

# Demographic considerations for concussion management

**SIRC Concussion in Sport Symposium 2023**  
**Driving change spotlight**

Amanda Black, CAT(C), PhD  
Assistant Professor and Certified Athletic Therapist  
Faculty of Kinesiology  
[ablack@ucalgary.ca](mailto:ablack@ucalgary.ca)  
 @aacademic

March 1, 2023



UNIVERSITY OF  
CALGARY



3



The  
Injury Prevention,  
Clinical Intervention and  
Implementation Science  
Lab



Prevention  
Diagnosis  
Prognosis  
Mechanism  
Rehabilitation

# Concussion Management- A Review



Team

Different  
Knowledge and  
Experience



Suspected  
Concussion

Concussion Education  
(Coach, Parents, Athlete)

Baseline Testing  
(If indicated in your setting)

Setting Specific: Access to CAT(C) or  
AHP to help with detection

Player reports to parent, coach or  
AHP

AHP or coach identifies and removes  
from play

Physician confirms diagnosis

Repeat testing, maybe imaging

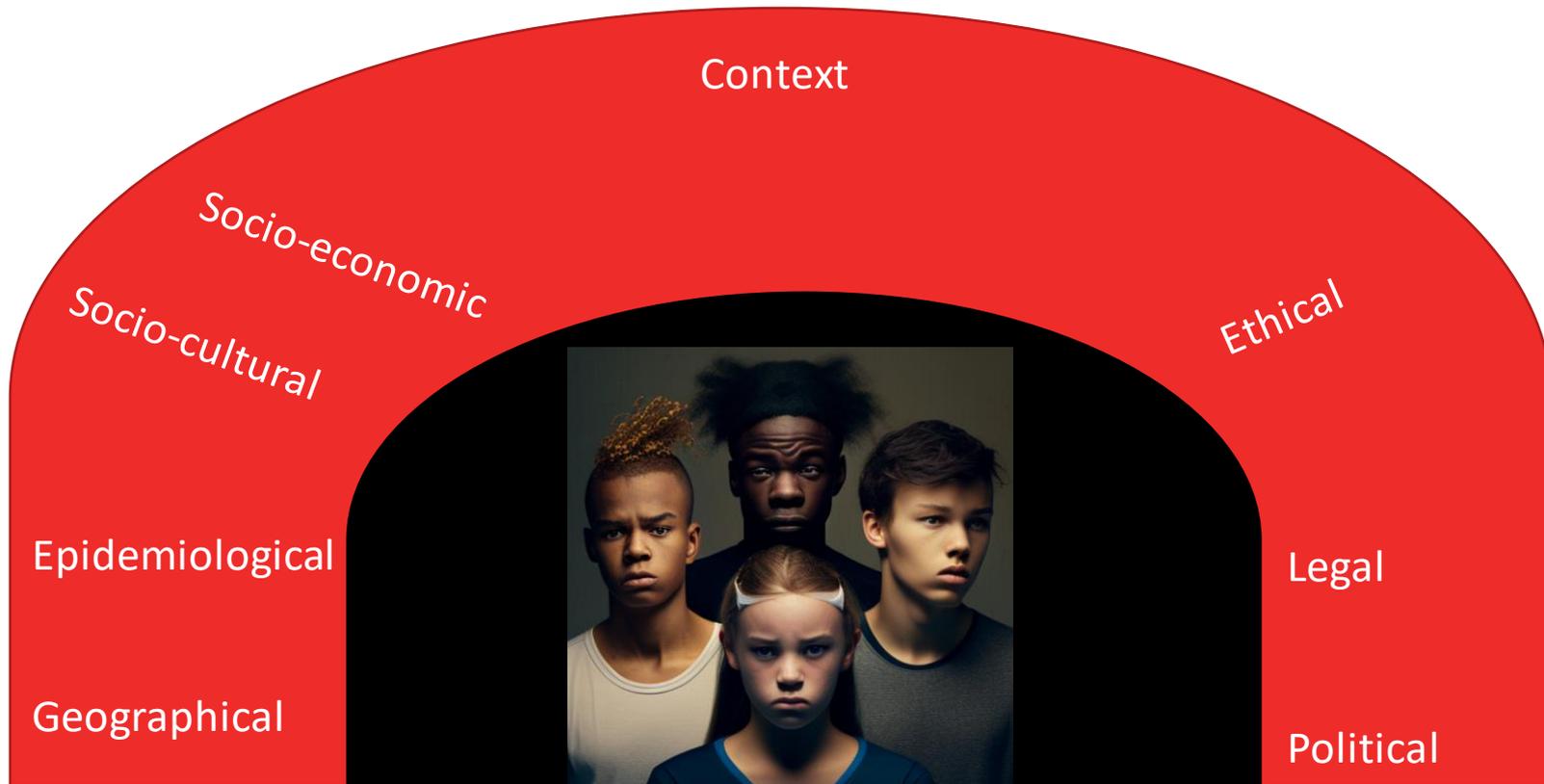
Initial rest, rehab (if necessary) and  
graduated RTP and clearance

