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Race Medicine and Use of Precision Medicine

PF2: The Scientist: Professional Formation 2

Assoc Prof. Caoimhe Clerkin (Credit to Prof. Marian Brennan)

3.4.25

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What ethnic group does this woman belong to?

- White
- Hispanic/Latino
- Black/ African American
- Native American
- Asian
- Other

Dorothy Roberts had a white father and black mother.

What race does she belong to now?

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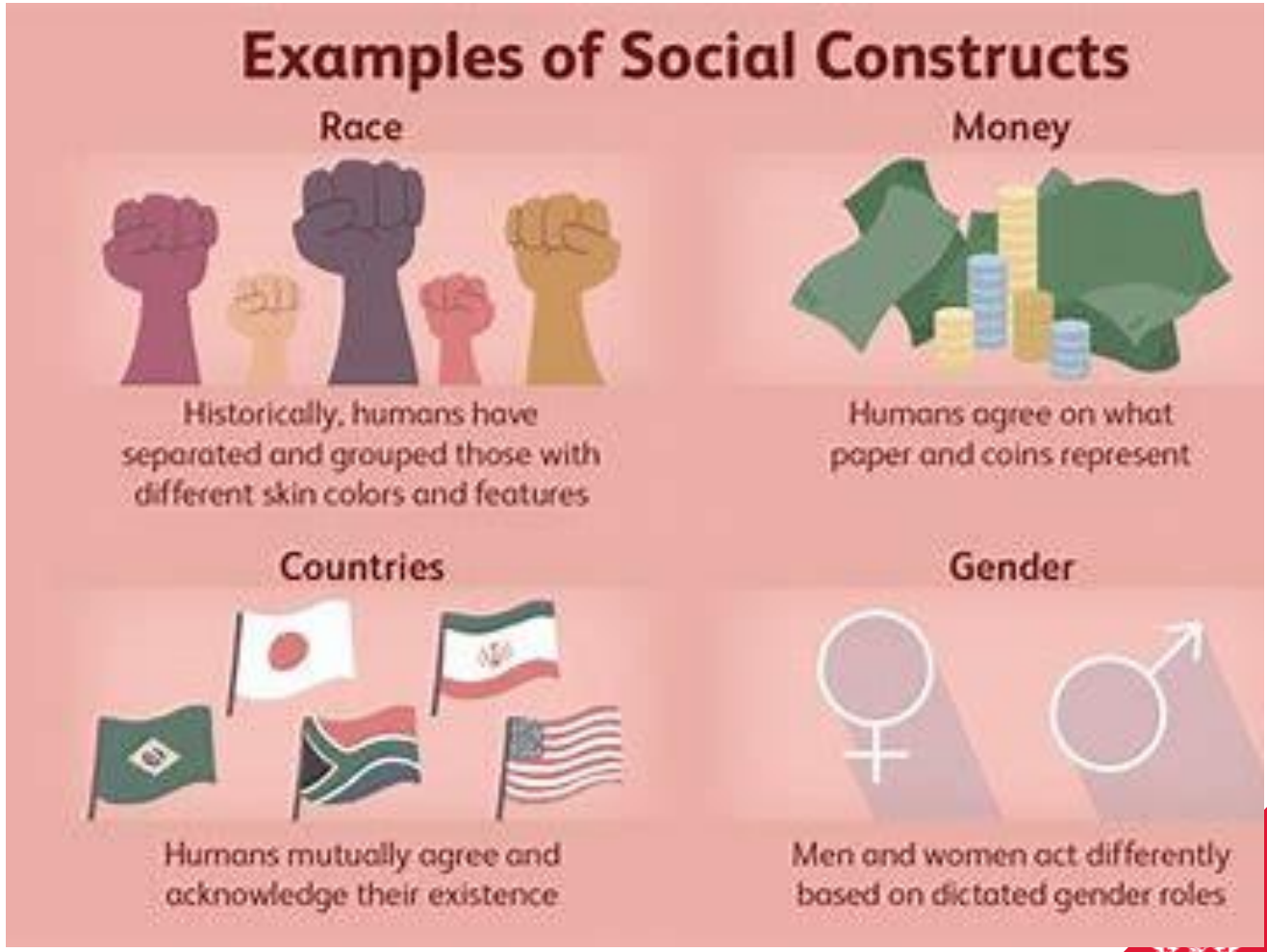
Race is a social construct

Your genetic make up is influenced by your parents, grand parents, great grandparents. Treating an individual with black skin, who has white ancestors could lead to false medical predictions and fatal medical outcomes

The term race is a crude simplistic effort to categorise people.

It is an example of a social construct, meaning that it has been formed as a result of human interactions i.e. it exists because people agree that it exists.



