Public Safety Wellness

Jonathan Sheinberg, MD, FACC
Lieutenant, Cedar Park Police Dept
Reserve Trooper, Texas DPS
Patrolman

Barnstable
Massachusetts
1989
Jonathan Sheinberg, MD, FACC

Board Certified in Cardiovascular Disease

- Georgetown University School of Medicine
- Internal Medicine Residency
- Cardiology Fellowship

- 14 Years Service in USAF
  - Cardiologist
  - Flight Surgeon
  - Element Leader
    - Far Forward Critical Care Unit (FFCCU)
    - Operation Enduring Freedom
THE PRESIDENT’S TASK FORCE ON 21ST CENTURY POLICING
FINAL REPORT

Building Trust & Legitimacy
Promoting trust and ensuring legitimacy through procedural justice, transparency, accountability and honest recognition of past and present obstacles

Policy & Oversight
Developing comprehensive and responsive policies on key topics while also implementing formal checks/balances and data collection/analysis

Technology & Social Media
Balancing embrace of technology and digital communications with local needs, privacy, assessments and monitoring

Community Policing & Crime Reduction
Encouraging the implementation of policies that support community-based partnerships in the reduction of crime

Training & Education
Emphasizing the importance of high quality and effective training and education through partnerships with local and national training facilities

Officer Wellness & Safety
Endorsing practices that support officer wellness and safety through the re-evaluation of officer shift hours and data collection/analysis to help prevent officer injuries
Officer Wellness & Safety

Endorsing practices that support officer wellness and safety through the re-evaluation of officer shift hours and data collection/analysis to help prevent officer injuries.
Officer Safety and Wellness Group Meeting Summary: Improving Law Enforcement Resilience - Lessons and Recommendations

Abstract: Since 2011, the COPS Office and the Bureau of Justice Assistance (BJA) have raised awareness, increased knowledge, and promoted practices that support the safety and well-being of law enforcement officers through the Officer Safety and Wellness (OSW) Group. In October 2016, the OSW Group brought law enforcement practitioners and subject matter experts together to discuss promising practices for supporting officer resilience. Resilience - the ability not only to recover emotionally from traumatic events but to withstand day-to-day work-related stress - is critical to the physical and psychological health of all law enforcement officers. In addition to summarizing the group's discussions at the October meeting, this report contains case studies of the emotional impact of mass casualty events on first responders in Dallas, Texas; Orlando, Florida; and San Bernardino, California. The report also provides recommendations for preparing officers for traumatic events and strategies for supporting overall resilience through physical and emotional health.

Product ID: COPS-P362
Publication Date: 06/19/2017
Author(s): Deborah Spence (ed.)

Email To A Friend
Officer Life Expectancy

Police officers live 21.9 years less than our civilian counterparts.
<table>
<thead>
<tr>
<th>Average Life Expectancy</th>
<th>57 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Age At Retirement</td>
<td></td>
</tr>
<tr>
<td><strong>Average Life Expectancy</strong></td>
<td>57 years</td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Average Age At Retirement</strong></td>
<td>57.1 years</td>
</tr>
</tbody>
</table>
Between the ages of 55-59…

Civilian’s chance of dying from a heart attack
• 1.5%

Police officer’s chance of dying from a heart attack
• 56%

1.5% vs 56%
What is wellness...
The condition of good physical, mental and emotional health, especially when maintained by an appropriate diet, exercise, and other lifestyle modifications.
Need for LEO Specific Wellness
The Cedar Park PD Model

- Cardiac Screening
- Physical Fitness
- Nutrition Weight loss
- Mental and Emotional Wellness

Wellness

TCCC
IFAK
Trauma
# Heart Disease

<table>
<thead>
<tr>
<th></th>
<th>Law Enforcement</th>
<th>Civilian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age of patient with heart attack</td>
<td>49 years</td>
<td>65 years</td>
</tr>
<tr>
<td>Heart attacks under age 45</td>
<td>29-45%</td>
<td>7%</td>
</tr>
<tr>
<td>Average Life Expectancy</td>
<td>57 years</td>
<td>79 years</td>
</tr>
</tbody>
</table>
Fitness

