Cardiac Screening Initiative

Jonathan Sheinberg, MD, FACC
Reserve Police Officer – Cedar Park Police Department
Volunteer Physician – Austin Police Department
<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>45%</td>
<td>7%</td>
</tr>
<tr>
<td>Average Life Expectancy</td>
<td>57 years</td>
<td>79 years</td>
</tr>
</tbody>
</table>

Officer Life Expectancy

1. Police officers live an average of 15 years less than the average American.[1]

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

3. Statistically, we are 25 times more likely to die from cardiovascular disease (CVD) than from the action of a suspect.[3]
Cardiology 101
Coronary Calcium Score
Cardiology 101
Lp-PLA2
(Lipoprotein-Associated Phospholipase A2)
Cardiology 101

Coronary Disease

Calcium Score > 0

PLA2 > 200
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

• 150 Police Volunteers
  – Austin Police
  – Cedar Park Police
  – Treasury Special Agents
  – US Marshall Service
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
Lp-PLA2

(Lipoprotein-Associated Phospholipase A2)
Results of Stress Test

- Normal Stress
- Abnormal Stress: 1%
Results of Calcium Score

- Normal CCS: 77%
- Abnormal CCS: 23%
Abnormal $\text{PLA}_2$

- Normal $\text{PLA}_2$: 66%
- Abnormal $\text{PLA}_2$: 34%
Calcium Score + PLA$_2$
Results of Plaque

77 of 143 participants were abnormal

53.8%
Results

• NO association of Coronary Disease with:
  – Age
  – Gender
  – Cholesterol levels
  – Weight
  – Presence of diabetes
  – Unit

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N (%) with disease</th>
<th>N (%) without disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin Role</td>
<td>15 (82.5)</td>
<td>9 (37.5)</td>
</tr>
<tr>
<td>Field Role</td>
<td>32 (53.3)</td>
<td>28 (45.7)</td>
</tr>
<tr>
<td>Investigative Role</td>
<td>29 (46.8)</td>
<td>33 (53.2)</td>
</tr>
<tr>
<td>Female</td>
<td>10 (47.6)</td>
<td>11 (52.4)</td>
</tr>
<tr>
<td>Male</td>
<td>67 (53.2)</td>
<td>59 (46.8)</td>
</tr>
<tr>
<td>Normal</td>
<td>17 (48.6)</td>
<td>18 (51.4)</td>
</tr>
<tr>
<td>Overweight</td>
<td>30 (51.7)</td>
<td>28 (48.3)</td>
</tr>
<tr>
<td>Obese</td>
<td>30 (55.6)</td>
<td>24 (44.4)</td>
</tr>
<tr>
<td>Hypertensive</td>
<td>32 (55.2)</td>
<td>26 (44.8)</td>
</tr>
<tr>
<td>Normotensive</td>
<td>44 (50.6)</td>
<td>43 (49.4)</td>
</tr>
<tr>
<td>LDL &gt; 130</td>
<td>36 (52.2)</td>
<td>31 (47.8)</td>
</tr>
<tr>
<td>LDL &lt; 130</td>
<td>41 (52.6)</td>
<td>37 (47.4)</td>
</tr>
<tr>
<td>LDL &gt; 100</td>
<td>64 (51.6)</td>
<td>60 (48.4)</td>
</tr>
<tr>
<td>LDL &lt; 100</td>
<td>13 (56.5)</td>
<td>10 (43.5)</td>
</tr>
<tr>
<td>sdLDL-c &gt; 20</td>
<td>63 (52.9)</td>
<td>56 (47.1)</td>
</tr>
<tr>
<td>sdLDL-c &lt; 20</td>
<td>13 (48.2)</td>
<td>14 (51.8)</td>
</tr>
<tr>
<td>HDL &lt; 50</td>
<td>32 (46.4)</td>
<td>37 (53.6)</td>
</tr>
<tr>
<td>HDL &gt; 50</td>
<td>45 (57.7)</td>
<td>33 (42.3)</td>
</tr>
<tr>
<td>TG &gt; 150</td>
<td>18 (51.4)</td>
<td>17 (48.6)</td>
</tr>
<tr>
<td>TG &lt; 150</td>
<td>59 (52.7)</td>
<td>53 (47.3)</td>
</tr>
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</table>
THE Risk Factor...
The Apple II (above) features color and sound. It is also the easiest of the computers in expand space and considered a leader in the industry. The Atari 800 (right) has fantastic graphic capability in color. More software has become available for it just this year. (Both are shown with Amdek Color 1 monitor.)
Daily Beverage Recommendations:
6 Glasses of Water

Wine in moderation

Monthly

Weekly

Daily

Daily Physical Activity

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Low fat = High carbohydrate
Relax ... it's a diet soda.
Despite These Advances, Life Expectancy is Slowing

First time in 200 years, children’s life expectancy is shorter than parents
The Solution
Importance of Monitoring Lipid Subclasses

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† Margolis J, et al. AHA, 2002, Chicago, IL
Lp-PLA₂ Predicts Major CV Events in CHD Patients: Mayo Heart Study

95% of patients with Lp-PLA₂ < 200 ng/ml were Event Free at 4 years

Brilakis ES et al. Mayo Heart Study. Euro Heart J 2005
Costs

• Coronary artery bypass grafting (CABG)
  – $39,407

• Coronary Stent (PCI)
  – $20,421

• Heart Attack
  – $6,569
  – Usually leads to
    • CABG
    • PCI
Costs to Treat

• 1000 officers
  – 25% - CABG
    • $9.8 MM
  – 25% - PCI
    • $5.1 MM
  – 25% - Heart attack
    • $6.6 MM
      – MD visits
      – Rx
  – TOTAL = $23.1 MM
Costs to Prevent

• 1000
  – CCS $50,000
  – Advanced Lipid Panel $1,500,000
  – Treadmill $151,000
  – Physician visits $130,000
    • 5 years - $650,000
  – Medication/supplements –
    • - $6 mil

– TOTAL = $ 8.4 MM
Cost Savings

• $14,700/officer per 5 years

• Extrapolated over 1500 officers
  – $22 MM per 5 years
Days Lost

- Bypass Grafting
  - 60-90 days

- Heart attack
  - 7-14 days

- Stent
  - 7-14 days
Summary

• Police Officers have significant increases
  – CV Events
  – CV Mortality

• Essential to identify those at risk
  – Initiate treatment
    • Reduce Mortality
    • Reduce Morbidity
    • Reduce Costs
    • Keep Officers On the Job
Recommendations

• Pilot Study very compelling
• Further studies are needed
• Aggressive screening seems to be warranted
  – 37 years and older (age 44 +/- 7)
    • Coronary Calcium Score
    • Lp-Pla₂
    • +/- TMT
Incidental Findings

• Hypertension – 41%
• Overweight – 39%
  – Obese – 37%
• Diabetes – 10%*
• Low Vitamin D₃ – 52%
• Other Illness
  – Lymphoma
  – Lung Cancer
  – Stills Disease (Rheumatologic)
  – Inflammatory Lung disease

* Based on Hgb A1C, Insulin level, or fasting blood glucose
Questions?

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