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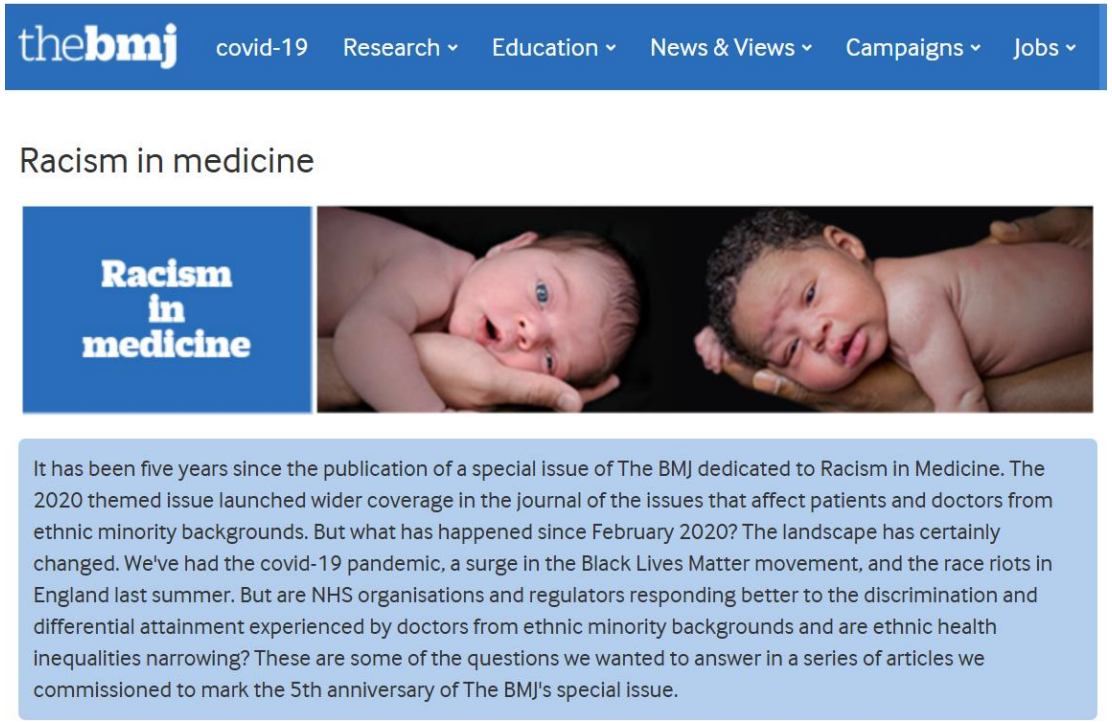
Race inequality in healthcare

The BMJ 2020 publication highlighted an undermined care for ethnic minorities in the UK. For example, maternal mortality is unequal in black mothers

This work led to an investigation, review and update of guidelines.



https://www.bmj.com/racism-in-medicine

The NEW ENGLAND JOURNAL of MEDICINE

SUBSCRIBE OR RENEW

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.

POINTS OF VIEW

Sitting in Our Discomfort

K. Gates

Despite renewed awareness of deep health disparities, many of the clinicians who had gathered for a talk on obesity chose to leave afterward, rather than stay to hear about implicit bias and

PERSPECTIVE

Research Participation in Marginalized Communities

K. Armstrong and C. Ritchie

Despite an increased focus on community engagement in

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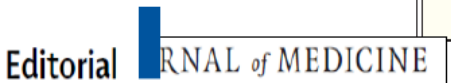
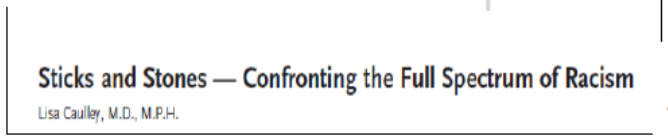
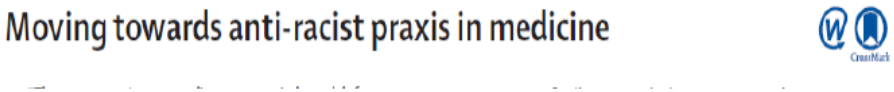
Racism in Medicine







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Learning Outcomes

1. Outline the underlying reasons for health disparities
2. Recognise that the term ‘race’ only refers to your social setting
3. Identify that race categories for clinical trials may be biased and outline the importance of including diverse groups in clinical trials
4. Discuss the development of artificial intelligence technology
5. Explain the role of precision medicine

We will have a pop quiz at the end of today. So pay attention!!

Learning Outcome 1:
Outline the underlying reasons for health disparities

There are a number of reason for health disparities. However, a number of reasons include

- **Limited access to health data globally**. E.g. Ireland would have limited access to Chinese health data and the Chinese population in Ireland would contribute to a small amount of the Irish population
- **Discrimination due to bias-** there is a common misconception that black people feel less pain than white people. Does this mean black people do not receive pain medication?
- **Health guidelines include race-specific treatments**.

