

**Team Spirometer Progress Report**  
**June 11, 2009 – June 18, 2009**

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**Goals for the past week**

- Create and distribute a newsletter
- Manufacture and test laminar flow prototypes
- Meet with Dean Health PFT lab physicians on 6/11
- Assist interns in software development
- Compare new sensors to previous models
  - Weigh cost vs. benefit of these new sensors

**Accomplishments**

- Created and distributed HTML newsletter to 34 people
  - David has received positive feedback from a few of them
  - Using tracking software, found that 17 people opened newsletter
- Sent draft of software specification to Java developer
  - Will hopefully receive feedback before weekend to make user interface/data processing platform decision
- Went to Dean's East Health Clinic pulmonary function testing (PFT) lab
  - Had spirometric equipment and calibration demonstrated
  - Calibration protocol is very intuitive – we could use a similar one
  - Demonstration of incentive screens
  - Noted database format
- Received 2 alternative pressure sensors
  - No testing yet
- Investigated existing spirometer patents
  - Have a list for reference
- Performed research in fluid dynamics
  - Reynolds number and relation to laminar flow
- Worked with Medecal interns to delegate programming roles
  - This week, they will program predictive equations to be displayed based on a person's age, sex, weight, etc.

- Will use equations and coefficients from Hankinson, 1999
- Attended an introduction to microcontroller seminar provided by ST Microelectronics
  - Alec Bath lectured mostly on theory of STM microcontroller
  - Two “labs”
- Protocol for measuring flow impedance (resistance)
  - Slightly modified from Professor Webster’s suggestion

### **Goals for the upcoming week**

- Decide on Lilly (resistive screen) vs. Fleisch (parallel capillaries) type spirometer design
  - Measure resistance of existing spirometers
  - Not goal for this week, but eventually need to test linearity of flow with pressure
- Decide on software platform
  - Most team members are leaning towards Adobe Flex/AIR even though it uses a lot of RAM
  - David is in contact with a Java developer who recommended staying away from Java
  - When we hear specific reasons, we will make a more informed decision
- Once spirometer type is decided, make 3 different casing designs
  - Screen or capillaries will be difficult to clean
  - Design spirometer that can be disassembled
  - Must also have handle for ergonomics
  - Design matrix
- Test alternate pressure sensors
- Continue to research fluid dynamics

### **Difficulties**

- Many meetings this week and only one team member
- Cannot make summer website and keep spring websites open simultaneously
  - Does the website have to be current or can this be done at the end of the summer?

### **Areas we would like assistance/feedback**

- Not sure how long it would take to debug website problem – how much time is this worth?
- Andrew’s name was spelled wrong on this website:
  - <http://www.engr.wisc.edu/bme/tongbme/2009.html>
  - Can this be corrected?