Unconscious and Conscious Bias in the Care of the Pediatric Patient

Adil H Haider MD, MPH
Kessler Director
Center for Surgery and Public Health
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EQUALITY IS THE CORNERSTONE OF MEDICINE
Surgical Disparities Persist in 2015

Compared to Similar White Patients:

• Black women are 40% more likely to die of breast cancer
• Hispanic patients are 50% more likely to receive Heart Surgery at a Low quality/High mortality hospital
• Black Children are 70% more likely to die after a post operative complication

Racial Disparities in Trauma?

• Trauma should be immune...
  – Near universal access to Pre-Hospital Emergency Medical Services
  – Emergent nature of trauma
  – Emergency Departments are “the great equalizers,” supposedly color blind
Inferior Care for Minority Children

• After mild Traumatic Brain Injury (TBI), Black children received less extensive:
  – Work up
  – Observation period

Study on Racial Differences in Outcomes after Pediatric TBI
Objective

To identify disparities in clinical or functional outcomes between children of different races with moderate to severe traumatic brain injury.
41,112 Trauma Patients

7,778 had Moderate to Severe TBI

7,041 children analyzed

737 children: small sample size minorities

Mean Age 8.2
64% boys

4,762 White
1,238 Black
1,041 Hispanic
Adjusted odds of mortality, discharge disposition and functional deficit of Black and Hispanic vs. White children

Adjusted for age, sex, physiologic/anatomic injury severity and comorbidities
Case: T.C.
August 11, 2006

16 year old female
Multiple Gun Shots to Abdomen

• On Arrival  Heart Rate : 140 bpm
  Blood Pressure: 90/60 mmHg

Immediately rushed up to Operating Room
OR / Hospital Course

Trauma Laparotomy-
  Briefly pulseless, Aorta Clamped
  IVC injury repaired
  Multiple Enterotomies
Damage Control Operation; 37 units PRBC

3 Take Backs to OR, Out of ICU on POD 12
Survived- POD 17 on Floor, refusing all care
Patient Suffering from early form of PTSD

- Patient was involved in a hostage situation
- Received Gun Shots during fire fight between her captor and Baltimore Police
  - Night Tremors
  - Insomnia
  - Anhedonia
  - Hallucinations
Black Children Experience Worse Clinical and Functional Outcomes After Traumatic Brain Injury: An Analysis of the National Pediatric Trauma Registry

Adil H. Haider, MD, MPH, David T. Efron, MD, Elliott R. Haut, MD, Stephen M. DiRusso, MD, PhD, Thomas Sullivan, BS, and Edward E. Cornwell III, MD

**Background:** Recent studies suggest racial disparities in the treatment and outcomes of children with traumatic brain injury (TBI). This study aims to identify race-based clinical and functional outcome differences among pediatric TBI patients in a national database.

**Methods:** A total of 41,122 patients (ages 2–16 years) who were included in the National Pediatric Trauma Registry (from 1996–2001) were studied. TBI was categorized by Relative Head Injury Severity Score (RHISS) and patients with moderate to severe TBI were included. Individual race groups were compared with white as the majority group. Differences between races in functional outcomes at discharge in three domains—speech, locomotion, and feeding—were determined using multiple logistic regression. Cases were adjusted for age, sex, severity of head injury (using RHISS), severity of injury (using New Injury Severity Score and Pediatric Trauma Score), premorbidities, mechanism, and injury intent.

**Results:** A total of 7,778 children had moderate or severe TBI with or without associated injuries. All races had similar demographics. Hispanics (n = 1,041) had outcomes comparable to whites (n = 4,762). Black children (n = 1,238) had significantly increased premorbidities, penetrating trauma, and violent intent. They also had higher unadjusted mortality and longer mean intensive care unit and floor stays. After adjustment, there was no difference in the odds of death between black and white children. However, black patients were more likely to be discharged to an inpatient rehabilitation facility and had increased odds of possessing a functional deficit at discharge for all three domains studied.