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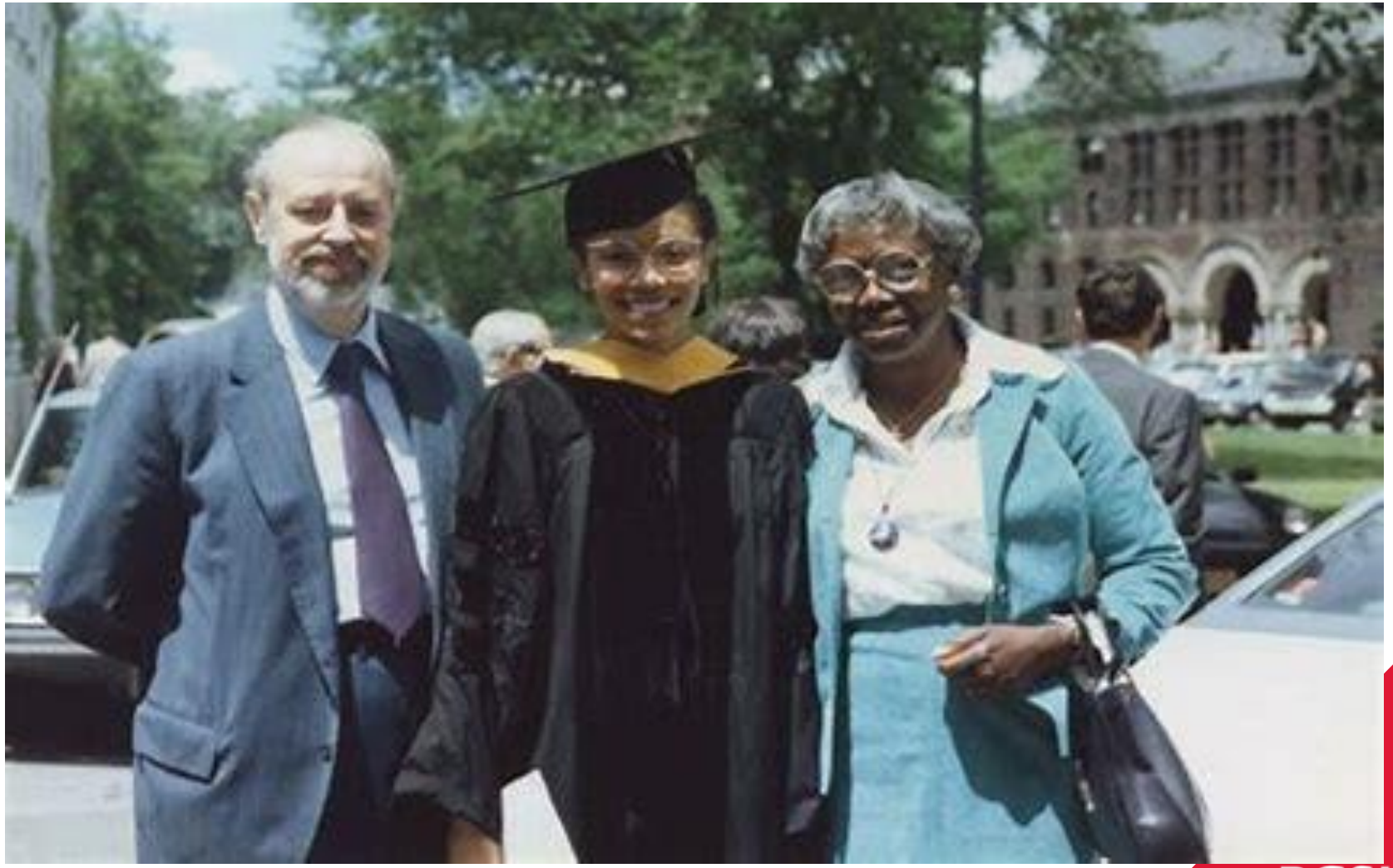
Learning Outcome 2: Recognise that the term ‘race’ only refers to your social setting

Dorothy Roberts had a white father and black mother.

Categorising Dorothy as black is incorrect and only helps the human race to generalise populations



Learning Outcome 3:
Identify that race categories for clinical trials may be biased and outline the importance of including diverse groups in clinical trials

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Example

A test for kidney function is measuring

1. Creatinine levels in the blood. This should be in the range of 0.6-1.2 mg/dl. Outside of this range would indicate that the kidneys are not effectively clearing compounds.

2. The next test would be to measure the estimated glomerular filtration rate. The normal glomerular filtration rate should be around 90 ml/min per 1.73 m2

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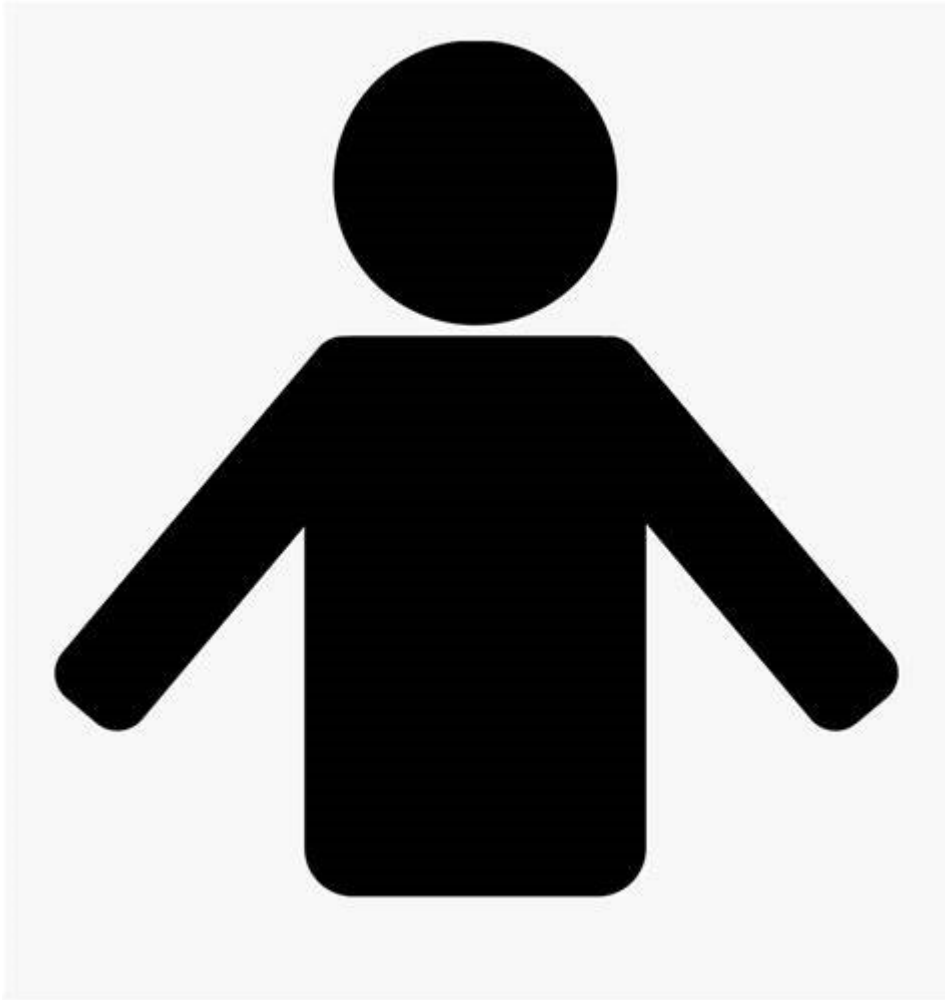
Example

