Racism and Racial Bias in Medicine

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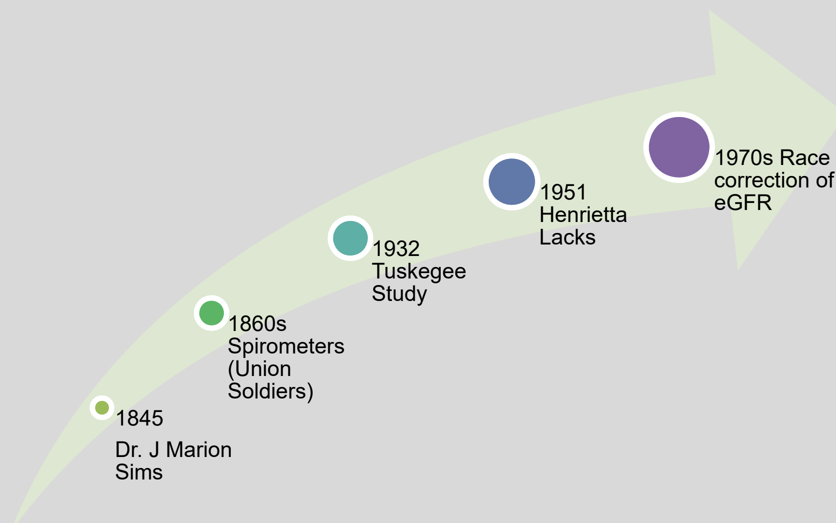
Objectives

- Racism in Medicine
- Racial Bias in Clinical Medicine
- Racial Correction among Clinical Guidelines
- Pathway forward

Racism in Medicine



What is racism?

a system of structuring opportunity and assigning value based on phenotypic properties (e.g., skin color and hair texture associated with "race" in the United States), which ranges from daily interpersonal interactions shaped by race to racialized opportunities for good education, housing, employment, and other resources, and unfairly disadvantages people belonging to marginalized racial groups. (APA Dictionary of Psychology)

Race is a social construct

- Race is not based on genetics
- ***There is greater genetic variation within races than between races***
  - Single race does not represent a common ancestry or biologic homogeneity
  - Standardization or consensus of racial or ethnic classifications are lacking

Racial Bias in Medical Education

- Race is misrepresented in medical education
- Presented as a risk factor for a disease often without the social context
- Clinical guidelines that use race as risk factor
- The connection between race and disease is rarely neutral
- Racial bias is reinforced in textbooks and among standardized testing

Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites

Table 1.

Percentage of white participants endorsing beliefs about biological differences between blacks and whites

Item	Study 1: Online sample (*n* = 92)	Study 2			
		First years (*n* = 63)	Second years (*n* = 72)	Third years (*n* = 59)	Residents (*n* = 28)
Blacks' nerve endings are less sensitive than whites'	20	8	14	0	4
Blacks' skin is thicker than whites'	58	40	42	22	25

Hoffman KM, Trawalter S, Axt JR, Oliver MN. Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. Proc Natl Acad Sci U S A. 2016 Apr 19;113(16):4296-301. doi: 10.1073/pnas.1516047113. Epub 2016 Apr 4. PMID: 27044069; PMCID: PMC4843483.

Racial Bias in Clinical Care

- Physicians and nurses have implicit bias similarly to the general population
- Pain is consistently underestimated and undertreated in Blacks compared to Whites
- Stigmatizing language in charts
  - Use of term "sickler" associated with negative attitudes towards patients with sickle cell disease
  - Minority patients were 2.54 times as likely to have negative descriptors

Race Correction in Clinical Guidelines

- Formal recommendations that is formed based on scientific evidence
- Improve health outcomes by reducing inappropriate variations in care
- Allows for individualized risk assessments that can be used to guide clinical management
- Race corrections are modifications of the clinical guideline based on the race of the individual

