

Endotracheal tube adaptor for administration of aerosolized medications

Client: Dr. Mark E. Schroeder

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

Date: November 6 to November 13, 2009

Problem Statement

The goal of this project is to make design changes to an endotracheal tube adaptor that was fabricated last semester for product optimization. The adaptor works as an interface to introduce aerosolized medication (e.g. Albuterol) from a pressurized canister into an anesthesia circuit to an anesthetized, intubated patient. This project was initiated due to a recent change in the Albuterol canister used by the UW-Hospital. The new canisters have been fitted with a non-removable, plastic, actuation counter resulting in a mechanical incompatibility with the old adaptor used at the hospital. The adaptor 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.

Last semester a prototype adaptor was produced that is universally compatible with all aerosolized medication canisters and also compatible with a specific gas sampling Luer port. It acts as a syringe to dispense medication in a simple fashion, with one hand, into the Luer port. This semester's objectives are: make the adaptor compatible with all Luer ports, adjust the size of the aperture at the distal end of the prototype for optimal medication delivery, and thoroughly test the prototype to ensure efficacy. The prototype will also be designed and constructed in a way such that it can be injection molded. Other objectives for the semester that put a spin on the "design" aspect of the class are: performing a market analysis of our adaptor, obtaining a design or utility patent, and licensing the technology to a medical supply company.

Last Week's Goals

- Continue searching for funding options for patent costs (long-term)
- Submit 2D CAD model to Doug Dummer at the Physics shop
- Find testing facility for both laser diffraction equipment and photo spectrometry equipment
- Draft testing protocol to ensure consistent, controlled testing parameters

Accomplishments

- Submitted new CAD model to the Physics shop (estimated to take 5-10 business days to complete)

- Contacted Professor Jaal Ghandi to secure laser diffraction testing facility

This Week's Goals

- Continue searching for funding options for patent costs (long-term)
- Draft testing protocol to ensure consistent, controlled testing parameters
- Find testing facility for photo spectrometry (we may already have a lab suitable for this through Tim)

Project Difficulties

- Waiting for prototype to be fabricated

Activities

Ozair Chaudhry

11.06.2009	Team meeting	2.00 hr
~~~~~	General research	1.00 hr

Timothy Barry

11.06.2009	Team meeting	2.00 hr
~~~~~	Emailing professors for LD testing	0.50 hr
~~~~~	Website maintenance	0.50 hr

Ryan Childs

11.06.2009	Team meeting	2.00 hr
~~~~~	General research	1.00 hr

Evan Joyce

~~~~~	Testing research	1.00 hr
~~~~~	Progress report	0.50 hr

Project Schedule

Tasks	September		October					November				December	
	18	25	2	9	16	23	30	6	13	20	27	4	11
Research and Development													
Research													
Brainstorm													
Develop Designs Changes													
Detail/Evaluate Changes													
Change Prototype													
Test Prototype													
Website	Tim												
Deliverables													
Midsemester Presentation													
Midsemester Report													
Final Presentation													
Final Report													
Progress Reports	Evan												

Expenses

- \$2000 retainer paid to patent attorney Ted Barthel
- Conference with Ted Barthel (roughly 2 hours at \$300/hr)