Reconsidering Race in Clinical Algorithms

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Introductions

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Reconsidering Race in Clinical Algorithms & Calculators

Disclosures: None

Objectives

- Describe the historical and current day use of race in medicine
- Recognize how the use of race impacts patient care across subspecialities
- Discuss challenges and benefits of moving from race-based medicine to race conscious medicine

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Race-Based Medicine

THE LANCET

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Viewpoint

From race-based to race-conscious medicine: how anti-racist uprisings call us to act

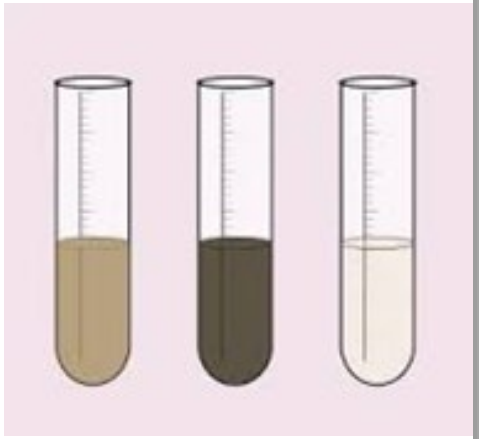
Jessica P Cerdeña MPhil [b c †], Marie V Plaisime MPH [d †], Jennifer Tsai MD [a †]

"Race-based medicine: a system by which research characterizes race as an essential, biological variable, that is then translated into clinical practice."

Race-Based Medicine

Research and education of disease etiology and management hyper-focuses on race as an independent contributor of health and health disparities, rather than established issues such as:

- Racialized policies
- Socioeconomic status and life stressors
- Access to healthcare
- Mistreatment of minoritized populations

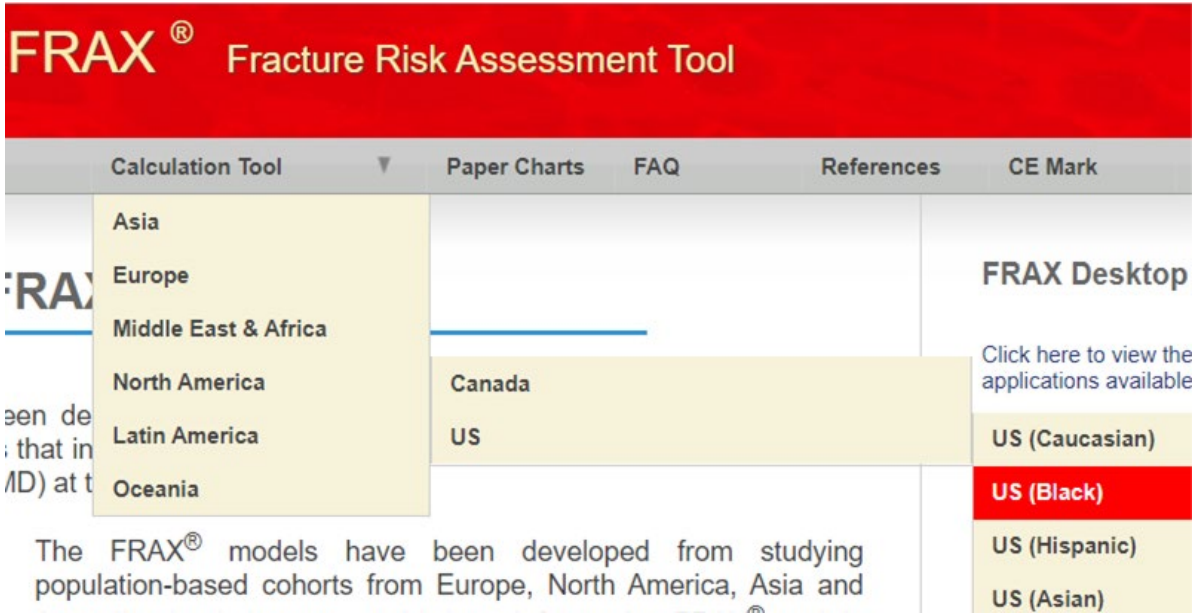


Additionally our own biases are unconsciously reinforced by:

- False correspondence between race, biology and genetics
- Perpetuation of harmful stereotypes
- Lack of awareness about racism in medicine

