

# A Holistic Approach to Health, Immunity, and Post COVID-19 Rehabilitation

Matt McAllister

Associate Professor

Director of the Metabolic & Applied Physiology Lab

Health & Human Performance



MEMBER THE TEXAS STATE UNIVERSITY SYSTEM

# Psychological Stress



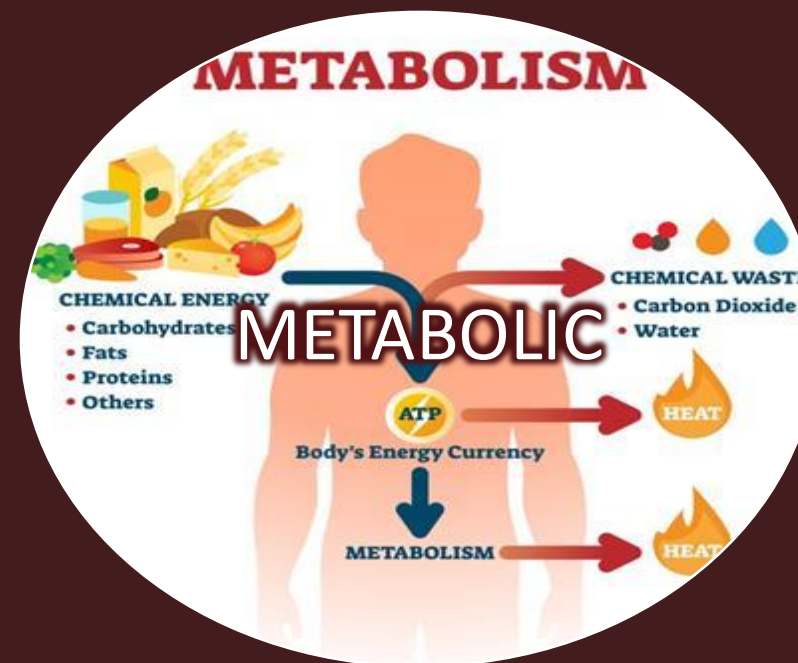




MENTAL



PHYSIOLOGICAL



METABOLIC



ENVIRONMENTAL

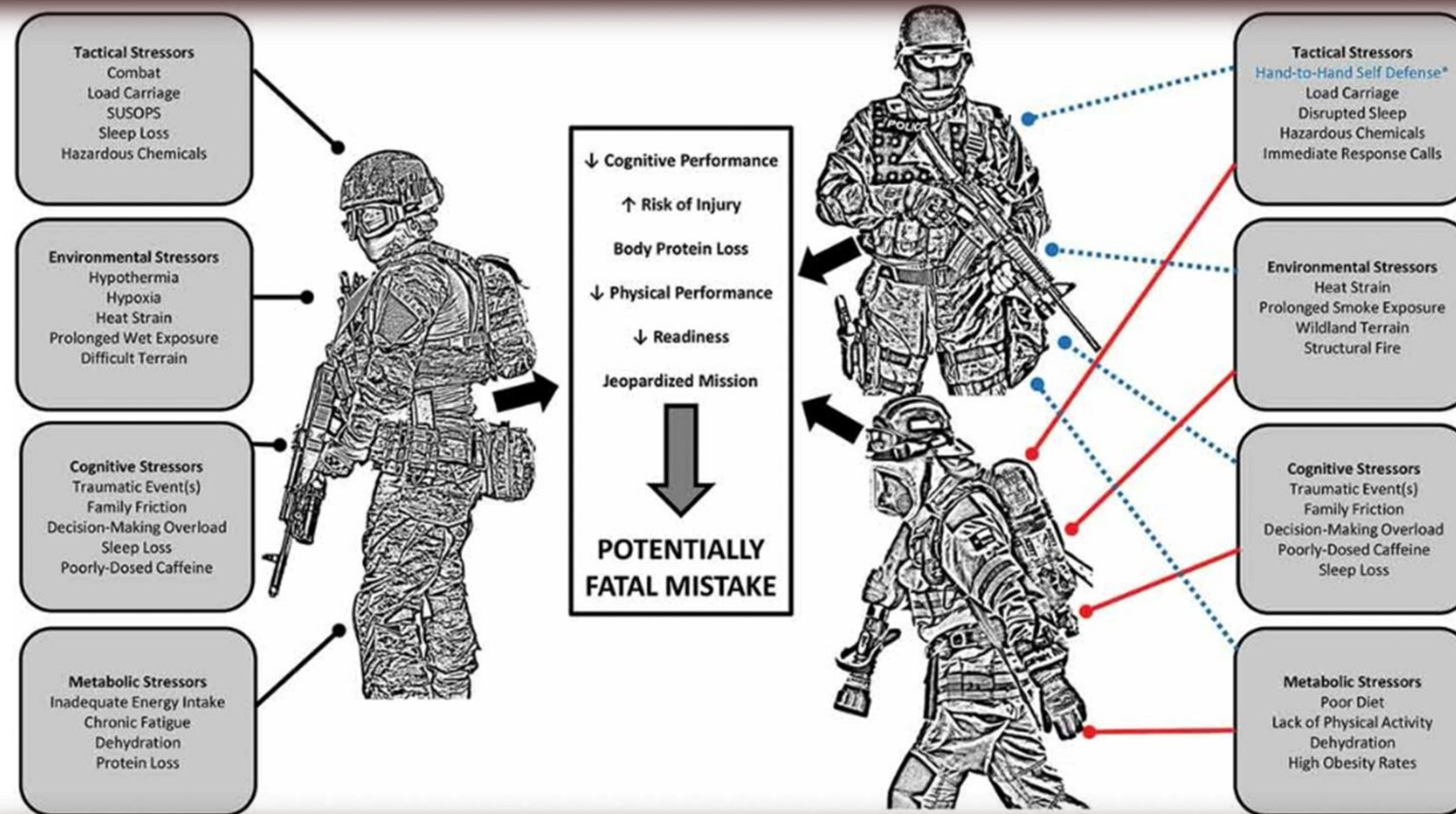
# Metabolic & Applied Physiology Lab

- Studying the metabolic and biochemical impact of stressors
- Biomarkers: blood & saliva
- In relation to cardiovascular disease (CVD) risk





