



Building Evaluations
That Translate
Evidence & Research
to Heart Evaluations
and Related Training

BETTER HEART

Final Report



First Responder Health and Safety Laboratory
Health and Human Physiological Sciences
Skidmore College



May 2023

EXECUTIVE SUMMARY

The **BETTER HEART** (**B**uilding **E**valuations **T**hat **T**ranslate **E**vidence and **R**esearch for **H**eart **E**valuations **A**nd **R**elated **T**raining) project sought to use the latest medical information, research findings from studies of firefighters, and data from firefighters’ occupational medical exams to develop enhanced, evidence-based guidelines for the detection of cardiovascular disease (CVD) in firefighters.

The BETTER HEART program brought together fire service leaders, occupational health experts, and researchers. The Core Multidisciplinary Project Team coordinated the efforts of the other groups while the Medical Advisory Team was responsible for making the recommendations for enhanced cardiac screening. As seen in Figure 1, these overlapping teams worked together to achieve the project’s two primary goals.

Figure 1: Structure of Teams and Goals of the BETTER HEART Project

<p>Core Multidisciplinary Project Team (CMPT) – Skidmore, Harvard, NIOSH, NIPSH, Advocate Lutheran General Hospital, Loudoun County (VA) Combined Fire Rescue System, Hanover Park FD, Broward County Fire Rescue</p> <p>Medical Advisory Team (MAT) – Occupational Medicine Providers, Cardiologists, Primary Care Providers</p> <p>Project Technical Panel (PTP) – Occupational Medicine Providers, Cardiologists, Primary Care Providers, Fire Service Partners [(Loudoun County (VA) Combined Fire Rescue System, Hanover Park FD, Broward County Fire Rescue, San Diego Fire-Rescue Department, IAFF, IAFC, NVFC, NFFF, FPRF)], Researchers</p>	
<p>Develop Evidence-Based Enhanced Screening Guidelines. Conduct Pilot Program, and Create Training/Educational Material</p> <p>CMPT+MAT+PTP</p> <ol style="list-style-type: none"> 1. Synthesize current research literature and medical understanding of cardiovascular disease progression and detection. 2. Develop screening guidelines informed by data synthesized by CMPT, clinical experience, and fire service partners. 3. Review occupational medical records to better understand cardiovascular disease risk profile of firefighters. 4. Work with fire service partners (on CMPT and MAT) to implement pilot program to understand potential hurdles to adoption. 	<p>Create Report that Integrates Evidence-Based Screening Guidelines into a Broader Context of Medical Evaluations</p> <p>CMPT</p> <ol style="list-style-type: none"> 1. Synthesize information from: <ol style="list-style-type: none"> a. Medical literature b. Current screening guidelines c. Evolving/novel screening and diagnostic tools d. Scientific research — Fire service and cardiovascular disease e. Fire service data 2. Create a report that can be used by health care providers, occupational health clinics, and fire service personnel. 3. Work with fire service partners and national leaders to disseminate recommendations and accompanying educational material.

Approximately half of all annual on-duty firefighter deaths are related to CVD. These deaths affect all areas of the fire service, including wildland, volunteer, and career firefighters.

Data obtained from occupational medical evaluations from clinics across the country revealed that firefighters have concerning rates of traditional CVD risk factors. When considered in aggregate, approximately 69% had blood pressure values indicative of hypertension, 33% had elevated blood cholesterol, and 36% were obese based on body mass index (BMI). Moreover, when firefighters were grouped by age, 77% of those in their 50s had hypertensive blood pressure values, 40% had high cholesterol values, and 44% were obese. When individual firefighters were tracked over a 5-year period, 50% of firefighters gained more than 3% of their initial body weight, whereas only 12% lost 3% or more of their body weight, and 38% remained relatively weight stable. Importantly, among those who gained weight, their CVD risk factor profile worsened, while those who lost weight had a better CVD profile despite advancing age.

This data highlights the need for comprehensive wellness and fitness programs focused on CVD prevention as a complement to occupational medical exams.

The Core Project Multidisciplinary Team and the Medical Advisory Team (MAT) believe that an NFPA compliant occupational medical evaluation should

form the foundation of cardiac screening for firefighters, including the use of maximal exercise stress testing as recommended. However, it is also clear that even when the current guidelines are fully implemented, they fail to identify some firefighters with underlying disease. The recommendations put forth in this document are intended to help identify additional firefighters with occult CVD so that they can be effectively treated.

The MAT was an assembled group of experts who considered the current state of science on CVD, published literature on CVD in the fire service, existing guidelines and current medical technology. Based on their review of information and clinical judgement they recommended that, if reasonable:

Firefighters should be screened for coronary heart disease using Coronary Artery Calcium scans at age 40 years, or earlier based on clinical judgement, such as in individuals with an intermediate or high Risk Score, or in those with risk factors and a family history of premature coronary artery disease.

Firefighters should be screened for structural heart disease (including left ventricular hypertrophy, cardiac chamber enlargement, valvular abnormalities) using echocardiography at age 40, or earlier in the presence of hypertension, obesity, and/or sleep apnea.

Access full report at: https://www.skidmore.edu/responder/firesvc_publications.php