

Delivery of Aerosol Drugs through Continuous Airway Positive Pressure (CPAP) Progress Report 10/18/2009 – 10/24/2009

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 by 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.

Side Project Suggested by Dr. Teodorescu: Create an ultrasonic nebulizer from an ultrasonic humidifier.

Last Week's Goals

- Pat & Joe – meet at ECB at 4:30 PM on 10/19/09
 - Order new ultrasonic humidifier by 10/20
 - Find voltage rating necessary for humidifier switch by 10/20
 - Obtain schematics for ultrasonic humidifier by 10/20
- Annie & Steve – meet at ECB at 4:30 PM on 10/19/09
 - Get outline of budget from Annie by 10/19/09
 - Order Switch by 10/23/09
 - Order DAQ board by 10/23/09
 - Order Valves and Tubing for final design by 10/23/09
- Meeting with Professor Webster at 12:40 on 10/23/09
- Group Meeting on 10/23/09

Summary of Accomplishments

- 10/23/09 Met with Professor Webster and received feedback from poster presentation and design notebooks
- 10/23/09 Lab work with ultrasonic humidifier: Disassembled it and learned how it functions
- Acquired new ultrasonic humidifier
- 120 V switch needed for ultrasonic humidifier component
- Ordered a DAQ board
- Acquired pipe fittings necessary to connect humidifier to CPAP system

This Week's Goals

- 10/26/09 group meeting at ECB at 7 PM
 - Assemble PVC connection components
- 10/29/09 meeting with Dr. T at 9:30 AM

- Get reimbursed for expenses to date
- 10/30/09 meeting with Professor Webster at 12:40 PM and lab work
 - Test prototype to see if concept works
- Steve – Order a 120 V switch Due 10/26/09
- Steve and Annie – Create block diagram for functioning of programming components. Due 10/30/09
- Annie – Brainstorm programming options. Due 10/30/09
- Joe – Order 1.25” I.D clear polycarbonate tubing Due 10/26/09
- Patrick - Divide up tasks for final report. Due 10/30/09
- Patrick/Steve – Find out if US humidifier can be run with blower disconnected. Due 10/30

Project Difficulties/ Reason for Missing Goals

- Schematics for new ultrasonic humidifier were unable to be obtained for proprietary reasons
- Switch not ordered yet because more information was needed

Activities

Team

10/19/09 Annie and Steve met to discuss programming options
 10/23/09 Met with Professor Webster
 10/23/09 Lab Work with US Humidifier (Patrick, Annie, Joe)

Patrick

- Acquired connection components
- Wrote progress report

Annie

- Correspondence with client to acquire a more detailed budget
- Patent research
- Ordered DAQ board

Joe

- Research
- BSAC meeting

Steve

- Selected a DAQ board to use for the project
- Updated web page

Costs

- Ultrasonic Humidifier – From Wal-Mart \$30.56 (Reimbursed by client \$40 cash)
- Ultrasonic Humidifier – From Home Depot \$31.64 (Not reimbursed yet)
- PVC piping – From ACE Hardware \$6.50 (Not reimbursed yet)
- DAQ board -

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																	
<i>*After this, research will be done on an as-needed basis.</i>																	