# High Stress Tactical Occupations





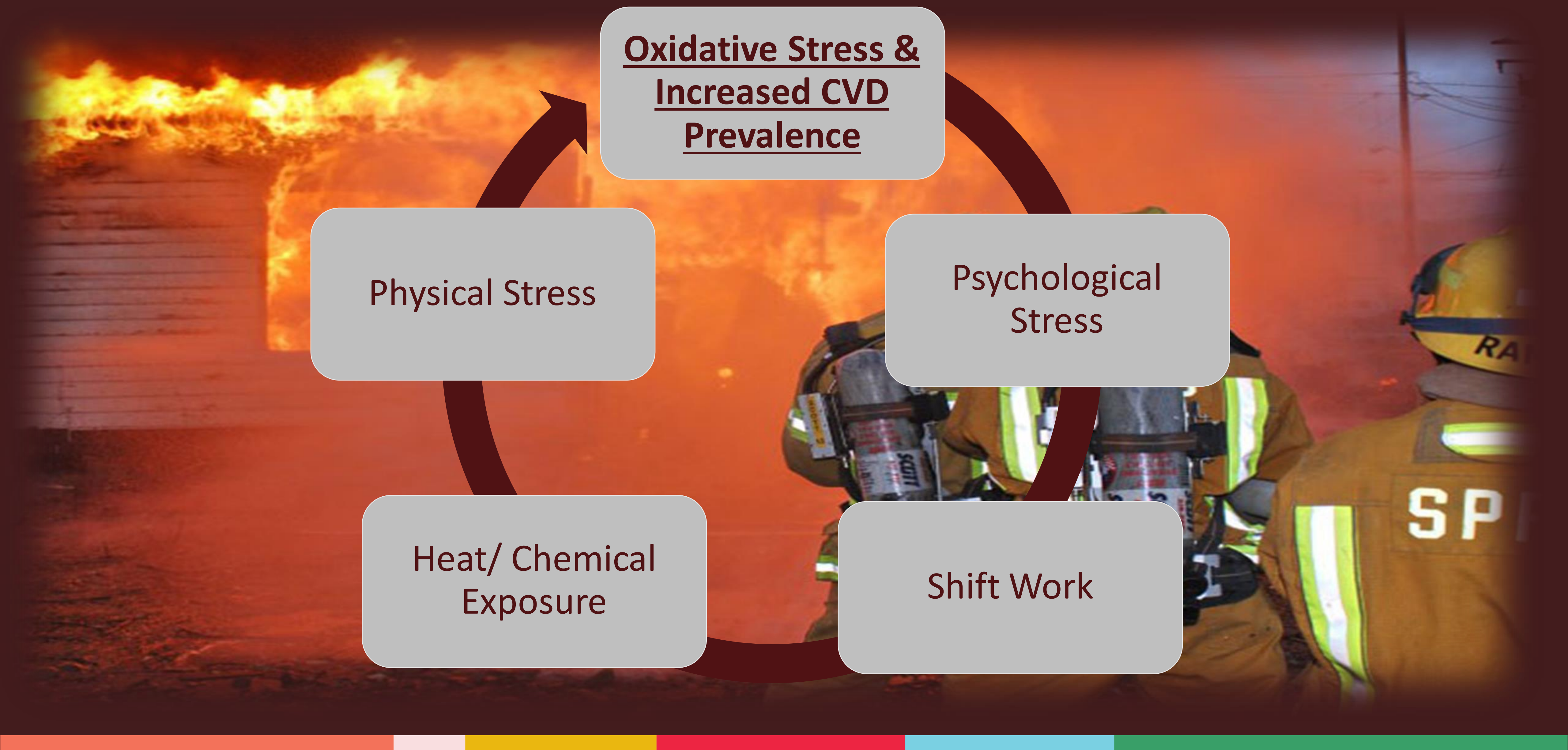




# Number & Types of Calls per Year

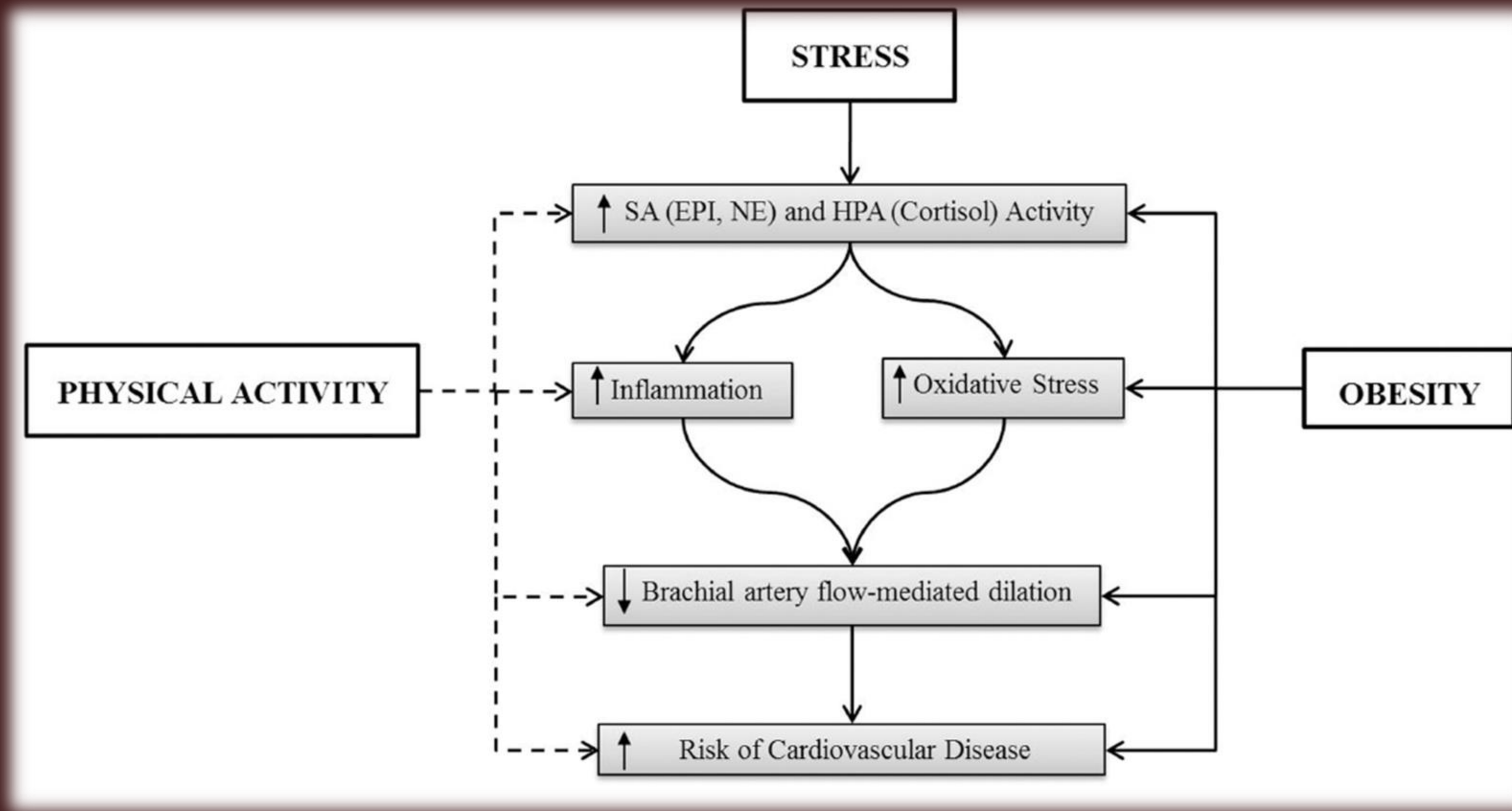
Year	Total	Fires	Medical Aid	False Alarms	Mutual Aid	Hazardous Materials	Other hazardous conditions	other