AHP: Allied Health Professional

# Every concussion is unique

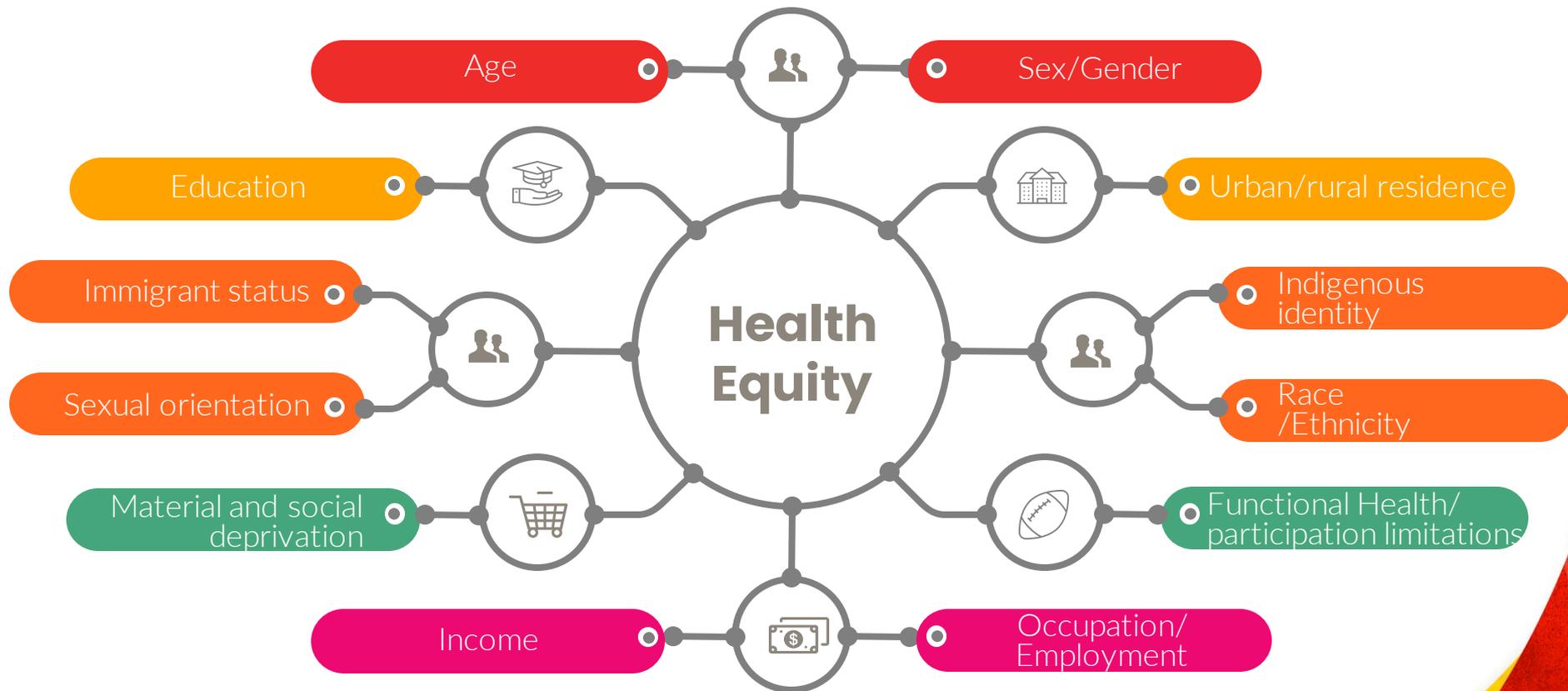


# Individual experience and demographic factors matter in addition to context and setting



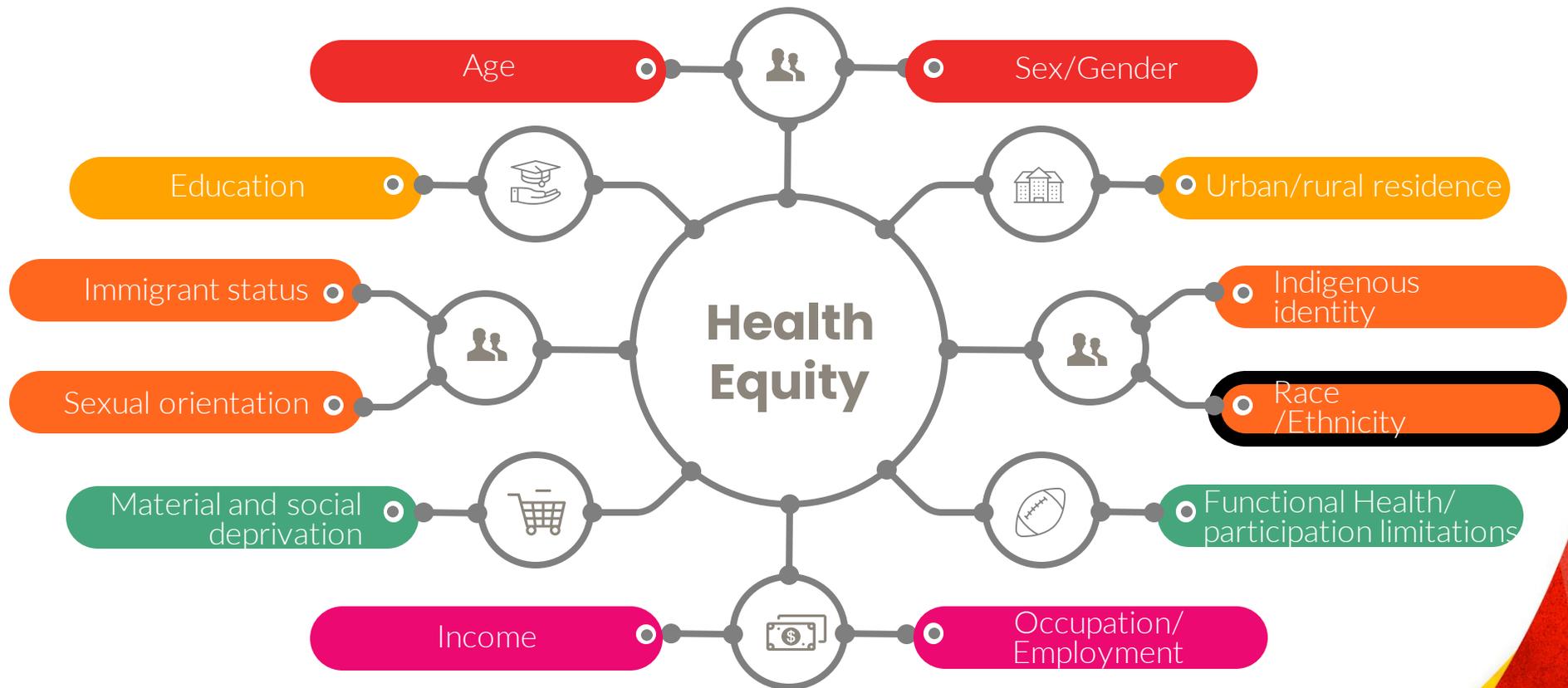
# Health Inequity and Important Factors

Socioeconomic and sociodemographic variables meaningful to health equity



# Health Inequity and Important Factors

Socioeconomic and sociodemographic variables meaningful to health equity



# Ethnicity/race debate in Healthcare

- Within medical education and in health research, 'race'/ethnicity is conceptualized primarily as a biological construct instead of a social construct
- Some medical decisions and clinical cut-offs are made based on racial classifications
- Experiences of discrimination, racism and historical trauma are important social determinants of health for certain groups such as Indigenous Peoples, LGBTQ and Black Canadians.

# Evidence on race and concussion is limited

- Primarily based on the United States
  - Ethnicity
    - Hispanic
    - Non-Hispanic
  - Race
    - White/Black/Other
- There are challenges with this...
- But let's contextualize this evidence as it relates to concussion

# Concussion Management and Race-United States



Team

Different  
Knowledge and  
Experience



