Public Safety Commission

Introduction

I am a board-certified cardiologist currently practicing in Austin, Texas and have been in practice for over 20 years. I have a very busy clinical practice and treat approximately 350-400 patients per month with various cardiovascular complaints. I attended Washington and Lee University before receiving my medical degree from the Georgetown University School of Medicine in Washington, DC. I completed a rotating internship at Georgetown and then completed my residency training in Internal Medicine at USAF Medical Center Keesler, located on Keesler Air Force Base, Mississippi. After residency, I completed my fellowship in Cardiovascular Diseases at Wilford Hall USAF Medical Center and have had the privilege of serving overseas in the United States Air Force during U.S. military operations in Haiti and in Operation Enduring Freedom.

Prior to practicing in Austin, I have served as Assistant Professor of Medicine at Wright State University in Dayton, Ohio, and at the Uniformed Services University of the Health Sciences in Bethesda, Maryland. I have been trained both invasive and noninvasive cardiology, with extensive experience performing cardiac catheterization, pacemaker implantation, transthoracic and transesophageal echocardiography, and other noninvasive cardiac procedures.

I have been involved in law enforcement since 1989 when I held my first commission as a patrolman in Barnstable, Massachusetts. I am currently a sworn peace officer for the state of Texas and serve as a Lieutenant on the Cedar Park Police Department, and a Reserve Trooper with the Texas Highway Patrol. Prior to this, I was appointed as a Special Deputy United States Marshal. I am also currently the medical director for the Central Texas Regional SWAT Team.

Over the last 7 years, I have also been involved in cardiac research within the Law Enforcement Community. I am a member of the US Dept. of Justice Presidential Task Force on 21st Century Policing and serve on the DOJ Officer Safety and Wellness Working Group. My colleagues and I have developed The Cardiac Screening Initiative (CSI), an observational cohort study with the intent on determining the prevalence of coronary disease in asymptomatic law enforcement officers.

My testimony today is reflective of both my experience as a physician and as a law enforcement officer.

Health disparities and issues plaguing law enforcement

One of the leading causes of death in law enforcement officers (LEOs) is atherosclerotic cardiovascular disease (ASCVD) including myocardial infarction (MI), stroke and peripheral arterial disease (PAD). Compared with civilians, the average age myocardial infarction in LEOs occurs at 49 years of age compared to age 65. Current data suggest that Law Enforcement Officers have a life expectancy that is more than twenty-two years less than their civilian counterparts. Currently, the average age of death of a law enforcement officer in the United States is 57 years of age. In the general population, the risk of death by a CV event (heart attack) between the ages of 55 and 59 is 1.6%. In law enforcement, the risk is 59%.

The definitive cause of this increased CV mortality is currently unclear but is likely related not only to an increased prevalence of known classic cardiac risk factors (hypertension, hyperlipidemia, diabetes etc.) but also to factors such as mental stress induced by work schedules, shift work, and traumatic events.

According to the Officer Down Memorial Data, Line of Duty death from heart attack is consistently the second or third leading cause of officer death, however, the tracked data only includes officers who suffer his or her MI during duty hours. When extrapolated from a ten- or twelve-hour shift to a twenty-four-hour day, death from cardiac disease easily becomes the number one killer of LEOs. It should also be noted that less than 5% of heart attacks are fatal, thereby "missing" the data for non-fatal heart attacks, which number in the thousands.

Police officers have a **stress pattern** which is often times very different than what is seen in individuals in the civilian sector. In data from more than 4,500 US LEOs from 1984 to 2010, Varvarigou et al reported that the risk of sudden cardiac death was "34-69 times higher during restraints/altercations, 32-51 times higher during pursuits, 20-23 times higher during physical training, and 6-9 times higher during medical/rescue operations." The inherent nature of policing consists of long periods of routine and sometimes mundane patrol or investigation punctuated by short periods of unexpected rapid elevation in catecholamines and a corresponding increase in heart rate and blood pressure. This is the so-called pattern of policing which is often described as "98% boredom and 2% sheer terror". The episodes of rapid adrenergic surge will occur during and after certain routine police actions including such events as use of force (both lethal and less than lethal), high-speed pursuit or other acutely stressful actions. For example,

during a use of force or high-speed pursuit, several well-defined physiological changes occur in response to the sympathetic activation. There is a rapid increase in heart rate, an increase in blood pressure, repeated Valsalva (increased intrathoracic pressure from breath holding), activation of both the left and right hemispheres of the brain as the officer use both sides of his or her upper and lower body in offensive and defensive threat mitigation. These intense episodes may go on for several minutes, and in many cases when officers are "fighting for their lives" rapidly convert from aerobic to anaerobic metabolism. This pattern of stress and the resulting catecholamine surge has been well-described. It is also known that MI, which is a result from these described changes in physiology, will often happen hours after the instigating event. Several states, INCLUDING TEXAS (with the recent passing of SB 1582), recognize this delay and will consider any firefighter or LEO who suffers a cardiac event while off duty presumptively to have developed the initial stage of their myocardial ischemic event while on duty.

Classic risk factors for heart disease are well known: age, gender, family history of premature heart disease, diabetes mellitus, hypertension, smoking, dyslipidemia, obesity, and physical inactivity. Primary prevention guidelines rely heavily on population-based 10-year risk prediction models to stratify risk and guide treatment in patients to prevent ASCVD events. Workplace factors include sudden (and sometimes drastic) elevation in heart rate due to an adrenaline rush (anticipatory, excitation or emotional), physical stress, heat stress, poor dietary or exercise habits in the workplace, poor sleep, restless sleep, disrupted sleep cycles and circadian rhythms, etc., all of which contribute to excess risk in LEOs. **Mental stress induced MI (MSIMI)** is an emerging area of research that may help to explain part of the excess risk of mortality and morbidity experienced by LEOs.