2015	33,635,500	1,345,500	21,500,000	2,566,500	1,492,500	442,000	643,000	5,646,000
2016	35,320,000	1,342,000	22,750,500	2,622,000	1,515,000	425,000	684,500	5,981,000







# Chronic, Excessive Exposure...







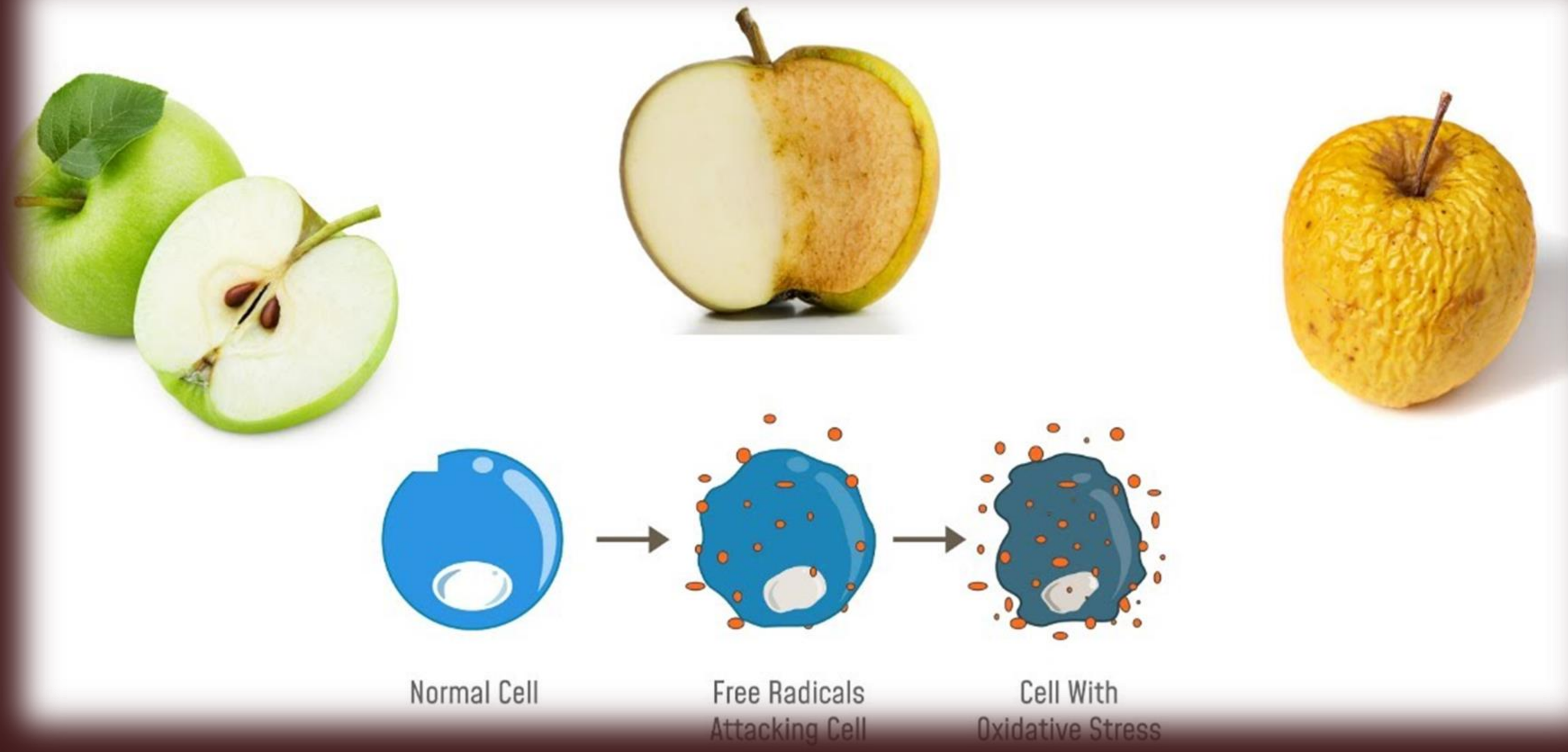
# What is Oxidative Stress?