Get with the Guidelines-Heart Failure Risk Score

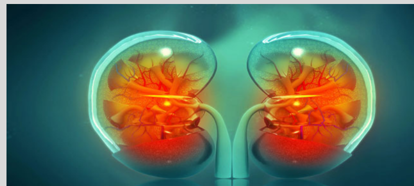
- Predicts in hospital mortality among patients with acute heart failure
- Input Variables:
  - SBP, BUN, Na, Age, HR, HX of COPD, Black or Nonblack
- Impact: nonblack individuals receive 3 additional points
- Potential harm:
  - Decrease allocation of health resources
  - Decrease referral to cardiology

Estimated GFR Calculator

- EGFR MDRD and CKD-EPI equations
- Input Variables:
  - Serum Creatinine, Age, Sex, Race (black, white, other)
- Impact: *reports higher GFR values for black indivdiuals at a given creatinine than non-black individuals*
- Potential harm:
  - Delay referrals to nephrology
  - Delay consideration for renal transplant
  - Inappropriate continuation of metformin
- *Multiracial?*

Estimated GFR Calculator

- National Kidney Foundation & American Society of Nephrology established a taskforce
- **Objective**: to reassess the inclusion of race in the estimation of glomerular filtration rate (GFR) and its implications for diagnosis and management of patients with, or at risk for, kidney diseases.



Estimated GFR Calculator

- “For US adults (>85% of whom have normal kidney function), we recommend immediate implementation of the CKD-EPI creatinine equation refit without the race variable in all laboratories in the United States because it does not include race in the calculation and reporting, included diversity in its development, is immediately available to all laboratories in the United States, and has acceptable performance characteristics and potential consequences that do not disproportionately affect any one group of individuals.”

VBAC

- Vaginal Birth after Cesarean
- Predicts risk of attempts of vaginal delivery for an individual following a cesarean
- Components:
  - Age, BMI, Prior vaginal delivery, Prior VBAC, Recurring indication for c-sxn, African American race, Hispanic ethnicity
- Predicts a lower likelihood of VBAC success for Blacks and Hispanics
- Potential harm:
  - Higher rates of repeat cesarean among Blacks and Hispanics
  - Longer recovery times, greater risk of surgical complications, greater risk of complications during subsequent pregnancies
  - Higher rates of post-partum hemorrhage and infection

Racial Bias in AI

Dissecting racial bias in an algorithm used to manage the health of populations (Obermeyer et al., 2019)

- Racial bias within algorithm lead to reduced number of black patients identified for extra care by more than half
- *"the algorithm uses health costs as a proxy for health needs. Less money is spent on Black patients who have the same level of need, and the algorithm thus falsely concludes that Black patients are healthier than equally sick White patients"*

Pulse oximetry varies with skin tone

- Pulse oximetry is the most common tool to assess blood oxygen saturation
- Not initially studied among a diverse population
- Overestimate the true oxygen saturation of individuals with darker pigmented skin
- Black patients had nearly 3 times the frequency of occult hypoxemia compared to white patients

Pulse oximetry and race

- **Racial and Ethnic Discrepancy in Pulse Oximetry and Delayed Identification of Treatment Eligibility Among Patients With COVID-19 (JAMA, Fawzy et al, 2022)**
- Retrospective cohort study analyzed 7126 patients with covid
  - Compared concurrently measured pulse oximetry and arterial blood gas
- Pulse oximetry overestimated arterial oxygen saturation levels among Asian, Black and Hispanic patients compared to White patients
- Associated with delays or unrecognized eligibility for COVID 19 therapies among Black and Hispanic patients

Pulmonary Function Test

- Pulmonary Function Tests include race-specific equations or adjustments
- Decreases the lower limit of normal for FEV1 and FVC
- "requires results from Black patients to be lower- in some cases by 15% -- than those from white patients of the same sex, height, and age in order for the PFT measurements to be interpreted as abnormal" (American Thoracic Society)

Pulmonary Function Test

- The Impact of Race Correction on the Interpretation of Pulmonary Function Testing Among Black Patients (A. T. Moffett et al)
  - N=14,080 PFTs
- Increase prevalence of obstructive lung disease (22.1%->23.9%)
- Increase prevalence of restrictive lung disease (8.8% -> 13.5%)
- Removal of race led to an increase in percentage of any pulmonary defect from 59.5% ->81.7%
- 48.6% increase in severity of obstructive, restrictive or mixed lung disease.

