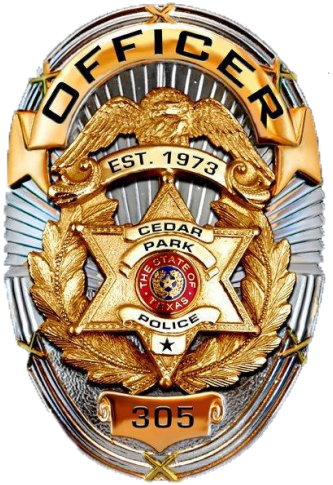

Public Safety Wellness

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

UNITED STATES MARSHAL

LONE STAR UNITED STATES MARSHAL FUGITIVE TASK FORCE
W/TX
1845

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

Resource Center

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.)

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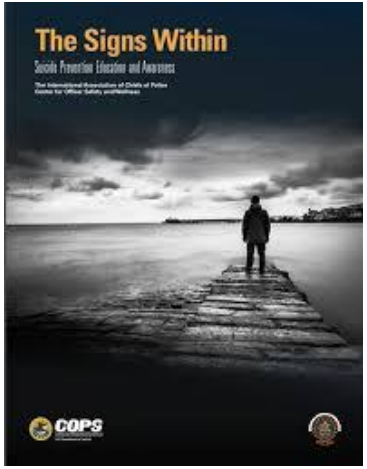
BJA

Bureau of Justice Assistance
U.S. Department of Justice

VALOR

Preventing Violence Against Law Enforcement
and Ensuring Officer Resilience and Survivability

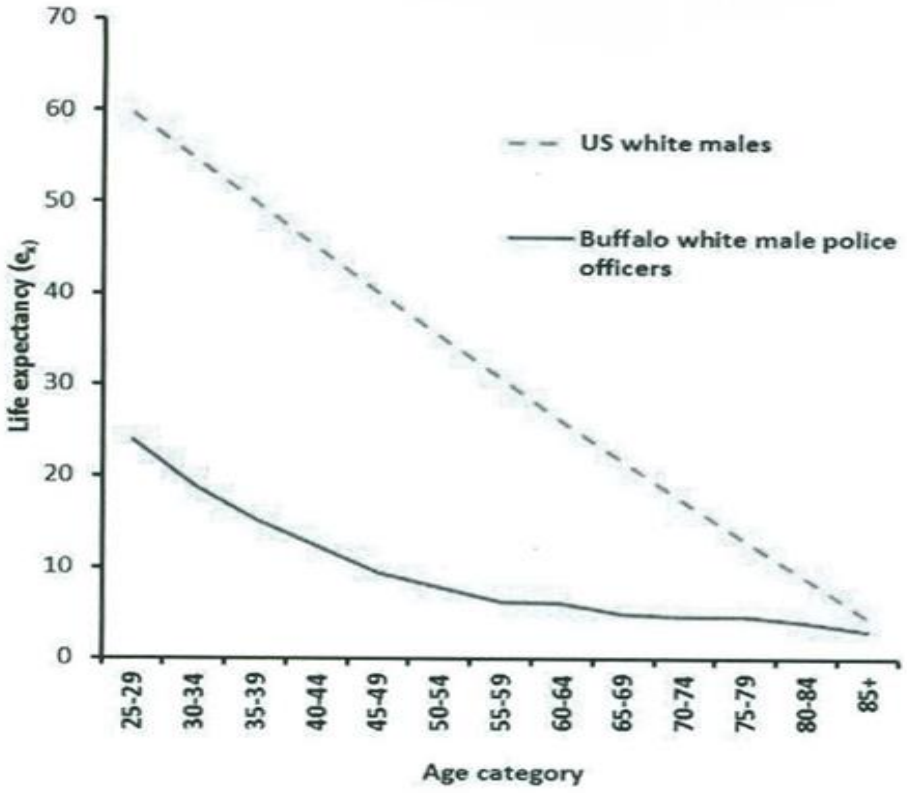
BUREAU OF JUSTICE ASSISTANCE



NOSI

NATIONAL OFFICER SAFETY INITIATIVES

Officer Life Expectancy



Int J Emerg Ment Health. 2013;15(4):217-28.

21.9

21.9

Police officers live 21.9 years less than our civilian counterparts

Average Life Expectancy	57 years
Average Age At Retirement	

Average Life Expectancy	57 years
Average Age At Retirement	57.1 years

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%

Int J Emerg Ment Health. 2013;15(4):217 28.

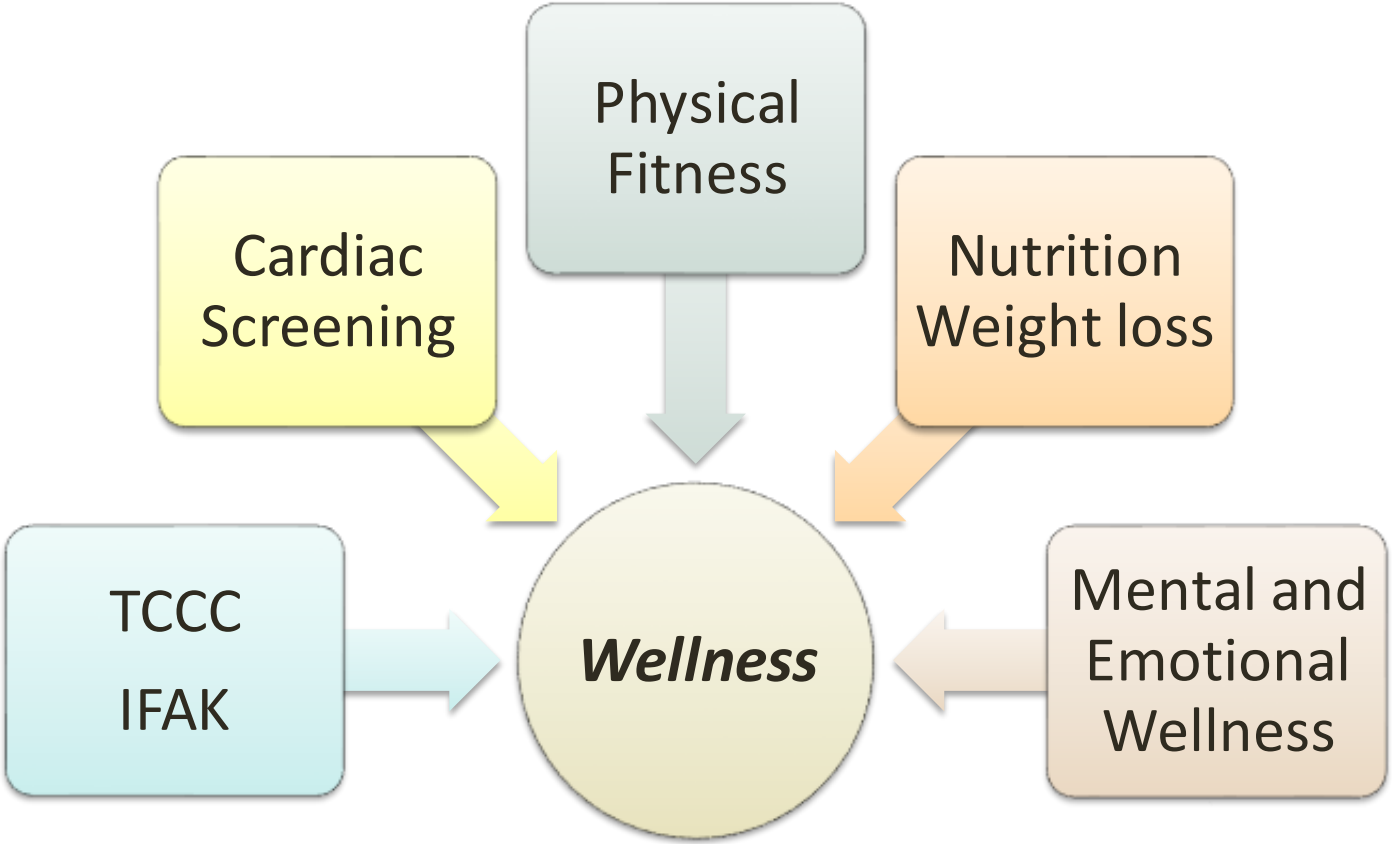
1.5% vs 56%

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

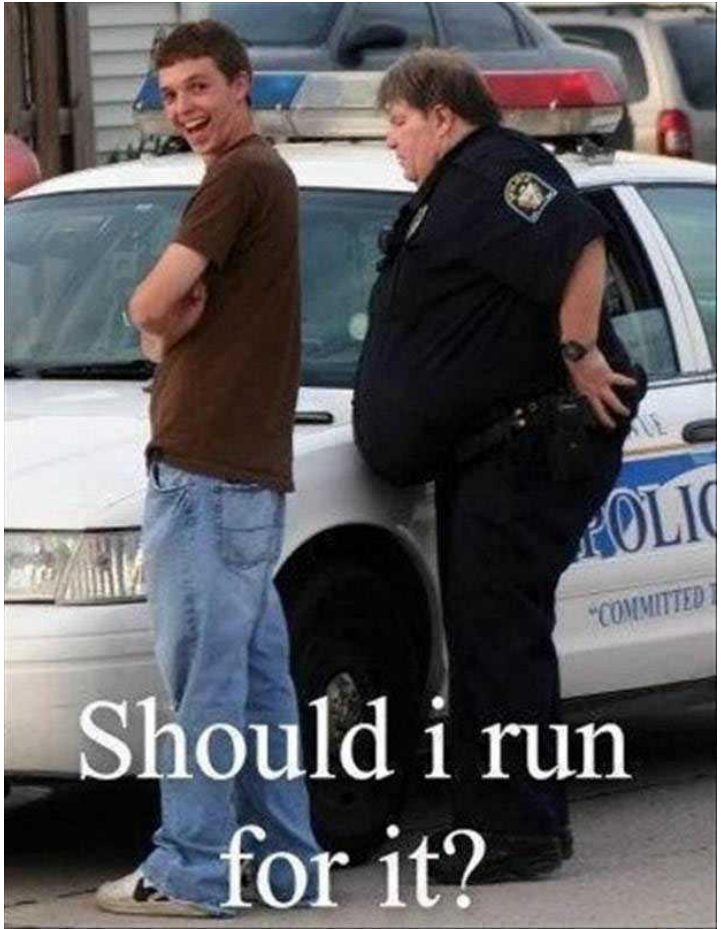


Trauma

Heart Disease

	Law Enforcement	Civilian
Average age of patient with heart attack	49 years	65 years
Heart attacks under age 45	29-45%	7%
Average Life Expectancy	57 years	79 years

