

Delivery of Aerosol Drugs through Continuous Airway Positive Pressure (CPAP) Progress Report 09/27/2009 – 10/03/2009

Names

Patrick Kurkiewicz, leader
Joe Decker, BSAC
Steve Welch, BWIG
Annie Loevinger, Communications

Clients

Dr. Mihai Teodorescu

Problem Statement

The CPAP system is most commonly used nightly in the homes of patients who struggle with sleep apnea. A method is needed for automated delivery of respiratory anti-inflammatory drugs, like albuterol, while using the CPAP device. Delivery of the necessary dose of such drugs should either be continuous or at timed intervals over a patient's sleep cycle.

Last Week's Goals

- Meet with Dr. Teodorescu at 9:30AM on 10/1
- Meet with Professor Webster at 12:40 PM on 10/2
- Pick up ultrasonic humidifier and test it to see if it can perform necessary function
- Divide up tasks for power point presentation
- Contact Dean R. Hess @ dhess@partners.org to discuss his work
- Read article from PubMed: "Aerosol Kinetics and Bronchodilator Efficacy..."
- Begin brainstorming programming options for CPAP delivery system

Summary of Accomplishments

- Managed to completely disassemble CPAP machine and found that there is no "drop valve"
- Checked out a book on programming and began discussing possible setups / parts needed
- Spoke with Professor Webster and got some ideas for programming possibilities
- Emailed Amit about participating in BME 462 lab and / or borrowing a microcontroller
- Reimbursed by Dr. Teodorescu for cost of ultrasonic humidifier

This Week's Goals

- Team meeting at 5:30 on 10/5 in ECB
- Divide up responsibilities for oral presentations
- See if we can borrow a microcontroller from Amit
- Get educated on programming details and get quotes for parts needed
- Explore possibility of using a 555 timer with current flow to blower as input
- Pick up ultrasonic nebulizer and test functionality
- Meeting with Professor Webster at 12:40 on 10/9

Project Difficulties/ Reason for Missing Goals

- Ultrasonic humidifier takes 7-10 days for delivery to WalMart

Activities

Team

- 10/01/09 Met with Dr. Teodorescu (Patrick, Steve, and Annie)
10/02/09 Met with Professor Webster (Patrick and Annie)
10/02/09 Did lab work, researched microcontrollers (Patrick and Annie)

Patrick

- Research on microcontrollers
- Disassembled CPAP machine
- Research on using CPAP to deliver nebulized gases
- Stopped by Wal-Mart to see if ultrasonic humidifier was delivered (it was not)
- Wrote last week's progress report

Annie

- Correspondence with client and advisor
- Research on microcontrollers

Joe

Steve

- Checked out book called "Making Things Talk" about computer programming

Costs

- Ultrasonic Humidifier - \$30.56 (Reimbursed by client \$40 cash)

Project Schedule																
Task	September				October					November				Decem		
	4	11	18	25	2	9	16	23	30	6	13	20	27	4	11	
Deliverables (Date Due)																Key
Website																Team
PDS																Patrick
Progress Report																Annie
Notebook																Joe
Midterm Presentation																Steve
Final Presentation																
Final Poster																
Final Report																
Client Evaluation																
Peer and Self Evaluations																
Meetings																
BSAC																
Team																
Client																
Advisor (in class)																
Dist. Entreprenuer Lec.																
Project Research*																
Current Devices																
CPAP System																
How a Nebulizer Works																
Aerosol Delovery Methods																
Albuterol/ related drugs																
Project Development																
Select Project																
Brainstrom Ideas																
Narrow Ideas																
Select Idea																
Work on Design																
Buy Necessary Parts (no later than)																
Work on Prototype Fabrication																

**After this, research will be done on an as-needed basis.*