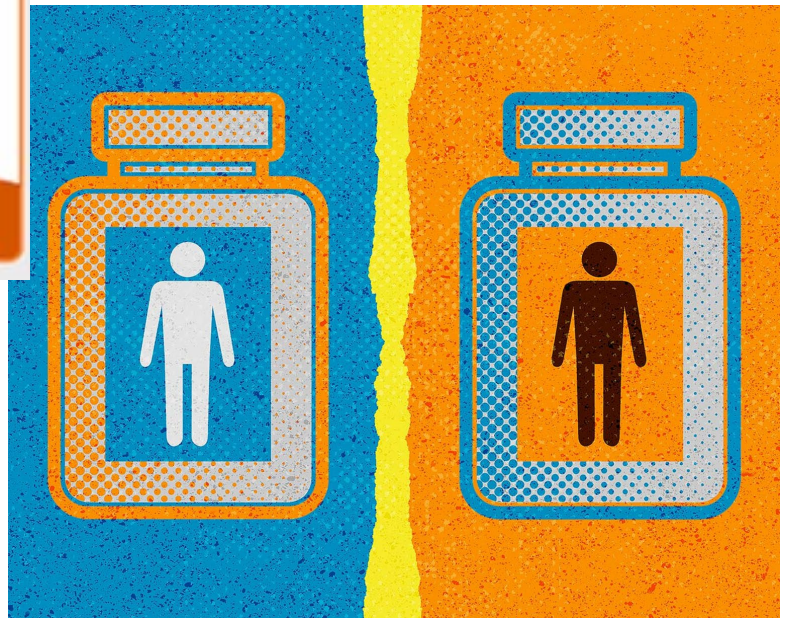
Race in Risk Algorithms & Calculators

Osteoporosis

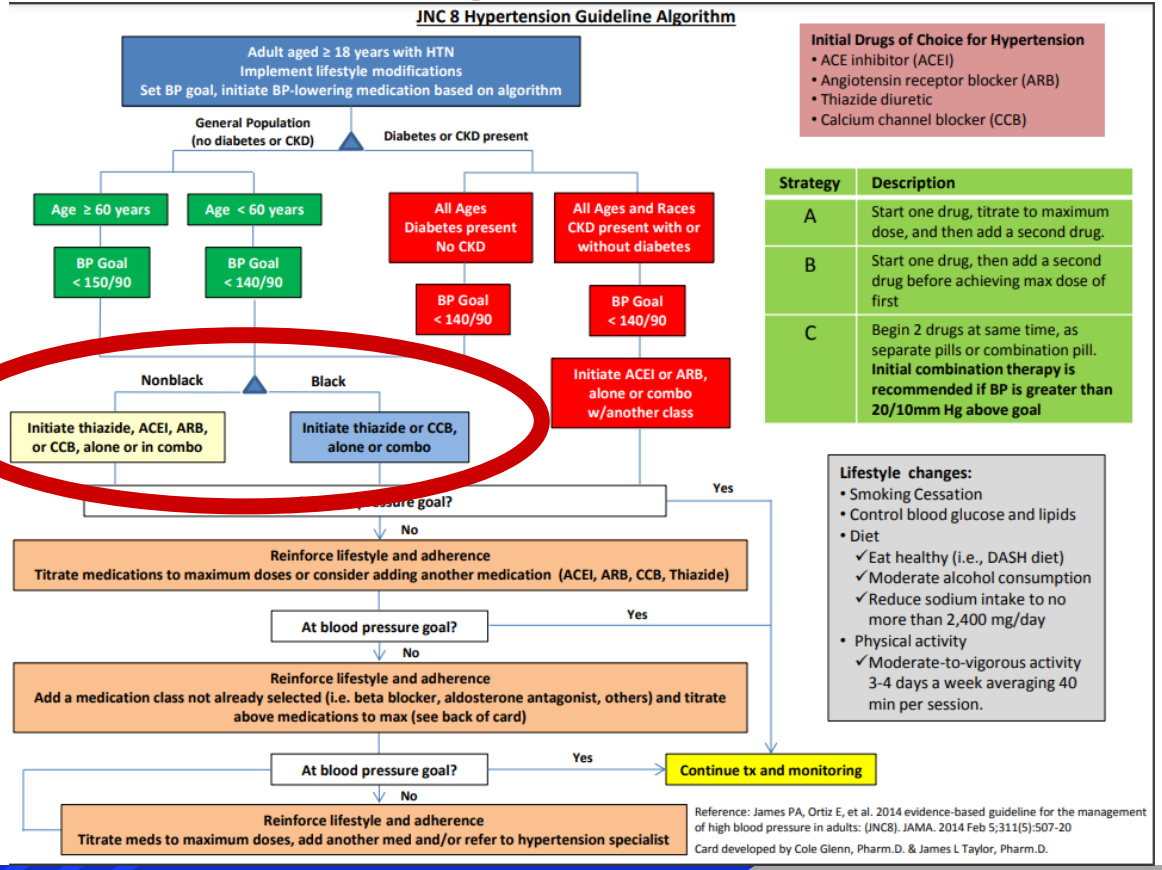


Race in Risk Algorithms & Calculators

Heart Failure



Race in Risk Algorithms & Calculators



Hypertension

Race

"***Race is a social construct*** that is used to group people based on physical characteristics, behavioral patterns, and geographic location. Racial categories are broad, poorly defined, vary by country and change over time.

People who are assigned to the same racial category do not necessarily share the same genetic ancestry; therefore, there are no underlying genetic or biological factors that unite people within the same racial category."

AAFP Policy on Race Based Medicine, July 2020

Race

“By using race as a biological marker for disease states or as a variable in medical diagnosis and treatment, the true health status of a patient may not be accurately assessed, which can ***lead to racial health disparities***.

The American Academy of Family Physicians (AAFP) opposes the use of race as a proxy for biology or genetics in clinical evaluation and management and in research.”

AAFP Policy on Race Based Medicine, July 2020

Historical Use of Race in Medicine

Philosophy

Human freedom, individual rights, principles of liberal democracy

- concept of original thought, empiricism, and the scientific method, ***but also . . .***