**Conclusion:** Black children with traumatic brain injury have worse clinical and functional outcomes at discharge when compared with equivalently injured white children.

**Key Words:** Racial disparities, traumatic brain injury, functional outcomes.

2006 ACS Surgical Forum Excellence in Surgical Research Award
To the Editor: I find the publication of the article by Haider in this journal to be extremely troublesome; especially, after it was presented at the American Association for the Surgery of Trauma (AAST) without discussion allowed from the floor due to time restraints.

Their conclusions could have unintended consequences, and are an insult to those that take care of injured children.
Our Reply: We fully understand the discomfort a study such as this creates. Perhaps no topic in American dialogue generates as much emotion as race. Our own study group is a racially, ethnically, religiously diverse collection of investigators—all of whom have spent our entire careers at urban trauma centers caring for predominantly minority patients.

We feel personally challenged by the results of this study—but are no less convinced of its validity.
Our REAL Response

Ensure that we are using state of the art and cutting edge research methodology

so that we could really

“Seek the Truth”
Develop the interdisciplinary field of: Trauma Outcome Disparities

Brought together pioneers in these fields:

- Surgeons
- Epidemiologists and Biostatisticians
- Quality and Safety Specialists
- Disparity Scientists
Apply Public Health Problem Solving Approach

- Identify the Problem and Create Awareness
- Understand the Mechanisms that Lead to the Issue
- Engage Stakeholders
- Create Solutions and Disseminate them
Apply Public Health Problem Solving Approach

Identify the Problem and Create Awareness

Understand the Mechanisms that Lead to the Issue
Engage Stakeholders

Create Solutions and Disseminate them
Serially investigated potential factors that could lead to disparities

Host factors
- Preexisting functional status
- Comorbidities (diagnosed/undiagnosed)
- Obesity/adiposity
- Coping status
- Age
- Gender

Prehospital factors
- Emergency medical services
- Scene times
- Access to trauma care
- Geography

Hospital/Provider factors
- Trauma center/hospital quality
- Trauma volume/severity
- Provider training
- Unconscious bias
- Race
- Payer status

Posthospital Care/Rehabilitation
- Hospital disposition
- Access to high quality rehabilitation
- Socioeconomic status

Outcomes

Are Surgical Care Providers Biased?

Would we treat this patient differently?

There is no data to suggest that any of us would do so knowingly.
Hypothesis

Like the general population, doctors may possess unconscious biases or preferences.

These Unconscious or Implicit Biases may lead us to unknowingly treat patients differently.
Race Implicit Association Test

Computer-based test of social cognition

Measures time it takes to match representatives of social groups with good and bad attributes

Test-takers with an implicit preference for whites would pair white with pleasure faster than they would with Blacks

https://implicit.harvard.edu/implicit
Put your middle or index fingers on the E and I keys of your keyboard. Words or images representing the categories at the top will appear one-by-one in the middle of the screen. When the item belongs to a category on the left, press the E key; when the item belongs to a category on the right, press the I key. Items belong to only one category. If you make an error, an X will appear - fix the error by hitting the other key.

This is a timed sorting task. **GO AS FAST AS YOU CAN** while making as few mistakes as possible. Going too slow or making too many errors will result in an uninterpretable score. This task will take about 5 minutes to complete.

Press the **space bar** to begin.

If the E and I keys do not work, click the mouse inside the white box and try again.

If the red X appears, press the other key to make the red X go away.
If the E and I keys do not work, click the mouse inside the white box and try again.

If the red X appears, press the other key to make the red X go away.
African American  European American

If the E and I keys do not work, click the mouse inside the white box and try again.

If the red X appears, press the other key to make the red X go away.
See above, the categories have changed. The items for sorting have changed as well. The rules, however, are the same.

