

## Calibrated Eye Dropper

Week 14: April 24, 2009 – April 30, 2009

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Michelle Tutkowski – Co-Leader  
Brooke Sampone – Communicator  
Jim Mott – BWIG  
Eamon Bernardoni – BSAC

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### Problem Statement:

A lab in the Department of Ophthalmology and Visual Sciences needs a device to accurately and efficiently deliver 5 $\mu$ 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 $\mu$ 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:

- Complete all fabrication of prototype
- Perform testing on device and compile testing data
- Complete poster and presentation
- Begin the final paper

### Week 14 Activities:

Individual	Activity	Time (hours)	Weekly Total (hours)	Overall Total (hours)
Michelle	Independent	1.00	7.00	63.00
	Team Meeting	6.00		
	Client Meeting	0.00		
Eamon	Independent Work	1.00	5.75	78.00
	Team Meeting	4.75		
	Client Meeting	0.00		
Sarah	Independent Work	1.50	7.50	66.25
	Team Meeting	6.00		
	Client Meeting	0.00		
Brooke	Independent Work	0.50	8.00	67.25
	Team Meeting	7.50		
	Client Meeting	0.00		
Jim	Independent Work	0.50	7.25	79.25
	Team Meeting	6.75		
	Client Meeting	0.00		

### Summary of Accomplishments:

The team completed fabrication of both prototypes. After researching piercable septa caps, the team was able to contact Wheaton Science Products, and Wheaton is sending the team five sample 8 mm polyethylene plug caps with starburst tops. The team performed accuracy testing with three MiniFIX pipettes by dispensing drops onto an analytical balance and then calculated the average volume dispensed and the average error. The team also collected data from 10 participants who completed a user survey which ranked four pipettes (purple prototype, blue prototype, MiniFIX pipette, standard micropipette) based on comfort, animal safety, and controllability. Finally, the team completed the poster for the final presentation and distributed sections for the final paper.

### Next Week's Goals:

#### Individual Goals:

- Brooke: Give poster presentation, finish notebook, complete final paper, keep in contact with client
- Eamon: Give poster presentation, finish notebook, complete final paper, BSAC

- Jim: Give poster presentation, finish notebook, complete final paper, maintain website
- Michelle: Give poster presentation, finish notebook, complete final paper, prepare progress report
- Sarah: Give poster presentation, finish notebook, complete final paper

**Team Goals:**

- Give poster presentation
- Complete and submit 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														X	X			
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 a sample package of 0.6 mL Eppendorfs from Professor Kreeger

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

The team received multiple hygienist rings from a family contact.