- “natural law”, promote oppressive social policies
- develop a hierarchy of race
    - justify the extermination of indigenous peoples
    - promote chattel slavery

Historical Use of Race in Medicine

Statistics

Karl Pearson - Pearson correlation coefficient

Ronald Fisher - concept of statistical significance

- Both eugenicists
- Observed differences
- Use calculations to support racism

Race in Medicine Today

- In 2003, the Human Genome Project concluded that humans are 99.9% genetically identical

  Proving that ***there is no genetic basis for race***

- Race is a social construct, yet it is still used as a biological variable in medical research to guide clinical guidelines.

- Clinical guidelines created based on race **directly impacts:**
  - Medical diagnosis
  - Treatment options
  - Quality of care that a patient receives

Let's Get on the Same Page

Health Disparity vs. Health Equity

Health Disparity

- A ***health difference*** closely linked with social, economic and/or environmental disadvantage

- Adversely affects groups of people who have systematically experience greater obstacles to accessing quality health care

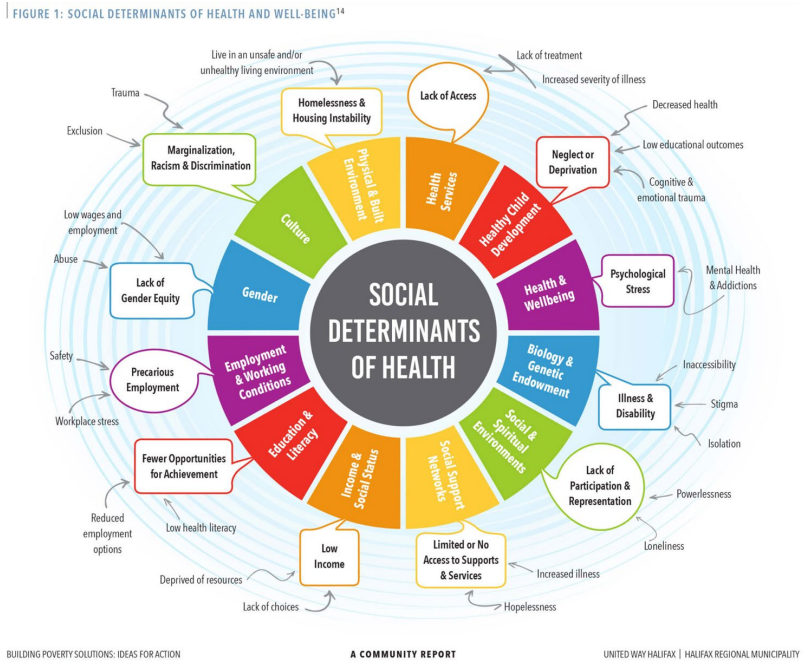
Health Disparity vs. Health Equity

Health Equity

- The attainment of the highest level of health for ALL people.

- Requires ***valuing everyone equally*** with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and health care disparities.

