

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 24 to May 1, 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

- Finish testing: survey, cascade impactor, analytical measurements, hypothetical flow model
- Finish work on poster for final report

Summary of Accomplishments

- Handed out survey and received some feedback
- Tried to get hypothetical SolidWorks flow model to work but do not have enough information (particle velocity)
- Met with Mike Olsen and discussed cascade impactor protocol. Will not be a test that we run until later (summer)
- Finished poster

This Week's Goals

- Begin working on final report

Project Difficulties

Activities

Ozair Chaudhry

4.24.2009 Advisor meeting	0.50 hr
4.24.2009 Laser diffraction testing	2.00 hr
4.26.2009 Work on poster	6.00 hr
4.27.2009 Meeting with Mike Olsen	1.00 hr
4.28.2009 Work on poster	3.00 hr
4.29.2009 Finished poster	3.00 hr
4.30.2009 Practice presenting	3.00 hr

Timothy Barry

4.24.2009 Advisor meeting	0.50 hr
4.24.2009 Laser diffraction testing	3.00 hr
4.26.2009 Work on poster	6.00 hr
4.27.2009 Meeting with Mike Olsen	1.00 hr
4.27.2009 Work on poster	3.00 hr
4.28.2009 Work on poster	3.00 hr
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Ryan Childs

4.24.2009 Advisor meeting	0.50 hr
4.24.2009 Laser diffraction testing	1.50 hr
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4.27.2009 Meeting with Mike Olsen	1.00 hr
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Evan Joyce

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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

- Prototype cost -- \$675 from Physics shop (15 materials, 660 labor)
- Additional touch-up -- \$55 from Physics shop (labor)
- Poster -- \$50 from college library