Suspected  
Concussion

Concussion Education  
(Coach, Parents, Athlete)

Baseline Testing  
(If indicated in your setting)

Setting Specific: Access to CAT(C) or  
AHP to help with detection

Player reports to parent, coach or  
AHP

AHP or coach identifies and removes  
from play

Physician confirms diagnosis

Repeat testing, maybe imaging

Initial rest, rehab (if necessary) and  
graduated RTP and clearance

White parents and athletes score higher on concussion knowledge assessments than Black parents and athletes

(Wallace 2020, Bloodgood 2013, Lin 2013, Wallace 2018)

Knowledge may affect athlete disclosure but evidence is mixed with race

(Wallace 2021, 2022)

# Concussion Management and Race-United States



Team

Different  
Knowledge and  
Experience



Suspected  
Concussion

Concussion Education  
(Coach, Parents, Athlete)

Baseline Testing  
(If indicated in your setting)

Setting Specific: Access to CAT(C) or  
AHP to help with detection

Player reports to parent, coach or  
AHP

AHP or coach identifies and removes  
from play

Physician confirms diagnosis

Repeat testing, maybe imaging

Initial rest, rehab (if necessary) and  
graduated RTP and clearance

# Neuropsychological tests

- Often stratified by:
  - Age
  - Educational Level
  - Gender

But what about race?