Social Determinants of Health



Impact of race on patient care

across subspecialties

Perception of Pain

The Historical Context of Pain Perception

- **Dr. J Marion Sims (1813-1883)** is known as the *"Father of Modern Gynecology"* due to his development of the successful operation of the vesicovaginal fistula.

- Dr. Sims carried out this surgical procedure on a group of enslaved Black women and performed up **to 30 operations in each woman** between late 1845 and the summer of 1849. **These women were provided no anesthesia.**

- Ether anesthesia was discovered in 1846 and Dr. Sims still did not utilized this during his operations with the above enslaved Black women and often praised the courage and strength of these enslaved black women tolerating his operations.

- Several physicians in the 19th century endorsed the expectation that black people were "more insensible to pain" which further perpetuated racial disparities and health inequalities that continue to be present today.

Racial Bias in the Perception of Pain

- A **meta-analysis published by the AAPM** in 2012 which included 22 years of observational studies that assessed pain assessments in numerous settings found the following:
    - Black/African American patients were **22% less likely** than White/Caucasian patients to receive any analgesia.
    - Black/African Americans were **29% less likely** than their White/Caucasian patients to receive treatment with opioids for similar painful conditions.
    - Hispanics/Latinos were **22% less likely** than their White counterparts to receive treatment with opioids.

Racial Bias in the Perception of Pain

Study #1: 121 participants

- Inclusion Criteria: US, native English Speaker, no medical training
- Randomly assigned to the rate the pain of gender matched black or white persons within the same scenario.
- **23.82% endorsed biological beliefs and 22.43% endorsed false beliefs**
- **73% endorsed at least one false belief item were possibly, probably or definitely true**

Study #2: 222 participants

- Inclusion Criteria: same as #1 but had medical training
- Provided pain ratings and recommendations for both black and white people within the scenarios.
- **11. 55% endorsed false beliefs**
- **50% reported at least one false belief item was possibly, probably or definitely true**

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 age more slowly than whites	23	21	28	12	14
Blacks' nerve endings are less sensitive than whites'	20	8	14	0	4
Black people's blood coagulates more quickly than whites'	39	29	17	3	4
Whites have larger brains than blacks	12	2	1	0	0
Whites are less susceptible to heart disease than blacks*	43	63	83	66	50
Blacks are less likely to contract spinal cord diseases*	42	46	67	56	57
Whites have a better sense of hearing compared with blacks	10	3	7	0	0
Blacks' skin is thicker than whites'	58	40	42	22	25
Blacks have denser, stronger bones than whites*	39	25	78	41	29
Blacks have a more sensitive sense of smell than whites	20	10	18	3	7
Whites have a more efficient respiratory system than blacks	16	8	3	2	4
Black couples are significantly more fertile than white couples	17	10	15	2	7
Whites are less likely to have a stroke than blacks*	29	49	63	44	46
Blacks are better at detecting movement than whites	18	14	15	5	11
Blacks have stronger immune systems than whites	14	21	15	3	4
False beliefs composite (11 items), mean (SD)	22.43 (22.93)	14.86 (19.48)	15.91 (19.34)	4.78 (9.89)	7.14 (14.50)
Range	0–100	0–81.82	0–90.91	0–54.55	0–63.64
Combined mean (SD) (medical sample only)			11.55 (17.38)		

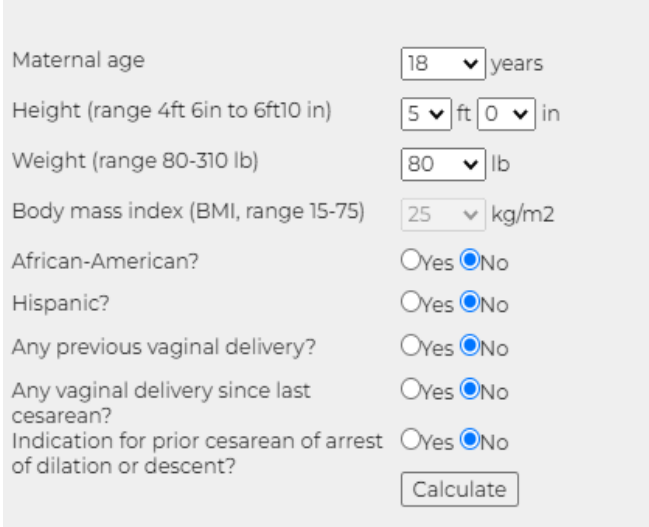
University of Virginia, 2016

Vaginal Birth After Cesarean (VBAC)

VBAC Calculator: The Origin

- **Vaginal Birth After C-section** is a term used for women who have had a cesarean section in the past and have decided on a proceeding with a successful vaginal birth in their current pregnancy.