Should i run for it?
Obesity

80% of LEO’s are overweight
40% of LEO’s are Obese
Mental Health (Emotional Intelligence)
The Cedar Park PD Model

- Cardiac Screening
- Physical Fitness
- Nutrition Weight loss
- Mental and Emotional Wellness
- TCCC IFAK

Wellness
The Cedar Park PD Model

Cardiac Screening

Physical Fitness

Nutrition Weight loss

Mental and Emotional Well Being

TCCC IFAK

LEO Wellness
### Heart Disease

<table>
<thead>
<tr>
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<th>Civilian</th>
</tr>
</thead>
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<td>7%</td>
</tr>
<tr>
<td>Average Life Expectancy</td>
<td>57 years</td>
<td>79 years</td>
</tr>
</tbody>
</table>
1. Police officers live an average of 15 years less than the average American.

2. Nearly 50% of police officers will die from heart disease within five years of retirement.

3. Statistically, we are 25 times more likely to die from cardiovascular disease (CVD) than from the action of a suspect.
# Officer Down Memorial Page

## 2016

<table>
<thead>
<tr>
<th>Total Line of Duty Deaths: 161</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/11 related illness</td>
</tr>
<tr>
<td>Aircraft accident</td>
</tr>
<tr>
<td>Animal related</td>
</tr>
<tr>
<td>Assault</td>
</tr>
<tr>
<td>Automobile crash</td>
</tr>
<tr>
<td>Drowned</td>
</tr>
<tr>
<td>Duty related illness</td>
</tr>
<tr>
<td>Fall</td>
</tr>
<tr>
<td>Gunfire</td>
</tr>
<tr>
<td>Gunfire (Accidental)</td>
</tr>
<tr>
<td>Heart attack</td>
</tr>
<tr>
<td>Motorcycle crash</td>
</tr>
<tr>
<td>Stabbed</td>
</tr>
<tr>
<td>Struck by train</td>
</tr>
<tr>
<td>Struck by vehicle</td>
</tr>
<tr>
<td>Training accident</td>
</tr>
<tr>
<td>Vehicle pursuit</td>
</tr>
<tr>
<td>Vehicular assault</td>
</tr>
</tbody>
</table>

## 2017

<table>
<thead>
<tr>
<th>Total Line of Duty Deaths: 136</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/11 related illness</td>
</tr>
<tr>
<td>Aircraft accident</td>
</tr>
<tr>
<td>Animal related</td>
</tr>
<tr>
<td>Assault</td>
</tr>
<tr>
<td>Automobile crash</td>
</tr>
<tr>
<td>Boating accident</td>
</tr>
<tr>
<td>Drowned</td>
</tr>
<tr>
<td>Duty related illness</td>
</tr>
<tr>
<td>Exposure to toxins</td>
</tr>
<tr>
<td>Gunfire</td>
</tr>
<tr>
<td>Heart attack</td>
</tr>
<tr>
<td>Motorcycle crash</td>
</tr>
<tr>
<td>Stabbed</td>
</tr>
<tr>
<td>Struck by vehicle</td>
</tr>
<tr>
<td>Unidentified</td>
</tr>
<tr>
<td>Vehicle pursuit</td>
</tr>
<tr>
<td>Vehicular assault</td>
</tr>
</tbody>
</table>
Extrapolated over a 24 hour day
30-45
** only 3-4% of heart attacks are fatal **
1000’s heart attacks per year
Texas Senate Bill 1582

Effective September 1st, 2019
Peace Officer “Presumptive Status”
Traditional Framingham Risk

Risk Assessment Tool for Estimating 10-year Risk of Developing Hard CHD

The Framingham Heart Study asks for the following data to estimate 10-year risk for "hard" coronary heart disease outcomes (myocardial infarction and coronary death) in adults aged 20 and older who do not have heart disease or diabetes.