Fitness



Obesity

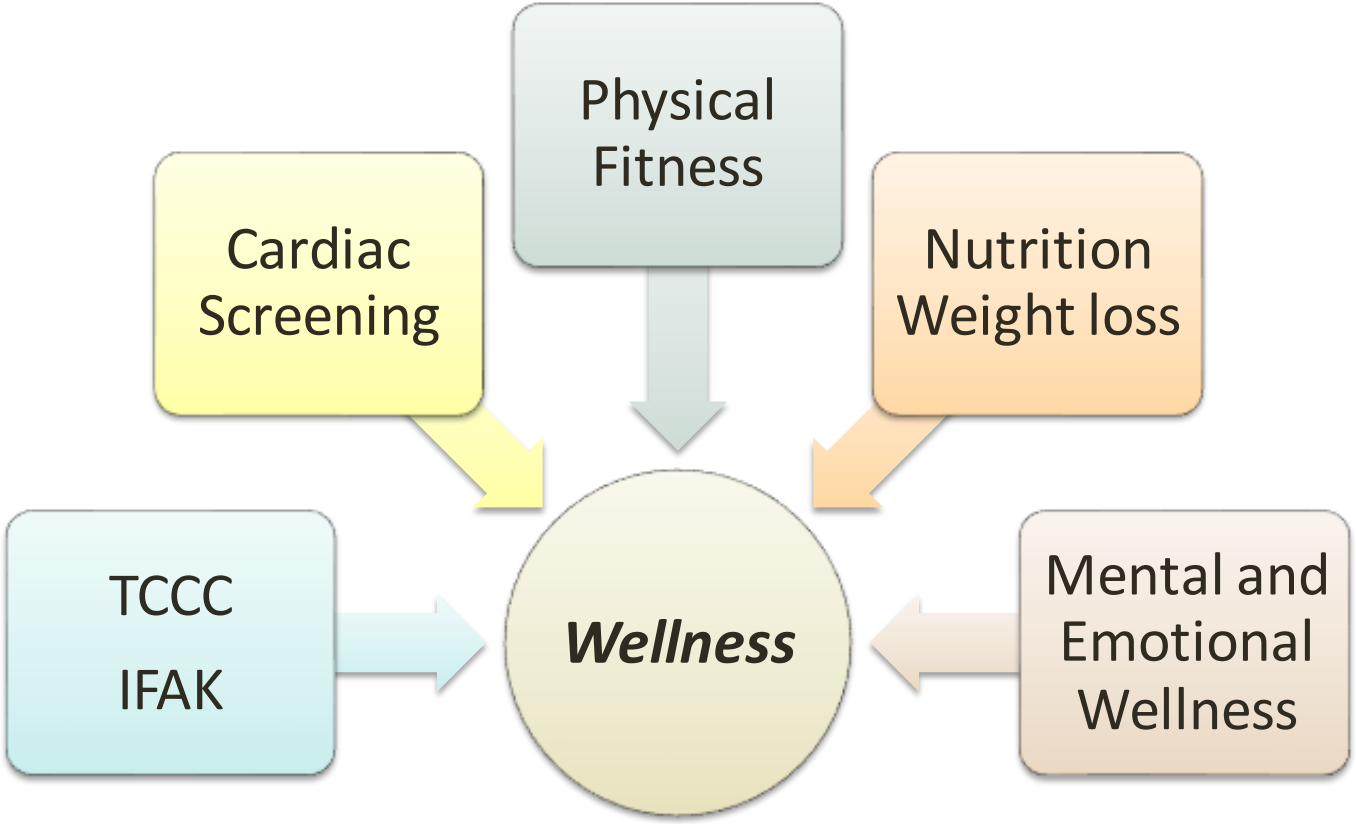
80% of LEO's are overweight

40% of LEO's are Obese

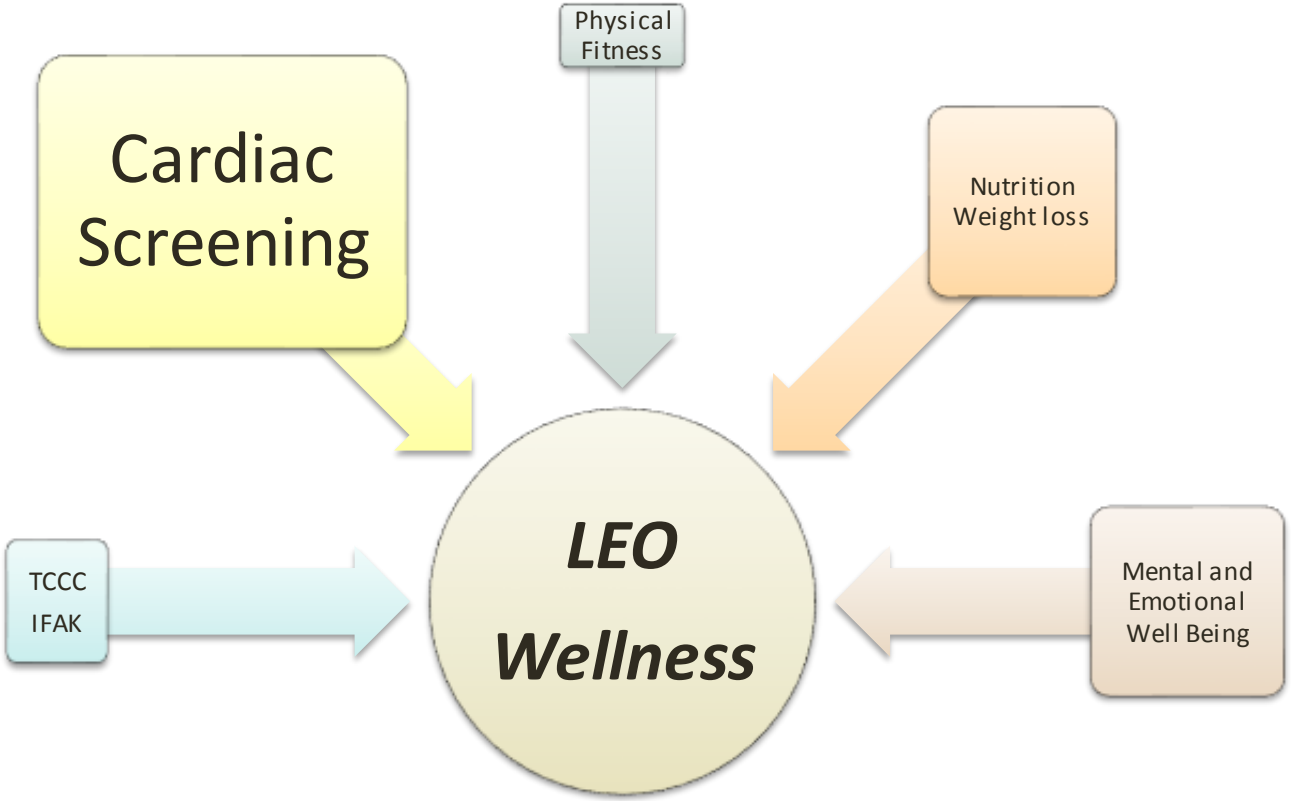
The Police Executive Leadership Program Class Exercise and Nutrition Questionnaire, administered by Daniel E. Shell, Division of Public Safety Leader- ship, Johns Hopkins University (Balti- more, MD, October 2003).

Mental Health (Emotional Intelligence)

The Cedar Park PD Model



The Cedar Park PD Model



Heart Disease

	Law Enforcement	Civilian
Average age of patient with heart attack	49 years	65 years
Heart attacks under age 45	45%	7%
Average Life Expectancy	57 years	79 years

POLICE
THE LAW ENFORCEMENT MAGAZINE
COMMUNITY FOR COPS

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.

Police Magazine, 1993

Officer Down Memorial Page

REMEMBERING ALL OF LAW ENFORCEMENT'S HEROES

2016

Total Line of Duty Deaths: 161

9/11 related illness	11
Aircraft accident	1
Animal related	1
Assault	3
Automobile crash	21
Drowned	2
Duty related illness	1
Fall	1
Gunfire	64
Gunfire (Accidental)	3
Heart attack	15
Motorcycle crash	8
Stabbed	1
Struck by train	1
Struck by vehicle	10
Training accident	1
Vehicle pursuit	4
Vehicular assault	13

2017

Total Line of Duty Deaths: 136

9/11 related illness	7
Aircraft accident	2
Animal related	1
Assault	6
Automobile crash	28
Boating accident	2
Drowned	5
Duty related illness	3
Exposure to toxins	1
Gunfire	45
Heart attack	15
Motorcycle crash	4
Stabbed	1
Struck by vehicle	4
Unidentified	1
Vehicle pursuit	5
Vehicular assault	6