- The VBAC calculator **was originally created in 2007 by the MFMU**.
  - There were **six variables** identified that impacted a women's chance of completing a successful C-section after a vaginal delivery.
  - The total number of points are inversely correlated with their chance of a successful VBAC.



VBAC Calculator and Race

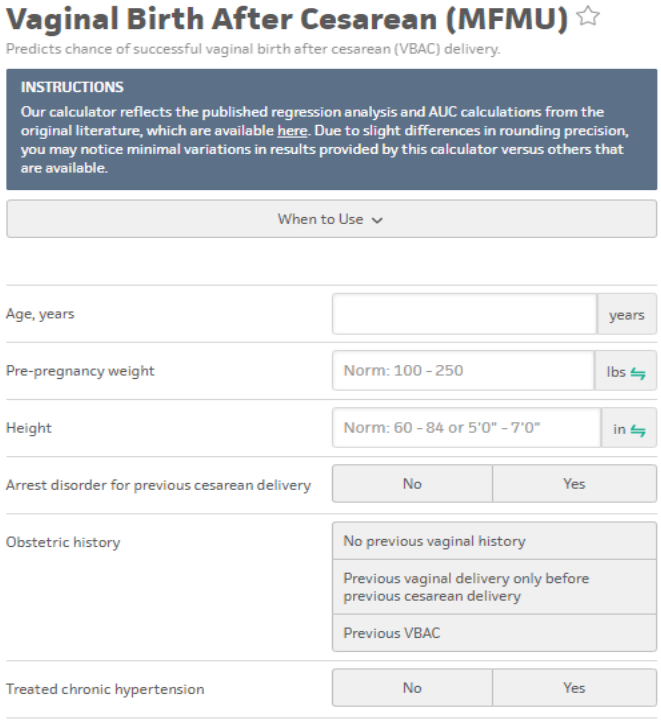
- The original VBAC calculator had ***two race-based correction factors***. The factors included one for African Americans and another for Hispanics.
    - These factors “subtracted” from the overall success of proceeding with a VBAC.
    - This lowered the chance of VBAC success associated with African Americans and Hispanics in comparison with their Caucasian counterparts.
- Including race in the VBAC calculator further implements racial disparities and discourages clinical providers from having non-white women perform a trial of labor after a C-Section.

VBAC Calculator and Race: Where are we today?

- **Race was removed from the VBAC calculator in 2021.**

- The MFMU Network now has an updated VBAC calculator without race. It is noted that an additional component of chronic HTN is a new variable added to the calculator as well.

- This updated clinical calculator is based on a study completed in 2021 that involved a secondary analysis of the Cesarean Registry of the MFMU Network that **used the same initial MFMU dataset** that derived the original VBAC calculator.



Pulse Oximetry

Pulse Oximetry

- Devices developed and approved for medical use among heterogeneous populations that do not reflect the diversity of the patients we care for.

- Devices are known to work less accurately on populations with darker skin tones because melanin, interferes with light-based pulse ox measurements.

- **This means individuals with darker skin tones can exhibit normal pulse ox readings, but be suffering from hypoxemia or other critical conditions.**

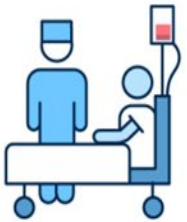
Pulse Oximetry

IHPI BRIEF

Pulse Oximeters are Less Accurate in Hospitalized Black Patients

INSTITUTE FOR HEALTHCARE POLICY & INNOVATION
UNIVERSITY OF MICHIGAN

Studies of three patient populations found that pulse oximeters missed low blood oxygen levels at a significantly higher frequency in Black patients than in White patients.



