Cardiovascular Risk Assessment and Management (CRAM) in Primary Care

Maj Jill Feig, MD, MPH
Physician Epidemiologist
15 September 04
Overview

- Epidemiology of coronary heart disease (CHD)
- CRAM Project description
- Illustration of automated risk score
- Six month data review
Acronyms Used & Explanations

- **CHD** = Coronary Heart Disease
- **10 YR CHD Risk** = Likelihood of developing any CHD outcome in 10 years (expressed as %)
- **CRAM** = Cardiovascular Risk Assessment and Management
Epidemiology of CVD

- CVD - #1 cause of death in US adults (950K/yr)
  - 12.6M people in US have CHD; 200K have fatal MIs per year*
  - Leading cause permanent disability in US workers γ
  - $351B direct & indirect health care costs in US in 2003 γ
  - 19.2% AD Army with coronary artery calcification by CT +
- Non-modifiable risk factors
  - Age, gender, family history
- Modifiable risk factors
  - Obesity (now assessed via abdominal circumference), smoking, sedentary lifestyle, HTN, DM

Sources: * NHLBI  γ CDC  + J Am Coll Card, Jan 2003
Percentage Breakdown of Deaths from Cardiovascular Diseases
United States: 2001

Source: CDC/NCHS.
Leading Causes of Death for All Males and Females
United States: 2001

A  Total CVD
B  Cancer
C  Accidents
D  Chronic Lower Respiratory Diseases
E  Diabetes Mellitus
F  Alzheimer’s Disease

Source: CDC/NCHS.
Cardiovascular Disease Mortality Trends for Males and Females
United States: 1979-2001

Source: CDC/NCHS.
What we know about ADAF now:

- **Mortality database review: 1981-2002**
  - 27 ADAF deaths related to physical activity
  - 5 had abnormal valves, infection, or RVH
  - 9 with documented CAD; none during fitness testing
    - Most during / after leisure exercise or yard work
- **Risk of sudden event during exercise low:**
  - BMTs – risk of 11 deaths per 100K recruit years*
  - Exercise-related death in middle aged men 6 per 100K γ
  - Exercise decreases risk of death overall
- **5% of ADAF in moderate and high categories** (partial data – may be more)

* DoD Recruit Mortality Registry
γ AHA/ACSM Scientific Statement
Why CRAM?

- SGPs & PCMs are *responsible* for managing ADAF. Sections 1.17, 1.24, and Chapter 4 in AFI 10-248.

- Five percent (5%) of ADAF have Moderate or High 10 yr CHD risk – approx 18k!
  - CHD Risk factors not being optimally managed in the US.
  - HTN, CHD, DM all increasing; **CVD #1 Killer**!

- Improve MTF staff efficiency:
  - Reduce lengthy chart review.
  - No hand calculation of CHD risk needed.
Goal of CRAM Project

- Improve the early identification, care prioritization, and management of ADAF at moderate or high risk for developing CHD using:
  - provider education
  - evidence-based practice guideline toolkits
  - automated CHD Risk available through PIMR
Pearls/Goals:

- Reinforce good CHD histories & physicals
- Those with premature CHD frequently have a NORMAL exam
- Order appropriate labs & begin lifestyle modifications
- ASA therapy for patients with a risk $\geq 6\%$
Framingham Risk Score

- One tool to assess CHD in asymptomatic patients
- Includes some modifiable and non-modifiable risk factors
- \textbf{NOT} included: obesity, family history, sedentary lifestyle
- Point total used to determine risk:
  - \textbf{LOW} = 10-yr CHD risk <10%
  - \textbf{MODERATE} = 10-yr CHD risk 10-20%
  - \textbf{HIGH} = 10-yr CHD risk > 20%
- Absolute and comparative risks are given
Individual People
### CPS Recommendations

<table>
<thead>
<tr>
<th>SBP</th>
<th>140</th>
<th>08/28/2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBP</td>
<td>74</td>
<td>08/28/2003</td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 10 Year Coronary Heart Disease Risk