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>□ years</td>
</tr>
<tr>
<td>Gender</td>
<td>□ Female □ Male</td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>□ mg/dL</td>
</tr>
<tr>
<td>HDL Cholesterol</td>
<td>□ mg/dL</td>
</tr>
<tr>
<td>Smoker</td>
<td>□ No □ Yes</td>
</tr>
<tr>
<td>Systolic Blood Pressure</td>
<td>□ mm Hg</td>
</tr>
<tr>
<td>Currently on any medication</td>
<td>□ No □ Yes</td>
</tr>
<tr>
<td>to treat high blood pressure</td>
<td></td>
</tr>
</tbody>
</table>

Calculated 10-Year Risk

Medscape
High Risk for heart disease
Abstract 3750: Prevalence of Coronary Artery Disease in New York City Police Officers as Predicted by Coronary Artery Calcium Scoring

Jia Lin See; Nikolas Wanahita; Nir N Somekh; Stephen E Nelson; Albert Barrette; Kenneth Giedd; Steven R Bergmann
Beth Israel Med Cntr, New York, NY

2068 NYPD Members of the Service (officers)

- Coronary Calcium Score
• There was NOT an increased prevalence of CAD among members of the NYPD compared to the general population
Cardiac Screening Initiative©

www.PublicSafetyHeart.org
Importance of Monitoring Lipid Subclasses

Investigation of 79 patients reports:
- 70% of patients requiring multiple percutaneous coronary interventions (PCI) had LDL IVb ≥ 10%
- 90% had LDL IIIa+b ≥20%
- 94% had HDL2b ≥ 20%
- 100% had either LDL IVb ≥ 10% or HDL2b ≥ 20%

† Margolis J, et al AHA, 2002. Chicago, IL
Simple Blood Test (Lp-PLA₂)
Lp-PLA$_2$ is Associated with Development of Rupture Prone Plaque

Early Plaque with Lipid Pool

Thick Cap with Small Necrotic Lipid Core “Stable Plaque”

Thin Cap “Rupture-Prone” Plaque

Ruptured Plaque with Thrombus in Lumen

Reddish-brown staining indicates presence of Lp-PLA$_2$ in human coronary atherosclerosis
Cardiac Screening Initiative©

- Observational Cohort of asymptomatic police officers
- To date over 3500 police officers evaluated
  - Coronary calcium scores
  - Blood tests
    - Advanced lipid testing
    - Inflammatory biomarkers
      - Lp-PLA$_2$
      - Myeloperoxidase
# Calcium Score

<table>
<thead>
<tr>
<th>Age</th>
<th>LEO Count</th>
<th>Civilian Count</th>
<th>Total Count</th>
<th>p</th>
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<tbody>
<tr>
<td>1 24-36</td>
<td>64</td>
<td>19</td>
<td>83</td>
<td>0.599</td>
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<tr>
<td></td>
<td>91.4%</td>
<td>95.0%</td>
<td>92.2%</td>
<td></td>
</tr>
<tr>
<td>&gt;0</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.6%</td>
<td>5.0%</td>
<td>7.8%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>20</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>2 37-41</td>
<td>107</td>
<td>40</td>
<td>147</td>
<td>0.705</td>
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<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>&gt;0</td>
<td>16</td>
<td>7</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15.0%</td>
<td>17.5%</td>
<td>15.6%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>40</td>
<td>164</td>
<td></td>
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<td></td>
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<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>3 42-44</td>
<td>76</td>
<td>61</td>
<td>127</td>
<td>0.799</td>
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<td></td>
</tr>
<tr>
<td>&gt;0</td>
<td>21</td>
<td>13</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td></td>
<td>27.0%</td>
<td>25.5%</td>
<td>26.8%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>74</td>
<td>171</td>
<td></td>
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<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>4 45-49</td>
<td>112</td>
<td>91</td>
<td>203</td>
<td>0.298</td>
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<td></td>
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<td>100.0%</td>
<td>100.0%</td>
<td></td>
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<tr>
<td>&gt;0</td>
<td>26</td>
<td>27</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>23.2%</td>
<td>29.7%</td>
<td>26.1%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>138</td>
<td>118</td>
<td>256</td>
<td></td>
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<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>5 50-67</td>
<td>98</td>
<td>251</td>
<td>349</td>
<td>0.487</td>
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<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
<tr>
<td>&gt;0</td>
<td>62</td>
<td>125</td>
<td>187</td>
<td></td>
</tr>
<tr>
<td></td>
<td>54.2%</td>
<td>49.8%</td>
<td>51.0%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>376</td>
<td>536</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>
Cardiac Screening Initiative