OFFICER DOWN MEMORIAL PAGE

REMEMBERING ALL OF LAW ENFORCEMENT'S HEROES

Extrapolated over a 24 hour day

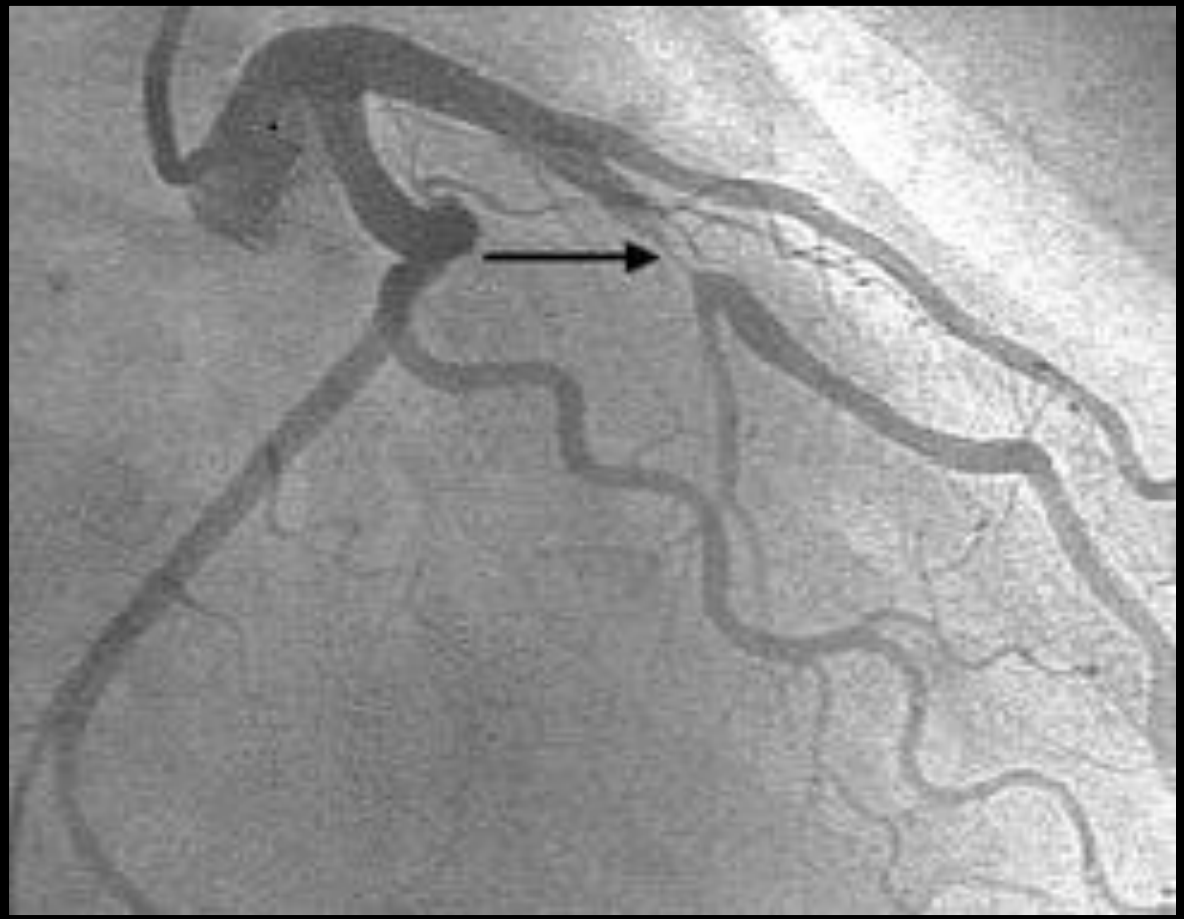
30-45

** only 3-4% of heart attacks are fatal **

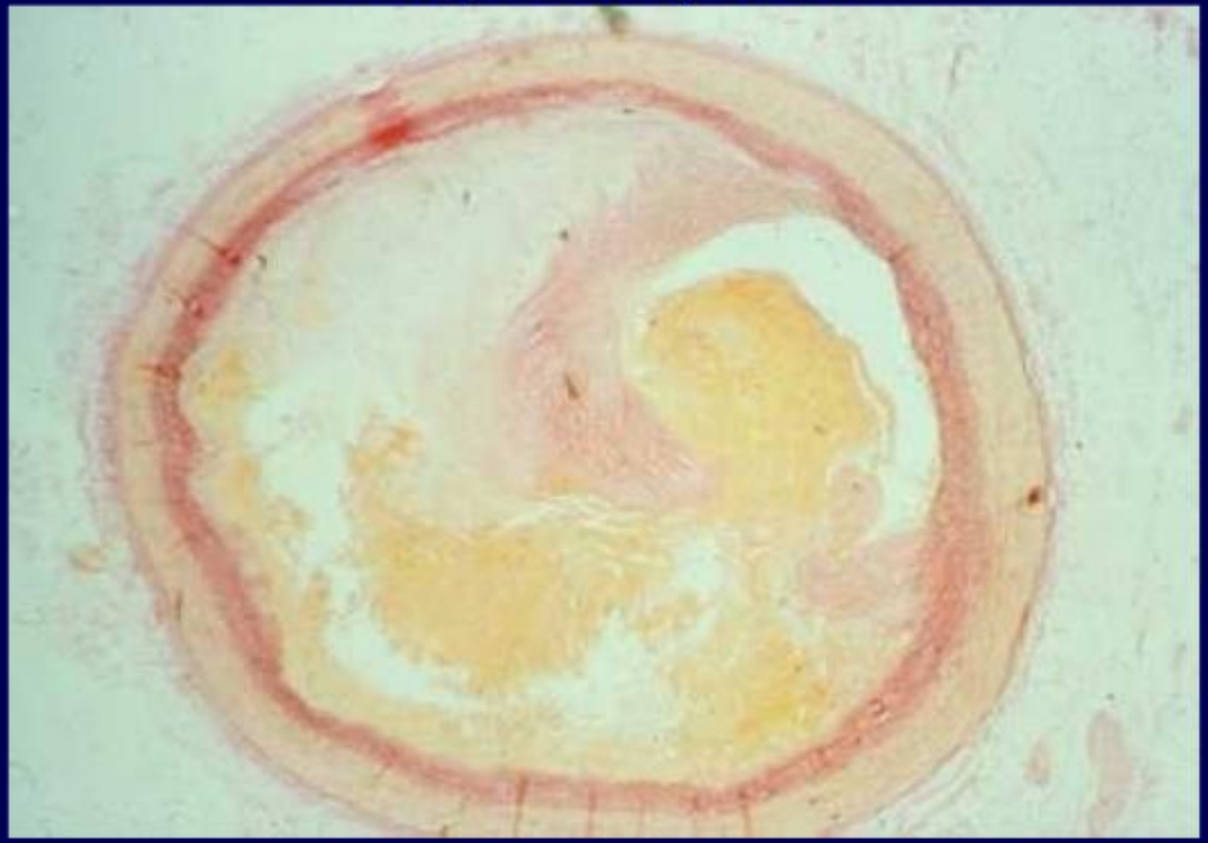
1000’s heart attacks per year

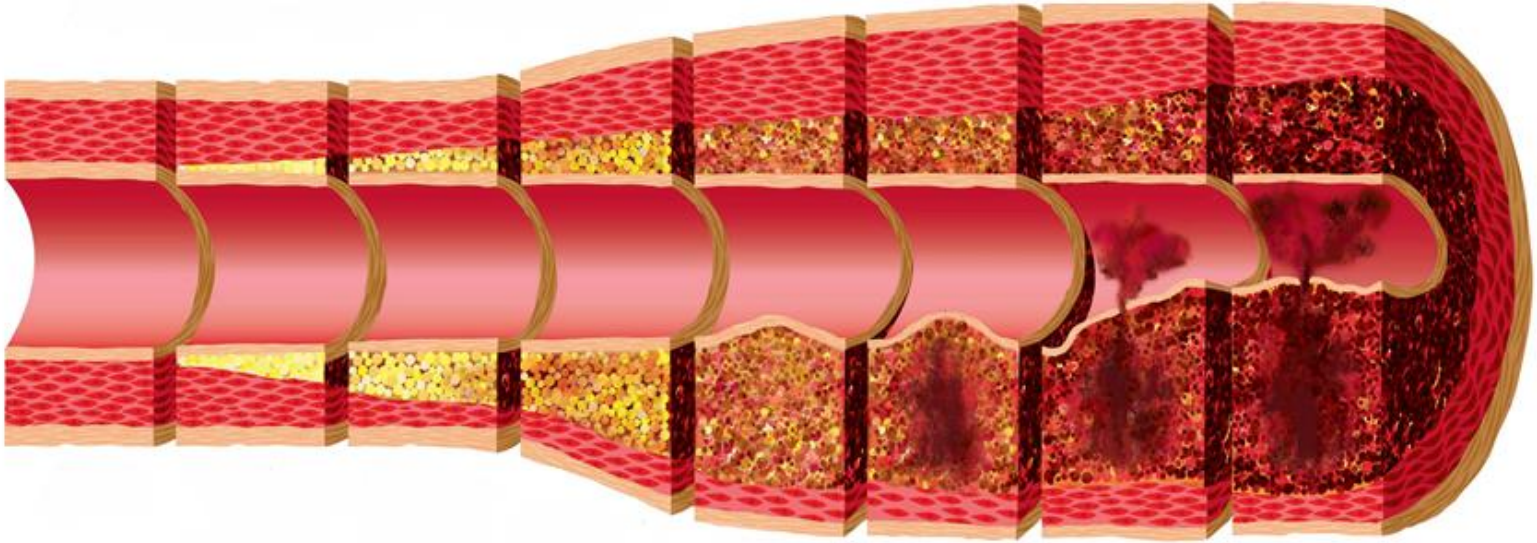
Texas Senate Bill 1582

Effective September 1st, 2019
Peace Officer "Presumptive Status"



Plaque rupture





Traditional Framingham Risk

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

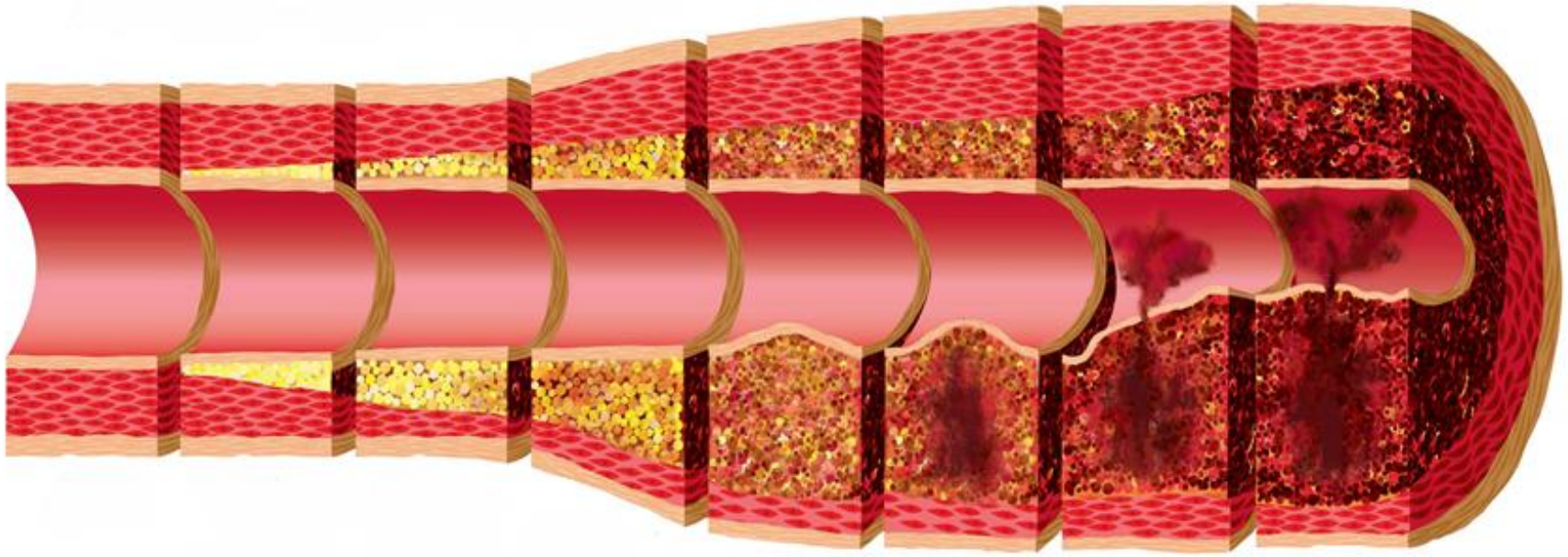
The Framingham Heart Study asks for the following data to estimate 10-year risk for "hard" coronary heart disease outcomes (myocardial infarction and coronary death) in adults aged 20 and older who do not have heart disease or diabetes.

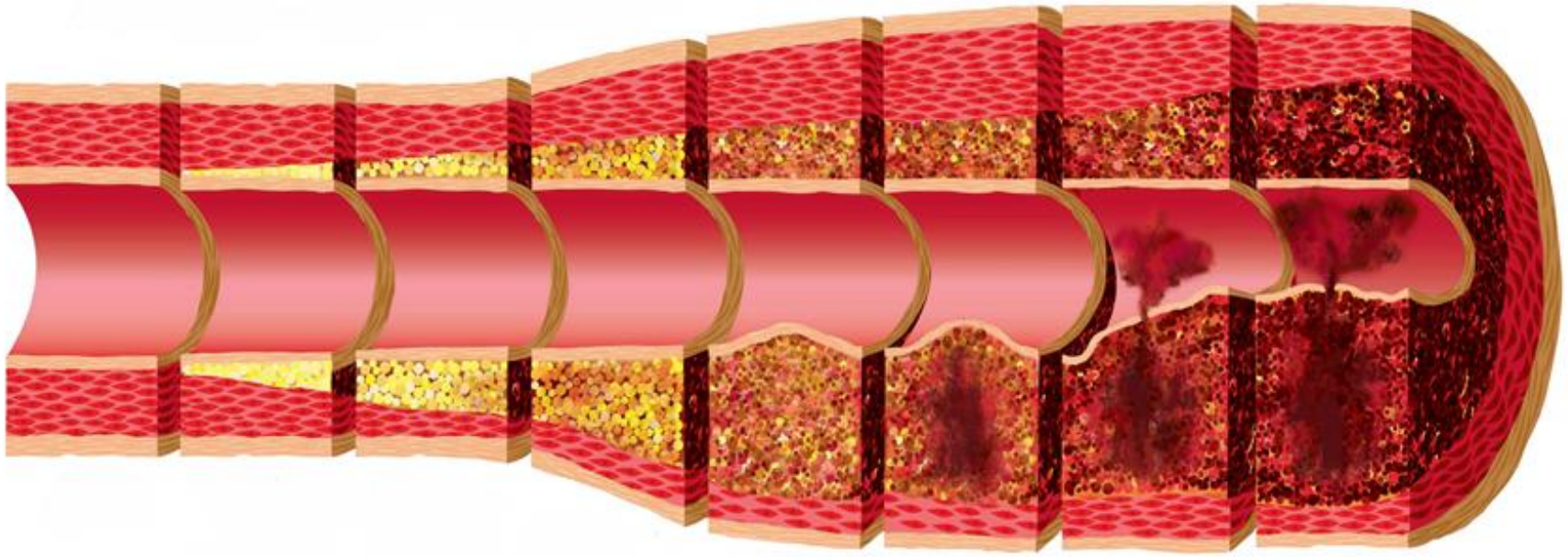
Age:	☐ years
Gender:	☐ Female ☐ Male
Total Cholesterol:	☐ mg/dL
HDL Cholesterol:	☐ mg/dL
Smoker:	☐ No ☐ Yes
Systolic Blood Pressure:	☐ mm Hg
Currently on any medication to treat high blood pressure	☐ No ☐ Yes