<table>
<thead>
<tr>
<th>Tot Chol</th>
<th>239</th>
<th>05/05/2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDL</td>
<td>27</td>
<td>05/05/2004</td>
</tr>
<tr>
<td>LDL</td>
<td>151</td>
<td>05/05/2004</td>
</tr>
</tbody>
</table>

### CHD Risk Assessment Using Framingham Risk Score (FRS)

<table>
<thead>
<tr>
<th>Risk</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0 - 9%</td>
</tr>
<tr>
<td>Moderate</td>
<td>10 - 20%</td>
</tr>
<tr>
<td>High</td>
<td>&gt; 20%</td>
</tr>
</tbody>
</table>

This is the absolute patient risk of developing CHD in the next 10 years.

Data source: Vitals PIMR, labs CHCS, and is updated monthly.

Date created 07/21/2004

Interpretation of CHD Risk:
Risk of developing Coronary heart disease (CHD) in 10 years

FRS is calculated based on gender, age, SBP, Tot Cholesterol, HDL, diabetes, and smoking status

http://www.acc.org/clinical/consensus/risk/dirindex.htm
PIMR Reports

Coronary Heart Disease Risk
<table>
<thead>
<tr>
<th>SSAN</th>
<th>Rank</th>
<th>Last Name</th>
<th>First Name</th>
<th>Middle Name</th>
<th>10 Year CHD Risk</th>
<th>DOB</th>
<th>Age</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>111-11-1111</td>
<td>MSG</td>
<td>DOE</td>
<td>JOHN</td>
<td>N</td>
<td>16.66</td>
<td>02/20/1963</td>
<td>41.28</td>
<td>M</td>
</tr>
<tr>
<td>222-22-2222</td>
<td>TSG</td>
<td>DANDY</td>
<td>JIM</td>
<td>S</td>
<td>8.91</td>
<td>01/13/1961</td>
<td>43.38</td>
<td>M</td>
</tr>
<tr>
<td>333-33-3333</td>
<td>SSG</td>
<td>DOE</td>
<td>JIM</td>
<td>F</td>
<td>8.75</td>
<td>03/14/1971</td>
<td>33.22</td>
<td>M</td>
</tr>
<tr>
<td>444-44-4444</td>
<td>MSG</td>
<td>DOE</td>
<td>BOB</td>
<td>L</td>
<td>6.84</td>
<td>10/27/1952</td>
<td>51.59</td>
<td>M</td>
</tr>
<tr>
<td>555-55-5555</td>
<td>LTC</td>
<td>DANDY</td>
<td>RANDY</td>
<td>V</td>
<td>5.88</td>
<td>05/23/1961</td>
<td>43.03</td>
<td>M</td>
</tr>
<tr>
<td>666-66-6666</td>
<td>TSG</td>
<td>JOLLY</td>
<td>ROGER</td>
<td>R</td>
<td>5.76</td>
<td>08/12/1972</td>
<td>31.80</td>
<td>M</td>
</tr>
<tr>
<td>777-77-7777</td>
<td>MSG</td>
<td>CHILLY</td>
<td>WILLY</td>
<td>C</td>
<td>4.95</td>
<td>09/07/1966</td>
<td>37.73</td>
<td>M</td>
</tr>
<tr>
<td>888-88-8888</td>
<td>MSG</td>
<td>YANKEE</td>
<td>DOODLE</td>
<td>L</td>
<td>4.51</td>
<td>11/12/1963</td>
<td>40.55</td>
<td>M</td>
</tr>
<tr>
<td>999-99-9999</td>
<td>SSG</td>
<td>CHEESE</td>
<td>DOODLE</td>
<td>P</td>
<td>4.35</td>
<td>10/19/1967</td>
<td>36.62</td>
<td>M</td>
</tr>
</tbody>
</table>

