Western

WESTERN RESEARCH HUB

THE HUB

FOR PHYSICAL ACTIVITY AND HEALTH

Answering the World Health Organization's Call to Implement the Global Action Plan on Physical Activity

Table of Contents

Executive Summary

The Problem – Our Collective Physical Inactivity

Physical activity provides a multitude of health benefits at all stages of life and plays a vital role in the treatment and prevention of a variety of noncommunicable diseases, yet half (49%) of Canadian adults (18 – 79 years) and fewer than half (44%) of children and youth (5 – 17 years) meet national physical activity guidelines for their health. Our collective inactivity is one of the largest risk factors for early morbidity and mortality.

The Plan - World Health Organization's Global Action Plan on Physical Activity

In response to the global epidemic of physical inactivity, the World Health Organization (WHO) created the Global Action Plan on Physical Activity (GAPPA) in 2018 to help countries prioritize decreasing physical inactivity. The WHO's target is to reduce the global prevalence of physical inactivity in adults and adolescents by 15% by 2030. The WHO released updated global physical activity guidelines to help countries implement the GAPPA.

The Project - Western Research Hub for Physical Activity and Health

We, the Western Research Hub for Physical Activity and Health, are responding to this call to action from the WHO. Our established team of over 30 diverse junior and senior scholars from seven different Faculties at Western University in London, Ontario, Canada, and a Community Advisory Council of members made up of six local organization representatives and four patient partners who co-design and inform our work. The Director of the Hub works closely with our Community Advisory Council and research team to develop and implement physical activity research, and ensures that the Hub stays accountable to our mission.

Our Mission

To advocate for and implement meaningful, sustainable and culturally relevant physical activity opportunities within our community and beyond.

Our Aims (Years 0-3)

1. Promote the World Health Organization's vision of "More active people for a healthier world".
2. Mobilize knowledge as the Canadian hub (and research leader) of the Global Action Plan on Physical Activity.
3. Provide academic leadership, collaboration and mentorship opportunities in physical activity implementation locally, provincially, nationally and internationally.

This white paper disseminates knowledge from Western University, Canada, on how the Western Research Hub for Physical Activity and Health's approach to collaboration and implementation best practices can make our communities more active.

What we've already done

MAY 2021

Hub Established

Developed The Western Research Hub for Physical Activity and Health and formed a Steering Committee of ten faculty researchers

JUNE 2021

Research Retreat Convened

Convened a meeting of over 30 multidisciplinary and interfaculty researchers at our Inaugural Research Retreat

SEPT 2021

Community Advisory Council Finalized

Partnered with a patient engagement expert to recruit local organization representatives and patient partners, develop guidelines and set a regular meeting schedule for co-creation of our resources and strategy

OCT 2021

Environmental Scan Completed

Identified 38 local researchers working on physical activity implementation and provided invitation to join the Hub

JAN 2022

My Active Ingredient Launched

Developed knowledge exchange tool in the form of a "peer-to-peer" website (myactiveingredient.org) informed by the Community Advisory Council to provide free, curated and easy-to-use physical activity resources

FEB 2022

Western Internal Summit Convened

Discussed research projects at Western University that address the GAPPA; researchers and community advisory council established the Hub's priority actions for the next 2 years

SEPT 2022

ACTIVE for Health Symposium Convened

Shared ongoing research, best practices, existing resources/tools and success stories in physical activity implementation in our city to organize efforts on the priority actions

AUG 2022 - FEB 2023

Formation of National and International Partnerships Begun

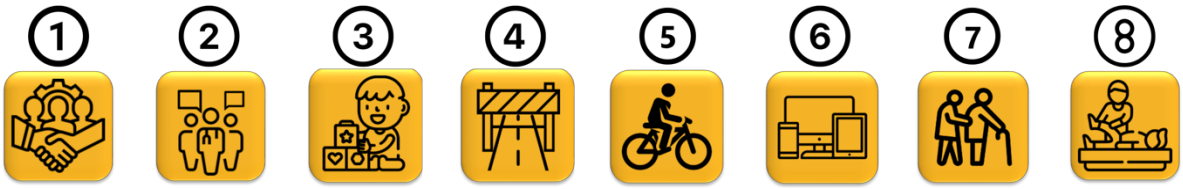
We are beginning to share our learnings with Canadian and international physical activity stakeholders & members of the WHO Physical Activity unit. We are showing how the Hub is addressing the GAPPA, and extending our national and international partnerships

What we're doing next

2023 - 2024

Priority Actions – Building Capacity for Implementation

Over the next 2 years, the Hub will address the following 8 priorities as identified and voted on by our community:



(1) engage and establish partnerships with key stakeholders
(2) harmonize messaging about physical activity among healthcare providers
(3) explore post-pandemic opportunities to support mental health of children
(4) address infrastructural barriers to physical activity
(5) invest and promote active travel to schools and workplaces
(6) explore the use of technologies & digital tools to promote physical activity equitably
(7) support social connectedness and mental health of older adults through physical activity programming in community and institutional settings
(8) ensure that individuals receiving institutional care can access equipment and resources to support movement and physical activity

Implementation Support Service

We will pilot an Implementation Support Service for interested researchers and community members by providing access to tools and resources that will build capacity, strengthen partnerships and increase potential for successful implementation projects in community or clinical settings. We will act as a centralized access point with a free knowledge mobilization platform, seed grants to help fund these projects, and a website to signpost these resources to the public.

