Adherence: the Perpetual Frontier

A Challenge for Reducing Health Disparities

Peter G. Kaufmann, PhD
National Heart, Lung and Blood Institute
AND
Antoinette Schoenthaler, EdD, MA
NYU School of Medicine

Script your Future
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Coronary Heart Disease and Stroke Death Rates, 1980-2000

Age-adjusted rate per 100,000

Coronary Heart Disease

CHD 2010 target

Stroke

Stroke 2010 target

US Life Expectancy by Race, 1970-2010

### Eight Americas – Profiles of the Disparities

<table>
<thead>
<tr>
<th>America</th>
<th>General Description</th>
<th>Population (millions)</th>
<th>Income per capita</th>
<th>Percent completing high school</th>
<th>Male life expectancy</th>
<th>Female life expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Asians</td>
<td>10.1</td>
<td>$21,675</td>
<td>80</td>
<td>82.2</td>
<td>87.7</td>
</tr>
<tr>
<td>2</td>
<td>White low-inc. rural Northland</td>
<td>3.6</td>
<td>$17,758</td>
<td>83</td>
<td>76.2</td>
<td>81.8</td>
</tr>
<tr>
<td>3</td>
<td>Middle America</td>
<td>219.0</td>
<td>$24,463</td>
<td>84</td>
<td>75.2</td>
<td>80.2</td>
</tr>
<tr>
<td>4</td>
<td>White poor – App/Miss Valley</td>
<td>11.0</td>
<td>$15,451</td>
<td>70</td>
<td>71.8</td>
<td>77.8</td>
</tr>
<tr>
<td>5</td>
<td>Western Native Americans</td>
<td>1.0</td>
<td>$10,008</td>
<td>69</td>
<td>69.4</td>
<td>75.9</td>
</tr>
<tr>
<td>6</td>
<td>Black middle America</td>
<td>23.4</td>
<td>$15,407</td>
<td>75</td>
<td>69.6</td>
<td>75.9</td>
</tr>
<tr>
<td>7</td>
<td>Black poor rural South</td>
<td>5.8</td>
<td>$10,432</td>
<td>61</td>
<td>67.7</td>
<td>74.6</td>
</tr>
<tr>
<td>8</td>
<td>Black high-risk urban</td>
<td>7.5</td>
<td>$14,798</td>
<td>71</td>
<td>66.7</td>
<td>74.9</td>
</tr>
</tbody>
</table>

Adherence is critical

Major CV events are inversely proportional to patients’ adherence to prescribed medications

$P$ value for trend $< .0001$

Choudhry NK et al., American Heart Journal 2014
The Problem

- Approximately one third of patients with a history of myocardial infarction and approximately one half without do not adhere to effective cardiovascular preventive treatment.

- Non-adherence is not determined by the class of drug prescribed (aspirin, blood pressure-lowering drugs, or statins), suggesting that side effects are not the issue.

Individual adherence to antihypertensive medications

- Poor medication adherence among hypertensive patients ranges from 30 to 70%\(^1-3\)

- African Americans have been shown to be 1.81 to 4.30 times less likely to adhere to their antihypertensive medications than their white counterparts in major trials\(^4-6\)
  - HDFP: 60% in whites versus 48% in African Americans\(^7\)

- Several studies have reported that medication use is lower among Hispanics than African Americans or whites,\(^8\) with equal BP control

- Adherence rates among Asian American and Pacific Islanders (AAPI) are from 49% among Filipinos to 65% among Japanese hypertensive patients\(^9\)

Five Dimensions of Non-adherence

- Patient
  - Physical Factors/Impairments
  - Psychosocial/behavioral factors
  - Knowledge

- Social/Economic
  - Living conditions
  - Health literacy
  - Language proficiency
  - Cost

- Therapy
  - Complexity
  - Duration
  - Side effects
  - Immediate perceived benefits
  - Lack of symptoms
  - Chronic vs. Acute
  - Comorbid conditions

- Condition
  - Access
  - Patient-provider communication
  - Continuity of care
  - Provider bias

- Health Care System
  - Continuity of care
  - Provider bias

Adherence to long term therapies: Evidence to Action. World Health Organization, 2003
### Racial Differences in Beliefs

<table>
<thead>
<tr>
<th>Belief statements –% agree with statement</th>
<th>African-American</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription medications do more harm than good</td>
<td>25%</td>
<td>16%</td>
</tr>
<tr>
<td>People should stop prescription medications every now and again</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Most medications are addictive</td>
<td>40%</td>
<td>27%</td>
</tr>
<tr>
<td>Doctors trust prescription medications too much</td>
<td>46%</td>
<td>41%</td>
</tr>
<tr>
<td>Generics are not as good as brand-name medications</td>
<td>39%</td>
<td>19%</td>
</tr>
<tr>
<td>I am more likely to skip the dose of a generic medication</td>
<td>24%</td>
<td>10%</td>
</tr>
<tr>
<td>Insurance companies push generics to save money at the expense of my health</td>
<td>71%</td>
<td>56%</td>
</tr>
</tbody>
</table>

Health Literacy: A Hidden Problem

- Low health literacy is often undetected (not just education!).