Data As Of: 07/21/2004

Color alerts are for low risk patients; high risk patients may have lower treatment thresholds.
<table>
<thead>
<tr>
<th></th>
<th>SBP</th>
<th>DBP</th>
<th>BP Date</th>
<th>Smoke</th>
<th>Smoke Date</th>
<th>DM</th>
<th>Tot Chol</th>
<th>Chol Cert Date</th>
<th>HDL</th>
<th>HDL Cert Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>132</td>
<td>90</td>
<td>01/06/2004</td>
<td>Y</td>
<td>05/19/2004</td>
<td></td>
<td>280</td>
<td>11/20/2003</td>
<td>34</td>
<td>11/20/2003</td>
</tr>
<tr>
<td>5</td>
<td>124</td>
<td>75</td>
<td>01/20/2004</td>
<td></td>
<td></td>
<td></td>
<td>224</td>
<td>01/28/2004</td>
<td>32</td>
<td>01/28/2004</td>
</tr>
<tr>
<td>7</td>
<td>128</td>
<td>77</td>
<td>08/20/2003</td>
<td></td>
<td></td>
<td></td>
<td>233</td>
<td>09/10/2003</td>
<td>60</td>
<td>09/10/2003</td>
</tr>
<tr>
<td>8</td>
<td>140</td>
<td>94</td>
<td>08/12/2003</td>
<td></td>
<td></td>
<td></td>
<td>218</td>
<td>08/13/2003</td>
<td>48</td>
<td>08/13/2003</td>
</tr>
</tbody>
</table>
Six month CRAM Data (Jan-Jun 04)

- 380K ADAF records
  - 7% without base code/DMIS ID
  - 0.6% (2311) at Ft Meade

- 57% of older patients and 65% of younger, multi-risk patients had “enough” data to calculate CHD risk
## Frequency of Risk Levels – Older ADAF

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>51104</td>
<td>93.7%</td>
</tr>
<tr>
<td>MODERATE</td>
<td>3286</td>
<td>6.0%</td>
</tr>
<tr>
<td>HIGH</td>
<td>126</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

Valid N = 54516

In Jan 04, 8.3% of this group were moderate or high risk
## Frequency of Risk Levels – Young, X-risk

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>9901</td>
<td>99.2%</td>
</tr>
<tr>
<td>MODERATE</td>
<td>80</td>
<td>0.8%</td>
</tr>
<tr>
<td>HIGH</td>
<td>4</td>
<td>&gt;0.1%</td>
</tr>
</tbody>
</table>

Valid N = 9985

In Jan 04, 1.4% of this group were moderate or high risk
How Are We Doing with Risk Reduction*?

Although statistically significant (p<0.05) changes have occurred in SBP, DBP, TC, and HDL, they are *clinically insignificant*

<table>
<thead>
<tr>
<th>Risk</th>
<th>Jan</th>
<th>Jun</th>
<th>Δ</th>
<th>z</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP</td>
<td>124.48</td>
<td>124.17</td>
<td>0.31</td>
<td>8.78</td>
</tr>
<tr>
<td>DBP</td>
<td>75.15</td>
<td>75.07</td>
<td>0.08</td>
<td>3.08</td>
</tr>
<tr>
<td>TC</td>
<td>184.61</td>
<td>184.31</td>
<td>0.30</td>
<td>2.85</td>
</tr>
<tr>
<td>HDL</td>
<td>49.60</td>
<td>49.61</td>
<td>-0.01</td>
<td>2.19</td>
</tr>
</tbody>
</table>

* Overall data, not stratified by age or gender
Similar findings to overall data

- All four variables decreased/increased by < 1%
- Exception: SBP ↑ by 1.8% in older F *
- Others not statistically tested (dirty data)

* P <0.05, z = -2.67
Conclusions

- Real data is not clean or complete
- Better job needed documenting those factors governed by regulation/good practice
- Confounders and short time interval may have reduced possible effect
- Program has potential to fill gaps and improve efficiency in CHD risk id & mgmt
Future CRAM

- Compare data over time to see if improving
- Spin-off Studies (“Son of CRAM”)
  - HTN prevalence and treatment
  - Dyslipidemia prevalence and treatment
  - Studies linked to fitness data?
- Continue educational activities
- Periodic tool kit CPG updates/revisions
  - Currency of CPGs; add shared decision making
- Expansion to more high risk beneficiaries
Questions?