Calculate 10-Year Risk

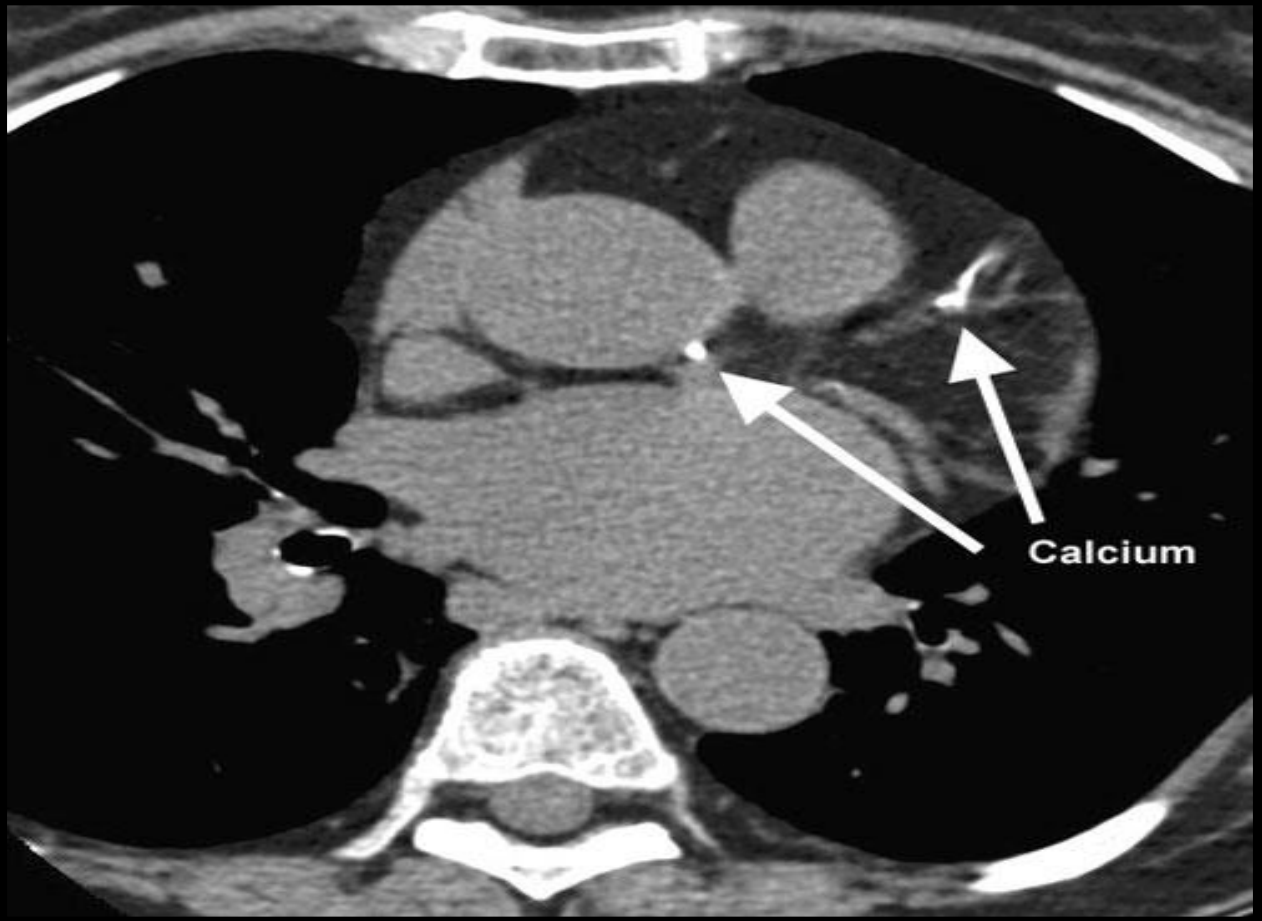
Medscape

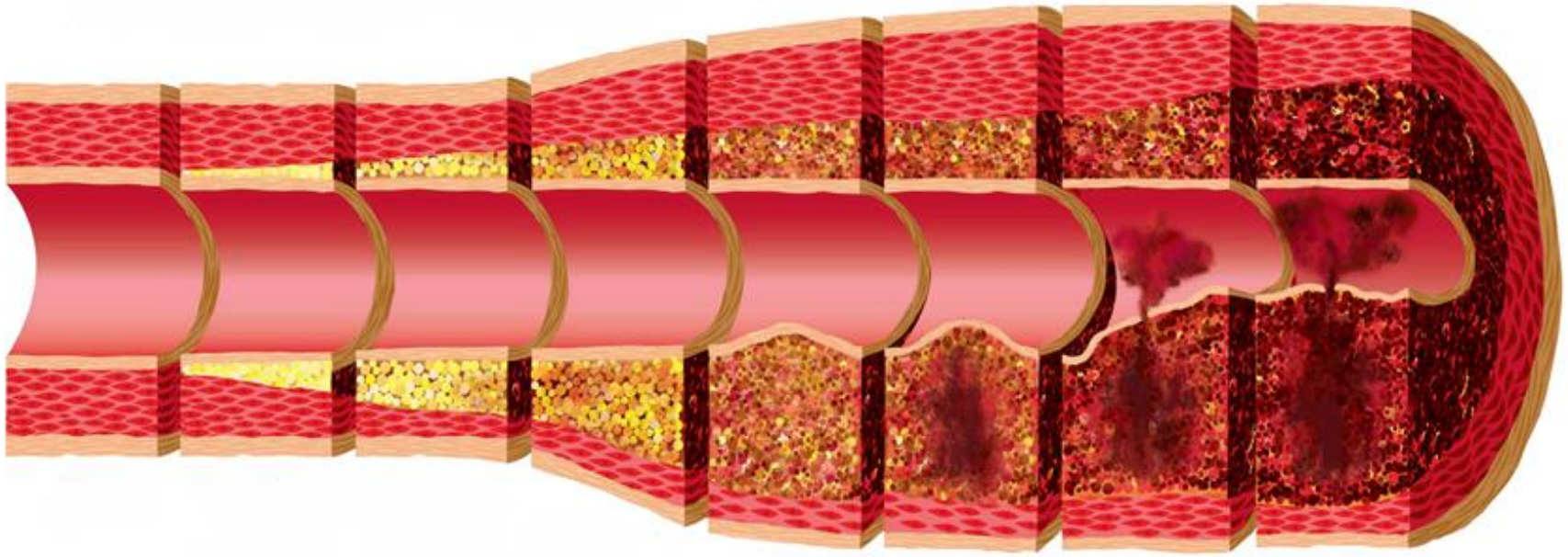
High Risk for heart disease






PHILIPS


Calcium



Circulation 2007;116:II - 853

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**

Circulation 2007;116:II - 853

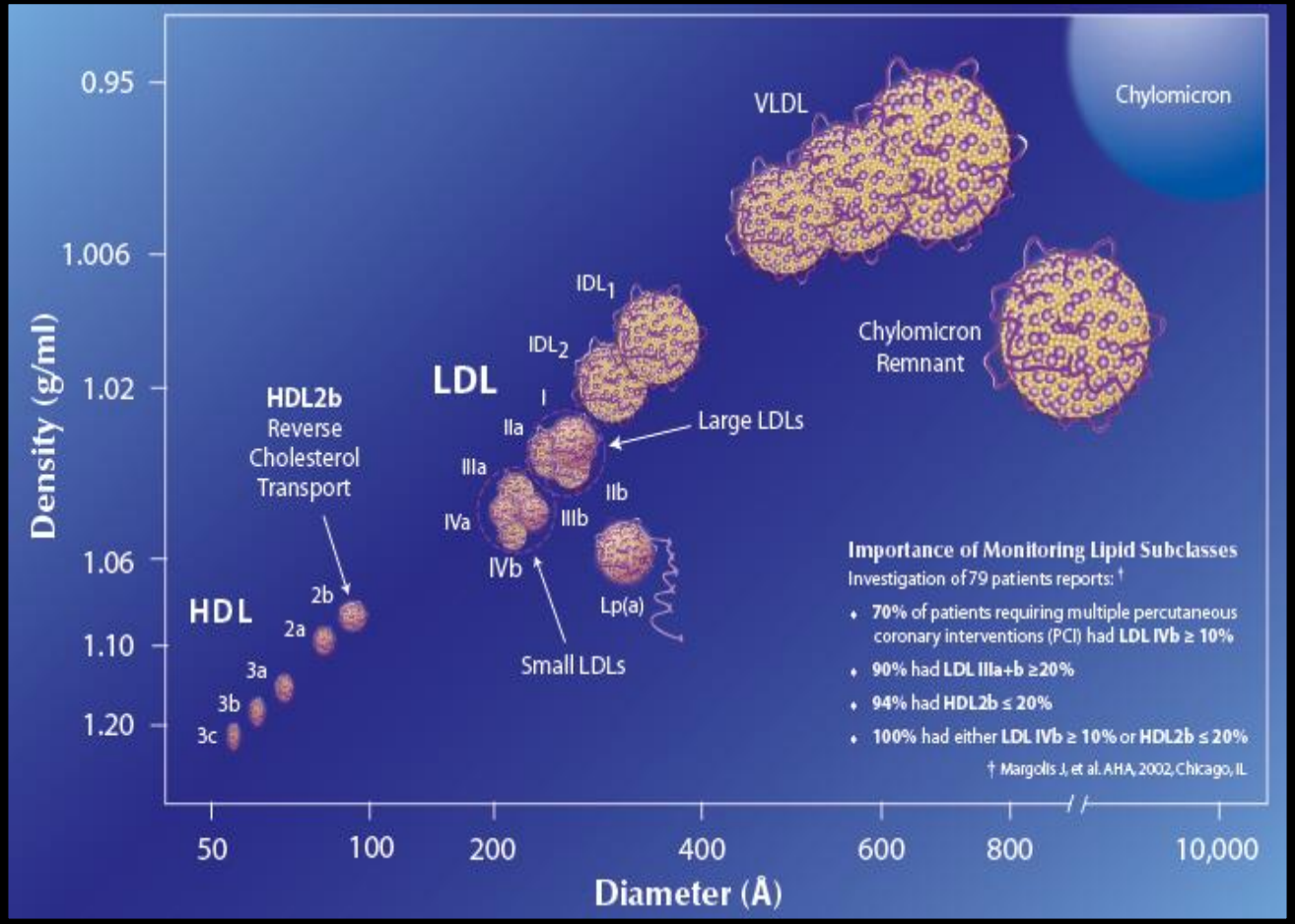
- There was NOT an increased prevalence of CAD among members of the NYPD compared to the general population

Cardiac Screening Initiative©

BaylorScott&White
HEALTH

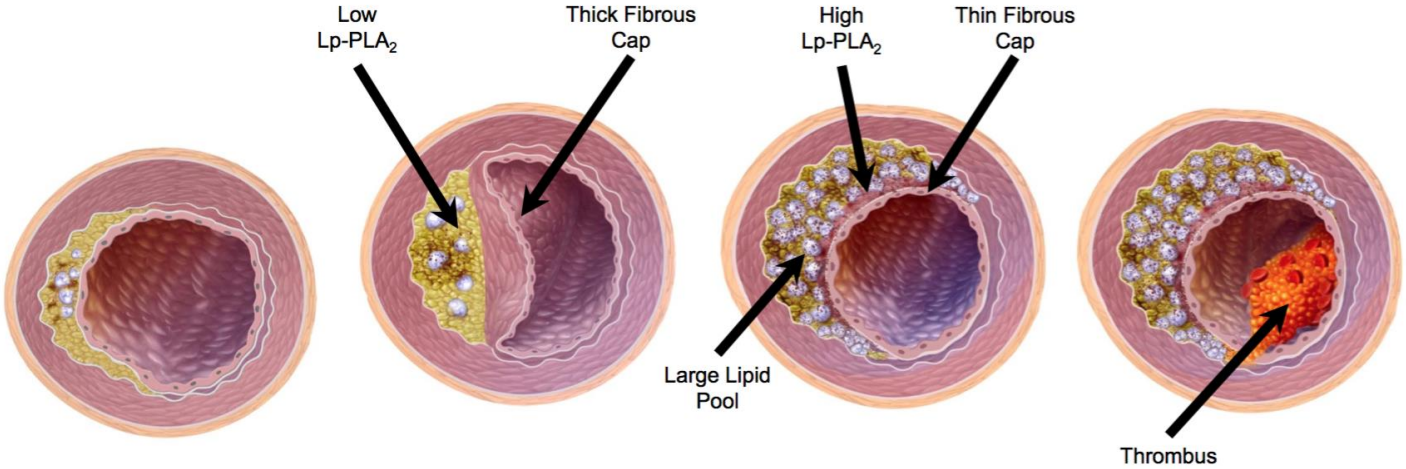
PUBLIC SAFETY
CARDIAC FOUNDATION
PREVENT·DETECT·SAVE
EST. 2015

www.PublicSafetyHeart.org


Density (g/ml)
0.95
1.006
1.02
1.06
1.10
1.20
Diameter (Å)
50
100
200
400
600
800
10,000
Chylomicron
VLDL
Chylomicron Remnant
IDL1
IDL2
LDL
I
IIa
IIIa
IVa
IVb
IIb
IIIb
Large LDLs
Small LDLs
Lp(a)
HDL2b
Reverse Cholesterol Transport
HDL
2b
2a
3a
3b
3c
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-PLA$_2$)

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

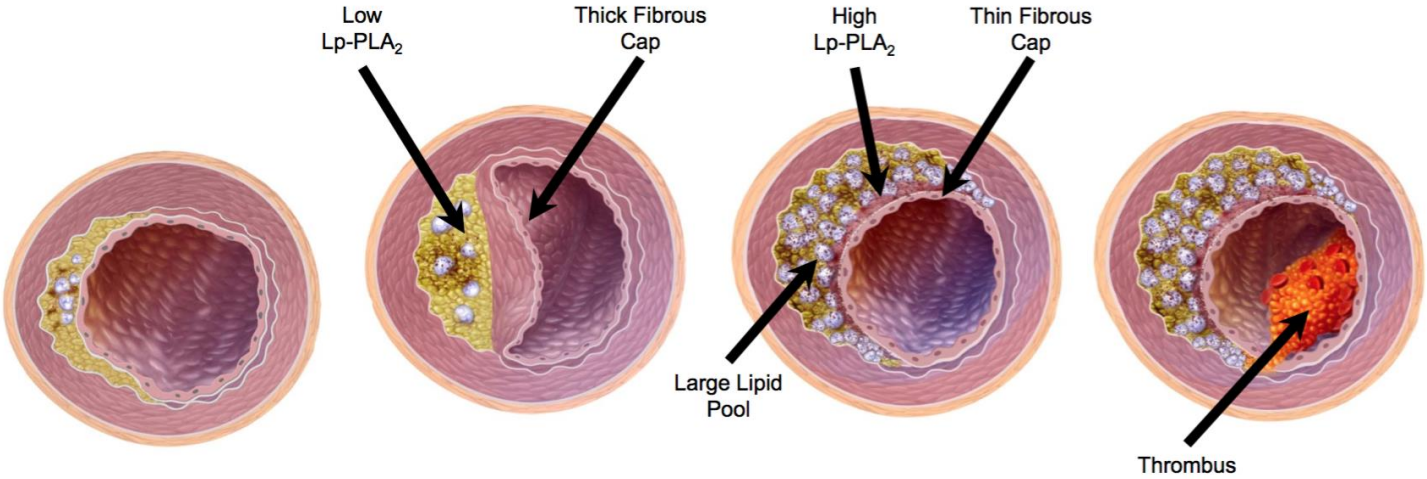
Calcium Score

Age				LEO	Civilian	Total	p
1 24-36		0	Count	64	19	83	0.599
			%	91.4%	95.0%	92.2%	
		>0	Count	6	1	7	
			%	8.6%	5.0%	7.8%	
	Total		Count	70	20	90	
			%	100.0%	100.0%	100.0%	
2 37-41		0	Count	91	33	124	0.705
			%	85.0%	82.5%	84.4%	
		>0	Count	16	7	23	
			%	15.0%	17.5%	15.6%	
	Total		Count	107	40	147	
			%	100.0%	100.0%	100.0%	
3 42-44		0	Count	55	38	93	0.789
			%	72.4%	74.5%	73.2%	
		>0	Count	21	13	34	
			%	27.6%	25.5%	26.8%	
	Total		Count	76	51	127	
			%	100.0%	100.0%	100.0%	
4 45-49		0	Count	86	64	150	0.298
			%	76.8%	70.3%	73.9%	
		>0	Count	26	27	53	
			%	23.2%	29.7%	26.1%	
	Total		Count	112	91	203	
			%	100.0%	100.0%	100.0%	
5 50-67		0	Count	52	125	177	0.467
			%	54.2%	49.8%	51.0%	
		>0	Count	44	126	170	
			%	45.8%	50.2%	49.0%	
	Total		Count	96	251	347	
			%	100.0%	100.0%	100.0%	
Total		0	Count	348	279	627	<0.001
			%	75.5%	61.6%	68.6%	
		>0	Count	113	174	287	
			%	24.5%	38.4%	31.4%	
	Total		Count	461	453	914	
			%	100.0%	100.0%	100.0%	

Cardiac Screening Initiative©

Lp-PLA$_2$ Changes Everything

Lp-PLA$_2$ is Associated with Development of Rupture Prone Plaque

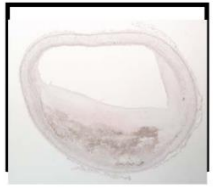


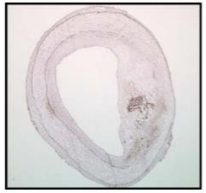
Early Plaque
with Lipid Pool

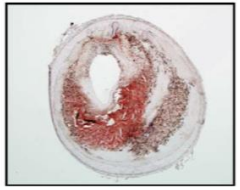
Thick Cap with Small
Necrotic Lipid Core
"Stable Plaque"

