



RESEARCH FOUNDATION

RESEARCH FOR THE NFPA MISSION

Analysis of Fire Fighter Eating and Sleeping Patterns: Optimizing daily eating time to reduce cardio-metabolic disease



PROJECT SUMMARY

Last Updated: 22 August 2018

Background:

Fire fighters are considered an “at-risk” population for metabolic diseases, yet 75% of fire departments nationwide have not adopted a health and wellness program according to the National Center for Biotechnology Information (Storer et al. 2014). Due to the nature of their work, firefighters encounter continual disruptions to their eating and sleeping patterns (circadian rhythm) which can compromise their metabolic fitness. Cardio-metabolic diseases such as hypertension, diabetes, obesity, fatty liver disease, and cancer can result from disrupted circadian rhythms, directly impacting the fitness, safety, and wellbeing of fire fighters.

Traditionally, reducing circadian rhythm disruption was achieved through sleep modification and minimizing ambient light exposure. However, this methodology is not applicable to emergency responders. Based on laboratory and clinical studies it is hypothesized that keeping nutritional quality, quantity, and physical activity consistent while consuming calorific intake within a consistent 8-12 hour time period every day can sustain a healthy circadian rhythm and reduce the risk of cardio-metabolic disease among fire fighters.

Implementation and Schedule:

This research project is led by Salk Institute for Biological Studies with collaborative support from the Fire Protection Research Foundation (FPRF). Funding for this project is through a three-year Assistance to Firefighters Grant (AFG), with a targeted project completion date of October 2020. The Principal Investigator for this project is: Dr. Satchidananda Panda of Salk Institute for Biological Studies., email: panda@salk.edu.

Project Goal and Aims:

This project aims to assess the extent of day-to-day disruption to fire fighters and to test reasonable interventions involving sleep and nutrition time optimization in alleviating risks for chronic diseases without compromising job performance. The general goal of this project is to analyze the impact of time-restricted feeding (TRF) on fire fighters to promote overall health and wellness and minimize the impact of shift work among fire fighters.

Project Methodology:

This study involves the following tasks:

Task 1: Develop Extended Expert Team and Refine Project Strategy. A Project Technical Panel (PTP) will be established to confirm the project plan, identify potential challenges, and guide deployment.

Task 2: Experimental Testing. A randomized controlled trial will be conducted involving fire fighters in the San Diego area. The fire fighters will randomly be assigned to (1) a control group of behavioral nutrition and sleep hygiene counseling; or (2) the intervention group of behavioral counseling with the addition of adopting a 10 hour eating window for 12 weeks (TRF). After the initial 12 weeks supervised intervention period, the fire fighters will go through self-guided intervention. The trials will be analyzed as follows:

- Evaluate the impact of time-restricted feeding (TRF) on blood glucose levels.
- Assess changes in metabolic and neuroendocrine biomarkers in response to imposed feeding/fasting cycles.
- Evaluate the influence of time-restricted feeding on sleep and activity.

These measurements will be done at the University of California, San Diego Clinical and Translational Research Institute under the supervision of co-investigator Dr. Pam Taub, M.D.

Task 3: Dissemination. Provide outreach and dissemination of project deliverables to the fire service stakeholders. Participants, study coordinator and the advisor panel will discuss the study progression and their suggestions will be incorporated into outreach and dissemination deliverables.

Project Deliverables:

The anticipated outcomes from this three-year effort are to:

- 1) Evaluate the impact of eating and sleeping pattern interventions (TRF) on reducing cardio-metabolic disease risks and improving fire fighter wellness; and
- 2) Utilize testing results to develop a circadian lifestyle management plan for fire fighters that alleviates cardio-metabolic risks.