# Strategies to Prevent Injuries among Firefighters: Updates from the SPIFi Project

## I. SPIFi Study Overview

Starting in 2009, Tucson Fire Department (TFD) partnered with public health experts from the University of Arizona and Johns Hopkins University to help prevent workforce injuries. Using a systematic risk management approach for employee health and safety (Figure 1), we engaged in a process to identify, design, and implement strategies intended to reduce workforce injuries and their associated costs.

Approximately 35 commissioned personnel from across TFD ranks participated in focus groups to discuss and provide feedback on the injury risks associated with ***fireground operations***, ***patient transport,*** and daily ***physical exercise***, and the identification of tactics to reduce those risks. These three activities are the leading cause of TFD injuries. Other activities resulting in injuries that were not a focus of this research include (but is not limited to) maintenance, drilling & training, work travel, and station duties. All levels of the workforce were involved so that the risk management strategies were more likely to meet the needs of TFD personnel, be used during day-to-day operations, and help reduce injury risk. Nearly everyone within TFD has assisted in the assessment of these strategies, by responding to a handful of surveys that were administered during 2012-2013.

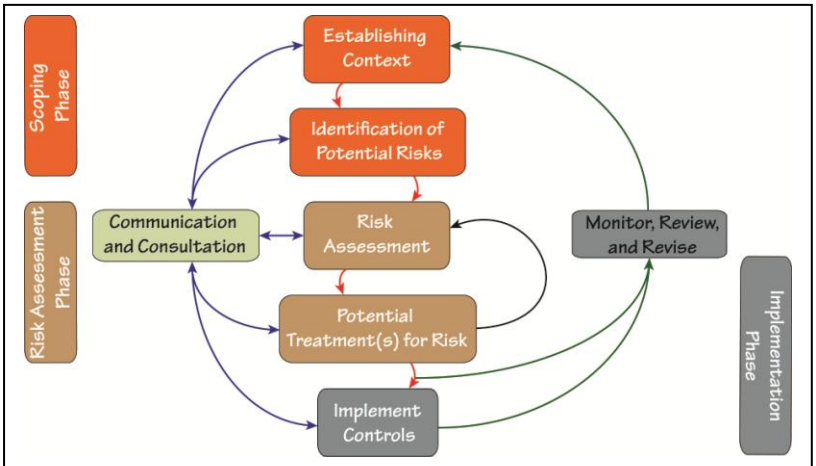


Figure 1. The risk management process

## II. Intervention Strategies

Forty-five intervention strategies were identified. Given logistics and funding limitations, only a selection of those interventions (listed below) was selected for the primary phase of implementation and evaluation.

*Fireground* strategies

- resulted in improvements to rehab protocols,
- provided visual reminders for safety (3-points of contact, hydration awareness), and
- instituted peer safety checks before and during overhaul, demobilization, and clean-up activities.

*Patient transport* efforts

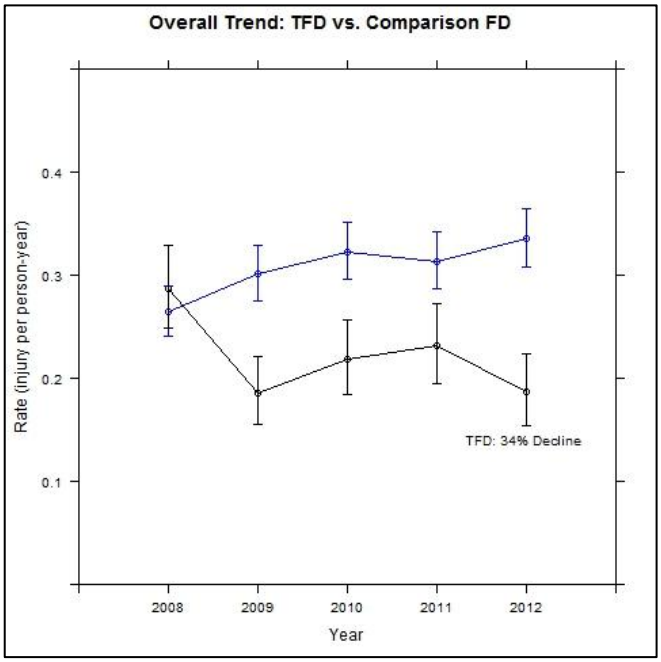
- tested transport devices, specifically a slideboard to ease the lower back loads during lateral gurney-bed transfers,
- developed routines for CPR compression rotations,
- reorganized the new firefighter probationary modules, and
- outfitted the ambulance fleet with electric gurneys to reduce the repetitive strains associated with lifting increasingly heavy patients.

*Physical exercise* improvements

- restructured protocols to provide more flexibility for each shift's designated workout time,
- provided a simple template for structuring exercise routines so that no one is injured in the process of maintaining their health,
- updated and maintained exercise equipment for each station to conduct daily workouts,
- supported recertification and engagement of the Peer Fitness Trainers (PFTs), who have played a significant role in restructuring and programming the fire academy's approach to fitness, and advised new firefighters throughout their probationary year to maintain fitness using appropriate exercises.

## III. What we know so far…

- Physical exercise is the most common activity associated with TFD injuries, followed by patient transport, drilling and training, and fireground operations.
- The most fit commissioned employees are less likely to be injured than others (using $VO_2$max, and a more comprehensive measure for fitness).
- Over the years 2008-2012, when this intervention was applied, TFD injury rates declined more than a control fire department (which did not receive this focused intervention), as shown in Figure 2.
- TFD employees and leadership thought the risk management process was valuable and effective for identifying task-specific risk and potential interventions. The TFD reported being aware of the interventions, using the new patient transport devices and PFTs. Perceptions about these interventions and ways to increase their utilization were also identified.




## IV. More evaluation and results to come

This project generated a wealth of data and information that is being reviewed and summarized so that:

- Participants can learn more about the changes that resulted from their participation.
- TFD can make more informed decisions for how this process can sustain itself in the long-term; and
- The study outcomes can help inform the greater fire and EMS population with TFD serving as the exemplary case for proactive health and safety management.
- Specific interventions and associated changes in the rates of fireground, patient transport, and physical exercise rates, as well as perceptions of the interventions and their implementation, will be provided in separate reports.

Additional details and contact information can also be found on the project website:
http://www.spifi.publichealth.arizona.edu/

### KEY POINTS

- A systematic risk management approach was used to identify, design, and implement strategies to reduce workforce injuries.
- A series of interventions were implemented in the areas of fireground operations, patient transport, and physical exercise.
- Since implementation of the risk management interventions, the injury rate at TFD has decreased significantly as compared to a contemporary control fire department.
- The interventions have been evaluated using surveys, focus groups, and interviews.