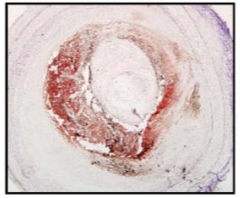
Thin Cap
"Rupture-Prone" Plaque

Ruptured Plaque
with Thrombus
in Lumen





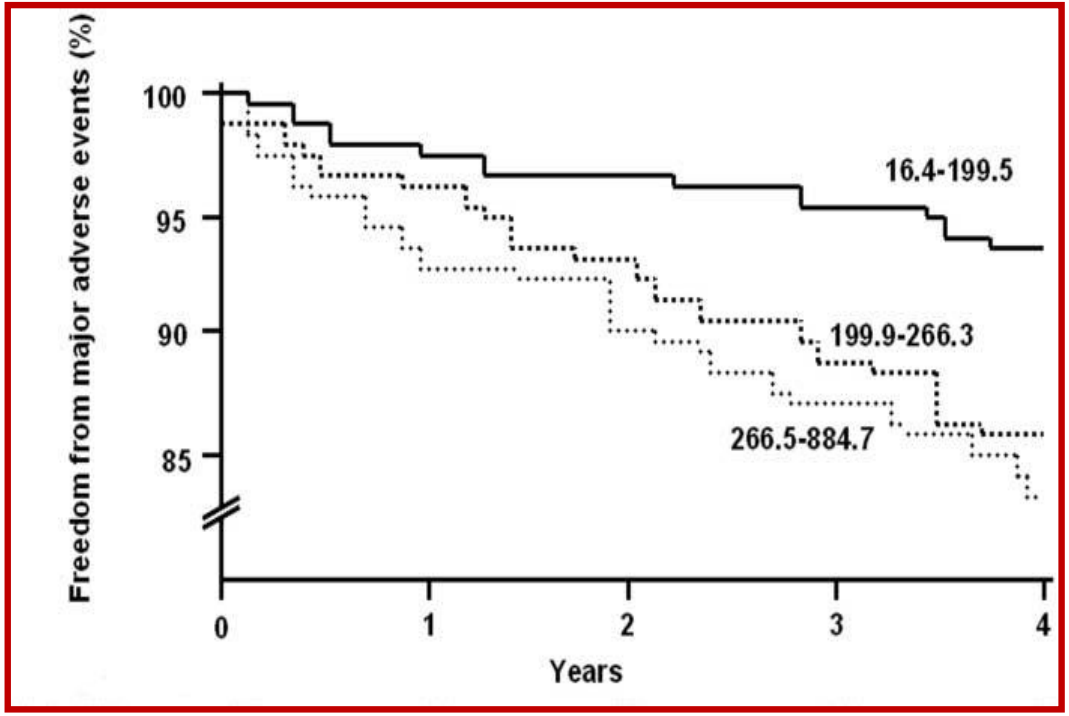




Reddish-brown staining indicates presence of Lp-PLA$_2$ in human coronary atherosclerosis

Lp-PLA$_2$ Predicts Major CV Events in CHD Patients: Mayo Heart Study

95% of patients with Lp-PLA$_2$ < 200 ng/ml were Event Free at 4 years



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

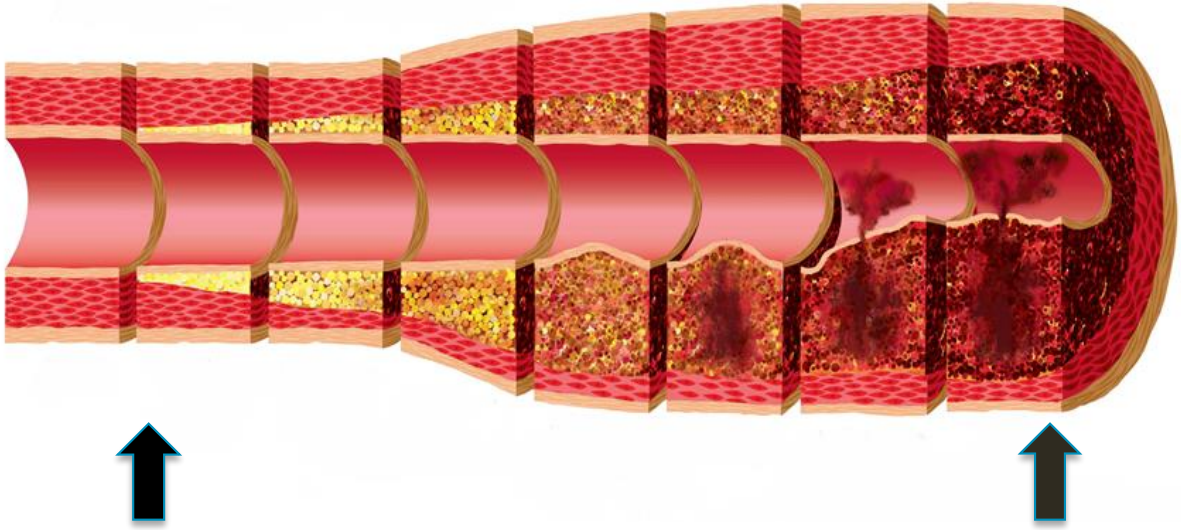
		24-36				37-41				42-44				45-49				50-67			
		N	Mean	SD		N	Mean	SD		N	Mean	SD		N	Mean	SD		N	Mean	SD	
Coronary Calcium Score	1 LEO	70	1.3	9.6		107	7.2	27.4		76	16.4	43.9		112	11.3	45.0		96	38.4	103.3	*
	2 Civilian	20	0.03	0.1		40	11.3	32.4		51	6.0	22.2		91	45.8	172.2		251	90.9	349.7	
Total Cholesterol, mg/dL	1 LEO	105	196.5	35.5		120	200.3	39.5		91	196.4	33.0		123	195.9	38.8		115	193.8	37.4	
	2 Civilian	158	193.9	46.2		159	193.6	38.8		165	195.8	40.6		260	200.9	52.2		914	191.1	47.2	
HDL Cholesterol, mg/dL	1 LEO	104	50.4	14.5		120	49.1	13.7	**	91	50.6	15.5		123	53.2	14.7		115	49.4	12.1	***
	2 Civilian	158	52.6	15.2		159	55.7	18.3		165	54.9	17.5		260	55.3	17.8		912	59.2	20.5	
LDL Cholesterol, mg/dL	1 LEO	104	128.0	32.2		120	130.1	34.9	*	91	126.8	30.8		123	124.9	34.2		115	123.9	32.9	**
	2 Civilian	158	123.2	40.2		159	119.9	34.7		165	121.8	38.7		259	123.7	39.6		912	113.9	40.3	
LpPLA2, ng/mL	1 LEO	97	195.2	40.7	**	109	191.8	53.7		88	185.2	43.3		119	184.7	41.9		110	187.8	43.1	
	2 Civilian	156	180.2	37.5		158	193.7	48.7		165	187.5	44.9		260	184.3	49.3		907	185.8	47.5	
Glucose, mg/dL	1 LEO	104	92.4	7.4		119	92.7	10.9		90	98.7	30.8		123	93.3	8.6	**	112	99.3	20.6	
	2 Civilian	146	93.1	22.6		145	94.0	28.4		150	94.0	11.1		229	97.1	15.4		813	101.7	25.2	
Insulin, uU/mL	1 LEO	105	9.8	8.3	*	120	12.2	16.9		91	9.9	7.7		123	11.6	11.7		114	11.9	10.5	
	2 Civilian	158	12.3	10.7		159	9.7	6.7		165	10.6	8.0		258	10.7	8.0		910	11.9	15.7	
BMI = rnd(wtkg/(htm**2))	1 LEO	59	28.1	4.6		63	28.7	4.9		57	28.7	5.2		62	28.5	4.6		69	29.3	5.3	
	2 Civilian	122	27.9	6.5		96	27.6	5.0		126	28.4	5.5		186	28.8	5.0		706	28.0	5.5	

Cardiac Screening Initiative©

Lp-PLA$_2$ Changes Everything

There is a statistical increase in this marker in cops as *early as 24 years old*

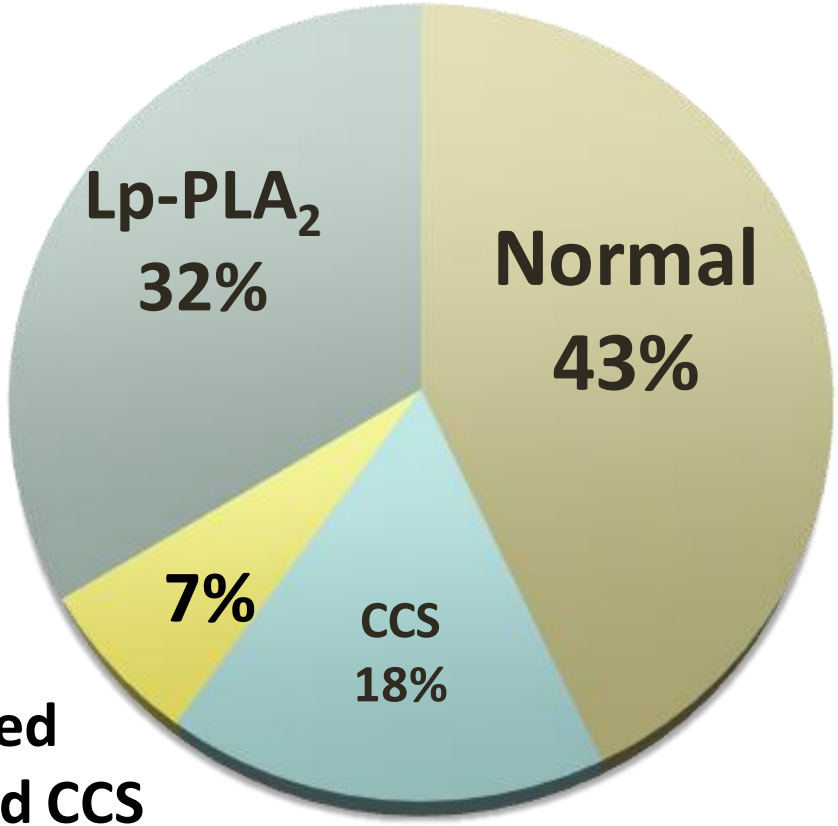
“Pre-clinical CAD”