# Mixed Evidence on Baseline Differences

## Disparities on Baseline Performance Using Neurocognitive and Oculomotor Clinical Measures of Concussion

Jessica Wallace,<sup>\*y,z</sup> PhD, MPH, LAT, ATC, Ryan Moran,<sup>y</sup> PhD, LAT, ATC, Erica Beidler,<sup>§</sup> PhD, ATC, LAT, Jamie McAllister Deitrick,<sup>||</sup> PhD, James Shina,<sup>†</sup> MD, and Tracey Covassin,<sup>#</sup> PhD, ATC  
Investigation performed at Youngstown State University, Youngstown, Ohio, USA

*Journal of the International Neuropsychological Society* (2018), 24, 1–10.  
Copyright © INS. Published by Cambridge University Press, 2017.  
doi:10.1017/S1355617717000716

Socioeconomic Status and Race Outperform Concussion History and Sport Participation in Predicting Collegiate Athlete Baseline Neurocognitive Scores

Zac Houck,<sup>1</sup> Breton Asken,<sup>1</sup> James Clugston,<sup>2</sup> William Perlstein,<sup>1</sup> AND Russell Bauer<sup>1</sup>

## Factors Contributing to Disparities in Baseline Neurocognitive Performance and Concussion Symptom Scores Between Black and White Collegiate Athletes

Jessica Wallace<sup>1</sup> • Tracey Covassin<sup>2</sup> • Ryan Moran<sup>3</sup> • Jamie McAllister Deitrick<sup>4</sup>

## Exploring Differences in Computerized Neurocognitive Concussion Testing Between African American and White Athletes

Anthony P. Kontos<sup>1,2,\*</sup>, Robert J. Elbin III<sup>3</sup>, Tracey Covassin<sup>4</sup>, Elizabeth Larson<sup>2</sup>

# Concussion Management and Race-United States



Team

Different  
Knowledge and  
Experience



Suspected  
Concussion

Concussion Education  
(Coach, Parents, Athlete)

Baseline Testing  
(If indicated in your setting)

Setting Specific: Access to CAT(C) or  
AHP to help with detection

Player reports to parent, coach or  
AHP

AHP or coach identifies and removes  
from play

Physician confirms diagnosis

Repeat testing, maybe imaging

Initial rest, rehab (if necessary) and  
graduated RTP and clearance

Racial differences found in  
practices related to  
imaging following CT as  
well as clinical outcomes

(Wallace 2021, 2022, Yengo-  
Kang 2021)

# Different outcomes/recovery based on race

## Exploring the outcomes and experiences of Black and White athletes following a sport-related concussion: a retrospective cohort study

Aaron M. Yengo-Kahn, MD,<sup>1,2</sup> Jessica Wallace, PhD, MPH, LAT, ATC,<sup>3</sup> Viviana Jimenez, MD, MPH,<sup>2,4</sup>  
Douglas J. Totten, BA,<sup>2,5</sup> Christopher M. Bonfield, MD,<sup>1,2</sup> and Scott L. Zuckerman, MD, MPH<sup>1,2</sup>

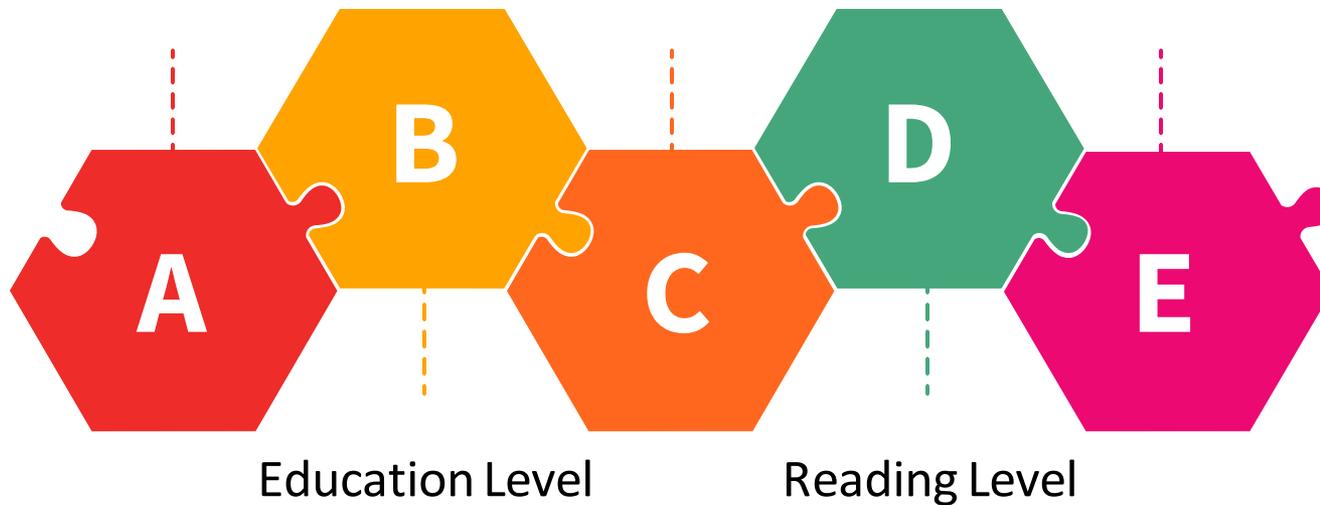
- **Symptom resolution:** The median time to symptom recovery (SR) for White athletes was 21.0 days (IQR 10.5–61.0) compared to 12.3 days (IQR 6.8–28.0) for Black athletes ( $p = 0.026$ ).
- **Return to learn:** The RTL was 2 school days (IQR 0–5) missed for White athletes compared to 0 days (IQR 0–2) for Black athletes ( $p = 0.010$ )
- **Post concussion activities:** White athletes more frequently reported sleeping less (19.0% vs 5.6%), doing less schoolwork (57.8% vs 41.7%), and watching less television (63.5% vs 52.8%) than before their concussion compared to Black athletes

