



Novel System to Detect COPD Exacerbations

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Young Clinician Award 2009

Investigator Profile

Education

- AB, Harvard and Radcliffe Colleges
- MD, Harvard Medical School
- MSc, Harvard School of Public Health



Clinical/Professional Appointment

- Assistant Professor of Medicine, Harvard Medical School
- Research Associate, Brigham and Women's Hospital
- Staff Physician, VA Boston Healthcare System

Recent Honors and Awards

- American College of Chest Physicians Alfred Soffer Research Award Finalist
- GlaxoSmithKline Development Partners' Junior Faculty Award
- VA Career Development Award, Rehabilitation Research and Development

Impact on Care

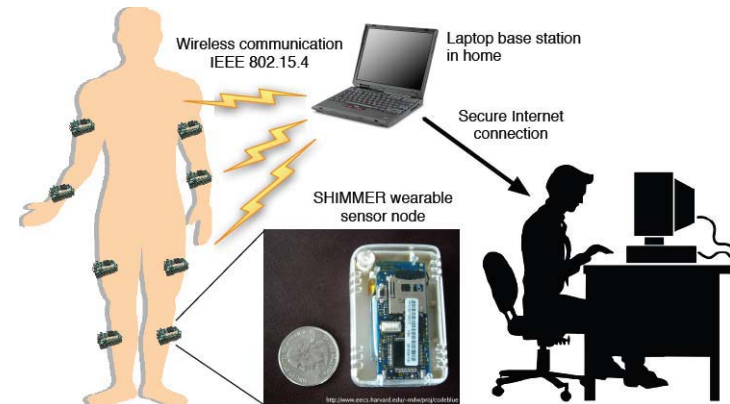
- Chronic obstructive pulmonary disease (COPD) is currently the fourth leading cause of death in the world and is projected in 2020 to rank fifth in worldwide burden of disease
- Exacerbations of COPD are characterized by a decrease in physical activity and physiologic changes that result in functional impairment and disability
- Early identification of an exacerbation and prompt treatment improves recovery time, reduces risks of hospitalization, and is associated with better health-related quality of life
- Economic analyses have shown that over 70% of COPD-related health care expenditures result from emergency room visits (> \$10 billion annually in the US)
- Strategies for early detection of exacerbations have potential substantially improve clinical outcomes and reduce healthcare costs

Abstract

Early detection of exacerbations of chronic obstructive pulmonary disease (COPD) has potential substantial clinical and economic benefit.

We propose 1) to develop a wearable system to monitor physical activity and physiological responses in the home environment, and 2) to develop data analysis procedures to characterize the patterns of physical activities and associated physiological responses from recordings in the home environment.

This novel system would detect the reduction in physical activities performed and the altered physiological responses present at the onset of an exacerbation, allowing for early identification and intervention.



Proposed wearable system to monitor COPD patients in the home environment. Wireless sensors on the body collect detailed physical activity and physiological data, storing the data locally. Sensors communicate captured signals via a low-power 802.15.4 wireless network to a PDA worn on the body or a laptop in the home. Data are delivered to the clinic via the Internet.