Racial Disparities in CAD care: Are We Closing the Gap?

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“Do Clinically Similar Patients Receive Different Levels of Quality of Care Based on Race/Ethnicity in . . .”

Survey of 344 cardiologists
Lurie et al. Circulation 2005; 111; 1264-1269
Cardiovascular Disease (MI, CHF, stroke, PVD)

- Leading cause of death among White Americans (36.2%)
- Leading cause of death among African Americans (33.6%)

Life-prolonging Therapies Available in Cardiovascular Medicine

- AICD therapy in pts at risk for SCD
- Reperfusion therapy in acute MI
- Revascularization in PAD
AICD Therapy in Patients at Risk for SCD

- **Circ 2003 Jul 22; 108 (3):286-291**
  - 6,000 Medicare pts s/p cardiac arrest
  - OR for Blacks (vs Whites) to receive AICD: 0.5

- **Am Heart J. 2007 Feb; 153(2): 320-7**
  - 50,000 VA pts at risk for cardiac arrest
  - OR for Blacks (vs Whites) to receive AICD: 0.54

- **JAMA 2007 Oct 3; 298 (13), 528-532**
  - 13,000 pts with EF< 30%
  - OR for BW (compared to WM) to receive AICD: 0.56
Reperfusion Therapy in AMI

- *Am Heart J 2001;142: 604-10*
  - 10,469 Black patients with STEMI from 1994 to 1998 (NRMI database)
  - 53% received thrombolytic therapy

- *JAMA 1994 Apr 20;271 (15): 1175-80*
  - 33,641 pts in VAMCs with dx of AMI
  - Compared to Whites, Blacks:
    - 33% less likely to undergo cath
    - 42% less likely to undergo PCI
    - 54% less likely to undergo CABG
Revascularization in PAD

- *Arch Surg* 1995 Apr; 130 (4): 381-6
  - 19,236 Medicare pts with LE ischemia
  - African Americans compared to Whites:
    - More likely to undergo amputation
    - Less likely to undergo revascularization

  - 691,833 pts with LE ischemia
  - 66% underwent revasc. or amputation
  - Risk factors for amputation:
    - Black race (1.9x more likely than Whites)
    - Low income (1.4x more likely than high income)
Life-prolonging Therapies Available in Cardiovascular Medicine

• AICD therapy in pts at risk for SCD
  • Blacks less likely than Whites to receive AICDs when indicated

• Reperfusion therapy in acute MI
  • Blacks suffering from a heart attack less likely than Whites to have cath or be treated with therapeutic coronary procedures (CABG or PCI)

• Revascularization in PAD
  • Compared to Whites with severe PAD, Blacks with severe PAD less likely to have revascularization, more likely to have amputation
Beginning in the late 80’s, multiple studies have revealed that, in the US:

- Blacks with STEMI less likely than Whites to receive thrombolytic therapy
- Blacks with STEMI less likely than Whites to have cardiac catheterization
- Blacks with STEMI less likely than Whites to have PCI or CABG
- Blacks with STEMI who present to hospitals without cath labs less likely to be transferred
Variation and Temporal Trends in the Use of Diagnostic Testing During Hospitalization for Acute Myocardial Infarction by Age, Gender, Race, and Geography (the Atherosclerosis Risk In Communities Study)

Camille A. Pearte, MD, MPH\textsuperscript{a,b,*}, Merle Myerson, MD, EdD\textsuperscript{a}, Joseph Coresh, MD, MHS\textsuperscript{c,d}, Robert L. McNamara, MD, MHS\textsuperscript{e}, Wayne Rosamond, PhD\textsuperscript{f}, Herman Taylor, MD\textsuperscript{g}, and Teri A. Manolio, MD, PhD\textsuperscript{a}

Table 4
Use of diagnostic cardiac testing in patients hospitalized for myocardial infarction (MI) by race, Atherosclerosis Risk In Communities Surveillance, 1987 to 2001