Implementation includes strategies to promote the adoption and integration of evidence-based health interventions into practice. Implementation research includes, but is not limited to, examining factors affecting implementation, implementation processes, methodologies and outcomes. The intent is to understand what, why, and how interventions work in "real world" settings.

Introduction

Background

Physically active people have lower health risks

Physical activity can prevent, reverse or help manage the symptoms of many chronic diseases (1) including: hypertension, the leading cause of death and disability around the world (2); dementia (3); and osteoarthritis, one of the most common reasons for primary care visits (4). Physical activity, even at low doses, is associated with a lower risk of mental illness (5), and available evidence supports that physical activity can confer protection against the emergence of depression regardless of age and geographical region (6). The COVID-19 pandemic has generated more interest in the lesser-known benefits of physical activity for infectious diseases, including reduced risk of infection, enhanced immune system function to prevent and hasten recovery from infections, and increased effectiveness of vaccination (7). Adults who engage in the recommended levels of physical activity are less likely to contract a SARS-CoV-2 infection, experience severe COVID-19 illness or have a COVID-19 related death (8).

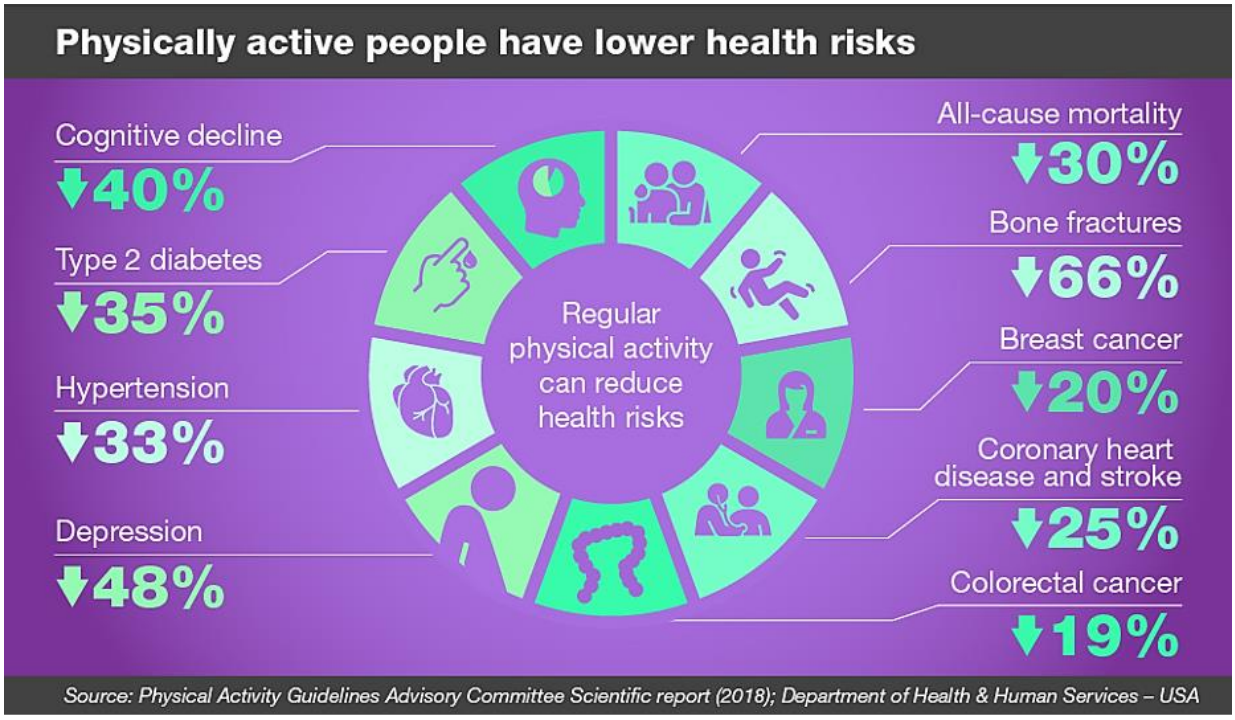


Figure 1: Reduced health risks from being physically active (9)

The WHO 2020 Guidelines on physical activity and sedentary behaviour

Figure 2. WHO 2020 Guidelines on physical activity and sedentary behaviour (10)

The WHO recommends that adults (18-64 years old) get at least 150-300 minutes of moderate intensity or 75-150 minutes of vigorous intensity aerobic physical activity per week (10). Pregnant and postpartum people without contraindications should engage in 150 minutes of moderate intensity aerobic activity per week (10). Children and youth (5-17 years) should engage in at least 60 minutes daily of moderate to vigorous physical activity (MVPA) and vigorous intensity aerobic physical activity on at least 3 days of the week (10).