Creatine levels: 2.8 mg/dl

Kidneys not effectively clearing

eGFR: 18 ml/min per 1.73 m2

severe kidney function



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Example

Creatine levels: 2.8 mg/dl

Kidneys not effectively clearing

eGFR: 18 ml/min per 1.73 m2

severe kidney function

Goes onto the transplant list based on healthcare guidelines

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Example

Creatine levels: 2.8 mg/dl

Kidneys not effectively clearing

eGFR: 18 ml/min per 1.73 m2

severe kidney function

No action based on healthcare guidelines

Example

Creatine levels: 2.8 mg/dl

Kidneys not effectively clearing

eGFR: 18 ml/min per 1.73 m2

severe kidney function

What approach is taken here?

Another example

Children who present with symptoms of a urinary tract infection (UTI) are usually treated with antibiotics if they meet certain criteria

Another example

Children who present with symptoms of a urinary tract infection (UTI) are usually treated with antibiotics if they meet certain criteria

Less criteria to be considered treat with antibiotics according to health care guidelines

Another example

Children who present with symptoms of a urinary tract infection (UTI) are usually treated with antibiotics if they meet certain criteria

The infection is further progressed before diagnostics/treatment according to health guidelines

Another example

Children who present with symptoms of a urinary tract infection (UTI) are usually treated with antibiotics if they meet certain criteria

The infection is further progressed before diagnostics/treatment according to health guidelines

Learning Outcome 3:
Identify that race categories for clinical trials may be biased and outline the importance of including diverse groups in clinical trials

Guidelines are based on flawed categorisation

It is imprecise to categorise patients

Race categories for patient care may have huge implications in treatment approaches and results.

Race Adjustments

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Cardiology
AHA Get with the Guidelines–Heart Failure9
→ Race correction lowers risk for non-white patients leading to deprioritization patients of colour

Pulmonary function tests
10-15% adjustment for black patients
→ Increases threshold for diagnosis and treatment e.g. COPD and asthma

Obstetrics
VBAC score predicts poorer outcomes for POC

Oncology
Rectal cancer survival calculator- estimates worse outcomes for POC, thus potentially influencing whether to treat or not.

Urology
Stone score- returns lower score for persons of colour adjustment equivalent to haematuria.

Paediatrics
Non-white children are required to meet more diagnostic criteria to be considered for investigations and treatment for UTI.

Hidden in Plain Sight — Reconsidering the Use of Race Correction in Clinical Algorithms Darshali A. et al. NEJM 2020

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Removal of race guidelines

AAP News

Retirement of UTI guideline among AAP efforts to end race-based medicine

August 05, 2021

"Given the clear evidence and overwhelming consensus that action was needed, the AAP Board of Directors took this firm stance against the use of race-based medicine in our current and future policies and is continuing its efforts to address previous harms and promote equity and transparency throughout all AAP core activities and functions, including education, programs, policy and research."

"when practiced in good faith, race-based medicine is bad medicine that leads to inequitable medical care and hurts the health and well-being of people of color,"

Changing practice guidelines

Task force were asked to

1. Clarify the problem
2. Evaluate the approaches
3. Provide recommendations

AJKD

Special Report

A Unifying Approach for GFR Estimation: Recommendations of the NKF-ASN Task Force on Reassessing the Inclusion of Race in Diagnosing Kidney Disease

Cynthia Delgado, Mukta Baweja, Deidra C. Crews, Nwamaka D. Eneanya, Crystal A. Gadegbeku, Lesley A. Inker, Mallika L. Mendu, W. Greg Miller, Marva M. Moxey-Mims, Glenda V. Roberts, Wendy L. St. Peter, Curtis Warfield, and Neil R. Powe

Background: In response to a national call for re-evaluation of the use of race in clinical algorithms, the National Kidney Foundation (NKF) and the American Society of Nephrology (ASN) established a Task Force to reassess inclusion of race in the estimation of glomerular filtration rate (GFR) in the United States and its implications for diagnosis and management of