# Many factors can confound racial differences that are often not measured

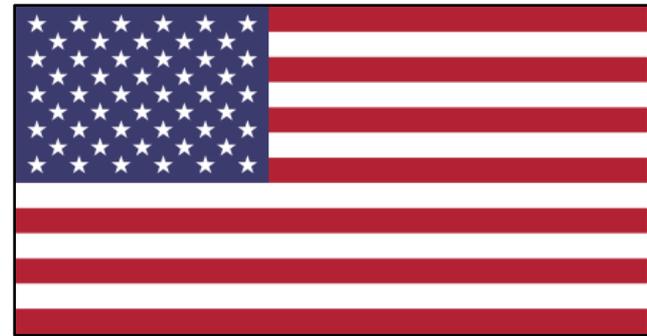
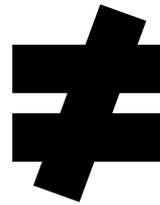
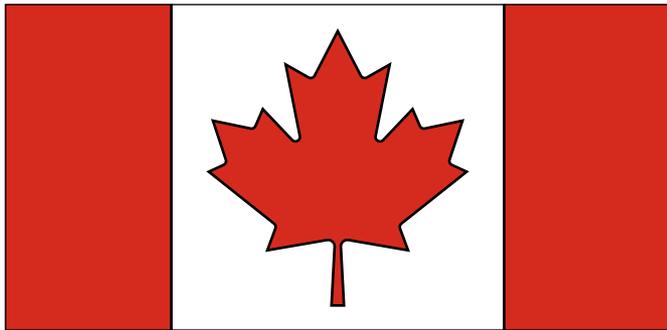
Socioeconomic  
status (SES)

Quality of Education

Acculturation



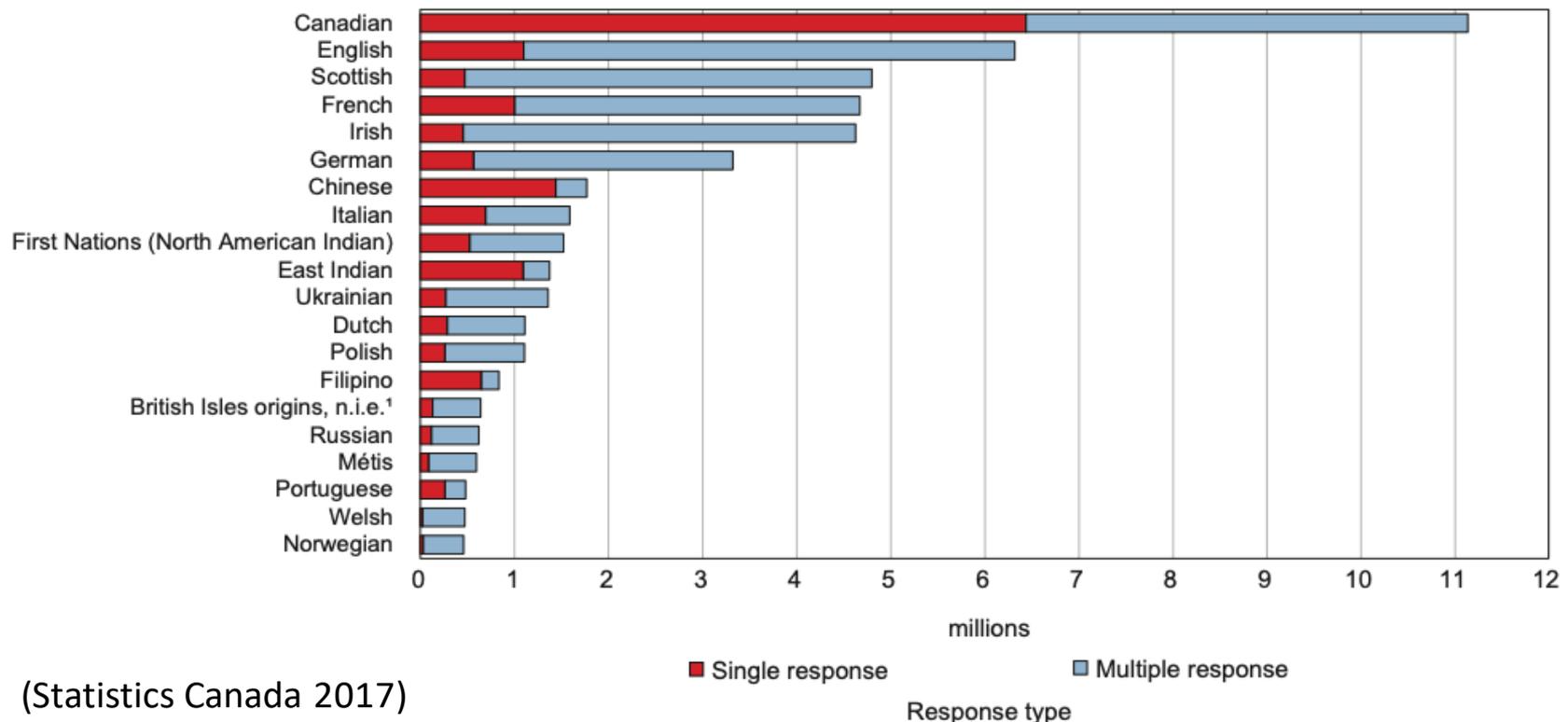
More importantly...



