MOC Questions:

1. Which is the strongest predictor of an individual public safety officer's risk of line of duty, sudden cardiac death?
   a. well-controlled hypertension
   b. Prior history of MI, stent or CABG
   c. obesity
   d. recent fire suppression duty

2. Which duties are associated with an increased risk of sudden cardiac death among public safety officers?
   a. fire suppression
   b. physical training
   c. physical altercations
   d. suspect pursuits
   e. all of the above

Handout- Kales- Causation of on-duty Cardiovascular Events among Firefighters and Law Enforcement Officers

Learning Objectives (2 sentences):

1-Understand the causation of on-duty CVD events as the result of interacting of strenuous duties and underlying heart disease resulting largely from lifestyle factors.

2-Translate CVD event epidemiology advances into improved public safety medicine clinical practice (e.g. fitness for duty, return to work and other clinical risk assessments).

Bibliography


________________

**Key Recommendations to Reduce Sudden Cardiac Death in Fire and Police**

Based on the established epidemiologic data, several measures to reduce SCD in the fire service logically follow. *Adapted from: Kales SN*, Smith DL. Sudden Cardiac Death in the Fire Service. Occup Med (Lond). 2014 [in press]. (Editorial)

1) Completely ban smoking and tobacco products in fire and law enforcement services.

2) Balance anti-discrimination and employment law considerations with common sense obesity standards for candidate and incumbent police/firefighters based on the elevated risks of injury, disability and particularly, cardiomegaly and SCD linked to excess adiposity.

3) Encourage wellness programs that among other measures offer *on-duty time for required regular exercise* to improve and maintain police/firefighters’ fitness; mitigate weight gain over the career span; and help manage existing risk CVD factors.
4) Ensure that routine medical evaluations are performed yearly for all police/firefighters, that CVD risk factors are evaluated and aggressively treated, and when appropriate, perform additional screening or testing (such as exercise stress testing, coronary artery calcium scans or echocardiography) to detect atherosclerosis or cardiac enlargement.

5) Restrict most police/firefighters with established CHD or other structural heart disease from participating in strenuous emergency duties on the basis of the overwhelming evidence supporting markedly higher relative risks (up to 15-fold even after covariate adjustments) of SCD among such public safety workers.

6) Consider mandatory retirement from the most strenuous duties at 60 years of age based on the statistical evidence of a sharp increase in the risk of death.

Key Slides

Physically Demanding Work Can Trigger CVD in Vulnerable Individuals

- Strenuous work
- Climbing stairs
- Forcible entry
- Search and rescue

Heavy PPE
- > 22 kg
- ↑ Metabolic work
- ↓ Heat dissipation

Hot and Dangerous Environment
- Over 100° C routinely
- Chaotic
- Low visibility

Smith, Kates, NFFF
How might Triggering Occur?

Cardiovascular Strain of Firefighting

A) Increased Shear Stress  Decreased Plasma Volume  Altered Electrolytes  Viscosity/Coagulatory Changes

Substrate of Cardiomegaly/LVH, and/or Underlying CHD

B) Plaque Rupture and Thrombus Formation  Arrhythmia

SCD or Other CVD Event

Extreme sacrifice: sudden cardiac death in the US Fire Service

Smith DL, Barr DA, Kales SN. 2013