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

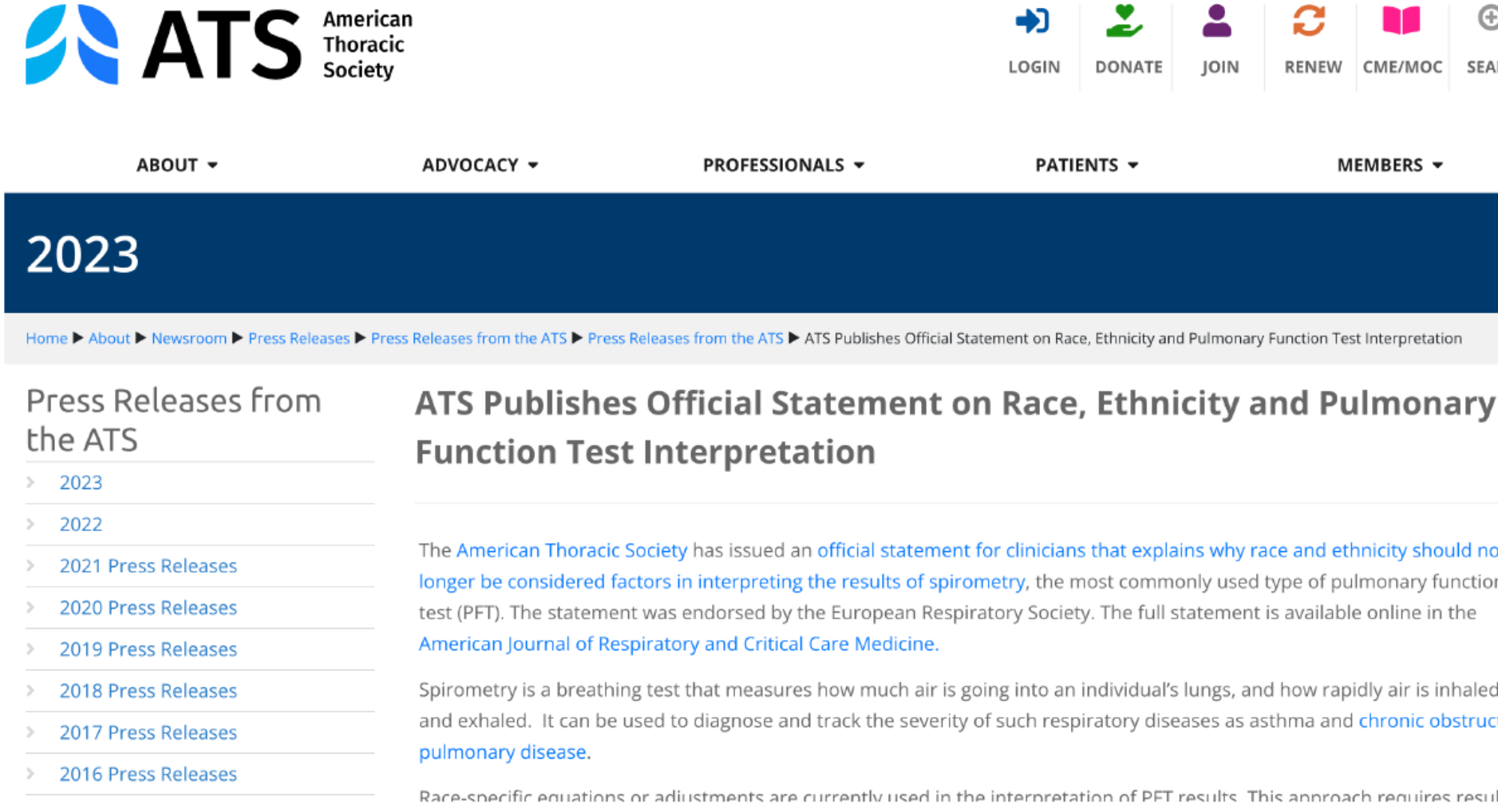
Visual Abstract online

Complete author and article information provided before references.

Correspondence to C. Delgado (Cynthia.Delgado@ucsf.edu) or N.R. Powe (Neil.Powe@ucsf.edu)

"The UK Kidney Association supports NICE and recommends that the adjustment for black ethnicity for eGFR be removed from UK practice."
https://ukkidney.org/

Changing practice guidelines



The World Medical Association

Declares racism to be a public **threat**

Asserts that **racism is based on a social construct with no basis in biological reality** and that any effort to claim superiority by exploiting racist assumptions is unethical, unjust and harmful

Recognises that the experience of racism is a social determinant of health and responsible for persistent health inequities

https://www.wma.net/policies-post/wma-declaration-of-berlin-on-racism-in-medicine/

Learning Outcome 4:
Discuss the development of artificial intelligence technology

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Who uses AI?

Learning Outcome 4: Discuss the development of artificial intelligence technology

What are we using AI for?

Learning Outcome 4:
Discuss the development of artificial intelligence technology

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How does AI work in medicine?

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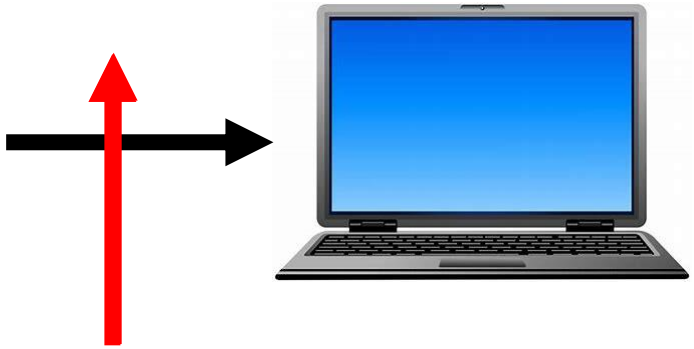
Learning Outcome 4:
Discuss the development of artificial intelligence technology

Health Care Data

What data is being used?

Is there bias in the data?



Choices are being made how to define target variables and quantifiable proxies.

Who does this?

