

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)

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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

- Finish SolidWorks model of prototype over spring break
- Contact companies that are able to build adaptor. Try to get quotes a few companies to find our best option
- Further discuss and start searching for testing options (for after we have a physical prototype)

Summary of Accomplishments

- Have a working Solid Works model that only needs slight measurement modifications
- Have testing ideas: medication flow rates, Solid Works software, sterilization test, and anesthesiologist questionnaire
- Found two shops on campus that can make the part for us – Physical Sciences Lab and the Physics Lab. These two shops do not work for profit and do a lot of

projects for students and faculty on the campus so labor is relatively inexpensive

- Continued correspondence with GSK which will hopefully lead to additional funding
- Conducted preliminary tests that indicate our adaptor will be able to deliver albuterol from where it leaves the canister to where it enters the circuit

This 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
- Learn how to use Solid Works flow testing and write up questionnaire for MD's in the Anesthesiology department

Project Difficulties

- Finding the interior dimensions of the Luer port on the anesthesia elbow

Activities

Ozair Chaudhry

3.27.2009 Advisor meeting/hospital visit	2.00 hr
3.30.2009 Group meeting	1.00 hr
4.02.2009 Meeting contact at UW-hospital	0.50 hr
~~~~~ Testing research	3.00 hr

Timothy Barry

3.27.2009 Advisor meeting/hospital visit	2.00 hr
~~~~~ Looked into testing ideas	1.00 hr
~~~~~ Website	1.00 hr

Ryan Childs

3.27.2009 Advisor meeting/brainstorming	2.00 hr
3.30.2009 Group meeting	1.00 hr
~~~~~ Updating Solid Works model	1.00 hr

Evan Joyce

3.27.2009 Advisor meeting/brainstorming	2.00 hr
3.30.2009 Group meeting	1.00 hr
4.02.2009 Meeting contact at UW-hospital	0.50 hr
4.02.2009 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
Research and Development																
Research	█	█	█				█								█	
Brainstorm		█	█	█			█								█	
Develop Prelim. Designs				█	█	█	█								█	
Detail/Evaluate Designs							█	█	█							
Build Prototype							█				█	█	█	█		
Test Prototype							█					█	█	█		
Website		Timothy														
Deliverables																
Midsemester Presentation							█	█							█	
Midsemester Report							█	█								
Final Presentation															█	█
Final Report							█								█	█
Progress Reports	Evan															

Expenses

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