Free radicals?

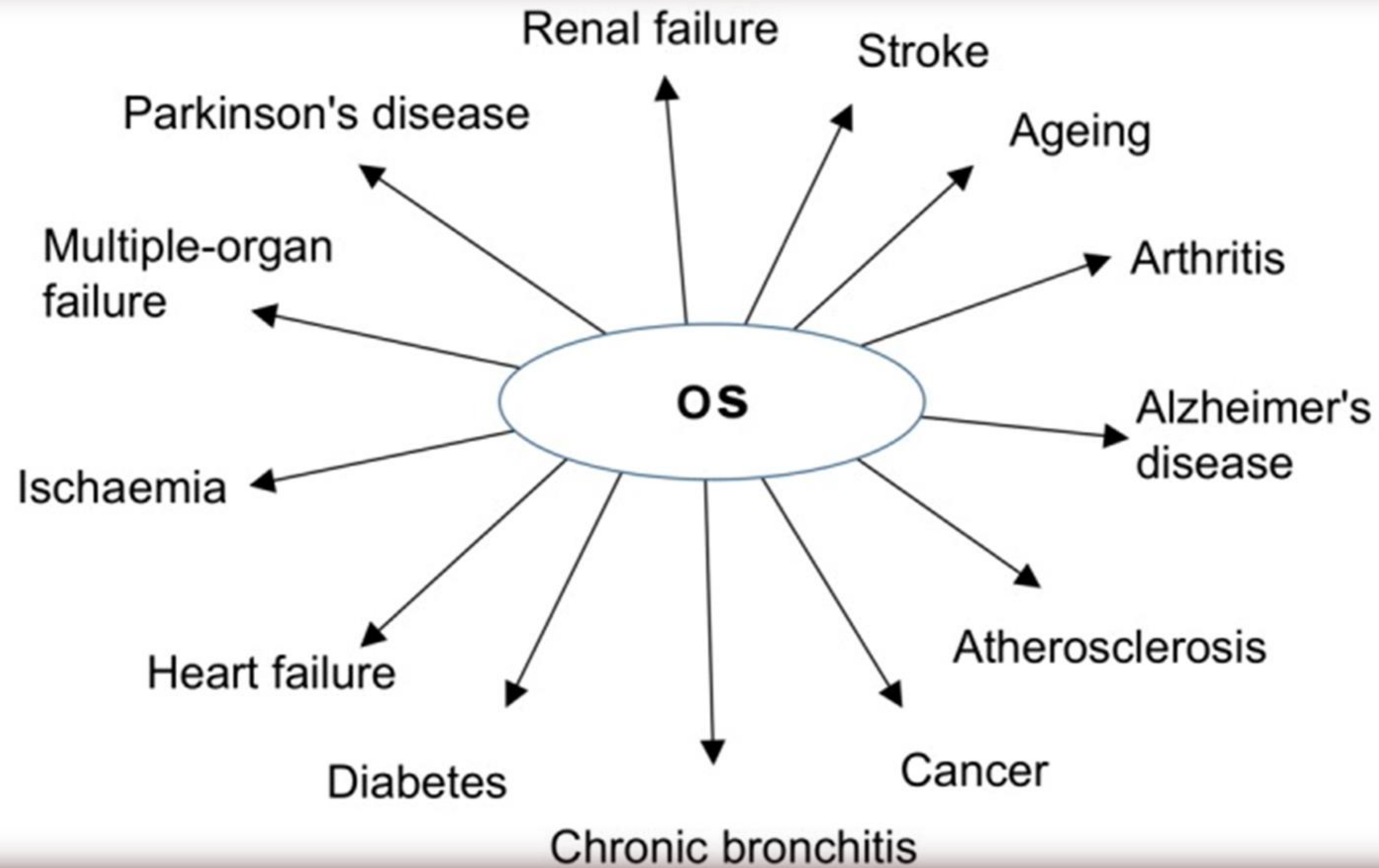
Cancer causing?

Pre-mature aging?











# Nutritional Interventions



- Dietary carbohydrate restriction
- Intermittent fasting
- Dietary supplement use (antioxidant therapy)
  - Curcumin
  - Astaxanthin
  - Exogenous ketone supplements

# In Firefighters: Performance, markers of oxidative stress, inflammation & CVD risk

## Time Restricted Eating

> [J Strength Cond Res.](#) 2022 Sep 1;36(9):2515-2522. doi: 10.1519/JSC.0000000000003860. Epub 2020 Oct 30.

### **Impact of Time Restricted Feeding on Markers of Cardiometabolic Health and Oxidative Stress in Resistance-Trained Firefighters**

[Matthew J McAllister](#)<sup>1</sup>, [Andrew E Gonzalez](#)<sup>1</sup>, [Hunter S Waldman](#)<sup>2</sup>

> [J Occup Environ Med.](#) 2021 May 1;63(5):441-447. doi: 10.1097/JOM.0000000000002169.

### **Time Restricted Feeding Reduces Inflammation and Cortisol Response to a Firegrounds Test in Professional Firefighters**

> [J Occup Environ Med.](#) 2021 Apr 1;63(4):343-349. doi: 10.1097/JOM.0000000000002144.

