

Sleep Apnea Therapy Device – Progress Report #1

Client: Dr. John Webster

Advisor: Dr. Megan McClean

Team Members: Calvin Hedberg, Taylor Karns, Jen Rich, Ben Mihelich

Date: Jan 20th – Jan 26th, 2017

Problem Statement

Clinically significant sleep apnea is a sleep disorder characterized by interference of breathing during sleep. Those who suffer from sleep apnea experience interrupted sleep which develops an increased risk of heart attack, high-blood pressure, arrhythmia, stroke, and diabetes. Continuous Positive Airway Pressure (CPAP) machines are the current standard for treatment. However, approximately half of all patients suffering from sleep apnea do not adhere to it well due to complications such as nasal congestion, headaches, and continued tiredness. Continuous dead space rebreathing is an alternative that has been researched and shown to stabilize central respiratory output in patients with mild to severe obstructive sleep apnea without the complications of CPAP. Thus, our team has been assigned the task of designing and fabricating a variable dead space device based on guidelines and research conducted by our client Dr. John Webster. This includes developing an algorithm such that the device can detect sleep apnea and consequently regulate the amount of dead space for proper respiration.

Last Week's Goals

- Create a Spring 2017 Sleep Apnea Team
- Begin/continue researching design topic
- Begin brainstorming design ideas

Summary of Team Role Accomplishments

- Calvin (Leader) - created team design notebook and filled out the week's progress report
- Taylor (Communicator & BPAG) – contacted client to set up initial meeting
- Jen (BWIG) – created and updated the team website
- Ben (BSAC) – prepared for upcoming BSAC meeting next week

Summary of Design Accomplishments

The current design was mapped out and explained to all new team members. This gave our team an idea of where to start. The team is planning to brainstorm new ideas for how to improve the power delivery system and the overall electronic circuit and components to make the device be able to operate autonomously on battery power. Design progress will be documented and reported as it occurs.

This Week's Goals

- Schedule our second team meeting to begin design brainstorming
- Meet with our advisor Friday at 1:30pm
- Meet with our client to reaffirm specifications and expectations

Difficulties with Project

No difficulties have been encountered at this time.

Activities

| Date | Person(s) | Task | Time (hrs) | Weekly Total | Semester Total |
|-----------|-----------|---------|------------|--------------|----------------|
| | Calvin | | | | 0 |
| | Taylor | | | | 0 |
| | Jen | | | | 0 |
| | Ben | | | | 0 |
| 1/24/2017 | Team | Meeting | 1.5 | 1.5 | 1.5 |

Project Schedule

TBD in upcoming team meeting

Expenses

None