In other published studies, the percent of officers with depression was nearly double (12.0% vs. 6.8%) and officers were nearly four times more likely to sleep less than six hours in a 24-hour period than the general population (33.0% vs. 8.0%). A higher percentage of officers were obese (40.5% vs. 32.1%), had the metabolic syndrome (26.7% vs. 18.7%), and had higher mean serum total cholesterol levels (200.8 mg/dL vs. 193.2 mg/dL) than the comparison employed populations.

Importance of physical fitness and command presence testing

Given the fact the police officer morbidity and mortality are substantially higher than what is seen in the general population, it is an absolute necessity that an employing agency attempt to reduce their officers' risks by improving their health. Failure to be proactive in this regard exposes the officers to early death and disability and the potential risk of sudden incapacitation. Sudden and unanticipated incapacitation has the consequence of placing that individual officer, his or her partners and the general public at grave risk. Not only does a proactive wellness program have the ability to reduce officer morbidity and mortality and help ensure that an officer makes it home to their families at the conclusion of their shift, it also substantially saves taxpayer dollars and reduces agency and governmental liability. The Commission on Accreditation for Law Enforcement Agencies (CALEA) has placed the cost to the taxpayers for an individual suffering a heart attack while in the employ of an agency of between $450k-$750k. Officers who are less fit have been shown to resort to the use of lethal force more readily than their fit colleagues. There is substantial case law which has recognized the liability due to "deliberate indifference" of agencies and governments who do not hold their officers accountable to a fitness standard. As an example, I cite Parker V District of Columbia. In this example, a district police officer had no required physical training or assessment for four years prior to the Parker incident. The plaintiffs successfully argued that because of his poor physical condition, officer Hayes most effective method for subduing the objects of his pursuits was the use of a firearm as opposed to the application of physical force. The District of Columbia was ultimately found liable for this.

In your expert opinion, is the TX DPS Command Presence Evaluation Program consistent with generally accepted scientific standards

It is well accepted in the medical literature and in current practice that waist circumference (WC) measurement is an independent risk factor for hypertension, diabetes, dyslipidemia (high cholesterol) and cardiovascular disease, even in those individuals who are of normal weight and normal BMI.

Several mechanisms have been proposed that implicate increased abdominal fat (adipose tissue) with the increases risk of coronary disease. The relations between WC and health outcomes are affected by demographic variables, including sex, race-ethnicity, and age. WC is an important predictor of health outcomes in men and women; Caucasians, African Americans, Asians, and Hispanics; and adults of all age groups.

Several questions need to be answered regarding WC:

1. Can waist circumference be reliably measured? Answer: **Yes**.

Individuals who are given appropriate training in technique, can provide highly reproducible measurements of WC in men and women.

2. Does waist circumference provide

   a) good prediction of diabetes, CHD, and mortality rate? Answer: **Yes**;

   b) incremental value in predicting diabetes, CHD, and mortality rate above and beyond that provided by BMI? Answer: **Yes**;

Data from many large population studies have found WC to be a strong correlate of clinical outcome, particularly diabetes, and to be independent of BMI. In addition, data from a limited number of studies demonstrate that WC remains a predictor of diabetes, CHD, and mortality rate, even after adjustment for BMI and several other cardiometabolic risk factors.

3. Do the current definitions used to determine a high WC identify a nontrivial number of patients who are at increased cardiometabolic risk, but who would not otherwise be identified by having a BMI ≥ 25 and an assessment of commonly evaluated cardiometabolic risk factors? Answer: **Yes**.

The recommended WC thresholds for increased cardiometabolic risk in men [>40 in (102 cm)] and women [>35 in (88 cm)] were derived from WC values that correlated with a BMI ≥ 30. The National Health and Nutrition Examination Survey III (NHANES III) found that about 14% of women and about 1% of men had a "high" WC but a normal BMI (18.5–24.9) (36). In addition, ≈70% of women who were overweight (BMI 25.0–29.9) had a WC > 35 in and ≈25% of men who were overweight had a WC > 40 in. An estimate based on data available from the World Health Organization's Monica Project, conducted in >32 000 men and women from Europe, Australia, and New Zealand, suggest that about 10% of participants who had a BMI < 30 had a WC above the recommended cutpoints for increased risk (36).

In regards to body fat measurement, percentage of bodyfat (PBF) has been shown to consistently be a better predictor of adverse CV outcomes than BMI measurement. Large studies of initially healthy men and women consistently link abdominal adiposity and body fat percentage with an increased risk of cardiovascular events. Compared with a reference body mass index (BMI) <25 kg/m^2, the relative risk of dying during the next decade ranges from 1.2 for overweight (25–29.9 kg/m^2) to 3.8 for severely obese (≥40 kg/m^2) subjects, after adjustment for age, smoking, alcohol, and physical activity. Abdominal fat, and PBF measured as the waist–hip ratio, more reliably predicts the risk of ischemic heart disease and death than BMI, even within normal body weights and after additional adjustment for blood pressure and cholesterol.

Therefore, because it is vital that an employing governmental agency ensure the safety and well-being of their employed officers, every possible risk for sudden incapacitation needs to be fully exposed and treated.

Respectfully submitted,

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