

An Evaluation of Postural Stability in Subjects Exercising in a Hot Environment While Wearing Firefighter PPE FY15 (93902JR)

Objective

- Demonstrate that postural stability/balance is reduced with increased core body temperature during exercise in the heat wearing PPE
- Demonstrate using fMRI that specific areas in the brain responsible for motor control and coordination are affected
- To relate changes in fMRI to postural stability in subjects exercise in the heat.
- Determine if cooling strategies can mitigate the reduced postural stability

Applicable standards

- N/A

Key Partners

- University of Cincinnati School of Medicine
- Children's Hospital, Cincinnati
- NIOSH DSR

Project Scope

- The NPPTL will conduct studies involving human subjects exercising in a hot environment while wearing firefighter PPE (Williams, PI)
- Subjects will be tested for postural stability using special force plates (AccuSway Plus Platform)
- Core temperature and other physiological variables will be monitored throughout the exercise
- Changes in postural stability will be related to increased body core temperature
- If available, a wireless EEG system will monitor changes in bioelectric brainwave activity throughout the testing.

Milestones

- FY15 - Protocol development, obtain OD and HSRB approval
- Purchase necessary instrumentation
- FY16 - Conduct human subject testing at NPPTL
- Conduct fMRI at UC
 - Present preliminary findings at scientific conference

Stakeholders

- Firefighters
- Healthcare workers
- IAFF
- Construction industry

Outputs

- N/A

Outcomes

- N/A

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