

# Endotracheal tube adaptor for administration of nebulized medications

**Client:** Dr. Mark E. Schroeder

**Team Members:** Ryan Childs (BSAC)  
Ozair Chaudhry (Communicator)  
Timothy Barry (BWIG)  
Evan Joyce (Leader)

**Date:** April 3 to April 10, 2009

## Problem Statement

The goal of this project is to develop an endotracheal tube adaptor that can consistently deliver aerosolized medication (Albuterol or Ipratropium) to an anesthetized patient during surgery by anesthesiologists at the UW-Hospital. The adaptor will be used on an intubated patient who is anesthetized with medication from an anesthesia circuit. The device should not impede the anesthesia circuit which flows at a rate of 4–5 Liters of air/minute and should solely act as a port to deliver medication should it be needed during surgery.

A recent change to the metered dose inhalers (MDI) made by GlaxoSmith&Klein, specifically the addition of an actuation counter on the top of the canister, has rendered our client's current adaptor ineffective. Our client would prefer an adaptor that either works with the patient's plastic dose dispenser, directly with the new MDIs, or as an addition to the current adaptor used. The adaptor we are pursuing acts as a "syringe" to dispense medication in a simple fashion, with one hand, into the Luer port of a readily available plastic anesthesia elbow. The elbow has a locking cap on the Luer port which will be used to prevent the circuit from being broken when the "syringe" adaptor is not in use.

## Last Week's Goals

- Finalize Solid Works model with dimensions of interior of Luer port on anesthesia elbow – have contact at hospital for this just need to meet with her
- Submit order to one of the two shops mentioned above (Physics/PSL)
- Learn how to use Solid Works flow testing and write up questionnaire for MD's in the Anesthesiology department

## Summary of Accomplishments

- Have a completely finished Solid Works model that will be compatible with the Luer port on the anesthesia elbow
- Have testing ideas: medication flow rates, Solid Works software, particle size test, anesthesiologist questionnaire, and analytically measuring medicine delivered – these will be discussed and decided upon on 4/10

- PSL quote was \$1045, Physics lab quote was \$4–500 (and they were better able to follow our specific dimensions/directions). We submitted the design to the Physics lab on 4/8 – part should be completed by 4/15–4/20
- Developed a survey for UW–hospital workers (anesthesiology department mostly) to take and rate our new design. Looked into hypothetical simulation testing for gas flow

### This Week's Goals

- Obtain finished part and give to client to pass around for survey
- Finish at least two other forms of testing (see above)
- Begin work on poster for final report

### Project Difficulties

- Corresponding with GSK (more of a long–term commitment/side project so not a major concern)
- Finding an analytical chemistry professor on campus to help measure minute medication amounts

### Activities

Ozair Chaudhry

4.03.2009 Hospital visit/finding elbow	2.00 hr
~~~~~ Testing research	1.00 hr

Timothy Barry

4.03.2009 Hospital visit/finding elbow	2.00 hr
~~~~~ Corresponding with anesthesia elbow co.	1.00 hr
~~~~~ Website	1.00 hr

Ryan Childs

4.07.2009 Finalizing Solid Works specs/discussion	1.00 hr
4.07.2009 Updating Solid Works model	1.00 hr
4.08.2009 Submitting part to Doug at Physics shop	0.50 hr
4.10.2009 BSAC meeting	1.00 hr

Evan Joyce

4.03.2009 Hospital visit/finding elbow	2.00 hr
4.07.2009 Finalizing Solid Works specs/discussion	1.00 hr
4.08.2009 Submitting part to Doug at Physics shop	0.50 hr
4.09.2009 Progress report	1.00 hr

## Project Schedule

Tasks	January		February				March				April				May	
	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1	8
<b>Research and Development</b>																
Research	█	█	█													
Brainstorm		█	█	█												
Develop Prelim. Designs				█	█	█										
Detail/Evaluate Designs								█	█							
Build Prototype											█	█	█	█		
Test Prototype												█	█	█		
<b>Website</b>		Timothy														
<b>Deliverables</b>																
Midsemester Presentation																
Midsemester Report								█	█							
Final Presentation															█	█
Final Report															█	█
Progress Reports	Evan															

## Expenses

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