Coronary Disease

>50% of police officers

n=914



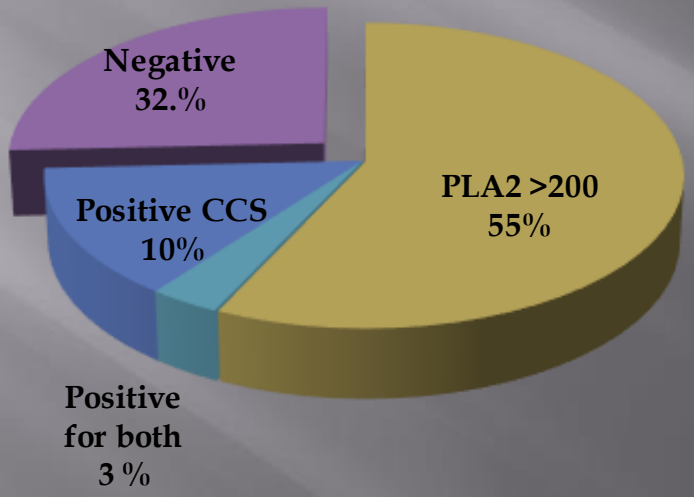
Combined PLA$_2$, and CCS

Evidence of Preclinical CAD

PLA_2 AND CARDIAC CALCIUM SCORES

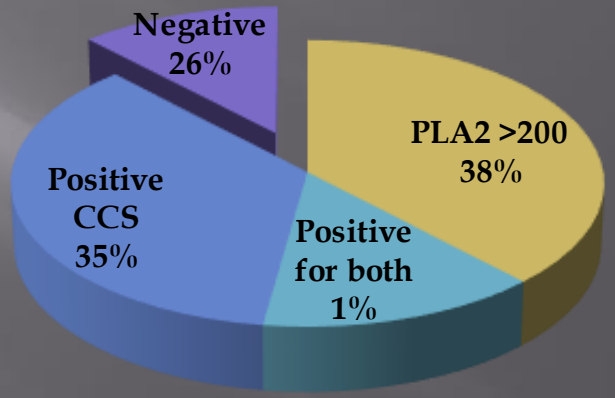
N=292

Police Department



68%

Fire Department

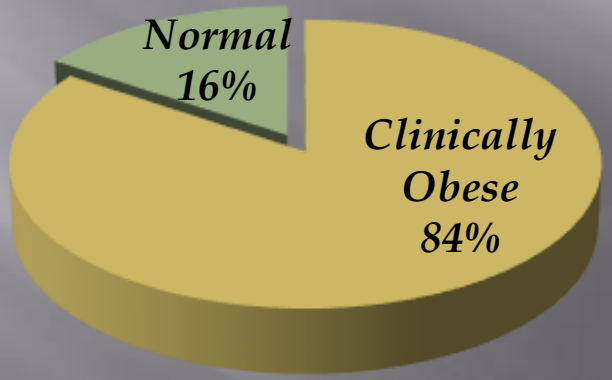


74%

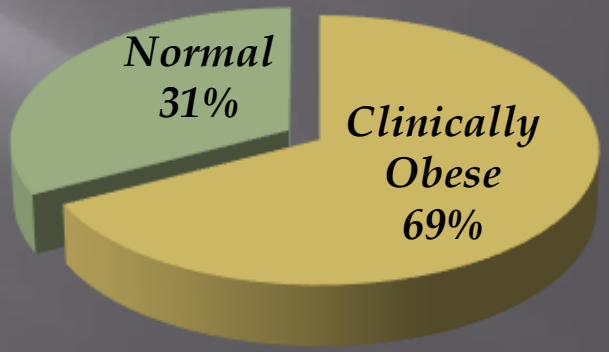
Evidence of Obesity-Body Fat %

>25% FOR MALES OR >32% FOR FEMALES

Police Department



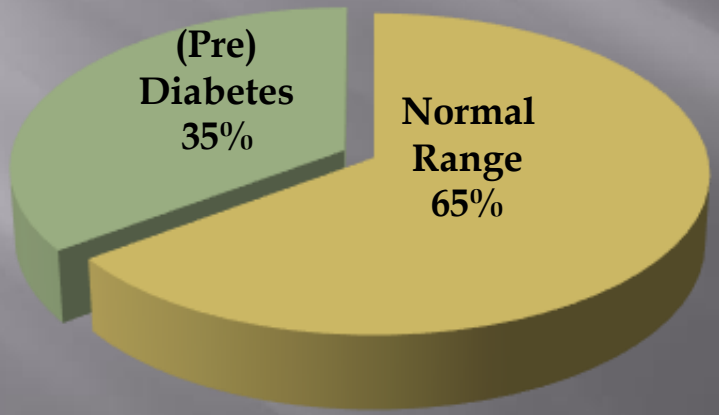
Fire Department



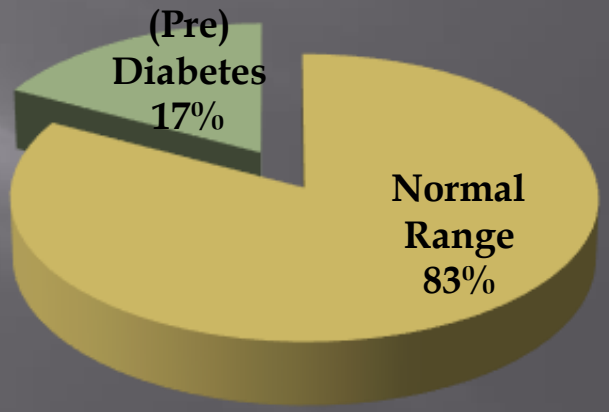
Markers of Prediabetes

INSULIN LEVELS

Police Department

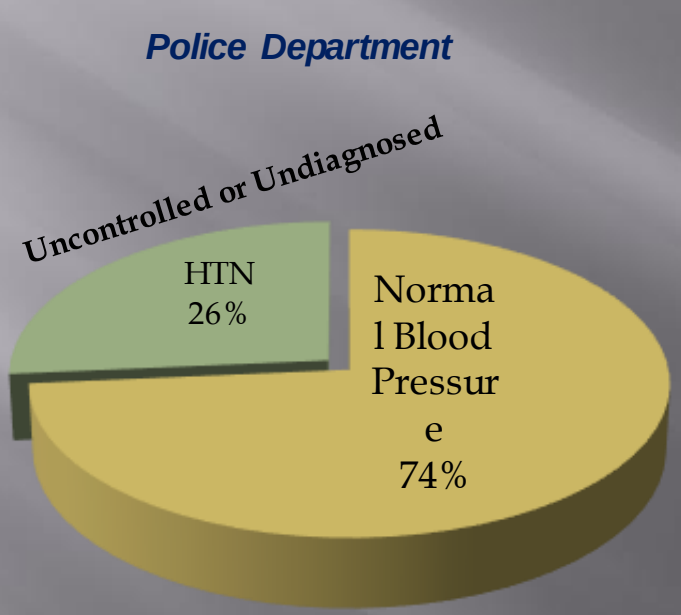


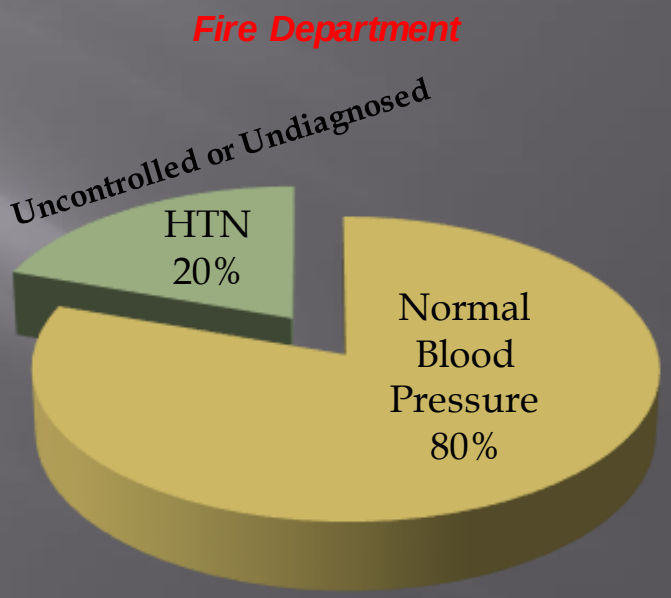
Fire Department



Evidence of Hypertension

UNDIAGNOSED OR POORLY CONTROLLED BLOOD PRESSURE



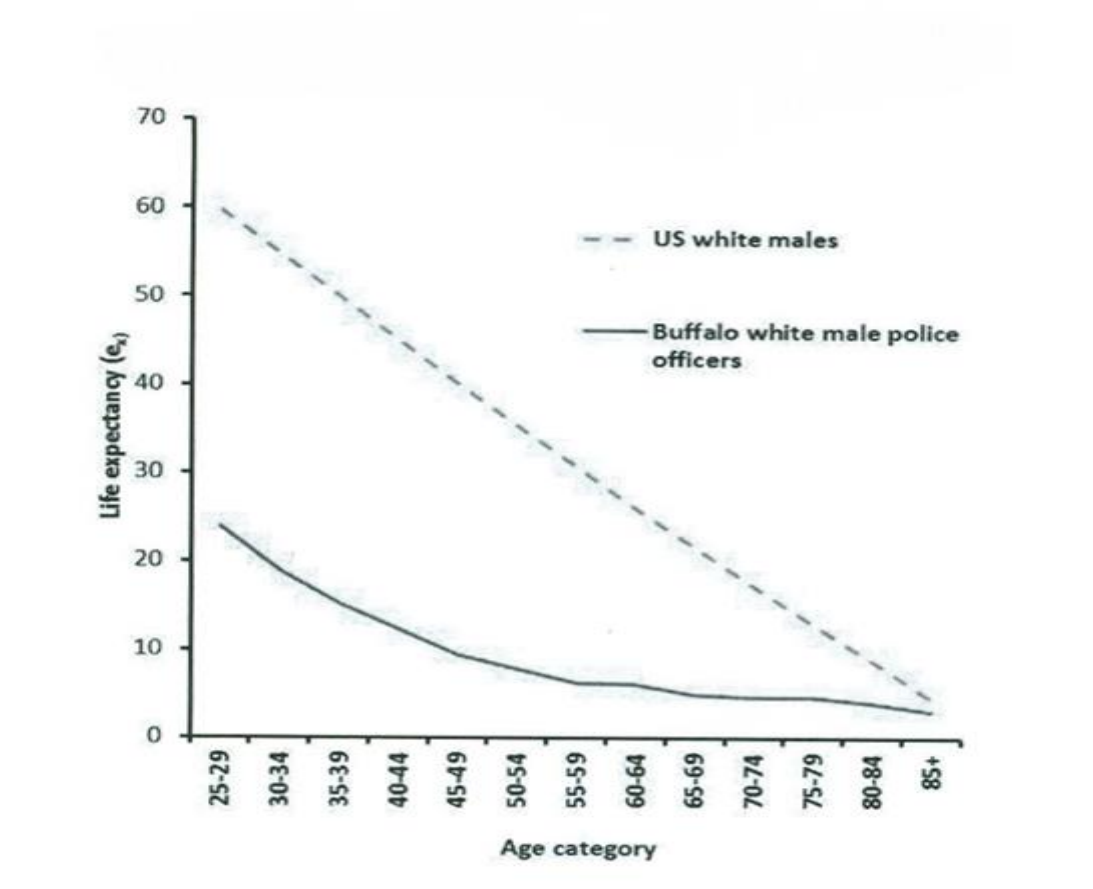


Summary

N=292

Coronary disease (80)	70%
(Pre) Diabetes (29)	25%
Clinically Obese (86)	76%
High Blood Pressure (25)	22%

Officer Life Expectancy



Int J Emerg Ment Health. 2013;15(4):217-28.

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


BaylorScott&White
THE HEART HOSPITAL
EMERGENCY


POLICE OFFICER
PLANO POLICE
POLICE
PLANO TEXAS
PLANO POLICE DEPARTMENT

Denton

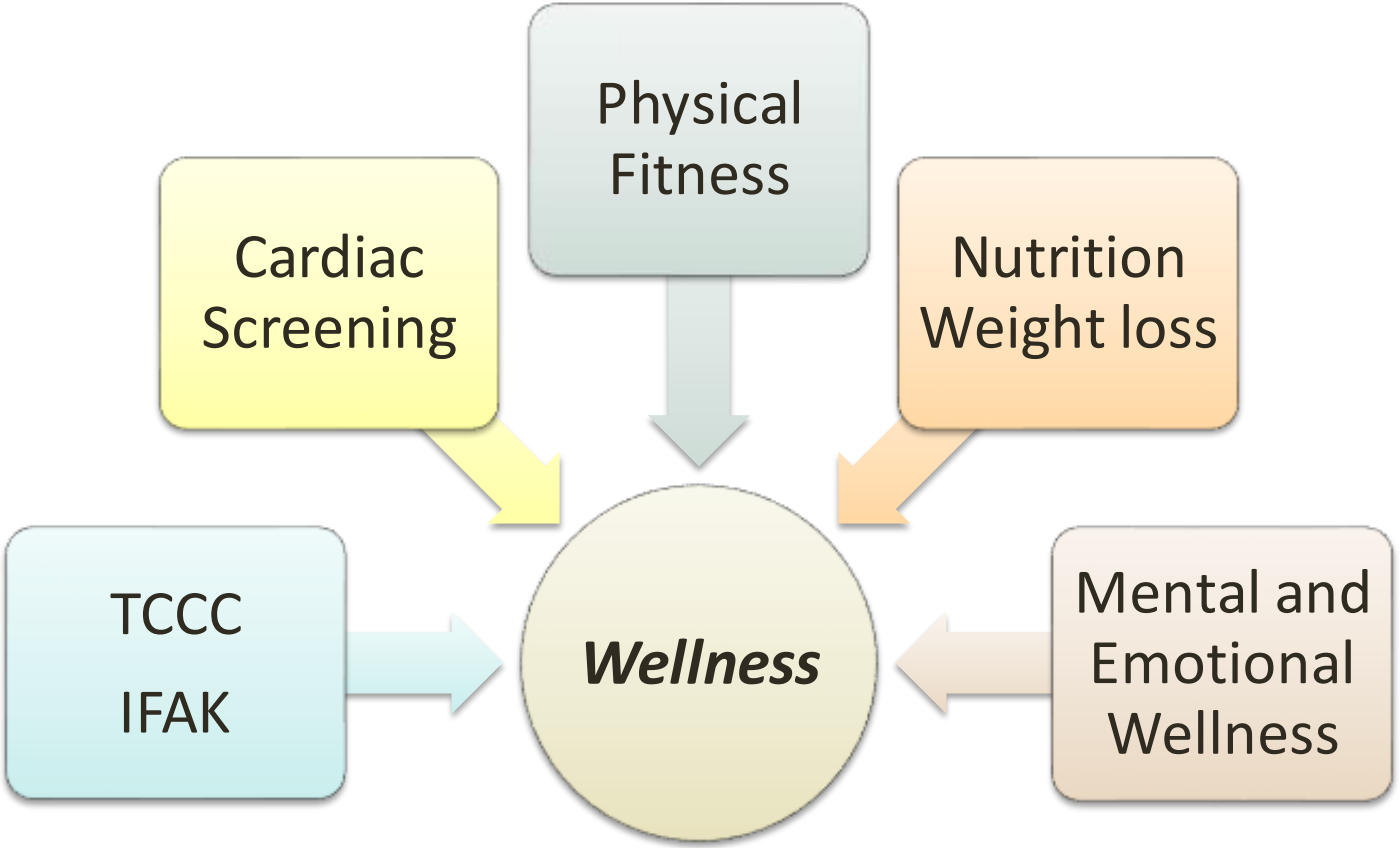
McKinney

BSW Pflugerville

BSW Circle C


The Ultimate Goal!

