UNITED STATES AIR FORCE
AEROMEDICAL UPDATE AND REVIEW
FOR AVIATORS WITH KNOWN
CORONARY ARTERY DISEASE

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The views expressed are those of the author and do not necessarily reflect the views of the United States Air Force or the United States Government.

I have no financial relationships to disclose.

I will not discuss off-label use and/or investigational use in my presentation.
MOC Question 1:

· True/False: The United States Air Force Aeromedical Consultation Services considers aviators with known coronary artery disease to ALWAYS be an unwaiverable condition requiring permanent termination of flight status.
The Basic Problem Of Cardiovascular Disease

- 1 CV death every 39 seconds
- Sudden cardiac death is the presenting symptom in 50% of people with heart disease
Clinical Layer - Summary

• CV disease incredibly common (*Total CVD Prevalence*: 34.2%)

• CV disease leading cause of death (*U.S. Death rate is 27.8% - which is 1 out of every 2.9 deaths*)

• Most Americans (2/3) with CVD are < 65 years

• Sudden cardiac death is presenting symptom in ~50%
Take-Home On Atherosclerosis

- It takes decades to form a clinically significant coronary lesion

- Medical therapy (anti-platelet, beta-blockers, cholesterol, anti-inflammatory) along with diet / exercise & tobacco-use play important role in altering the balance of etiologic factors

- Everyone in this room has it already
How do we (ACS) find you?

- Top Three Ways Aviators with asymptomatic CAD come to our attention:
  - 1) Other disease makes us curious/concerned
  - 2) Coronary Calcium scores > 10
  - 3) Screened for no good reason
I got screened…and CATHED! but I’m asymptomatic…

- 1487 male aviators
  - Mean age 43 yr, follow-up 14 yr

- 929 NML, 249 mild CAD (10%-50%), 124 moderate CAD (50%-70%), and 185 severe CAD (>70%)

- Average annual event rates at 2, 5, 10, and 15 yr for:
  - Cardiac death, first nonfatal MI, or first delayed coronary revascularization
  - Cardiac death or first nonfatal MI

Source: USAF ECG Library Database: Analysis Natural History CAD
Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2013-0438, 31 Jan 2013
Asymptomatic CAD

<table>
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<th>Aggregate</th>
<th>$\leq 50$</th>
<th>$50 \leq 120$</th>
<th>$120 \leq 180$</th>
<th>$&gt; 180$</th>
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<tbody>
<tr>
<td>event rate</td>
<td>0.6%</td>
<td>1.1%</td>
<td>2.7%</td>
<td>3.5%</td>
</tr>
</tbody>
</table>

$\times$

0.00004*

Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2013-0438, 31 Jan 2013
MOC Question 2:

- Military aviators with mild to moderate coronary artery disease, based on the United States Aeromedical Consultation Services stratification guidelines, produced an average annual event rate of approximately what percent per year?

A. 1%
B. 10%
C. 33%
D. 50%
Old Standards pre-2005

Coronary Artery Disease that has NOT been treated by revascularization:

Clinically significant CAD = lesions with $\geq 50\%$ stenosis by coronary angiography.

Such disease is nearly always symptomatic.

These lesions show $>5\%$ per year annual cardiac event rates.

Aviator faced almost immediate DQ – NO WAIVER!
New data from the ACS

- 185 cases of known CAD
- 71 cases required revascularization
- 82 cases of asymptomatic CAD reviewed
- 30 aircrew disqualified for severe CAD on screening, onset of heart failure, documented arrhythmias or unfavorable comorbidities (especially Diabetes Mellitus)
Current USAF CAD Policy

- MinCAD => aggregate <50% non-high performance waiver, annual noninvasive evaluation, cath only for sx, worsened tests or unsuccessful risk factor modification

- ModCAD => aggregate >50 but <120%, non-high performance waiver ONLY with another qualified pilot, limited to only one 50%-70% lesion and, for lesion 50%-70% normal perfusion distal to lesion annual evaluation, serial cath q 5 yr (NEW).

- SCAD => aggregate >120% or any single lesion >70% or Left main >50% = DQ w/o waiver

- Luminal irregularities => needs waiver at 1 yr, then 4 yr, then annually

- NO WAIVER for initial pilot applicants with coronary artery disease.
Luminal Irregularities

- Coronary angiography with irregular arterial edges due to atherosclerotic plaque but <10-20% stenosis
- ACS database review showed that aviators with LI only had no events in the first five years after diagnosis.
- Between 5 and 10 years follow-up, cardiac event rates were 0.54% per year compared to 0.1% per year for those with truly normal coronary angiography.
MOC Answer 1:

· The United States Air Force Aeromedical Consultation Services considers aviators with known coronary artery disease to ALWAYS be an unwaiverable condition requiring permanent termination of flight status.

· FALSE
Questions?

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Myocardial Infarction

- ACS “experience” in older, former aircrew with MI
  - Cardiac event rate about 2.5%/yr out to 5 yr, NO cardiac deaths

- Cardiac literature similar demographic groups
  - Event rates also 2.0%-3.0%/yr

- Coronary revascularization policy approved in 2008 with similar event rates from ACS former aircrew database and cardiac literature
  - Assumed event rate of 2.0%-3.0%/yr acceptable for low performance and nonpilot or dual pilot status
  - Anticipated actual event rate 1.0%-2.0%/yr or less
Myocardial Infarction Policy

IDENTICAL to Revascularization Policy

- Minimum 6-mo DNIF observation followed by...
- Full ACS evaluation, including coronary angiography and be 100% revascularized
- Normal LV function at rest and at peak stress (by nuclear imaging and/or stress echo)
- No evidence of reversible ischemia
- Must meet risk factor modification thresholds prior to initial evaluation and at each reevaluation
MOC Question 3:

· True/False: About 50% of initial and recurrent acute coronary events continue to be fatal.
MOC Answer 3:

- True