When the items belong to a category on the left, press the E key; when the item belongs to a category on the right, press the I key. Items belong to only one category. An X appears after an error - fix the error by hitting the other key. GO AS FAST AS YOU CAN.

Press the space bar to begin.

If the E and I keys do not work, click the mouse inside the white box and try again.

If the red X appears, press the other key to make the red X go away.
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If the E and I keys do not work, click the mouse inside the white box and try again.

If the red X appears, press the other key to make the red X go away.
Implicit preference for **Whites**: Response to these pairings is faster.
Implicit preference for Blacks:
Response to these pairings is faster

European American & bad
- pain
- death
- stink
- grief
- agony
- filth
- tragedy
- vomit

good & African American
- gentle
- happy
- smile
- joy
- warmth
- pleasure
- paradise
- rainbow
Understanding and Using the Implicit Association Test: III. Meta-Analysis of Predictive Validity

Anthony G. Greenwald  
University of Washington  

Eric Luis Uhlmann  
Northwestern University  

T. Andrew Pochman  
Southern Methodist University  

Mahzarin R. Banaji  
Harvard University  

This review of 122 research reports (184 independent samples, 14,900 subjects) found average $r = .274$ for prediction of behavioral, judgment, and physiological measures by Implicit Association Test (IAT) measures. Parallel explicit (i.e., self-report) measures, available in 156 of these samples (13,068 subjects), also predicted effectively (average $r = .361$), but with much greater variability of effect size. Predictive validity of self-report was impaired for socially sensitive topics, for which impression management may distort self-report responses. For 32 samples with criterion measures involving Black–White interracial behavior, predictive validity of IAT measures significantly exceeded that of self-report measures. Both IAT and self-report measures displayed incremental validity, with each measure predicting criterion variance beyond that predicted by the other. The more highly IAT and self-report measures were intercorrelated, the greater was the predictive validity of each.

Keywords: Implicit Association Test, implicit measures, validity, implicit attitudes, attitude–behavior relations

Supplemental materials: http://dx.doi.org/10.1037/a0015575.supp
Race IAT Results from General Pop (> 1 million responders)

- Strong preference for White people: 27%
- Moderate preference for White people: 27%
- Slight preference for White people: 16%
- Little to no automatic preference: 17%
- Slight preference for Black people: 6%
- Moderate preference for Black people: 4%
- Strong preference for Black people: 2%
Do these Implicit Preferences Impact Clinical Decision Making?

Implicit Bias among Physicians and its Prediction of Thrombolysis Decisions for Black and White Patients

Alexander R. Green, MD, MPH¹, Dana R. Carney, PhD², Daniel J. Pallin, MD, MPH³, Long H. Ngo, PhD⁴, Kristal L. Raymond, MPH⁵, Lisa I. Iezzoni, MD, MSc⁶, and Mahzarin R. Banaji, PhD²

¹The Disparities Solutions Center, Massachusetts General Hospital, Harvard Medical School, 50 Staniford Street, Suite 901, Boston, MA 02114, USA; ²Department of Psychology, Harvard University, Boston, MA, USA; ³Brigham and Women’s Hospital, Harvard Medical School, Boston, MA, USA; ⁴Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA; ⁵University of North Carolina–Chapel Hill, Chapel Hill, NC, USA; ⁶The Institute for Health Policy, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA.

**CONTEXT:** Studies documenting racial/ethnic disparities in health care frequently implicate physicians’ unconscious biases. No study to date has measured physicians’ unconscious racial bias to test whether this predicts physicians’ clinical decisions.

**OBJECTIVE:** To test whether physicians show implicit race bias and whether the magnitude of such bias predicts thrombolysis recommendations for black and white patients with acute coronary syndromes.

**DESIGN, SETTING, AND PARTICIPANTS:** An internet-based tool comprising a clinical vignette of a patient presenting to the emergency department with an acute coronary syndrome, followed by a questionnaire and

**CONCLUSIONS:** This study represents the first evidence of unconscious (implicit) race bias among physicians, its dissociation from conscious (explicit) bias, and its predictive validity. Results suggest that physicians’ unconscious biases may contribute to racial/ethnic disparities in use of medical procedures such as thrombolysis for myocardial infarction.