Critically ill adults in the intensive care unit

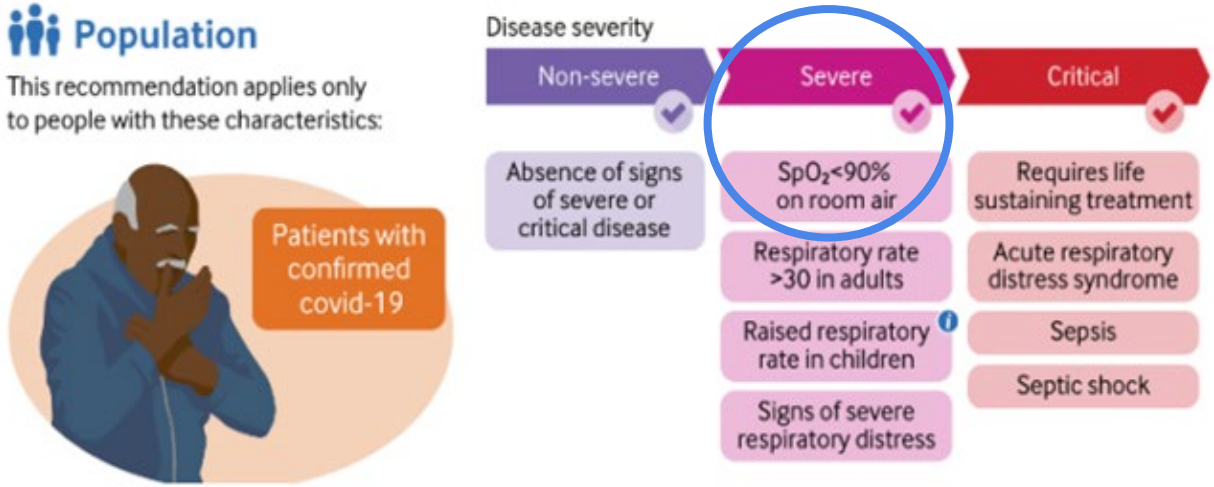
Children admitted to the hospital

Adults hospitalized at U.S. Veterans Health Administration hospitals

Pulse Oximetry

- Black patients experience more occult hypoxemia than White patients, which is associated with increased mortality in a variety of clinical situations.

- Particularly a concern over the COVID-19 pandemic as **clinical algorithms required documentation of hypoxemia *prior to* initiating potentially life-saving treatment measures.**