Racial Bias and Medical Equipment – Pulmonary Function Test

- Race and Ethnicity in Pulmonary Function Test Interpretation: An Official American Thoracic Society Statement (American Journal of Respiratory and Critical Care Medicine)
- 2021 American Thoracic Society convened expert panel
- Recommendation to replace race and ethnicity specific equations with race neutral average reference equations
- "The superficial appearance of race should not be used to infer biological characteristics. Continued use of race in PFT interpretation risks perpetuating false ideas that race distinguishes people on the basis of innate and immutable features."
- "Normalization of differences with race-specific equations in PFT interpretation potentially contributes to medical harms from the lack of attention to modifiable risk factors for reduced pulmonary function resulting from racism."

COVID-19

- Public Health Emergency of International Concern (Jan 2020)
- By the end of 2020, 1,813,188 deaths had been due to COVID-19 globally (World Health Organization)
- 3rd leading cause of death in the US (2020)
  - 385,000 Deaths in US

Risk for COVID-19 Infection, Hospitalization, & Death by Race/Ethnicity

Rate ratios compared to White, Non-Hispanic persons	American Indian or Alaska Native, Non-Hispanic persons	Asian, Non-Hispanic persons	Black or African American, Non-Hispanic persons	Hispanic or Latino persons
Cases[1]	1.6x	0.8x	1.1x	1.5x
Hospitalization[2]	2.4x	0.7x	2.0x	1.8x
Death[3, 4]	2.0x	0.7x	1.6x	1.7x

Source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases

COVID and Race

- Association of Race with Mortality Among Patients Hospitalized with Coronavirus Disease at 92 US Hospitals
- N = 11,210 in 12 states
- Objective: To evaluate the association of race, adjusting for sociodemographic and clinical factors, on all-cause, in-hospital mortality for patients with COVID-19.
- *"After adjustment for age, sex, insurance, comorbidities, neighborhood deprivation, and site of care, there was no statistically significant difference in risk of mortality between Black and White patients"*

Social Determinants of Health

- The conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life (WHO)
  - Education
  - Housing
  - Food Insecurity
  - Employment and Job Insecurity
  - Economic Stability
  - Healthcare Access and Quality
  - Neighborhood and Built Environment
  - Social and Community Context

Healthy People 2030, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Retrieved [date graphic was accessed], from https://health.gov/healthypeople/objectives-and-data/social-determinants-health

Diabetes and SDoH

- SES strong predictor of disease onset and progression
- Health insurance is the strongest single predictor of meeting DM quality measures
- Residential segregation (race/ethnicity and income)
- ADA Health Equity Bill of Rights: unequal distribution of resources, services and health risks contribute to diabetes disparities

How do we respond

- "In many areas of the world, the categorization of people by race is associated with structural racism and its negative effects. Globally, race/ethnicity is a social construct that changes across geography and time, making it difficult to envision it as a fixed characteristic of people; this is true now more than ever before with increased movement of people and mixing of cultures."
  - Nirav R. Bhakta, MD, PhD, University of California, San Francisco School of Medicine.

How do we respond - Medical Education

- Recognize race as a social construct distinct from ethnicity, genetic ancestry or biology
- Presents race within a socioecological model of individual, community and society to explain how racism and systemic oppression result in racial health disparities (AMA)

How do we respond - Research

- Recognize race as a social construct distinct from ethnicity, genetic ancestry or biology
- Ensure that research is inclusive & has diverse participants
- Prevent the incorporation of current biases into AI or machine learning algorithms

How do we respond – Clinical Care

- Increase awareness of personal implicit bias
- Analyze algorithms or policies that have race correction
- Recognize that risks associated with certain groups may represent modifiable risk factors
- Support the development of policies that reduce racial bias and health inequities