**KEY WORDS:** unconscious bias; thrombolysis; race; clinical decisions; disparities.

DOI: 10.1007/s11606-007-0258-5
Conclusion: Implicit Bias Predicts Thrombolysis


n=220
IM and Emed Residents
Need Conscious Mental Processing to Overcome Bias

- Implicit attitudes are more likely to influence behaviors when cognitive processing capacity is low:
  - due to fatigue
  - under pressure
  - cognitive overload
- It takes “cognitive luxury” to override implicit biases

**New Hypothesis:** Implicit bias could impact trauma provider care
Studies to determine association between implicit bias and clinical assessments

Clinical Vignettes in which Patient race randomly altered used to identify potential treatment differences

Similar strategy to compare Social Class: Occupation used as a proxy For example Lawyer compared to Toll Booth collector
IAT Medical Student Study

• Medical students (n=211) entering JHSOM Classes 2013 and 2014 completed a web survey
  1. Eight clinical scenario vignettes
  2. IAT—Race and Social Class
  3. Direct questions on race and class preferences
IAT Scores: Black vs. White

- Prefers Black
- Prefers White

2.0% - 6.1% - 5.6% - 17.8% - 15.2% - 31.0% - 22.3%

\[ \rho = -0.08 \]
IAT Scores: Black vs. White

- Prefers Black
- Prefers White

\[ \rho = -0.08 \]
Responses to Clinical Vignettes by Patient Race

Haider, AH et al. JAMA 2011; 306:942-951
IAT Scores: Upper vs. Lower Class

Prefers Lower

Prefers Upper
IAT Scores: Upper vs. Lower Class

\[ \rho = -0.43 \]

Prefers Lower

Prefers Upper
Responses to Clinical Vignettes by Patient Social Class

Haider, AH et al. JAMA 2011; 306:942-951
Conclusion

• A majority of medical students exhibit an unconscious bias preferring Whites and Upper Social class

• Unlike data on physicians, these biases do not impact their assessment of surgical patients
3 Additional Studies of Providers

- 750 Trauma Care Providers
  - 250 Nurses at JHMI
  - 250 Physicians and Mid-level Providers (NP, PA) at JHMI
  - 250 Members of Eastern Association for the Surgery of Trauma (EAST)
IAT Scores: Nurses


Figure 2. Implicit and explicit biases among registered nurses (RNs). Graphs depict a visual comparison of the number of RNs reporting (A) no explicit racial or (B) class bias to those demonstrating bias on implicit association testing.
IAT Scores: Surgeons

Results Similar to Med Students

• Implicit Racial Bias was not associated with Clinical Vignette Responses
• Same Held True for Vignettes on Social Class

Conclusion: Unable to demonstrate an association between IAT scores and responses to clinical vignettes
How does this relate to Children?

- Is the Bias towards to Patient or their Parents/Care givers
- Would providers do more to “protect/help” minority children from their care givers

Inconclusive Data: From Sabin et al. on a study of 85 pediatricians @ Univ Washington.

Need to observe real patient encounters to tell.
So how can we solve disparities?

1. Improve awareness of the problem
2. Create true funding streams for research
3. Use better approaches to truly understand why disparities occur and implement interventions
4. Give surgeons tools to provide more culturally appropriate and patient centered care
What I Believe

Science will inform policies that lead to a combination of
– Systemic Changes
– Societal Changes
– Health Care Work Force Changes

Which will lead to the
Eradication of Disparities
Thank You

CENTER FOR SURGERY AND PUBLIC HEALTH
At Brigham and Women’s Hospital

Facebook.com/csph.bwh
@CSPH_BWH  @adilhaiderMD