

Bronchoalveolar Lavage Trap

Group 17

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Team: Laura Zeitler (Team Leader)

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Problem Statement:

In order to diagnose respiratory problems in immunosuppressed patients, bronchoalveolar lavage is used to obtain a bronchiole fluid sample. A bronchoscope is guided through the respiratory tract and wedged into a bronchiole, which is then flushed with saline solution. The solution is then extracted with a vacuum and accumulates in the sterile collection trap. In the current procedural setup, the lavage trap is free-hanging and unstable. Manipulation of the bronchoscope and surrounding movement can displace the trap resulting in loss of sample to the vacuum line. To prevent unnecessary expense and patient inconvenience from sample loss, a new trap needs to be developed.

Last Week's Goals

- Find materials to create a testable prototype
- Find a device to measure pressure of vacuum in hospital
- Find necessary weight of ball

Summary of Accomplishments

- Developed some rapid prototyping ideas considering the materials available to us
 - Idea #1 involves using another lavage trap with fabrication adjustments as a quick way to test the valve concept
 - Idea #2 uses other materials like tubing, rubber stoppers, and larger balls to scale up the components of our design
 - The pros and cons of each design were weighed and fabrication plans were developed
- Acquired materials for the prototype including lavage traps from the hospital, and other materials at the American Science and Surplus Store and residences of team members.
- Borrowed a pressure gauge from David Buschke to test the vacuum pressure of the hospital's system.

This Week's Goals

- Get shop permits
- Test vacuum pressure at hospital
- Experimentally determine appropriate weight of ball using hospital's vacuum
- Begin fabrication of prototype
- Begin work on Solidworks depiction of final design

Project Difficulties

We are hoping that one of the balls we currently have will be experimentally feasible to work in our design considering the vacuum pressure at the hospital. However, if one does not work, we may have difficulties purchasing a single ball fitting our specifications and calculating exactly what that ball should weigh.

Activities

Team Member	Date	Activity	Duration
Kim Kamer	3/13/2009	Researched what materials to order/making prototype	2.5 hours
	3/13/2009	Advisor/Group meeting- prototyping, testing, and fabrication plans	1 hour
	3/14/2009	Email for pressure gage, searched for materials, practiced drilling/cutting	3 hours
	3/22/2009	Vacuum pressure research and Design Ethics video	45 minutes
	3/25/2009	Vacuum pressure gage pickup	15 minutes
	3/25/2009	Plans for vacuum pressure testing on Friday	45 minutes
Ali Johnson	3/19/2009	Finding, Picking out and Buying materials	1.5 hr
	3/25/2009	Plans for vacuum pressure testing on Friday	45 minutes
Laura Zeitler	3/13/2009	Advisor/Group meeting- prototyping, testing, and fabrication plans	1 hour
	3/25/2009	Plans for vacuum pressure testing on Friday	45 minutes
	3/26/2009	Progress Report	20 minutes
	3/26/2009	Design Ethics Video	30 minutes
Elise Larson	3/16-19/2009	Correspondence/Scheduling	30 minutes
	3/13/2009	Advisor/Group meeting- prototyping, testing, and fabrication plans	1 hour
	3/22/2009	Photographs, Analysis of Similar System	45 minutes
	3/24/2009	Pick up extra traps	45 minutes

Expenses

Date	Item	Cost	Comments
3/19/09	Miscellaneous Prototype Supplies	\$3.70	American Science and Surplus Store

