Pharmacogenetics, Personalized Medicine, and Race: Understanding Implicit Bias

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Objectives

By the end of this session, learners will be able to:

- Distinguish between implicit and explicit bias
- Define empathy in the context of delivery of care
- Value the complexity in studying gene-environment interactions
- Identify at least one strategy for reducing racial bias in personalized medicine
Overview

- 9:20-9:30: Concepts of race, ethnicity, biases, and equity
- 9:30-9:35: Racial biases in care delivery
- 9:35-9:45: Implications of race, ethnicity, and pharmacogenetics for personalized medicine
- 9:45-10:00: Small group exercise
- 10:00-10:15: Discussion and summary
Concepts of Race, Ethnicity, Biases, and Equity
Race, Ethnicity, and Culture

- Social derived constructs with historical underpinnings

- **Race**
  - Describes people by their phenotype
  - Emerged as a term in North America in the 16th and 17th centuries

- **Ethnicity**
  - Classification of people based on shared experiences (Peoples and Bailey, 2012)
  - Ancestry, culture, language, nationality, cuisine, art, religion, and physical appearance

- **Culture**
  - Interrelated with race and ethnicity
  - Set of learned values, beliefs, customs, and behaviors (Leifer and Fleck, 2012)
  - Influences how people perceive, act, and react to others and things

Carter-Edwards et al., 2018
Race, Ethnicity, and Culture (2)

- Historically associated with **social determinants of health**
  - Economic stability
  - Education
  - Social and community context
  - Health and health care
  - Neighborhood and the built environment

- **Health Disparities**
  - Disproportionate difference in social determinants that negative impact less advantaged groups

- “**Such disparities can contribute to missed opportunities in health care decision-making and negatively impact the capacity to prevent or treat chronic disease and develop self-management plans**” (Carter-Edwards et al., 2018; Salmond and Echevarria, 2017)
Health Equity and Related Terminology

Health Disparities
- Differences in health that are not only unnecessary and avoidable but, in addition, are considered unfair and unjust

Social Determinants of Health
- Conditions in which people are born, grow, live and work that can contribute to or detract from the health of individuals and communities

Health Inequality
- Differences in health status or distributions of health determinants between different population groups, not social characteristics

Health Equity
- Everyone should have a fair opportunity to attain their full health potential and that no one should be disadvantaged from achieving this potential

Health Inequity
- Subset of health disparities where the measured health differences between populations are considered systemic, unnecessary and avoidable, and are therefore unfair and unjust

Adapted from the Centers for Disease Control and Prevention
Implicit Bias

- Also called unconscious bias
- The assignment of attributes of qualities to all individuals from a particular group, also known as stereotyping
- Operates outside of a person’s awareness
- Can be in direct contradiction with stated beliefs and values
- Can interfere with clinical assessments, decision-making, and patient-provider relationships
- We all have implicit biases

https://nccc.georgetown.edu/bias/module-3/1.php
Our Brains at Work

• The brain as a prediction-machine
• Wired for threat identification
• Seeks the simplest path to conclusions

Sylvia Burgess, PhD, One Step at a Time Consulting, LLC, 2020
The Unconscious Mind

- **Schemas:** The “frames” through which our brains help us understand the world
  - Sort into categories
  - Create associations
  - Fill in the gaps

Adapted from Sylvia Burgess, PhD, One Step at a Time Consulting, LLC, 2020
How Unconscious Bias Works

- Scientists estimate people are exposed to as many as 11 million pieces of information at any one time
- Our brains can only functionally deal with 40
- The solution? **Mental Shortcuts**
  - Brain seeks to conserve energy
  - Decision-making, ambiguity, novelty and problem solving all take heavy cognitive reserve
  - Mental shortcuts evolved to save time, often yielding reliable results

Adapted from Sylvia Burgess, PhD, One Step at a Time Consulting, LLC, 2020
• How We Think
  • Humans need meaning.
    • Individual meaning
    • Collective meaning
  • Only 2% of emotional cognition is available consciously
  • Racial bias tends to reside in the unconscious network

Sylvia Burgess, PhD, One Step at a Time Consulting, LLC, 2020

We unconsciously think about race even when we do not explicitly discuss it.
Addressing Unconscious Bias

- Reframing our thoughts – practicing mindfulness
- Engage in understanding other cultures
  - Inclusive cultures can counteract the impact of bias
- Take constructive approaches to inclusivity
- Replace stereotypes
- Practice individuation
- Engage in empathy
  - Meeting the patient where the patient is
  - Involves understanding the larger context
  - Increases trust

Sylvia Burgess, PhD, One Step at a Time Consulting, LLC
Devine PG, Forscher PS, Austin AJ, Cox WT, 2012
Understanding Culture

If there is not the understanding that cultures are different and that people have different ways of responding to the basic realities of life and economics and politics and love and eating and a million things because of what their cultures have been, then we can’t understand each other.

