SEIZURE MONITOR: ENTREPRENEURIAL PROJECT

4/22/11
Team 23
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OVERVIEW

- Problem Statement
- Background
- Existing Products
- Seizure Monitor Design
  - Components of the Watch
  - Components of the Alarm Clock
  - Microcontroller
- Budget
- Future Work/Applications
- Conclusion
- Acknowledgements
- Questions
**Problem Statement**

- To create a device that is capable of accurately monitoring and detecting seizures in a nonintrusive way.

**Who will benefit?**
- Patients
  - Flexibility
- Caregivers
  - Less Stress
- Physicians
  - More Information
BACKGROUND: SEIZURES

- Prevalence
- Course
  - Aura
  - Tonic Phase
  - Clonic Phase
- Outcome
- How can the characteristics of seizures be utilized in enhancing our design?
ACM data from Tonic and Clonic Phases

Tonic Phase

Clonic Phase
Existing Products

- Medpage ST-2, MP5, Emfit Nocturnal Tonic-Clonic Seizure Monitor
  - Prolonged irregular movements result in an alarm being generated by the monitor with a signal transmitted to the alarm pager

- Disadvantages
  - Monitors only during sleep time
  - Some mattresses not effective for patients under 56 lbs
  - Large bed or heavy mattress requires two sensors
  - Aural detection via microphone
  - Flexibility: Vactions, sleepovers, etc
Figure 1. Set Up
SEIZURE MONITOR- WRIST WATCH

Features:

- Motor Seizure Detection
- Velcro strap
- 2.44” x 2.00” x 1.25”
- Wireless Communication
- Cheap Manufacturability

Future Features:

- LED ‘Power’ and ‘battery warning’ Indicators
- Digital Time Display

Figure 2. Wrist Watch
Seizure Monitor - Alarm Clock

Features:

- LED Lights
- Speaker
- Battery Power
- Small Size → Portability
- Wireless Communication

Future Features:

- Digital Time Display
- Snooze Button
- LED ‘Power’ and ‘battery warning’ Indicators

Figure 3. Alarm Clock
MICROCONTROLLER

- **Speaker for alarm clock**
  - Able to generate alarm sound using microcontroller
- **LED**
  - Turn on/off LED on alarm clock
- **Bluetooth**
  - Connect alarm clock to HyperTerminal
- **Accelerometer**
  - Output accelerometer data onto HyperTerminal via Bluetooth
Future Work

- Further Programming
  - LabVIEW
  - Microcontroller
- Future Features for Watch and Alarm Clock
- Parkinson’s Disease Applications
- PDA and Smartphone Applications
- GPS Locator in Watch
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ACKNOWLEDGMENTS

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Questions?