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Faculty Advisor: Dr. Susan Reutman

4th Year Nursing PhD student

Title: Use of physiologic markers to evaluate firefighters' reactions when exposed to stressors

Abstract:

Purpose: Elevated cardiovascular deaths among firefighters suggest the need for improved surveillance during stress of on-duty firefighting activities[2]. Vital sign alterations during firefighting activities may serve as early warning signs of cardiovascular and respiratory distress. Goals of early VS alteration detection: 1. Permit reduction of acute exposures prior to manifestation of adverse cardiovascular or respiratory health sequela; 2. Allow timely health interventions, and; 3. Identify firefighters not demonstrating acute distress as they perform essential job functions.

Background: This is a pilot research feasibility report based on evaluation of preliminary data from the University of Cincinnati Education and Research Center's Targeted Research Training (TRT) "Firefighter Study". TRT Aim 1, addresses firefighter responses to heat stress. This poster is being presented to inform development of the study entitled, "Use of physiologic markers to evaluate firefighters' reactions when exposed to stressors." This effort expands on previously completed TRT funded data collections to achieve a sufficient sample size to permit a focus on firefighters' vital signs outcomes.

Design: All subjects sign informed consents as per the approved IRB protocol. Data collection processes are designed around the firefighters' live-burn trainings. The trainings included 3 scenarios lasting approximately 10 minutes. Objective and subjective measures are gathered prior to the trainings (baseline) and post-scenario throughout the trainings**.** For control group data will be gathered at baseline and approximately one hour after end of live-burn training at the fire departments.

Methods: Heart rate is monitored continuously during the three training scenarios using a Zephyr Bioharness. Measures of blood pressure, heart rate, SpO2, tympanic temperature, perceived exertion, perceived respiratory distress, and height and weight will be obtained pre- and post-scenario.

Pilot Feasibility Results: Feasibility results for this expanded vital signs project were based on analysis of preliminary TRT vital signs data collection from three regional fire departments that agreed to take part to date during the TRT study. Approximately four firefighters per each live-burn training participated in the TRT study and 100% completed the data collection.

Conclusions:

Feasibility: Determined feasible to acquire previously collected vital signs data and replicate vital signs collection methods in expanded study. Total required sample size: projected for expanded firefighter study analysis (N = 94). An estimated total of 10 additional live-burn trainings at regional sites will be required to achieve a sufficient sample size for a vital signs analysis. Limitations: Majority of sample subjects in prior TRT effort have been urban, Caucasian men, and not all fire departments perform annual medical testing or provide stress tests for their firefighters providing fewer sample subjects that meet study eligibility criteria.

Acknowledgement:

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University of Cincinnati
17th Annual
Pilot Research Project
Symposium
October 13-14, 2016

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Produced by Kurt Roberts Department of Environmental Health

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Pilot Research Training Program (PRP) Overview

Welcome to the University of Cincinnati Education and Research Center's (ERC) 16th Annual Pilot Research Project (PRP) Symposium on October 8-9, 201Welcome to the University of Cincinnati Education and Research Center's (ERC) 17th Annual Pilot Research Project (PRP) Symposium on October 13-14, 2016, held in the Auditorium of Proctor Hall, College of Nursing. The purpose of the PRP is to increase the research capacity of research trainees and young investigators in occupational health and safety and to encourage those in related disciplines to pursue occupational health and safety research.

Under the administrative direction of Dr. Amit Bhattacharya, research proposals are solicited and peer-reviewed annually from qualifying faculty and graduate students from the **University of Cincinnati and the following PRP partnering institutions – Air Force Institute of Technology, Bowling Green State University, University of Toledo – Health Science Campus, Central State University, Purdue University, University of Kentucky, Western Kentucky University, Eastern Kentucky University, Murray State University, Ohio University and Kentucky State University**.

At this symposium, the 2015-16 awardees will be presenting the results of their research and the 2016-17 awardees will make poster presentations of their proposed work. The keynote speaker on Thursday, October 13, 2016 is **Anita Schill, PhD, MPH, MA**, Senior Science Advisor to the Director and Co-Manager for the Total Worker Health® Program with the National Institute for Occupational Safety and Health (NIOSH), will deliver the keynote address on "**Advancing Well-Being Through Total Worker Health.**"

The University of Cincinnati's Education and Research Center is one of 18 such centers funded by the National Institute for Occupational Safety and Health (NIOSH) nationally. Dr. Tiina Reponen serves as the director of the ERC, which is based in the university's Department of Environmental Health within the College of Medicine. The purpose of the ERC is to train professionals in the didactic and research skills necessary to lead the occupational safety and health disciplines. Results of research are translated into action through an outreach program and shared with professionals and practitioners in the region via continuing education.

Since 1999, the PRP program has allocated over $1.3 million to support 222 pilot research projects. These projects have served as a catalyst in bringing over $34 million in additional research support to the region from sources independent of the PRP program, such as, the National Institute for Occupational Safety and Health (NIOSH), National Institutes of Health (NIH), United States

Department of Agriculture (USDA), National Science Foundation (NSF), and the Centers for Disease Control and Prevention (CDC). Additionally, the PRP has brought 47 new investigators from other fields of expertise to the area of occupational safety and health research.

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