# Canada has a rich ethnic and cultural heritage

- In 2016, over **250** ethnic origins or ancestries were reported
- **4** in **10** people reported more than one origin

The top 20 ethnic origins reported alone or in combination with other origins (single or multiple response), Canada, 2016



# More racial categories

- White
- South Asian  
(e.g. East Indian, Pakistani, Sri Lankan)
- Chinese
- Black
- Filipino
- Arab
- Latin American
- Southeast Asian  
(e.g. Vietnamese, Cambodian, Laotian, Thai)
- West Asian (e.g. Iranian, Afghan)
- Korean
- Japanese
- Other

- While we don't have very much information specific to concussion, we do have evidence of health inequities in our Canadian healthcare system...
  - Systemic racism
  - Underrepresentation of visible minorities in leadership positions in healthcare
  - Negative healthcare experiences based on race

# Experience of discrimination based on race or colour, 5 years before COVID

## Based on 2020 General Social Survey

Total Visible Minority (30.2%)      Not a visible minority (3.9%)

- South Asian – 35.0%
- Chinese – 35.0%
- Black – 49.6%
- Filipino – 38.9%
- Arab – 15.6%
- Latin American – 18.0%
- Southeast Asian – 27.7%

# Many opportunities for sociodemographic factors like race to affect individuals with concussion

- Patient/parent → Health care professional interaction
- Coach/athlete
- Parental anxiety
- Fear of liability
- Communication challenges
- Access to care

# Concussion Management-Possible Racial in Canada Disparities?



Team

Different  
Knowledge and  
Experience



Suspected  
Concussion

Concussion Education  
(Coach, Parents, Athlete)

Baseline Testing  
(If indicated in your setting)

Setting Specific: Access to CAT(C) or  
AHP to help with detection

Player reports to parent, coach or  
AHP

AHP or coach identifies and removes  
from play

Physician confirms diagnosis

Repeat testing, maybe imaging

Initial rest, rehab (if necessary) and  
graduated RTP and clearance

Only one province has  
legislation outlining  
concussion education

Less resources dedicated to  
sports in Canada; many  
teams don't have access to  
CAT(C)