Racial discrepancy in pulse oximeter accuracy in preterm infants

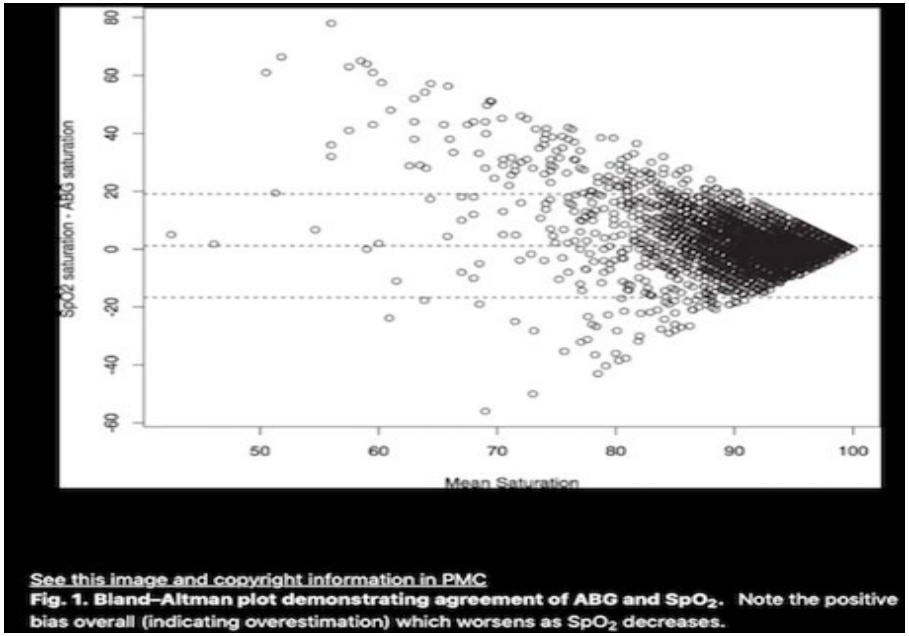


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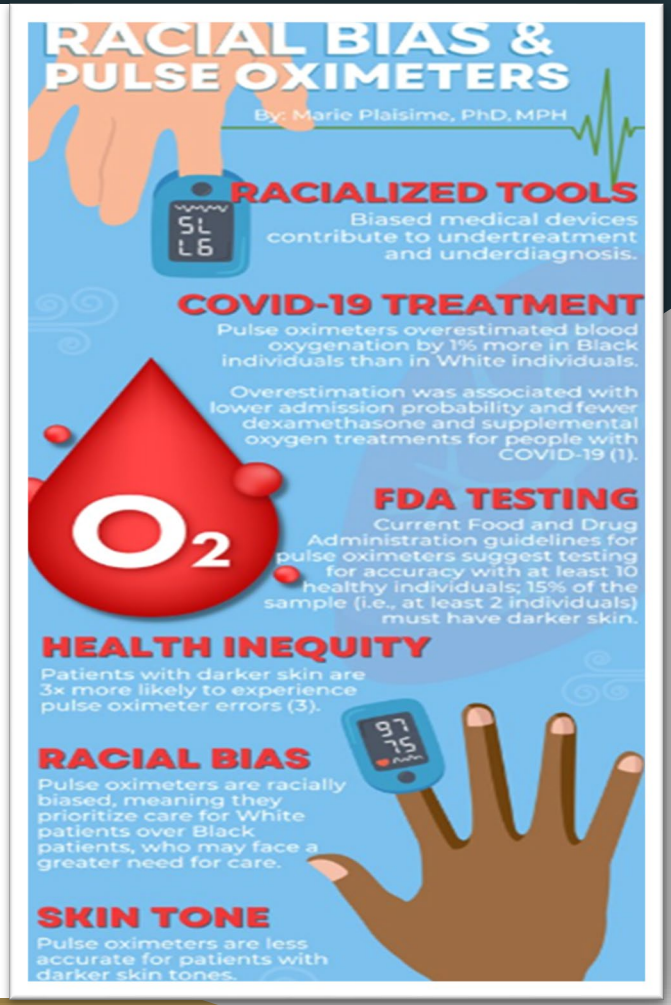
Fig. 1. Bland–Altman plot demonstrating agreement of ABG and SpO_2. Note the positive bias overall (indicating overestimation) which worsens as SpO_2 decreases.

- Pulse ox commonly used in Neonatology
- Total of 294 premature infants < 32 weeks were examined in this study (124 Black and 170 White)
- All underwent simultaneous arterial blood gas and pulse oximetry measurement.
- Results showed **SpO2 overestimation, measured by mean bias, was 2.4-fold greater for Black infants and resulted in greater occult hypoxemia** (SpO2 > 90% when actual SaO2 < 85%)

Pulse Oximetry:
Where are we today?

- Most devices standardized for patients with lighter skin ones.
- Future studies could measure skin tone and oxygen delivery more directly while also examining other comorbidities and sociodemographic factors that may contribute to disparities.
- Recently, FDA announced plans to change pulse ox measures to aid in calibrating the device to perform equally across all skin tones.
- However, these standards have not been approved at this time.

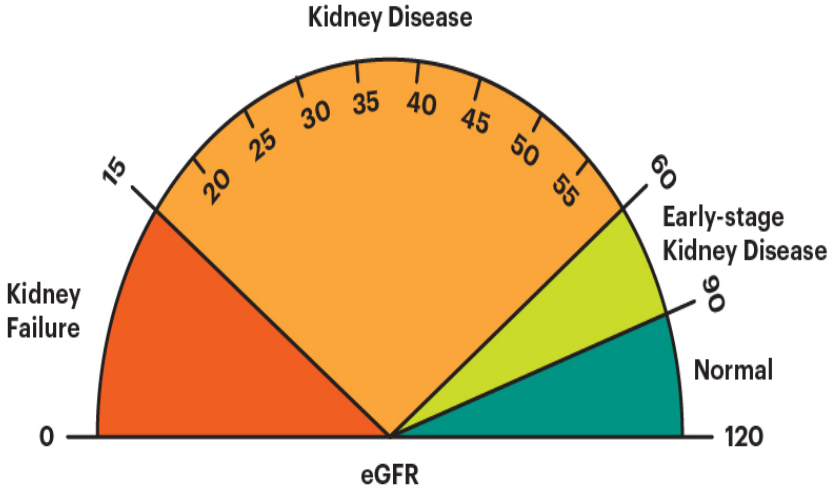


Estimated Glomerular Filtration Rate (eGFR)

eGFR

- Used to help diagnosis and stage kidney disease, decide medication dosing, accessibility of treatment modalities, decide when to initiate dialysis, renal transplant list enrollment and more.

- The most commonly used eGFR equation encompasses age, sex, level of creatinine **… and race.**



eGFR

	White	Black
Serum creatinine µmol/l (mg/dL)	250 (2.8)	250 (2.8)
Age	55	55
Sex	F	F
Weight (kg)	80	80
Height (cm)	160	160
BSA (m^2)	1.89	1.89
Cockroft-Gault (ml/min)	28	28
MDRD (ml/min/1.73m^2)	18	22
CKD-EPI (ml/min/1.73m^2)	18	21

Consequence of race adjustment?

