Heart Disease and the Law Enforcement Officer

Jonathan Sheinberg, MD, FACC
Cedar Park Police Department

As a fellow Law Enforcement Officer and a physician I am trying to spread the word. We are missing the boat, and because of this, we are dying. There is a simple reason that law enforcement officers have some of the best pensions in the country – we do not live long enough after retirement to fully collect them. Several programs have been created to address premature officer death and officer safety is a primary concern for every agency whether on the local, state or federal level. Police officers and Special Agents are intimately aware of safety policy and procedure requirements: wear reflective vests, always use body armor, do not engage in high-speed pursuits for low-level crimes etc. Despite these efforts however, there is another cause of officer death and disability that is usually overlooked – cardiovascular disease.

Heart attacks are always in the top two or three categories of police line of duty deaths. However, if extrapolated to a full 24-hour day, heart attack likely becomes the number one killer of men and women in uniform. This is not new information. More than 20 years ago, International Association of Chiefs of Police (IACP) published some of their initial data (Violanti, 2013). The data are shocking. The life expectancy of a police officer is 20 years less than his or her civilian counterpart. The average age of a law enforcement officer (LEO) who has suffered a heart attack
is 49 years, compared to 67 years of age for the general population (Figure 1).

Finally, it is known that a LEO is twenty-five times more likely to suffer death and disability from heart disease than from a violent action of a suspect. Despite this information, many agencies have been slow to develop wellness programs and cardiac screening assessments.

It is now very clearly understood that the most effective treatment of coronary artery disease is prevention. With today’s technology, the understanding of nutrition and the development of certain medications, heart disease is completely detectable, preventable and even reversible. The key to this prevention, detection and treatment of cardiovascular disease is the development of a cardiovascular screening program and an overall wellness program.

**Wellness** is defined as the condition of good physical, mental and emotional health, especially when maintained by an appropriate diet, exercise and other lifestyle modifications. Any program that supports wellness is absolutely vital in a profession in which 80% of officers are obese (Shell et al, 2003 ). Obese police officers may at times be ineffective in their job and may place their agency in a position of increased liability. It has been seen time and time again, an “out of shape” officer may resort to deadly force more quickly than his or her physically fit counterpart, as the ability to go ”hands on” becomes less effective. Obesity isn’t a problem specific to Law Enforcement, it is a global pandemic and recently for the
first time in recorded history, 30% more deaths will occur from complications of obesity than from starvation.

The concept of wellness centers around nutrition. To better understand nutrition, several myths need to be dispelled. First and foremost, the biggest public health nightmare in the last 50 years arose from the 1983 United States guidelines recommending a reduction of fat in the American diet from 40% to 30% of calories consumed. The results have been catastrophic and have resulted in the obesity pandemic and the associated complications of obesity such as the increase in type II diabetes and the increase in cardiovascular disease. In 1983, an inaccurate concept was presented: dietary fat consumption results in heart disease. It was thought that dietary consumption of fat raised Low Density Lipoproteins (LDL – or bad cholesterol). LDL causes heart disease therefore dietary fat causes heart disease. This is simply not true. Although dietary fat does raise the bad cholesterol, it raises a type of bad cholesterol which is actually not that bad after all. Fat consumption results in an LDL particle that is buoyant or “fluffy”. These large, fluffy particles pass directly through the blood stream and are cleared by the liver. They are not absorbed into the blood vessel walls, and therefore do not contribute to arterial blockage formation. In contradistinction to this, when carbohydrates or sugar are eaten, the body produces a type of bad cholesterol which is truly bad. These cholesterol particles are small and dense (think golf balls vs. beach balls) and therefore have the ability to cross the cell lining of the blood vessels and collect in the coronary artery wall. This is how plaque (and eventually coronary disease)
develops. It is therefore essential to understand that it is in fact carbohydrates and sugar that results in heart disease, not fat. It is now understood as fact that bread, rice, pasta, juice, soda, tortilla and such cause the development of bad dense LDL particles and therefore the development of heart disease (figure 2). The concept of a diet rich in fruits, vegetables and meat is the basis of the “Paleo” or caveman diet. This diet of low carbohydrate consumption is not only vital to cardiac health but to overall general wellness.

**It’s a perfect storm and it’s not your fault...**

Our bodies are not designed to eat carbohydrate laden processed food. However the deck is stacked against us. Sugar, wheat and corn are subsidized by the federal government and therefore inexpensive. Processed food is readily available and packaged for ease of consumption. Finally, this type of food tastes good and it is addictive. It is a well-understood marketing tool that the more sugar a manufacture places in the food, the more it is consumed. The combination of inaccurate guidelines, subsidization, processing and the adding of sugar to improve taste – has resulted in the biggest public health crisis in the last 50 years, that is obesity, diabetes and progressive heart disease.
We are not powerless...

In order to turn back the tide of obesity, diabetes and heart disease the physiology of obesity needs to be examined and understood. Obesity is not simply a bad behavior, it is a problem of biochemistry.

When hungry, the stomach secretes a hormone called *ghrelin*. This peptide reaches the brain and tells the brain its time to eat. After eating has begun, the fat tissue receives nutrients and a hormone called *leptin* is released. This leptin travels to the brain and activates the nervous system resulting in the “sugar high”. The brain knows it has food available and therefore it’s okay to expend energy.