The Cedar Park PD Model



ALERRT

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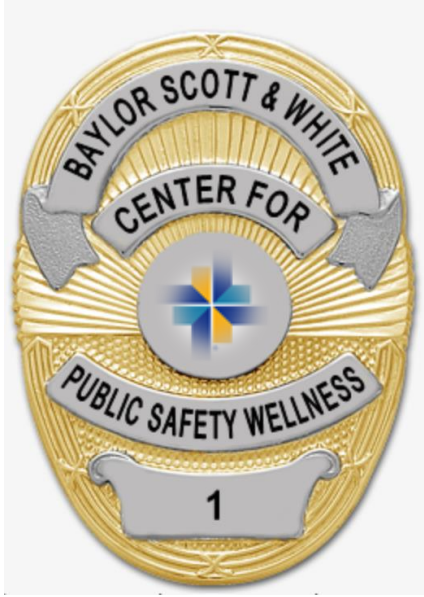
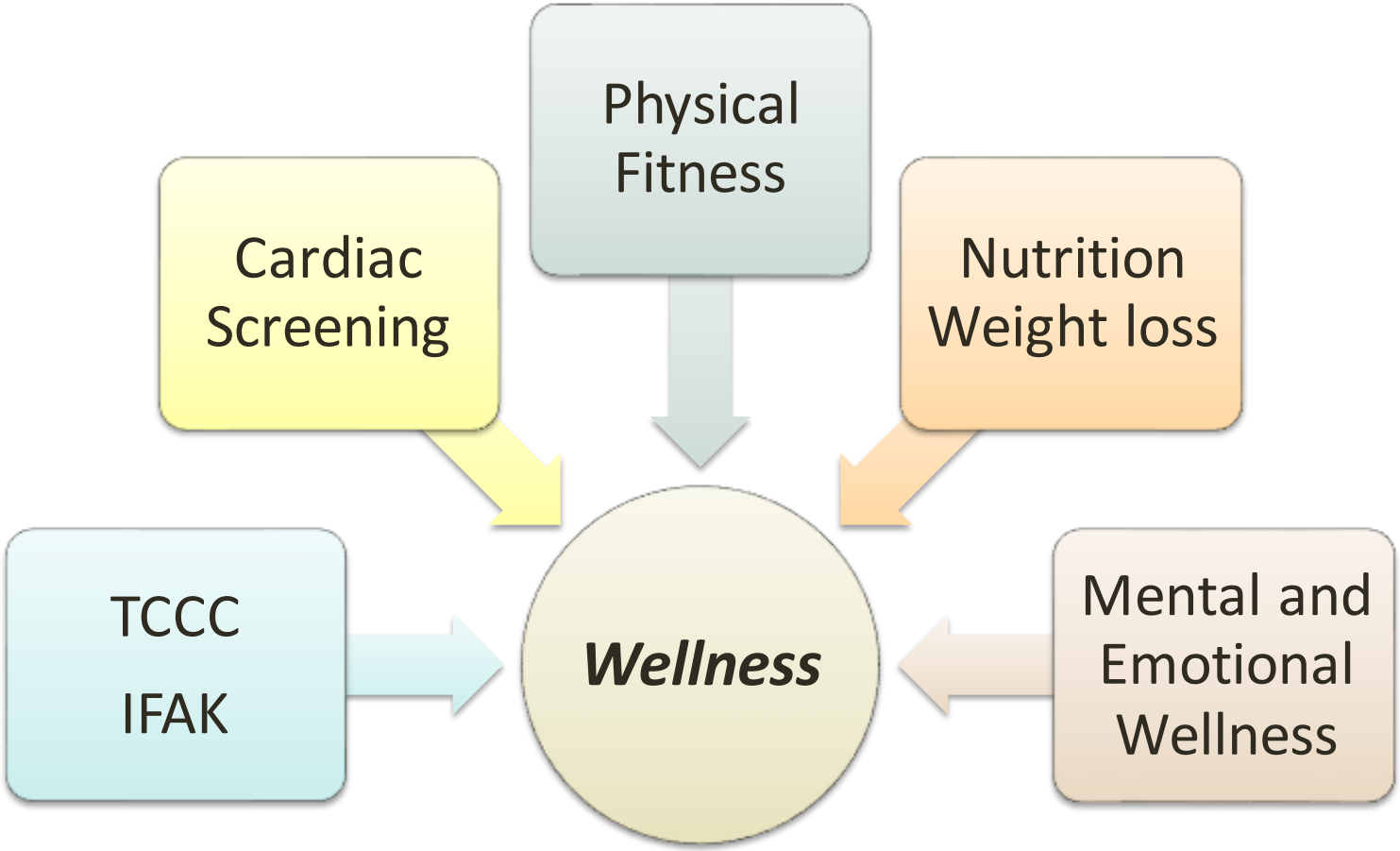
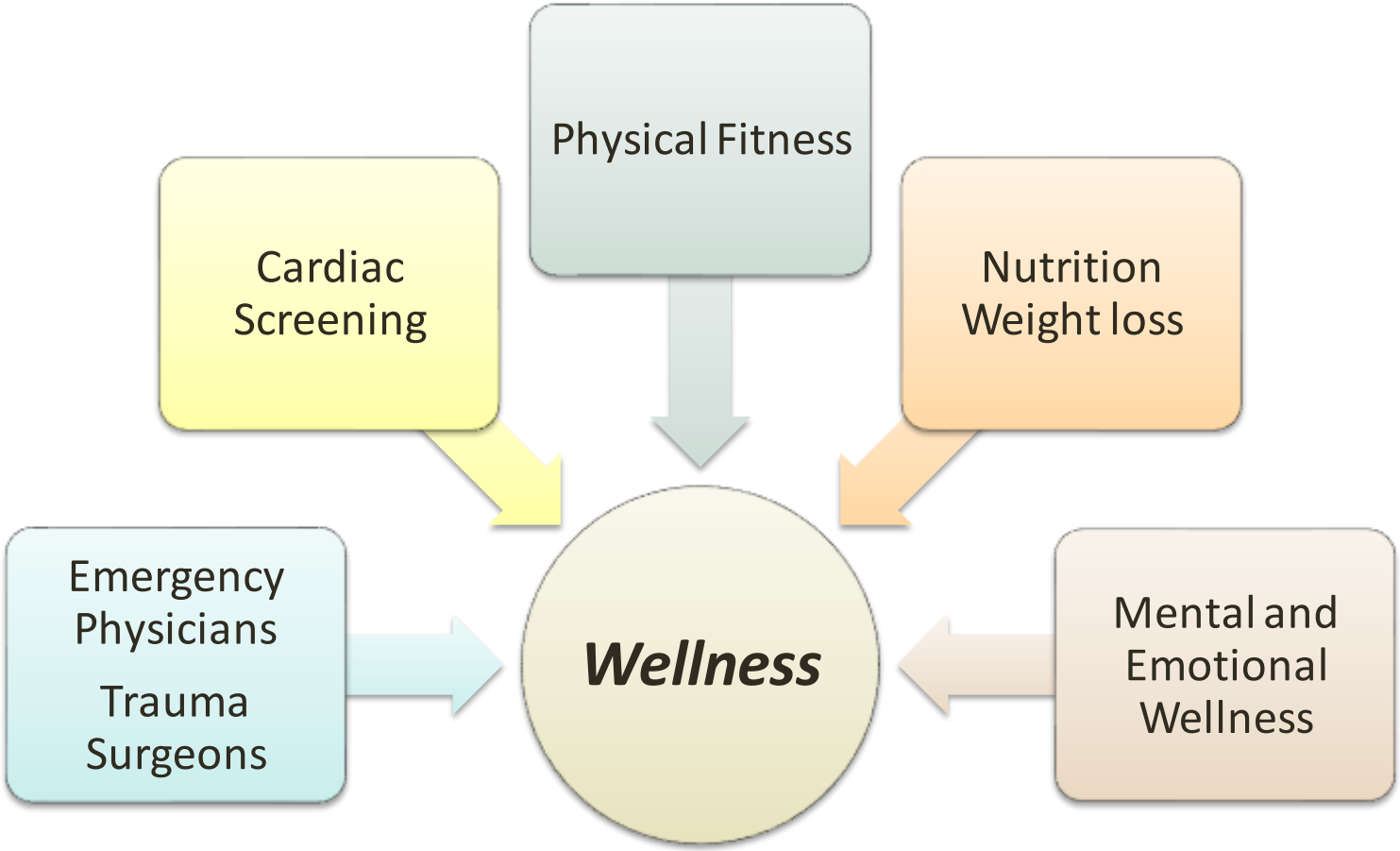
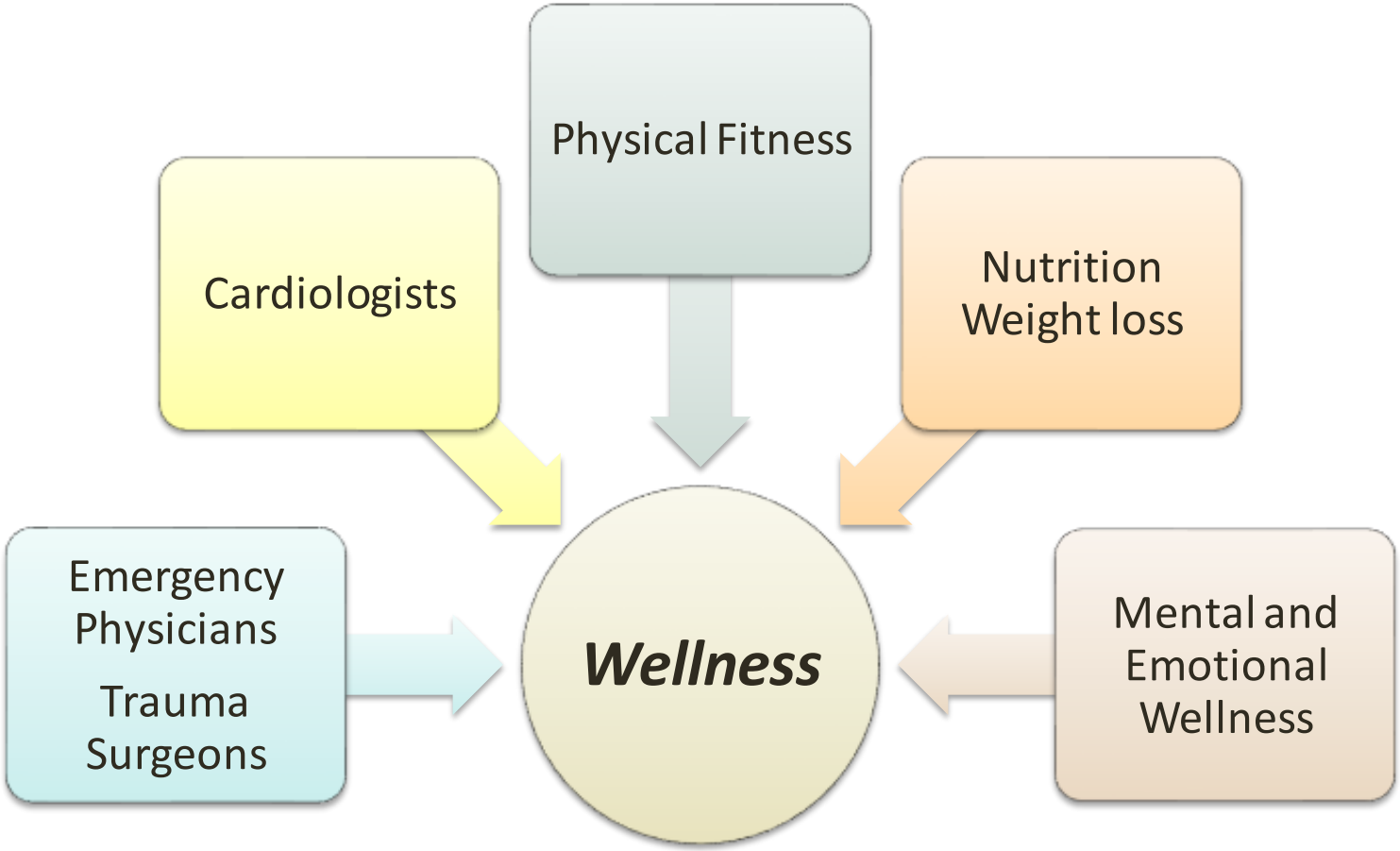
HEALTH