Ex) 55 year old women same:

- serum creatinine
- age
- weight
- height
- body surface area

A White woman would be referred for kidney transplant evaluation

... a Black woman would not.

Moving from race-based medicine to race consciousness medicine

How to Overcome Race-Based Medicine

- Don’t use race as an independent risk factor for a disease process.
- Promote the removal of race from the one-liner.
- Understand the role that SDoH play in healthcare outcomes.
- Even though discrimination on the level of racism, sexism, ableism, etc is not listed under the SDoH, the stress from experiencing these things do contribute to poor health outcomes.
- Push forward research that focuses on the structural barriers that yield various clinical outcomes.
- Advocate for policies that help to break down the structural barriers that promote health inequities.
- Don’t be afraid to challenge the norm and constantly ask yourself:

How does the inclusion of race perpetuate/alleviate health inequity?

Race-Based → Race Conscious Medicine

Ex) Hypertension

Assumes and asserts biologic difference among racial and ethnic groups

Ex) Pre-Eclampsia

Addresses structural racism and resultant health inequity

When is it generally appropriate to use race in clinical care decisions?

Acknowledgement of race as a social construct and aim is health equity.

Organizational Statements

Organizational Statements

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HEALTH EQUITY

AMA: Racism is a threat to public health

NOV 16, 2020 • 5 MIN READ

Kevin B. O'Reilly
News Editor

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Building on its June pledge to confront systemic racism and police brutality, the AMA has taken action to explicitly recognize racism as a public health threat and detailed a plan to mitigate its effects.

AMA Equity Plan 2021-2023

Read about the AMA's strategic plan to embed racial justice and advance health equity.

Read the Strategy

"The AMA recognizes that racism negatively impacts and exacerbates health inequities among historically marginalized communities. Without systemic and structural-level change, health inequities will continue to exist, and the overall health of the nation will suffer," said AMA Board Member Willarda V. Edwards, MD, MBA.

"As physicians and leaders in medicine, we are committed to optimal health for all, and are working to ensure all people and communities reach their full health potential," Dr. Edwards said. "Declaring racism as an urgent public health threat is a step in the right direction toward advancing equity in medicine and public health, while creating pathways for truth, healing, and reconciliation."

Organizational Statements

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

The Impact of Racism on Child and Adolescent Health

Maria Trent, MD, MPH, FAAP, FSAHM,[a] Danielle G. Dooley, MD, MPhil, FAAP,[b] Jacqueline Dougé, MD, MPH, FAAP,[c] SECTION ON ADOLESCENT HEALTH, COUNCIL ON COMMUNITY PEDIATRICS, COMMITTEE ON ADOLESCENCE

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

Eliminating Race-Based Medicine

Joseph L. Wright, MD, MPH, FAAP,[a,b] Wendy S. Davis, MD, FAAP,[c] Madeline M. Joseph, MD, FAAP,[d] Angela M. Ellison, MD, MSc, FAAP,[e,f] Nia J. Heard-Garris, MD, MSc, FAAP,[f] Tiffani L. Johnson, MD, MSc, FAAP,[g] and the AAP Board Committee on Equity

Organizational Statements

The NEW ENGLAND JOURNAL of MEDICINE

Race and Medicine

The Race and Medicine collection reflects NEJM's commitment to understanding and combating racism as a public health and human rights crisis. Our commitment to antiracism includes efforts to educate the medical community about systemic racism, to support physicians and aspiring physicians who are Black, Indigenous, and people of color, and ultimately to improve the care and lives of patients who are Black, Indigenous, and people of color.

Organizational Statements

Society for Maternal•Fetal Medicine

SMFM Special Statement: Race in maternal–fetal medicine research–Dispelling myths and taking an accurate, antiracist approach

Profound inequities in maternal and infant outcomes based on race exist, and the maternal-fetal medicine community has an important role in eliminating these disparities. Accurately employing race and ethnicity as social constructs within research that guides clinical practice is essential to achieving health equity. We must abandon commonly propagated myths that race is a surrogate for genetics or economic status and that data are exempt from potential bias. These myths can lead to harmful misconceptions that exacerbate racial disparities in maternal and infant health outcomes. Furthermore, these myths obscure racism as the true underlying etiology of racial disparities. Understanding that race is a social construct and using an antiracist approach to research are essential in combating racism and eliminating unacceptable disparities in maternal and infant health. This document provides specific suggestions to approach the research process with an antiracist framework.

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