Lp-PLA₂ Changes Everything
Lp-PLA₂ is Associated with Development of Rupture Prone Plaque

- Early Plaque with Lipid Pool
- Thick Cap with Small Necrotic Lipid Core “Stable Plaque”
- Thin Cap “Rupture-Prone” Plaque
- Ruptured Plaque with Thrombus in Lumen

Reddish-brown staining indicates presence of Lp-PLA₂ in human coronary atherosclerosis
Lp-PLA<sub>2</sub> Predicts Major CV Events in CHD Patients: Mayo Heart Study

95% of patients with Lp-PLA<sub>2</sub> < 200 ng/ml were Event Free at 4 years
|                                | 24-36 |     | 37-41 |     | 42-44 |     | 45-49 |     | 50-67 |     |
|--------------------------------|-------|--|--|-------|--|-------|--|-------|--|-------|--|
|                                | N    | Mean | SD | N    | Mean | SD | N    | Mean | SD | N    | Mean | SD |
| Coronary Calcium Score         | 1 LEO | 70   | 1.3 | 9.6 |       |     | 2 LEO | 40    | 11.3 | 32.4 | 51    | 6.0  | 22.2 |
|                                |       |      |    |      |      |    |       |      |     |      |      |    |
| Total Cholesterol, mg/dL       | 1 LEO | 105  | 196.5 | 35.5 |       |     | 2 LEO | 158   | 193.9 | 46.2 | 159  | 193.6 | 38.8 |
|                                |       |      |    |      |      |    |       |      |     |      |      |    |
| HDL Cholesterol, mg/dL         | 1 LEO | 104  | 50.4 | 14.5 |       |     | 2 LEO | 158   | 52.6 | 15.2 | 159  | 55.7 | 18.3 |
|                                |       |      |    |      |      |    |       |      |     |      |      |    |
| LDL Cholesterol, mg/dL         | 1 LEO | 104  | 128.0 | 32.2 |       |     | 2 LEO | 158   | 123.2 | 40.2 | 159  | 119.9 | 34.7 |
|                                |       |      |    |      |      |    |       |      |     |      |      |    |
| LpPLA2, ng/mL                  | 1 LEO | 97   | 195.2 | 40.7 |       |     | 2 LEO | 156   | 180.2 | 37.5 | 158  | 193.7 | 48.7 |
|                                |       |      |    |      |      |    |       |      |     |      |      |    |
| Glucose, mg/dL                 | 1 LEO | 104  | 92.4 | 7.4  |       |     | 2 LEO | 146   | 93.1 | 22.6 | 145  | 94.0 | 28.4 |
|                                |       |      |    |      |      |    |       |      |     |      |      |    |
| Insulin, uU/mL                 | 1 LEO | 105  | 9.8  | 8.3  |       |     | 2 LEO | 158   | 12.3 | 10.7 | 159  | 9.7  | 6.7 |
|                                |       |      |    |      |      |    |       |      |     |      |      |    |
| BMI = m(d/2kg)/(htm**2)        | 1 LEO | 59   | 28.1 | 4.6  |       |     | 2 LEO | 122   | 27.9 | 6.5  | 96   | 27.6 | 5.0 |
|                                |       |      |    |      |      |    |       |      |     |      |      |    |

* p < 0.05
** p < 0.01
*** p < 0.001
Cardiac Screening Initiative

Lp-PLA₂ Changes Everything

There is a statistical increase in this marker in cops as *early as* 24 years old
"Pre-clinical CAD"