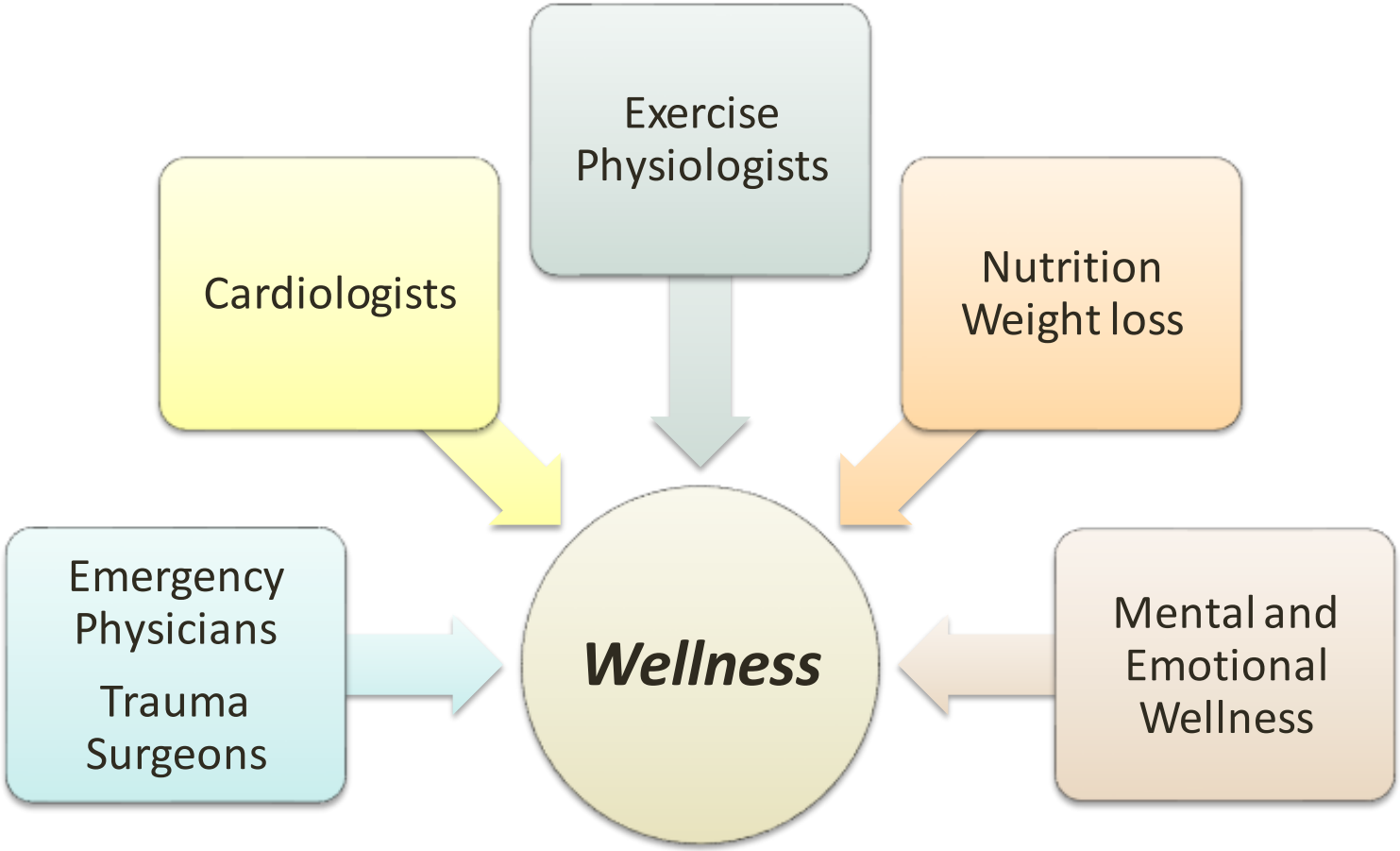
Center for Public Safety Wellness

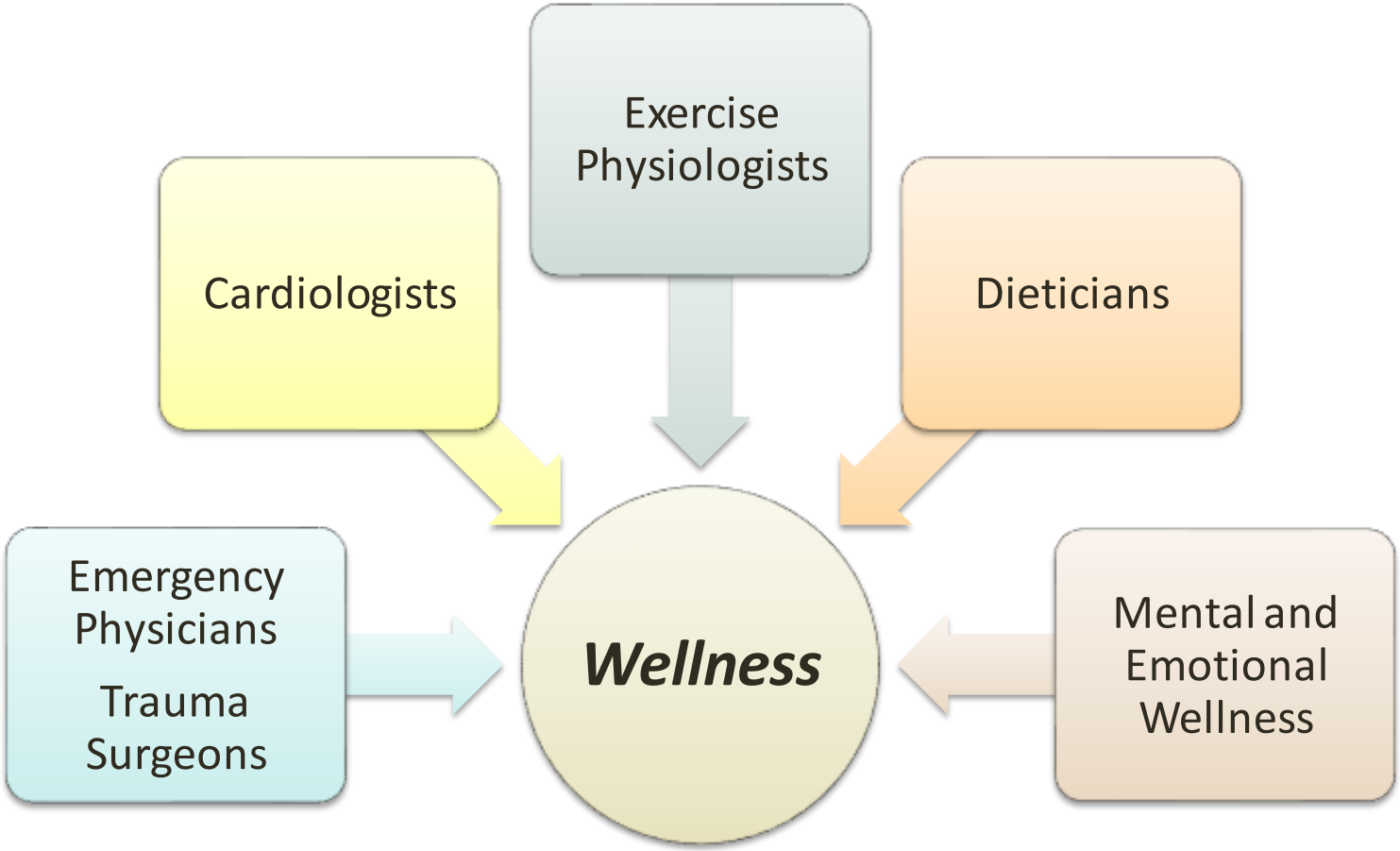


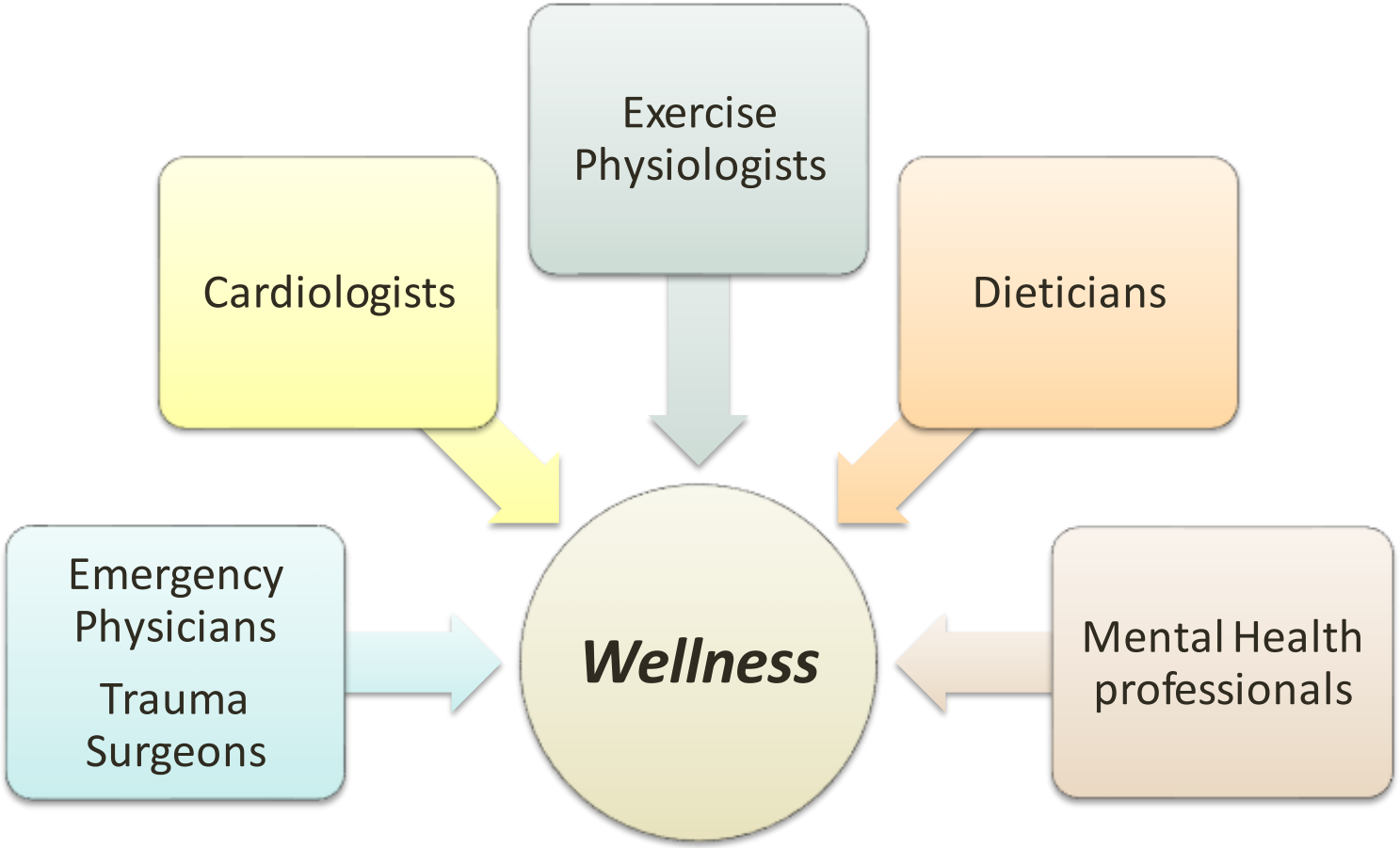

Physical Fitness
Cardiac Screening
Nutrition Weight loss
TCCC
IFAK
Wellness
Mental and Emotional Wellness


Physical Fitness
Cardiac Screening
Nutrition Weight loss
Emergency Physicians
Trauma Surgeons
Wellness
Mental and Emotional Wellness


Physical Fitness
Cardiologists
Nutrition
Weight loss
Emergency
Physicians
Trauma
Surgeons
Wellness
Mental and
Emotional
Wellness


Exercise Physiologists
Cardiologists
Nutrition Weight loss
Emergency Physicians
Trauma Surgeons
Wellness
Mental and Emotional Wellness


Exercise Physiologists
Cardiologists
Dieticians
Emergency Physicians
Trauma Surgeons
Wellness
Mental and Emotional Wellness


Exercise Physiologists
Cardiologists
Dieticians
Emergency Physicians
Trauma Surgeons
Wellness
Mental Health professionals

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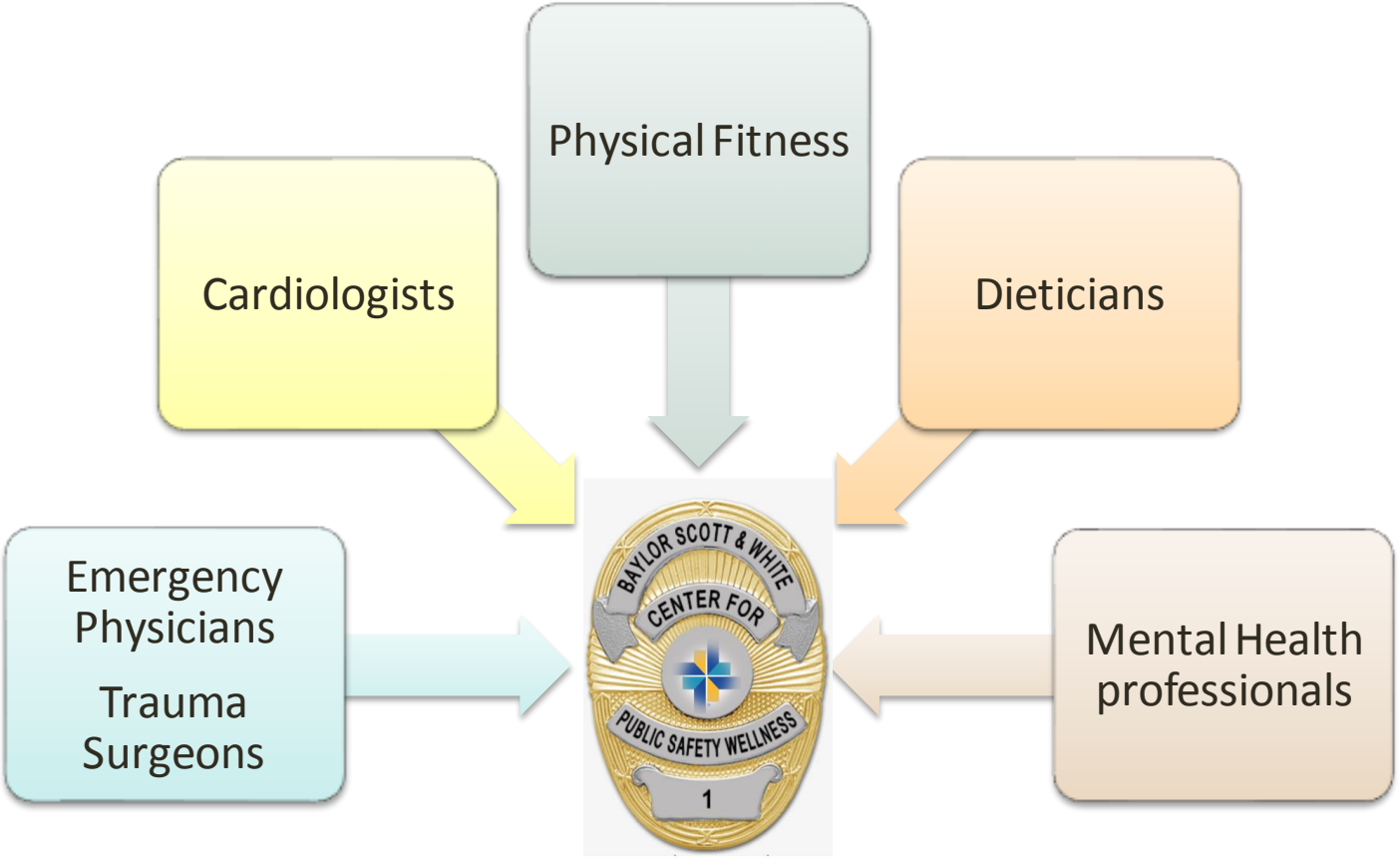

Questions?

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