- People who are confused about health information may feel ashamed.

- They may mask their shame to maintain their dignity.
93 Million Adults have Basic or Below Basic Literacy
2003 National Assessment of Adult Literacy

- Proficient: 13%
- Below Basic: 14%
- Intermediate: 44%
- Basic: 29%

Basic or Below Basic
52% of H.S. Grads
61% of Adults ≥ 65

Dr. Rima Rudd 2010
Harvard School of Public Health
Health Literacy

- Greater emergency room use
- Less likely to engage in disease prevention behavior
- Poorer medication adherence
- Inadequate care for chronic diseases
- Increased hospitalizations/costs
- Poorer health outcomes
- Increased risk of mortality
Collaborative communication in race-discordant relationships was associated with better adherence, with levels similar to being in a race-concordant relationship.

BUT white providers’ non-collaborative was associated with poor adherence.
Eliminating co-payments for medications after hospitalization for MI improves adherence about 5%.

Does not reduce major vascular events if revascularization is included.

Automated pharmacy outreach for statins

Age group, y

$\geq$70
60-69
50-59
40-49
<40

OR (95% CI)
Blister packs – including multi-drug blisters
Blister packs – including multi-drug blisters

Lee JK et al., JAMA. 2006
Mail-order pharmacy services

- 90-day mailed prescriptions may reduce barriers to access to medications and increase adherence
- Primarily benefits patients that prefer this method; reduces adherence in those that don’t

**Medication Adherence Rates (mean PDC) for 90-Day Prescriptions**

- Anti-diabetics: 77%
- Beta-blockers: 77%
- Calcium Channel Blockers: 79%
- Other anti-hypertensives: 78%
- Statins: 74%
- 90-Day Home Delivery Pharmacy: 68%


“methods of improving medication adherence for chronic health problems tested to date are mostly complex and not very effective”

“even when outcomes were improved… the effects were generally small”

“even in the studies with the strongest methodology, no consistent evidence exists that medication adherence can be improved within the resources usually available in clinical settings”

There is no evidence that low adherence can be 'cured'. Thus, effective methods to improve adherence must be maintained for as long as the treatment is needed, requiring interventions that can be integrated into the care system in a cost-effective manner.

Nieuwlaat et al, Cochrane Database Syst Rev, 2014
Patient Factors

Race/Ethnicity/SES

Physician Beliefs About Patient
(Beliefs about social and behavioral factors and Resources. Includes conscious and unconscious activated beliefs)

Patient Behavior in Encounter
(eg. Question-asking Self-disclosure, assertiveness)

Patient Cognitive & Affective States
(eg. Acceptance of medical advice, attitude, self-efficacy, intention)

Physician Interpretation of Symptoms

Physician/Patient Joint Clinical Decision-Making
(Diagnosis, Treatment Recommendation)

Provider Interpersonal Behavior
(eg. Participatory style, warmth, content, information giving, question-asking)

Patient Satisfaction, Trust

Patient Behaviors
(eg. Adherence, self-management, utilization)

Modified from: Risa Lavizzo-Morey, RWJF, and Unequal Treatment, NAP, 2002
“This is a classic example of impoverished data, on a huge, intractable problem, with poorly defined hypotheses, for which we have no useful tools or interventions.”
Creativity Science

FourSight Approach

- Clarify --- Ask the right question.
- Ideate --- Create multiple ideas/brainstorm
- Develop — Build out a solution
- Implement --- Rally others and execute solution

Team members will have natural talents in one of these areas—build teams to represent all four processes.
Conclusion

- There is no evidence that low adherence can be 'cured'.
- Effective methods to improve adherence must be maintained for as long as the treatment is needed.
- Interventions must be tailored for the individual patient and integrated into the care system as a routine of precision medicine.
- “The research in this field needs advances, including improved design of feasible long-term interventions, objective adherence measures, and sufficient study power to detect improvements in patient-important clinical outcomes.”

Modified from Nieuwlaat et al, Cochrane Database Syst Rev, 2014