- Carlos Fuentes
Empathy is the ability to meet the patient where the patient is at in their self-management of their care, which involves being aware of, or sensitive to, the thoughts, feelings, and experiences of another.... Empathic provider skills are necessary to counteract or reduce implicit bias when caring for patients from diverse racial, ethnic, and cultural backgrounds.

Carter-Edwards et al., 2018
Merriam-Webster Dictionary
Racial Biases in Care Delivery
Racial Differences in Cardiac Procedures

- 428,300 Black and White male veterans
- 74,540 Blacks, 353,730 Whites

Cardiac catheterization, angioplasty, coronary artery bypass grafting

White veterans were 38%, 34%, and 42% more likely to receive these procedures than Black veterans

Results after controlling for demographics, existing conditions, and geographic region.
No Impact of Implicit Bias on HTN Treatment

- Electronic medical records for 4794 Black, Latino, and White patients in the Colorado Kaiser Permanente system
- Implicit Association Test (IAT) for primary care providers
- Implicit bias did not affect clinicians' provision of care to their minority patients, nor did it affect the patients' outcomes. The identification of health care contexts in which bias does not impact outcomes can assist both patients and clinicians in their efforts to build trust and partnership.

Blair et al., 2014
Medical Mistrust and Primary Care for Blacks

- Medical mistrust and usual source of care
- 1408 Black and White patients in a low-income community with access to same care
- Blacks were 43% more likely to use the Emergency Department as a primary source of care
- After controlling for mistrust, racial difference attenuated
- Racial differences in use of outpatient hospital remained after controlling for trust

Arnett et al., 2016
Implications of Race, Ethnicity, and Pharmacogenetics for Personalized Medicine
Personalized Medicine

- A multi-faceted approach to patient care that approves the ability to diagnose and treat, but also offers the potential to detect disease earlier and treat it
  - Risk assessment
  - Prevention
  - Detection
  - Diagnosis
  - Treatment
  - Management

Personalized Medicine and Pharmacogenetics

- More than 75% of medical student feel unprepared to address race in medicine (Tsai, 2018)
- Genes have been considered more feasible to explain than social determinants of health – yet just as complex
  - Racial genetic differences for Cystic Fibrosis and Sickle Cell
  - Others more complex
    - Asthma
    - Cardiovascular disease
    - Diabetes
- Genetic diversity of different ancestral populations may have implications for the frequency of rare genetic variants (Ortega and Meyers, 2014)
DNA Results Summary for Lori Edwards

Ethnicity Estimate

- Nigeria: 30%
- Cameroon, Congo & Western Bantu Peoples: 24%
- Benin & Togo: 13%
- Mali: 11%
- England & Northwestern Europe: 7%
- Scotland: 6%
- Ireland: 5%
- Sweden: 2%
- France: 1%
- Southern Bantu Peoples: 1%

Additional Communities

- Early Virginia African Americans
- Mississippi & Alabama African Americans
- Central Alabama-Mississippi Border African Americans

21% European ancestry
79% African ancestry
Role of Race in Medicine

Rather than a risk factor that predicts disease or disability because of genetic susceptibility, race is better conceptualized as a risk marker—of vulnerability, bias or systemic disadvantage.

- Jennifer Tsai, Scientific American, 2018
Minimizing Implicit Bias in Precision Medicine

*PM initiatives need to pay special attention to the discriminatory and harmful impacts that structural racism could have on minority groups involved in their respective projects. It is only by acknowledging and discussing the existence of implicit racial biases and trust issues in healthcare and research domains that proper interventions to remedy them can be implemented.*

- Geneviève et al., BMC Medical Ethics, 2020
Small Group Exercise
Small Group Exercise

- Break into four small groups
- Discuss the article: *Individuation and implicit bias in genetic counseling communication* (Lowe, Beach, and Roter, 2019)
  - Answer a series of 3-4 questions as a small group
- Identify one spokesperson for your small group when we convene as a class
- Discuss the article for 15 minutes, then summarize your group’s feedback for 5 minutes
Small Group Exercise – Discussion Questions

- Describe your own experience where you felt you were a member of an outgroup.

- What are your immediate thoughts on racial biases in genetic counseling?

- Describe possible examples of counseling behaviors that could be predictive of implicit biases in this study.

- What are the strengths and limitations of the study?

- What would you do as a pharmacology health professional to minimize racial biases in conducting research?
Reflection

What did you learn from this presentation and the group exercise that you can use moving forward when thinking of pharmacogenetics, race, and personalized medicine?
Summary

▪ Implicit bias involves the unconscious, and often, negative categorization of individuals.

▪ The role of environmental factors in the context of race, ethnicity, and culture is complex.

▪ Efforts to minimize implicit bias may include:
  ▪ Empathy;
  ▪ Reframing;
  ▪ Replacing stereotypes;
  ▪ Inclusivity.
References


Leifer G, Fleck E. Growth and development across the lifespan: A health promotion focus: Elsevier Health Sciences; 2012


Image Citations

- DNA string: https://pixabay.com/illustrations/dna-string-biology-3d-1811955/
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Thank You!

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