Are they biased?

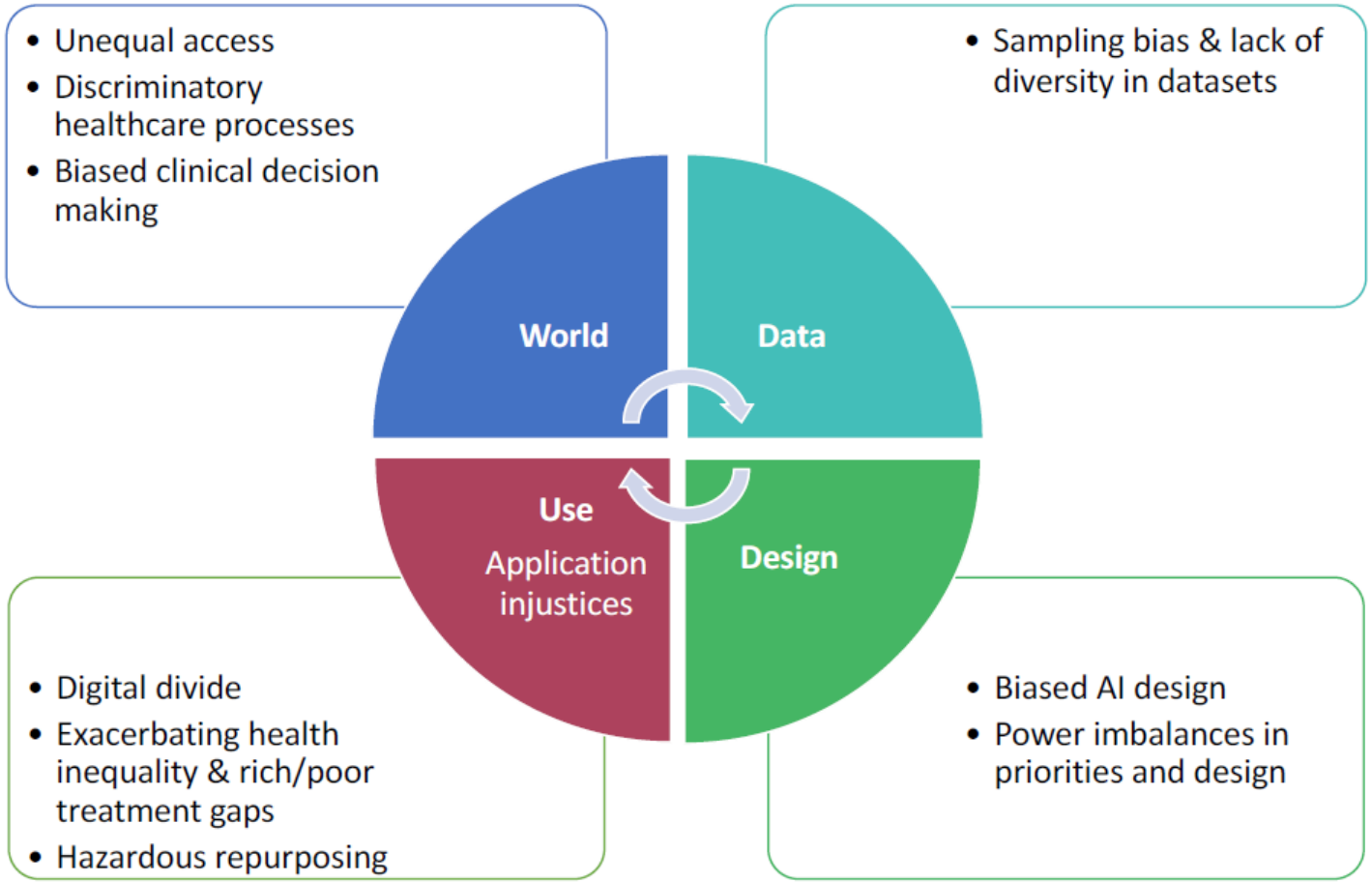
Predicts an outcome

Proposes a treatment approach

Interpreter may be biased

Continued use may train your AI to become even more biased

Learning Outcome 4:
Discuss the development of artificial intelligence technology



Adapted from: Does "AI" stand for augmenting inequality in the era of covid-19 healthcare? https://www.bmj.com/content/372/bmj.n304

What is the solution?

Learning Outcome 5:
Explain the role of precision medicine

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NCI definition:

A form of medicine that uses information about a person's own genes or proteins, to prevent, diagnose or treat disease.

FDA definition:

Precision medicine, sometimes known as 'personalised medicine' is an innovative approach to tailoring disease prevention and treatment that takes into account differences in peoples genes, environments, and lifestyles. The goal of precision medicine is to target the right treatments to the right patients at the right time.