### **Impact of Time Restricted Feeding on Fitness Variables in Professional Resistance Trained Firefighters**

[Andrew E Gonzalez](#)<sup>1</sup>, [Hunter S Waldman](#), [Mark G Abel](#), [Kevin W McCurdy](#), [Matthew J McAllister](#)

## Carbohydrate Restriction

> [J Strength Cond Res.](#) 2020 Oct;34(10):2785-2792. doi: 10.1519/JSC.0000000000003749.

### **A 28-Day Carbohydrate-Restricted Diet Improves Markers of Cardiovascular Disease in Professional Firefighters**

[Hunter S Waldman](#)<sup>1 2</sup>, [JohnEric W Smith](#)<sup>2</sup>, [John Lamberth](#)<sup>2</sup>, [Brent J Fountain](#)<sup>3</sup>, [Richard J Bloomer](#)<sup>4</sup>, [Matthew B Butawan](#)<sup>4</sup>, [Matthew J McAllister](#)<sup>5</sup>

> [J Strength Cond Res.](#) 2019 Dec;33(12):3284-3294. doi: 10.1519/JSC.0000000000003354.

### **A 28-Day Carbohydrate-Restricted Diet Improves Markers of Cardiometabolic Health and Performance in Professional Firefighters**

[Hunter S Waldman](#)<sup>1 2</sup>, [JohnEric W Smith](#)<sup>2</sup>, [John Lamberth](#)<sup>2</sup>, [Brent J Fountain](#)<sup>3</sup>, [Matthew J McAllister](#)<sup>4</sup>





# Exercise Training

- Increased endogenous antioxidant protection
- Decreased susceptibility to oxidative stress
- Reduced markers of CVD risk





Randomized Controlled Trial > J Strength Cond Res. 2022 Aug 1;36(8):2139-2146.

doi: 10.1519/JSC.0000000000003831. Epub 2020 Oct 1.

## Acute Resistance Exercise Reduces Postprandial Lipemia and Oxidative Stress in Resistance-Trained Men

Matthew J McAllister<sup>1</sup>, Kambri S Steadman<sup>1</sup>, Liliana I Renteria<sup>1</sup>, Marcus J Case<sup>1</sup>,  
Matthew B Butawan<sup>2</sup>, Richard J Bloomer<sup>2</sup>, Kevin W McCurdy<sup>1</sup>