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Blacks</th>
<th>Whites</th>
<th>p Value</th>
<th>Unadjusted OR (95% CI)</th>
<th>Adjusted Model 1 OR (95% CI)</th>
<th>Adjusted Model 2 OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angiography</td>
<td>39%</td>
<td>60%</td>
<td>*</td>
<td>0.44 (0.38–0.51)*</td>
<td>0.33 (0.28–0.39)*</td>
<td>History of MI\textsuperscript{1} 0.50 (0.40–0.65)*</td>
</tr>
<tr>
<td>No History of MI\textsuperscript{1}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.26 (0.20–0.33)*</td>
</tr>
<tr>
<td>Echocardiogram</td>
<td>55%</td>
<td>38%</td>
<td>*</td>
<td>1.53 (1.26–1.87)*</td>
<td>1.89 (1.62–2.19)*</td>
<td>1.77 (1.52–2.07)*</td>
</tr>
<tr>
<td>Right-sided cardiac catheterization</td>
<td>11%</td>
<td>24%</td>
<td>*</td>
<td>0.46 (0.36–0.59)*</td>
<td>0.42 (0.34–0.51)*</td>
<td>0.42 (0.34–0.51)*</td>
</tr>
<tr>
<td>Nuclear testing</td>
<td>11%</td>
<td>7.1%</td>
<td>*</td>
<td>1.61 (1.13–2.29)*</td>
<td>1.63 (1.27–2.09)*</td>
<td>1.65 (1.29–2.13)*</td>
</tr>
<tr>
<td>Exercise stress</td>
<td>12%</td>
<td>9.4%</td>
<td>*</td>
<td>1.41 (0.98–2.03)</td>
<td>1.32 (1.01–1.71)*</td>
<td>1.41 (1.08–1.83)*</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>28 d</td>
<td>10</td>
<td>8.6</td>
<td></td>
<td>1.18 (0.95–1.48)</td>
<td>1.34 (1.04–1.71)*</td>
<td>1.45 (1.10–1.92)*</td>
</tr>
<tr>
<td>1 yr</td>
<td>22.3</td>
<td>17.4</td>
<td>*</td>
<td>1.36 (1.15–1.61)*</td>
<td>1.64 (1.36–1.97)*</td>
<td>1.60 (1.30–1.97)*</td>
</tr>
</tbody>
</table>

- 2 year time period  OR for Blacks with AMI to receive PCI/CABG
- 1994-1996  0.53
- 1997-1999  0.52
- 2000-2002  0.55
- 2003-2005  0.54
Influence of Race on Death and Ischemic Complications in Patients With Non–ST-Elevation Acute Coronary Syndromes Despite Modern, Protocol-Guided Treatment

Marc S. Sabatine, MD, MPH; Gavin J. Blake, MD, MPH; Mark H. Drazner, MD, MSc; David A. Morrow, MD, MPH; Benjamin M. Scirica, MD; Sabina A. Murphy, MPH; Carolyn H. McCabe, BS; William S. Weintraub, MD; C. Michael Gibson, MD, MS; Christopher P. Cannon, MD

An analysis from the TACTICS-TIMI 18 randomized trial of invasive strategy vs. conservative strategy in pts with USA/NSTEMI
Influence of Race on Death and Ischemic Complications in Patients With Non–ST-Elevation Acute Coronary Syndromes Despite Modern, Protocol-Guided Treatment

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• Compared to Whites, in the invasive arm treated with PCI, Blacks treated with PCI were only $\frac{1}{2}$ as likely to receive a stent

• ?? Stand alone PTCA for USA/NSTEMI ??

