

**\* Progress Report 9**

**\* Title:** Measurement of Pulse Transit Time

**\* Names:** Blake Hondl (Team Leader)  
Anna Karas (Communications)  
Zak Cohen (BWIG)  
Meghan Olson (BSAC)

**\* Client:** Christopher G. Green, M.D.

**\* Advisor:** Mitch Tyler

**\* Date:** 10/28/05 – 11/03/05

**\* Problem Statement:** Develop a device/method to measure pulse transit time (PTT) in pediatric patients using signals from an ECG monitor and an oximeter. This will allow a physician to monitor whether a patient is being aroused from REMS sleep and help the physician determine if the patient has obstructive sleep apnea.

**\* Restatement of Team Goals:**

- Test ECG and pulse oximeter circuits
- Generate algorithm for PTT
- Code to display PTT waveform along with ECG and plethysmograph
- Meet with neurophysiologist/sleep lab
  - Determine how well our solution will work with their processes
- Get design notebooks back?

**\* Summary of Accomplishments:**

- Tested ECG circuit
  - Performs correctly
- Met with Dr. Weber (neurophysiologist in sleep lab)
  - Acquired more sample data
  - Confirmed that a software program that calculates PTT from an .edf file and adds a PTT signal to the .edf file would be acceptable
- Received design notebooks and updated them
- Acquired a USB data acquisition (DAQ) module to interface with a Windows PC and Labview

**\* Statement of Team Goals:**

- Test pulse oximeter circuit
- Amplify ECG and plethysmograph to appropriate levels for DAQ module (7.5V<signals<10V)
- Generate algorithm for PTT
- Determine method to interface DAQ module to PC
  - Acquire drivers to interface with Labview

**\* Project Schedule:**

Week	Activities
1	09/02/05 Assign team roles, contact client to set up meeting

2	09/09/05	Research design topics, define questions for meeting with client, start PDS
3	09/16/05	Meet with client, continue research on design topics, complete PDS
4	09/23/05	Meet with sleep lab neurophysiologist, establish possible design solutions
5	09/30/05	Choose the best design solution, research resources to help in the implementation of the design, start detailed design specification
6	10/07/05	Complete detailed design specification, possible work on prototype, work on midsemester presentation,
7	10/14/05	<b>Midsemester presentation</b>
8	10/21/05	Begin work on prototype
9	10/28/05	Build ECG and oximetry circuits Software code to take in .edf file
10	11/04/05	Test ECG and oximetry circuits Software code to calculate PTT
11	11/11/05	Software code to display PTT to user Research hardware for extra circuit capability
12	11/18/05	Complete prototype: Hardware appropriate for presentation Complete software for displaying PTT from .edf file
13	11/25/05	Work on poster presentation Minor modifications to hardware and software <b>Thanksgiving</b>
14	12/02/05	Complete poster presentation Work on final report <b>Final poster presentations</b>
15	12/07/05	Complete final report <b>Final report and notebooks due</b>
15	12/09/05	<b>Final meeting with advisor</b>

\* **Difficulties:** None

\* **Activities:**

**Group:**

Team meetings: 2.0 hrs  
Meeting with Dr. Weber: 2.0 hrs

**Individual:**

*Blake Hondl*

DAQ/labview research: 1.0 hr  
Updating design notebook: 0.5 hr  
Meeting with client: 1.0 hr

*Anna Karas*

ECG circuit testing: 1.0 hr  
Email communications: 0.5 hr  
Meeting with client: 1.0 hr

*Meghan Olson*

ECG circuit construction/testing:	2.0 hrs
Meeting with client:	1.0 hr
<i>Zak Cohen</i>	
EDF file research	2.0hrs
Weekly Total:	26.0 hrs
Semester Total:	144.25 hours

**\* Expenses:**

	<b>Item</b>	<b>Cost</b>
<b>Fall 2005</b>		\$
		\$
<b>Total</b>		<b>\$0</b>