# EVEN ONE WORKOUT

Can attenuate metabolic stress from high calorie meal



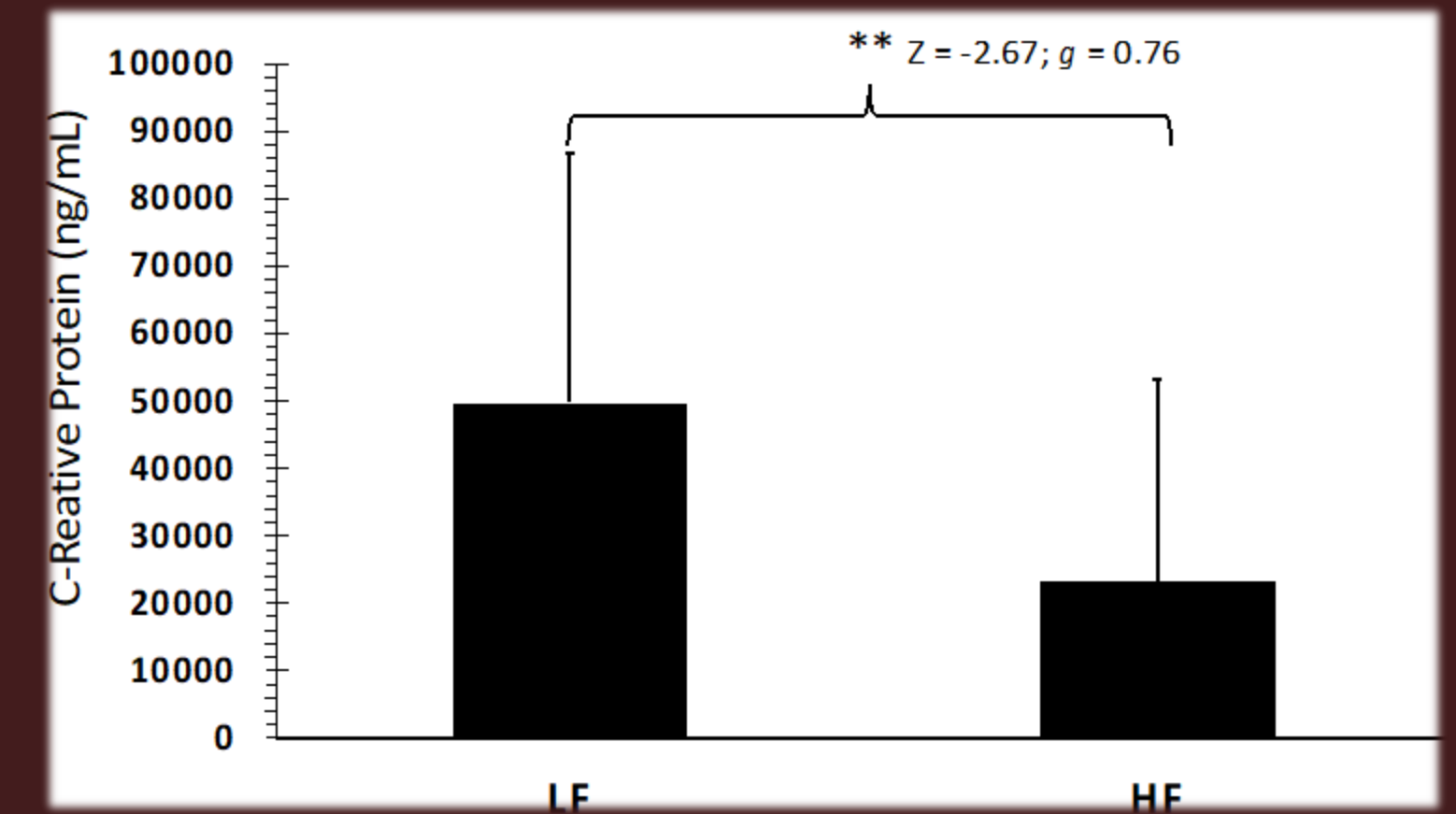
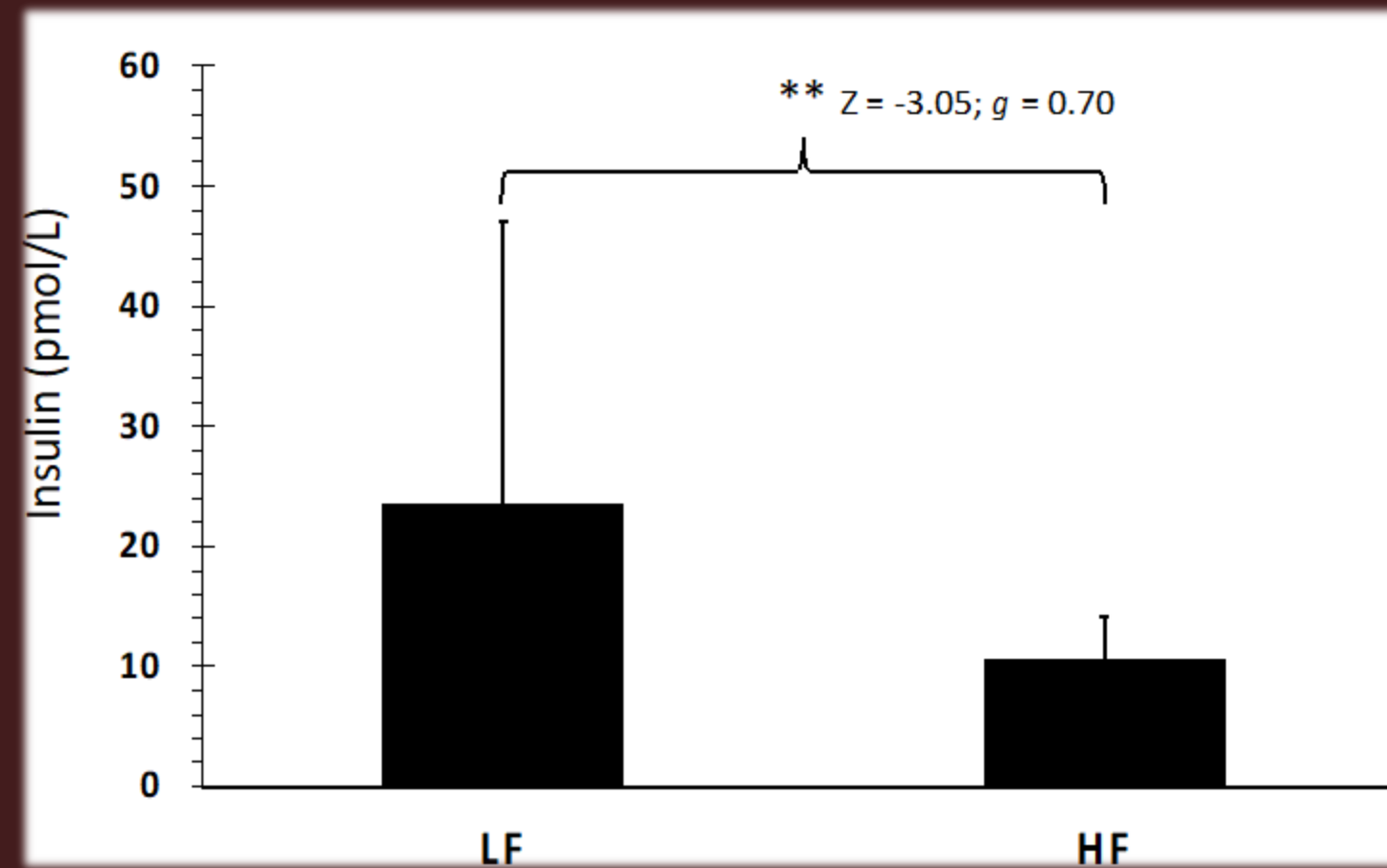


# Is Regular Exercise Training in Firefighters Cardioprotective?

Most Recent Study Examined Fitness Metrics:

- Cardiorespiratory fitness
- Body composition
- Muscular endurance & strength

In relation to blood markers of oxidative stress, inflammation, & CVD Risk



## Firefighters with higher cardiorespiratory fitness demonstrate lower markers of cardiovascular disease risk

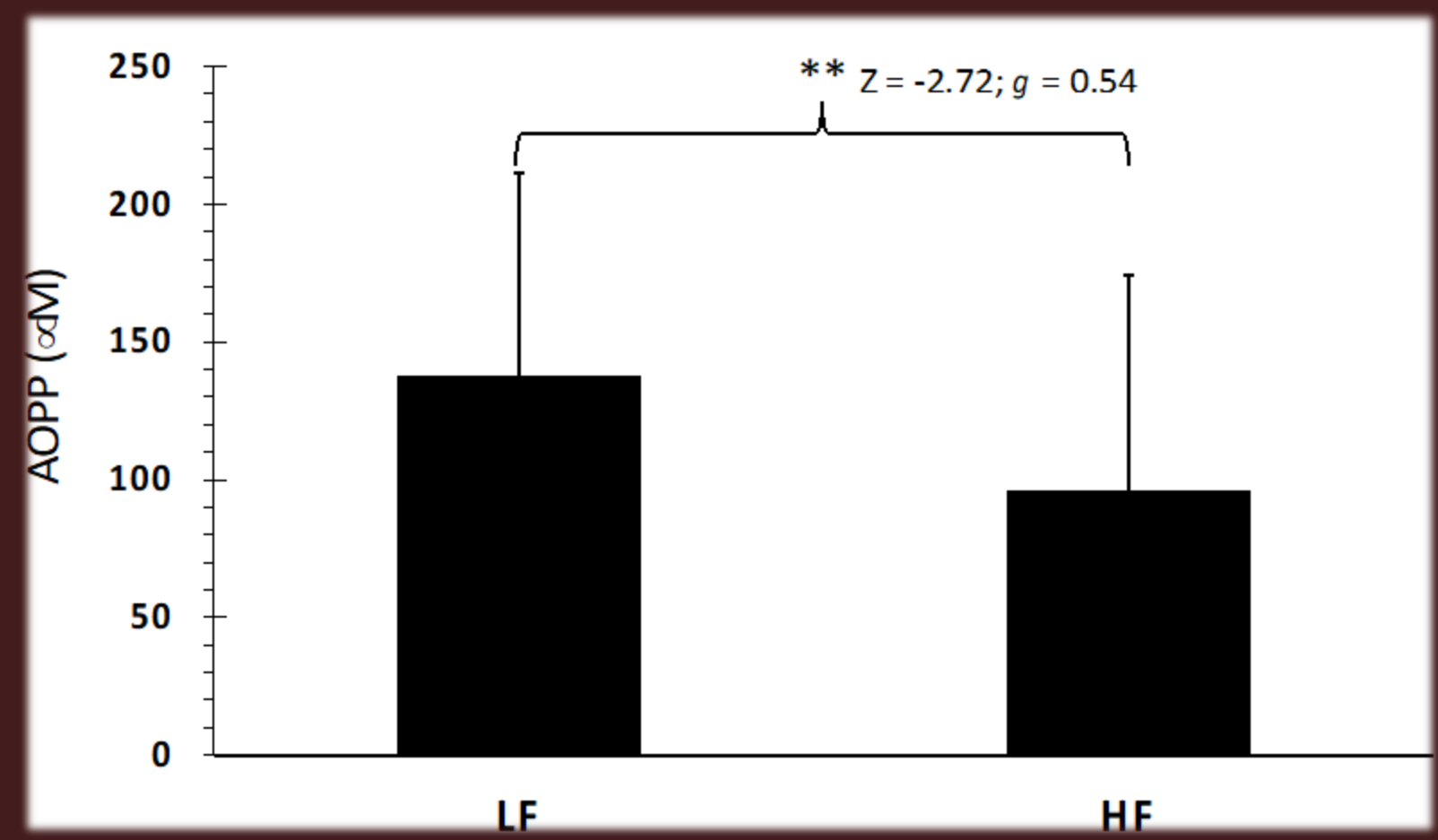
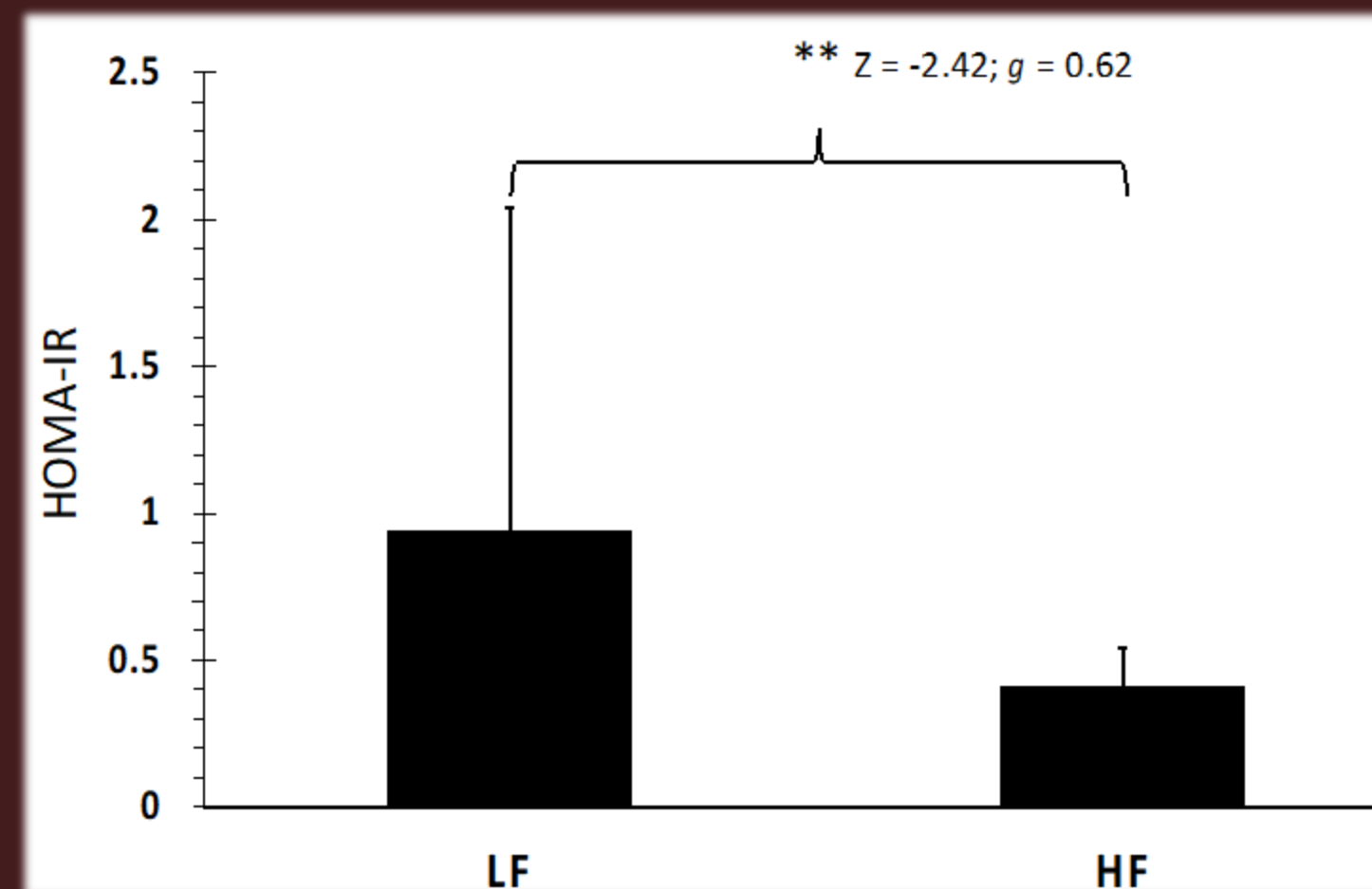
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[Author Information](#) 😊