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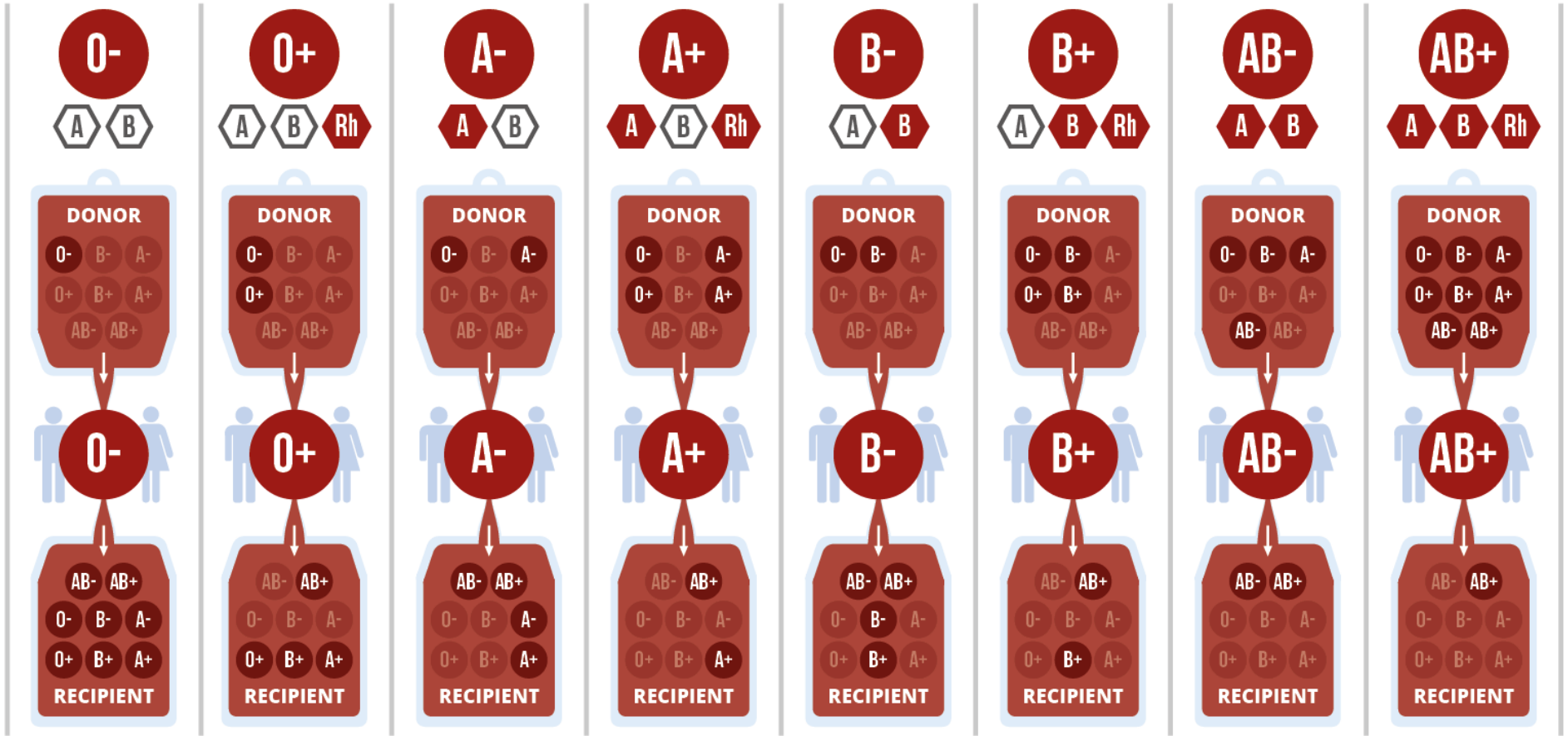
Learning Outcome 5:
Explain the role of precision medicine

This is not a new technique. Take for example blood donations. Only certain blood groups can donate blood to certain individuals, and only certain individuals can receive blood from certain blood groups.

This is because on our red blood cells there are proteins. If these proteins do not exist on the receivers blood group they see this as being “foreign” and will destroy and eliminate the cell, resulting in blood rejection.

Therefore, we must identify individual blood typing before receiving blood donations

BLOOD TYPE COMPATIBILITIES



KEY ANTIGEN ANTIBODY

Blood types are determined by 'antigens', substances found on the surface of red blood cells. A, B, and Rh are possible antigens; they are genetically determined, and can appear alone or in combination. Antigens are destroyed by antibodies in blood plasma if they're not recognised by the body's immune system, which is why not all blood types are compatible.

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Learning Outcome 5:
Explain the role of precision medicine

Another example, is in the treatment of breast cancer.
Some breast cancers, particularly aggressive forms of breast cancer, have a protein HER2.

Therefore to treat this form of breast cancer, treatments are designed to target this specific protein i.e. Herceptin targets the HER2 protein in cells.

Herceptin has no effect if the HER2 protein is not expressed in the cell and therefore has no therapeutic effect on other forms of breast cancer.

