiency, and animal safety in optical drug delivery.

Previous Week's Goals:

- Finish PMMA molds for both ergonomic pipette grips
- Finish tip ejector modifications to be compatible with MiniFIX pipette
- Fabricate ring Eppendorf holders
- Research and implement idea of diaphragm Eppendorf caps
- Devise and write testing procedure

Week 13 Activities:

Individual	Activity	Time (hours)	Weekly Total (hours)	Overall Total (hours)
Michelle	Independent	1.75	7.25	56.00
	Team Meeting	5.50		
	Client Meeting	0.00		
Eamon	Independent Work	0.00	6.25	72.25
	Team Meeting	6.25		
	Client Meeting	0.00		
Sarah	Independent Work	0.50	6.00	58.75
	Team Meeting	5.50		
	Client Meeting	0.00		
Brooke	Independent Work	0.50	5.75	59.25
	Team Meeting	5.25		
	Client Meeting	0.00		
Jim	Independent Work	0.00	6.00	72.00
	Team Meeting	6.00		
	Client Meeting	0.00		

Summary of Accomplishments:

The team completed pouring the PMMA into the first pipette grip. Fabrication then continued by completing the tip ejector which was rounded to add strength. The team modified a hygienist ring so that it can carry three small Eppendorf tubes. Fabrication on the second ergonomic grip progressed as the team added PMMA for a mold around the MiniFIX. Research on diaphragm caps (known as pierceable septa covers) was begun, but it has not yielded definite results yet. Preliminary testing ideas were developed which include a survey of users for comfort and an accuracy test with an analytical balance. Finally, the team began to compile the poster for the final presentation.

Next Week's Goals:**Individual Goals:**

- Brooke: Perform device testing, help to complete poster and presentation, keep in contact with client
- Eamon: Perform device testing, help to complete poster and presentation, BSAC
- Jim: Perform device testing, help to complete poster and presentation, maintain website

- Michelle: Perform device testing, help to complete poster and presentation, continue to research pierceable septa covers
- Sarah: Perform device testing, help to complete poster and presentation, prepare progress report

Team Goals:

- Perform testing on device
- Complete poster and presentation
- Begin the final paper

Difficulties:

There are no difficulties at this time.

Project Schedule:

Tasks	Jan		Feb				Mar					Apr				May		
	23	29	6	13	20	27	6	11	13	20	27	3	10	17	24	1	6	8
Research	X	X	X	X														
Brainstorming	X	X	X	X	X													
PDS			X															
Prototype Design				X	X	X	X											
Prototype Fabrication								X	X	X	X	X	X	X				
Testing																		
Meeting with Client		X		X							X							
Team Meeting	X	X	X	X	X	X	X		X		X	X	X	X				X
Presentation							X											
Written Reports								X										
Peer/Self Evaluations									X									

Expenses:

Five miniFIX micropipettes from Dynalab cost \$99.00.

One packet of three Ultra Precision Compression Springs from McMasterCarr cost \$7.70.

The team received 4 oz. of PMMA polymer and monomer from Greg Gion.

The team received multiple hygienist rings from a family contact.