• Did I miss something ??
Plot of adjusted HRs and 95% CIs for composite end point; for individual components of end point, including death, MI, and rehospitalization (rehosp) for ACS; and for end point during index hospitalization and after hospital discharge

<table>
<thead>
<tr>
<th>End point</th>
<th>Adj HR</th>
<th>(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite endpoint</td>
<td>1.54</td>
<td>(1.16-2.05)</td>
</tr>
<tr>
<td>Individual endpoints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>2.32</td>
<td>(1.19-4.53)</td>
</tr>
<tr>
<td>MI</td>
<td>1.56</td>
<td>(0.92-2.62)</td>
</tr>
<tr>
<td>Rehosp for ACS</td>
<td>1.34</td>
<td>(0.96-1.88)</td>
</tr>
<tr>
<td>Timing of endpoint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In hospital</td>
<td>1.99</td>
<td>(1.14-3.48)</td>
</tr>
<tr>
<td>After discharge</td>
<td>1.43</td>
<td>(1.02-1.99)</td>
</tr>
</tbody>
</table>

Have We Made Progress?

### Disparities in the 90’s
- Peterson. NEJM 1997
- Borzak. Am Heart J 1999
- Taylor. Am J Cardiol 1998

### Disparities in the 2000’s
- Sonel. Circ 2005
- Popescu. JAMA 2007
- Chen. NEJM 2001
- Bradley. JAMA 2004
Disparities in Cardiovascular Care: Potential Culprits

1. Physician bias?
2. Black pts averse to high-tech procedures (are there trust issues)?
3. Are MDs caring for Blacks overwhelmed/underperforming?
4. Inadequate resources/treatment at hospitals frequented by Blacks?
5. Are Blacks less informed about heart disease symptoms, treatment, and medications?
6. Racial insensitivity/racism of White MDs?
7. Paucity of African American CV specialists?
Thesis # 1: African Americans are Overrepresented at Hospitals that Underperform

- Many Hospitals Treating African Americans with Heart Disease:
  - Have Longer D2B times
  - Have Longer Delays for Defibrillation for pts with in-house cardiac arrest
  - Perform relatively high #’s of limb amputations
  - Are less likely to be staffed by highly credentialed doctors
  - Tend to have low procedural volumes
Columbus, Ohio Heart Centers:
Inverse Relationship between Procedural Volume and % Black Patients

% Black patients
Do differences in hospital and surgeon quality explain racial disparities in lower-extremity vascular amputations?

Regenbogen SE, Gawande AA, Lipsitz SR, Greenberg CC, Jha AK.

- 86,865 Black and White Medicare pts having major vascular surgery

- **Compared to Whites, Blacks more likely to:**
  - Have amputation (45% vs 20%)
  - Have surgery by non-specialists (41% vs 27%)
  - Have surgery in low volume hosp (40% vs 32%)
  - Have surgery in “high amputation” hosp (53% vs 29%)
Do differences in hospital and surgeon quality explain racial disparities in lower-extremity vascular amputations? Regenbogen SE, Gawande AA, Lipsitz SR, Greenberg CC, Jha AK.

But . . . Here’s some sobering news . . .

- Even in high-volume hospitals with PTA facilities, when the surgery is performed by fellowship-trained vascular surgeons:
  - Amputation rates: 7% for blacks vs. 4% for whites
  - Conclusion: When referred to high-volume, skilled specialists at high volume hospitals, the magnitude of disparities decreased, but still persisted
Thesis #2: There are Not Enough African American Cardiovascular Specialists

- Approx. 35 million African Americans
- CVD is the leading cause of death
- *Fewer than 600* African American CV specialists (cardiologists, CT surgeons, vascular surgeons)
- There is a serious pipeline problem
“Underrepresented in Medicine”

- AAMC (and OSU) Recognizes that a Diverse World Should Have Physicians from Diverse Backgrounds

- AAMC Officially Recognizes that the Following Racial/Ethnic Groups are Underrepresented in Medicine Relative to their Percentage in the Population:
  - African Americans, Hispanics, American Indians
Cardiologists by Ethnicity: AMA 2006 Data

- White: 63%
- Asian: 19%
- Hispanic: 6%
- Black: 3%
- Other: 12%
Cardiologists in Training: 2002
Total n=2,223

- White: 61%
- Asian: 30%
- Hispanic: 6%
- Black: 3%
Pipeline Problem: It starts in high school

Averaged Freshmen Graduation Rate—United States, 2007

- African American: 60%
- Asian: 91%
- Latino: 62%
- Native American: 61%
- White: 80%

National Center for Education Statistics, Common Core of Data, 2006-2007
Racial Disparities in CAD Care: Are We Closing the Gap

Time to move from Problems . . .