Coronary Disease

>50% of police officers
n=914

- Normal: 43%
- Lp-PLA₂: 32%
- CCS: 18%
- Combined PLA₂ and CCS: 7%
PLA₂ AND CARDIAC CALCIUM SCORES

**Police Department**
- PLA₂ >200: 55%
- Positive CCS: 10%
- Positive for both: 3%
- Negative: 32%

**Fire Department**
- PLA₂ >200: 38%
- Positive CCS: 35%
- Positive for both: 1%
- Negative: 26%

N=292

68% 74%
Evidence of Obesity-Body Fat %

>25% FOR MALES OR >32% FOR FEMALEs

Police Department

- Normal: 16%
- Clinically Obese: 84%

Fire Department

- Normal: 31%
- Clinically Obese: 69%
Markers of Prediabetes

INSULIN LEVELS

Police Department

- (Pre) Diabetes: 35%
- Normal Range: 65%

Fire Department

- (Pre) Diabetes: 17%
- Normal Range: 83%
Evidence of Hypertension

undiagnosed or poorly controlled blood pressure

Police Department

- Normal Blood Pressure: 74%
- HTN: 26%

Fire Department

- Normal Blood Pressure: 80%
- HTN: 20%
N=292

- Coronary disease (80) 70%
- (Pre) Diabetes (29) 25%
- Clinically Obese (86) 76%
- High Blood Pressure (25) 22%
Officer Life Expectancy
In-service Heart Attack
In-service Heart Attack

$400,000 - $750,000

www.calea.org/newweb/newsletter/No87/healthfitness.htm
Days Lost

• Bypass Grafting
  • 60-90 days

• MI
  • 7-14 days
  • *antiplatelet Tx

• PCI
  • 7-14 days
  • *antiplatelet Tx
Where do we go from here...

Research

Law Enforcement Officer Cardiac Screening Initiative (LEO-CSI)

A Clinical Study Activity

ABSTRACT

The leading cause of duty-related death among US police officers is myocardial infarction (MI). The number of law enforcement officers who die on the job is staggering. While guidelines for the medical screening of police officers do exist, the screening process is not mandated. As such, many departments do not provide medical screenings, while others may. It is conceivable that screenings are more frequently mandated at larger metropolitan police departments as opposed to smaller, more rural agencies. We also know, that despite the guidelines that exist, there is great variation in what the screening entails. With a population so vulnerable to coronary disease, we believe that appropriately screening this population for early detection of coronary artery disease is essential. We believe that the current screening techniques that are being employed (as variable as they may be), are not as good to accomplish the goal of early detection in such a vulnerable population. We further believe that new technologies are far superior to those currently being used, and that by eliminating the older tests, and adopting the newer tests, we will reduce the morbidity and mortality in police officers due to cardiovascular disease, and probably at a cost savings to law enforcement agencies and the tax-payer. Our proposed study is designed to collect those data from actual police officers.

More CVD or more CV risk factors?

Is there a better predictive model?

Bayesian analysis

Does mental stress play a contributing role in endothelial dysfunction?
Waco
Plano
Denton
The Ultimate Goal!
The Cedar Park PD Model

Cardiac Screening

Physical Fitness

Nutrition Weight loss

TCCC IFAK

Wellness

Mental and Emotional Wellness
Wellness

Physical Fitness

Nutrition

Weight loss

Cardiac Screening

Mental and Emotional Wellness

TCCC

IFAK
Wellness

Emergency Physicians
Trauma Surgeons

Cardiologists

Physical Fitness

Nutrition
Weight loss

Mental and Emotional Wellness
Wellness

Emergency Physicians

Trauma Surgeons

Cardiologists

Exercise Physiologists

Nutrition Weight loss

Mental and Emotional Wellness
Wellness

Emergency Physicians

Trauma Surgeons

Cardiologists

Exercise Physiologists

Dieticians

Mental Health professionals
Wellness

Emergency Physicians

Cardiologists

Physical Fitness

Dieticians

Trauma Surgeons

Mental Health professionals
Questions?

Jonathan.Sheinberg@BSWhealth.org

(512) 626-0512