Learning Outcome 5:
Explain the role of precision medicine

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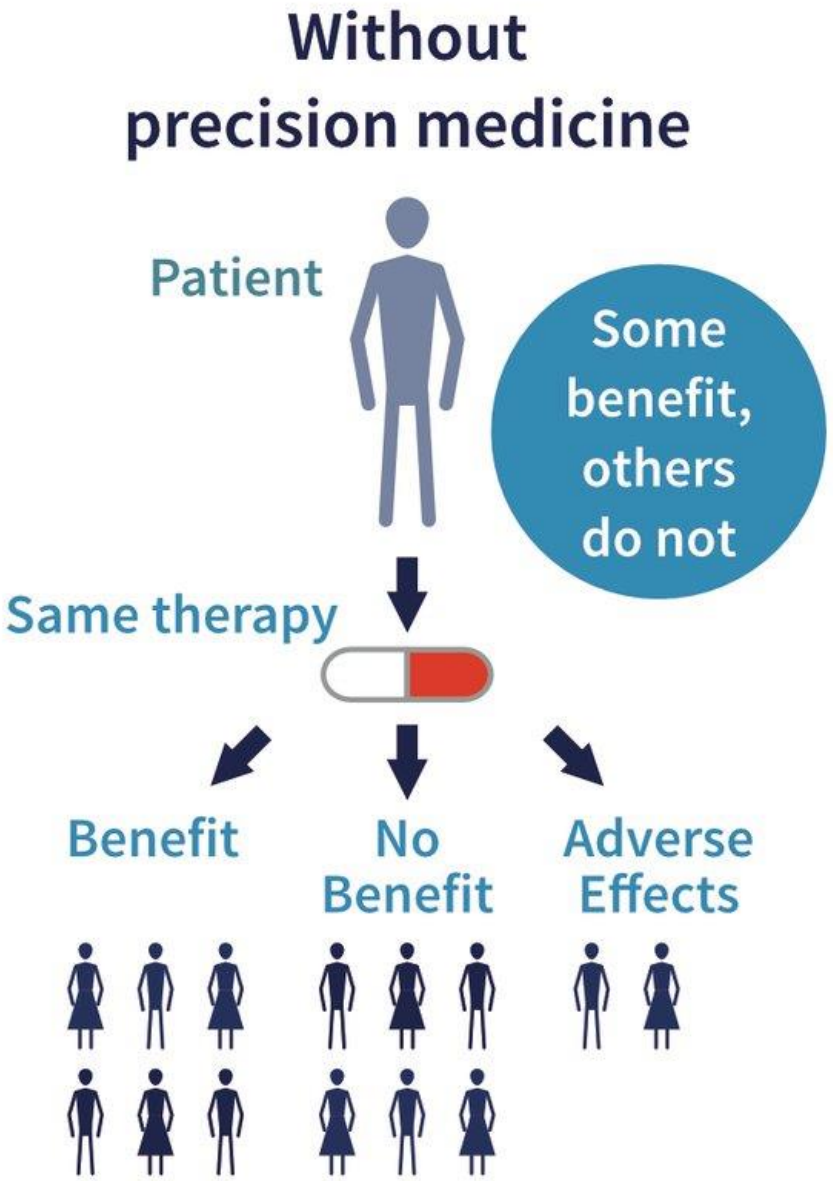
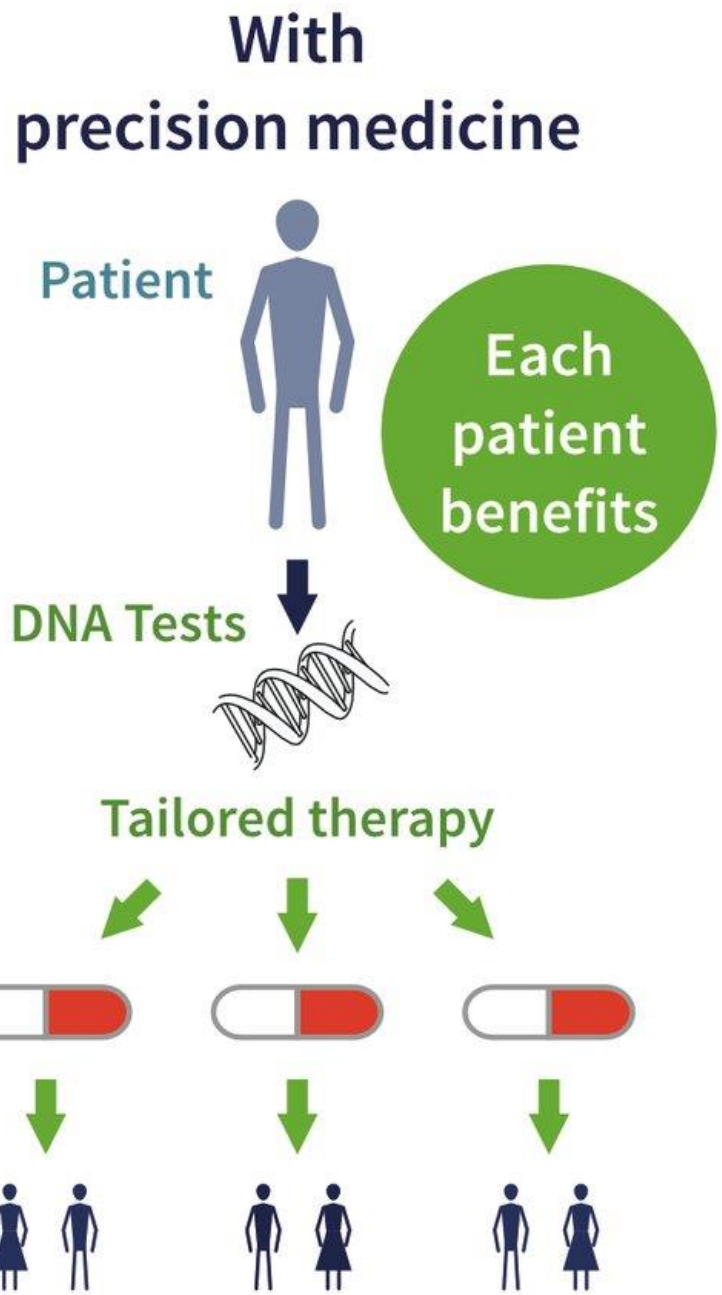
Learning Outcome 5: Explain the role of precision medicine

Therefore, by identifying a person's genetic makeup or the proteins they express we can tailor our diagnostic and therapeutic approaches.





Race POP QUIZ