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# Data In Press

## N = 98 Professional Firefighters

- Ordinary least squares regression models

## Major predictors, biomarkers of CVD Risk:

- High waist circumference
- Low cardiorespiratory fitness
- High blood triglyceride concentrations

Underscores the importance of maintaining high cardiorespiratory fitness in firefighters

ORIGINAL ARTICLE

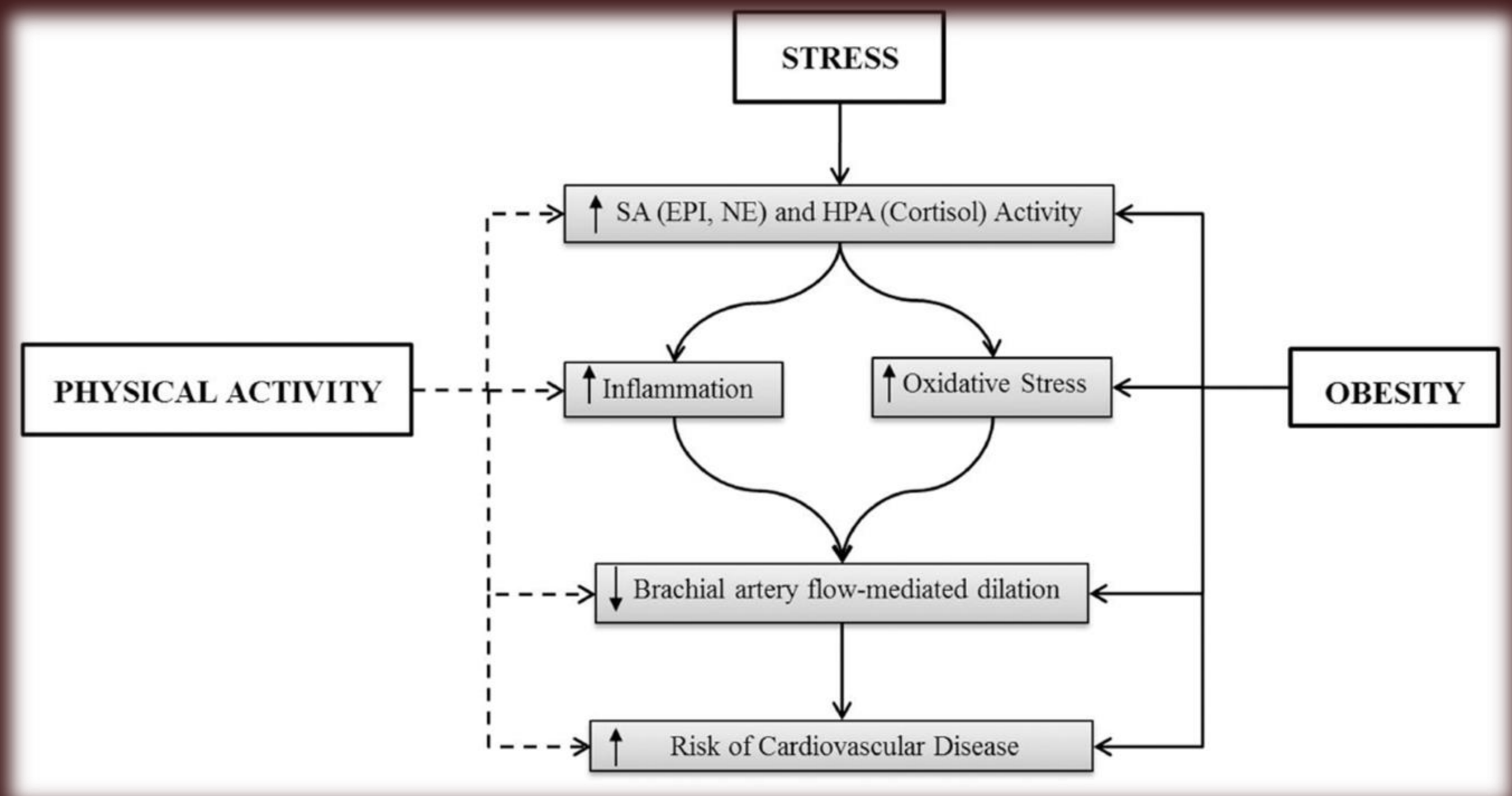
### Risk factors for cardiometabolic disease in professional firefighters

McAllister, Matthew J.<sup>1</sup>; Gonzalez, Drew E.<sup>2</sup>; Leonard, Megan<sup>2</sup>; Martaindale, M. Hunter<sup>3</sup>; Bloomer, Richard J.<sup>4</sup>; Pence, Jacquelyn<sup>4</sup>; Martin, Steven E.<sup>5</sup>

[Author Information](#)📄

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# What About Stress Markers?





# An Important Item to Remember

## Whom Do We Publish For? Ourselves or Others?

in International Journal of Sports Physiology and Performance

*Click name to view affiliation*


Martin Buchheit

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