To Solutions
Solutions

- Help “Black” hospitals step up their game...
  - Enforce guideline driven care/algorithms
  - Enforce volume requirements
  - Partner with high volume/high quality centers

- Or usher them out of the game
  - CON
  - JCAHO/AHCPR/Feds/State Agencies
  - Regional STEMI centers
  - Attract African American pts to high volume/high quality ctrs
Temporal trends in the use of defect-free care by race/ethnicity and enrollment per quarter in GWTG-CAD

Proportion of MI pts receiving:

1) ACE/ARB for low EF
2) BB at DC
3) Statins at DC
4) Tobacco cessation
5) ASA on admission
6) ASA at DC
7) Revascularization

<table>
<thead>
<tr>
<th>QUARTE</th>
<th>WHITES</th>
<th>BLACKS</th>
<th>HISPANIC</th>
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<td>Q1 2002</td>
<td>1070</td>
<td>71</td>
<td>63</td>
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<tr>
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<td>Q3 2002</td>
<td>3217</td>
<td>231</td>
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<tr>
<td>Q4 2002</td>
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<td>Q2 2003</td>
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<td>Q3 2003</td>
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<tr>
<td>Q4 2003</td>
<td>5557</td>
<td>517</td>
<td>597</td>
</tr>
<tr>
<td>Q1 2004</td>
<td>9006</td>
<td>639</td>
<td>631</td>
</tr>
<tr>
<td>Q2 2004</td>
<td>6074</td>
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<td>Q3 2004</td>
<td>5562</td>
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<td>562</td>
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<tr>
<td>Q4 2004</td>
<td>5839</td>
<td>485</td>
<td>632</td>
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<tr>
<td>Q1 2005</td>
<td>7291</td>
<td>656</td>
<td>770</td>
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<tr>
<td>Q2 2005</td>
<td>7471</td>
<td>620</td>
<td>655</td>
</tr>
<tr>
<td>Q3 2005</td>
<td>9054</td>
<td>763</td>
<td>672</td>
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<tr>
<td>Q4 2005</td>
<td>8325</td>
<td>760</td>
<td>629</td>
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<tr>
<td>Q1 2006</td>
<td>7852</td>
<td>685</td>
<td>643</td>
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<tr>
<td>Q2 2006</td>
<td>7773</td>
<td>648</td>
<td>590</td>
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<tr>
<td>Q3 2006</td>
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<td>481</td>
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<td>Q4 2006</td>
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<td>413</td>
</tr>
<tr>
<td>Q1 2007</td>
<td>9113</td>
<td>578</td>
<td>298</td>
</tr>
<tr>
<td>Q2 2007</td>
<td>2510</td>
<td>260</td>
<td>134</td>
</tr>
</tbody>
</table>
Start Early:
“Heart School” for Middle Schoolers
Increase in Diversity in Cardiovascular Medicine Fellowship Class

Percentage of total general cardiology fellows belonging to underrepresented in medicine (URM) racial groups as of July of labeled year

Fig. 2
Summary

- CVD remains the leading cause of death among African Americans
- Shocking disparities exist in the delivery of cardiovascular care in the US
- Opportunity is ripe for multi-pronged attack on this state of affairs.
Summary

- Many African Americans Receive Cardiac Care at Hospitals that underperform with regard to evidence based therapies and procedural volumes

- There is a Severe Shortage of African American Cardiovascular Physicians, with a serious problem in the pipeline

- Efforts to Reduce Racial Disparities in Cardiovascular Care Will Have to Aggressively Address these Problems
“Of all the forms of inequality, injustice in health care is the most shocking and inhumane”—MLK, Jr