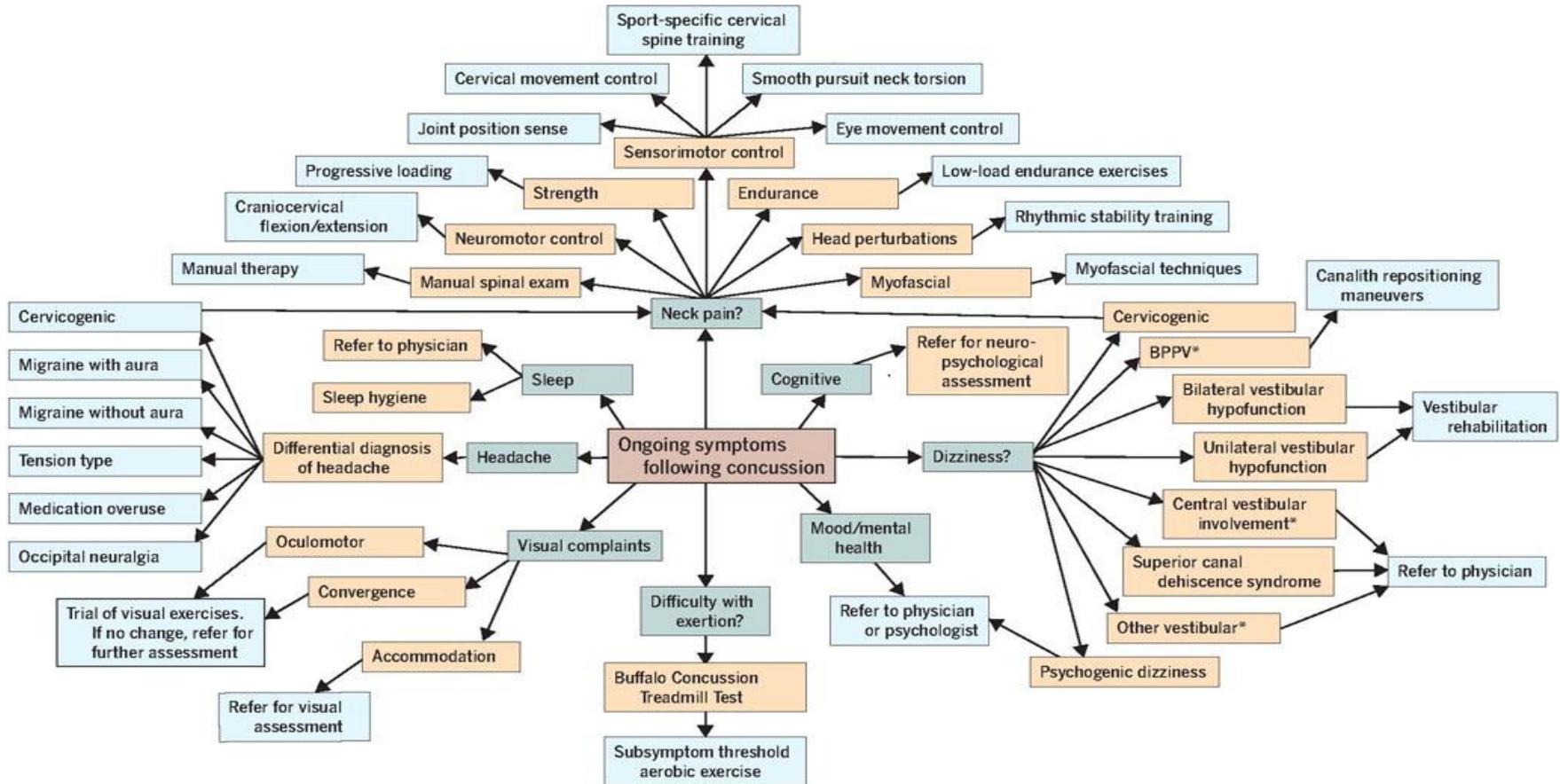
Family physicians may not  
be educated in concussion

Lengthy wait times and lack  
of access to physicians

Weekly visits to a physician's  
office or clinic may not be  
possible for some families

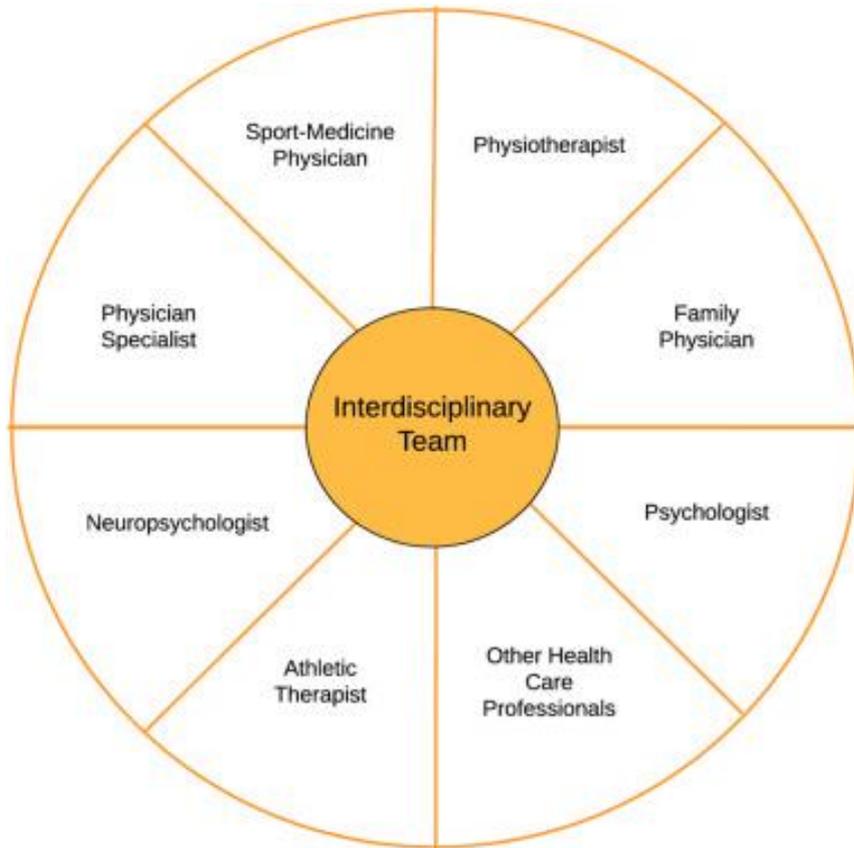
What about ongoing  
symptoms?