However, when an individual is overweight, his or her body's insulin levels are elevated. The elevated insulin present in the body blocks the leptin and the brain does not know it has been fed. In essence, those with elevated insulin levels have brains that think they are “starving”. In this situation, the brain attempts to decrease the body's metabolism, hold onto every calorie and does not “encourage” exercise. This works great if one is starving. But for the majority – it backfires; it creates obesity (figure 4).

This cycle CAN be broken! By simply removing the sugar from the diet, the body’s insulin level will decrease and the brain will once again recognize leptin. Weight loss occurs rather quickly. Therefore, the rates of obesity, diabetes and heart
disease can be radically reduced by simply eliminating sugar and reducing carbohydrates from the diet.

**Early detection is key**

**SCREENING** is defined as the “examination of a group to separate well persons from those who have an undiagnosed pathologic condition or who are at high risk”. In other words, how can a population of police officers who have been historically at high risk for premature heart disease be evaluated to identify those individuals who are likely to develop heart attacks *before* they have their first problem?

In order to help answer this question, **The Public Safety Cardiac Foundation (PSCF)** was created. This foundation is a 501 (c) 3 not-for-profit entity, developed to obtain grant funding to sponsor cardiovascular research and promote cardiovascular screening within law enforcement agencies. The PSCF has already created Cardiac Screening Initiative (CSI), a pilot study that has made some significant headway in developing strategies to help in the early detection of heart disease in police officers. The CSI evaluated police officer volunteers who were not having any symptoms. These officers were asked to perform three very simple screening tests: an exercise treadmill test, a coronary calcium score CT scan (a low dose radiation CAT scan designed to detect the small flecks of calcium present in blockages) and an advanced blood test. The advanced blood test (Boston Heart Diagnostic Lab) was performed to look at the presence of different types of cholesterol particles and the presence of
a maker of coronary inflammation, which would suggest the early development of blockage. This inflammatory biomarker, phospholipase associated appoprotein 2, (PLA-2) is an enzyme that is released by the heart’s blood vessels in response to blockage formation. This process is similar to the inflammation that occurs after getting a splinter (figure 3). The results of the study so far have been absolutely staggering. Of the officers screened to date, 54% have detectable coronary disease.

Save lives, save money

By detecting coronary disease in its earliest stages and before it causes symptoms, it is possible to not only save officer lives, but to keep officers on the street and reduce their agency expenses. Due to the high costs of health care, it is estimated that aggressive screening for heart disease can save approximately $5000 per officer per year when extrapolated across a large department. Also, considering that after coronary artery bypass surgery, a heart attack or a stent placement/angioplasty there are significant amounts of time that officer will be off the job, requiring increased overtime for the remainder of the officers. This cost is ultimately passed along to the tax payers.

The responsibility for officer wellness and screening lies within the training academy, the agency and the individual officer or agent. Initially, the training academy must set the tone and establish the concept that wellness is an important component of law enforcement. Just as graduates currently understand that they
will be required to maintain proficiency with their weapons, they should also have the expectations that they will be required to maintain physical fitness and weight standards. Individual agencies must also develop a degree of accountability within its ranks, using either the “stick or carrot” approach or any combination of thereof. Agency fitness standards cannot be created in a vacuum, but instead, need to be developed with collaboration between command staff, departmental physicians, union representatives, fitness professionals and training directors. Finally, it is ultimately the responsibility of the individual officer or special agent to understand their increased risk for coronary disease and seek out possible screening and wellness programs, even if they are not offered by their specific agency.

It is quite clear that obesity, diabetes and coronary disease are major factors that contribute to premature police officer death and disability. It is absolutely vital that law enforcement agencies recognize this risk and develop wellness and screening programs to keep their officers healthy, effective and safe.

--------------

Dr. Jon Sheinberg is Board Certified Cardiologist practicing in Austin Texas. He is a sworn officer with the City of Cedar Park Police Department and serves as the medical director of the Central Texas Regional SWAT Team. He may be reached at: Jonathan.sheinberg@cedarparktexas.gov

(512) 626-0512
Citations


<table>
<thead>
<tr>
<th></th>
<th>Law Enforcement</th>
<th>Civilian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age of patient with heart</td>
<td>49 years</td>
<td>65 years</td>
</tr>
<tr>
<td>attack</td>
<td></td>
<td></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>


Figure 1. The comparison between police officer and civilian age for heart attack and life expectancy.
Figure 2. Dietary fat results in large “fluffy” LDL particles, while the consumption of carbohydrates results in the development of small dense LDL particles. In the example above, both individuals have an LDL of 100mg/dl but it is the person with more small dense cholesterol particles who is at risk for heart disease.
Figure 3. In response to the development of plaque or early blockage in the arteries of the heart, the arteries are irritated and in response to the plaque release the inflammatory marker PLA-2.

Lp-PLA$_2$

(Lipoprotein-Associated Phospholipase A2)
Figure 4. Increased consumption of sugar results in increase insulin levels. The elevated insulin levels block the hormone leptin and results in obesity and its complications such as diabetes and heart disease.