# Ongoing symptoms require additional care and a multifaceted assessment





# Interdisciplinary Team for Management



Many of these resources are not covered or have long wait lists!

When it comes to race and concussion in Canada there is a *huge* gap in the literature...

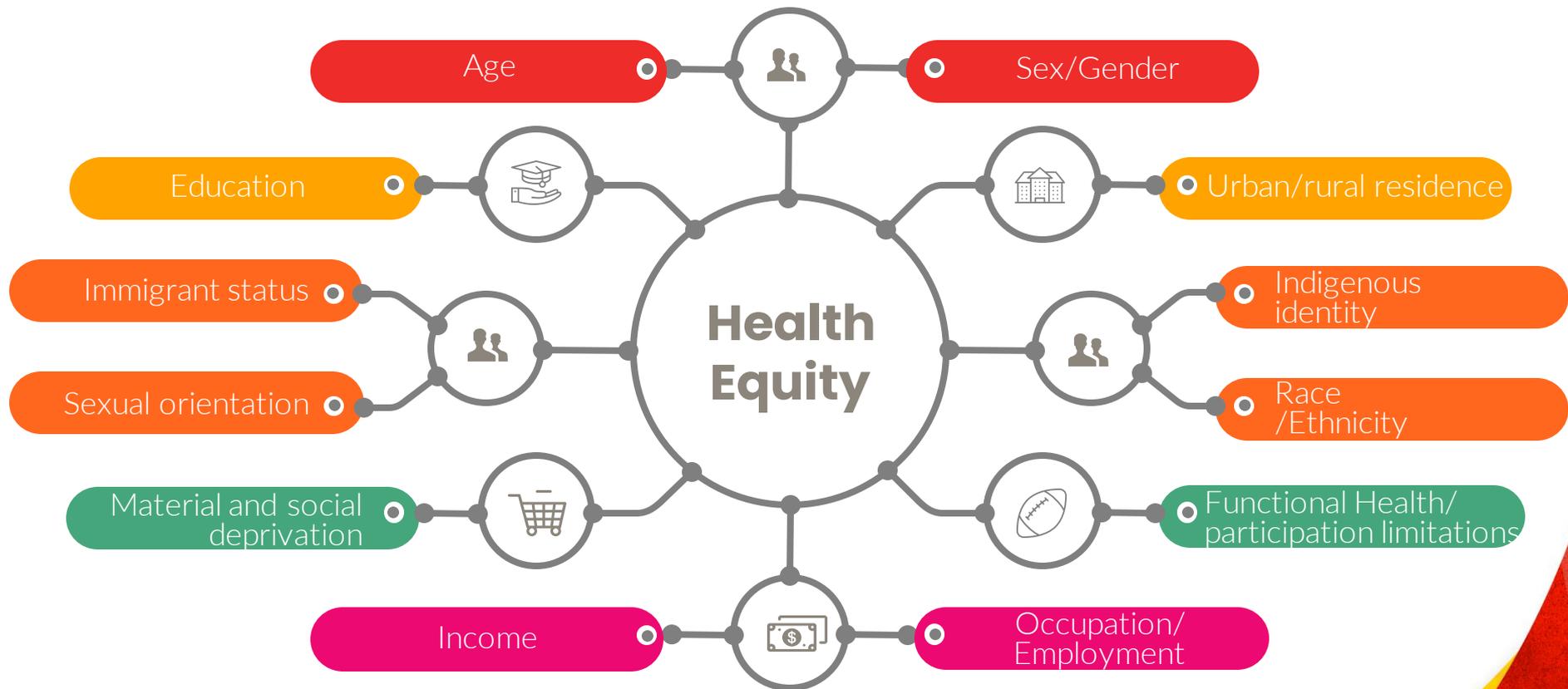
# What do we need to do moving forward?

- We need further studies to better understand how sociodemographic factors like race or ethnicity play into concussion management in Canada.



# What do we need to do moving forward?

Understand all socioeconomic and sociodemographic variables meaningful to health equity



# What do we need to do moving forward?

- We need further studies to better understand how sociodemographic factors like race/ethnicity play into concussion management in Canada.
- We need to understand how the nuances of perception, communication and the relationship between provider, patient/parent, coach influences concussion management.
- We need to work together to embrace equity, diversity and inclusion practices.

# Stakeholder: Actionable items

- Is my concussion protocol culturally sensitive and inclusive, taking into account the unique needs and experiences of athletes from diverse cultural backgrounds?
  - Cultural competence
  - Microaggressions awareness
  - Language access
  - Community involvement (Inclusive and diverse)
  - Education and outreach (programs culturally sensitive)

Let's continue to have this conversation....

**Thank you!**



**Contact Information:**

**Amanda Black**

Assistant Professor, University of Calgary

Certified Athletic Therapist

[ablack@ucalgary.ca](mailto:ablack@ucalgary.ca)

 @aacademic