Physical inactivity is an epidemic

Physical inactivity exposes individuals to a greater risk of dying than smoking, obesity, or hypertension (11) and is the 4th leading risk factor for death worldwide, accounting for 6% of deaths globally (12,13).

Physical inactivity increases the risk of communicable and noncommunicable diseases. Worldwide, it is estimated that physical inactivity causes 6% of the burden of disease from coronary heart disease, 7% of type 2 diabetes, 10% of breast cancers and 10% of colon cancers (14). A 25% reduction in the rate of physical inactivity would prevent an estimated 1.3 million deaths a year globally (14). Physical inactivity is also associated with a higher risk of severe COVID-19 outcomes (15,16) and a higher likelihood of infection (8).

Most Canadians are inactive

The 2018-2019 Canadian Health Measures Survey found that 49% of Canadian adults aged 18 to 79 and 44% of children and youth (5 -17 years) met national physical activity guidelines for their age group (17). The COVID-19 pandemic has negatively affected youth physical activity levels as the proportion of youth aged 12-17 meeting Canadian physical activity recommendations decreased from 50.8% pre-pandemic to 37.2% during (18). Policies aimed at controlling the spread of COVID-19 and subsequent school closures may have negatively affected physical activity levels in this group (19) , and the long-term health consequences remain to be determined.

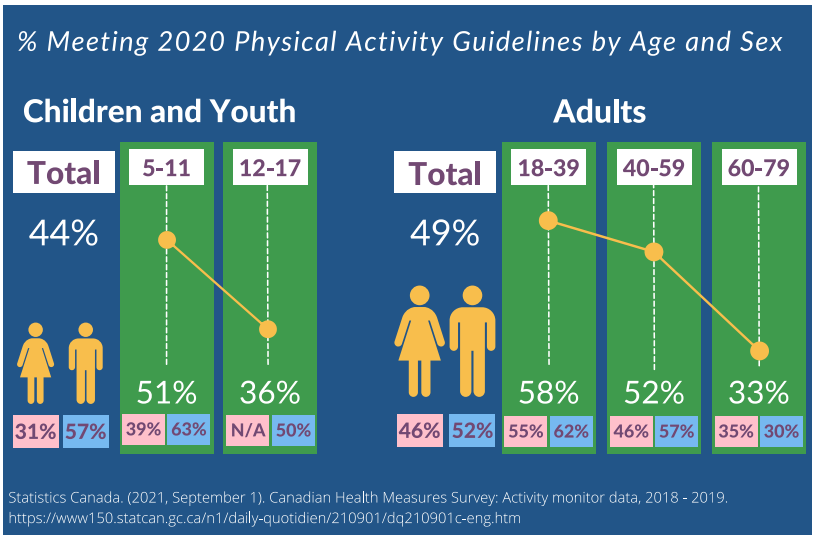


Figure 3. Percentage of individuals meeting 2020 Canadian physical activity guidelines by age and sex

Physical inactivity costs billions of dollars worldwide

Conservative estimates from 2013 show that physical inactivity costs healthcare systems $53.8 billion (USD) worldwide, and that inactivity-related deaths contribute to $13.7 billion in productivity losses (20). High-income countries bear a larger proportion of economic burden (80.8% of health-care costs and 60.4% of indirect costs) (20). In Canada, a 2012 analysis estimated that physical inactivity costs $2.4 billion, $4.3 billion and $6.8 billion (CAD) in direct, indirect, and total health care spending, respectively (21) The total health care costs of physical inactivity represented 3.7% of overall health care costs in a 2009 analysis in Canada (21).

The WHO Global Action Plan on Physical Activity (GAPPA)

In response to the increase in physical inactivity, the WHO created the GAPPA and set a target of a 15% relative reduction in the global prevalence of physical inactivity in adults and in adolescents by 2030 (22) The GAPPA's mission is: *"To ensure that all people have access to safe and enabling environments and to diverse opportunities to be physically active in their daily lives, as a means of improving individual and community health and contributing to the social, cultural and economic development of all nations"* (22). To promote physical activity at all levels, the GAPPA provides a systems-based framework of four strategic objectives through 20 policy actions (Figure 4) consisting of 'upstream' policy actions to improve social, cultural, economic, and environmental factors, and 'downstream' approaches to provide information and education to the individual. These objectives and policy actions were created to help countries prioritize decreasing physical inactivity.

Figure 4: The four objectives and 20 policy actions from the WHO's GAPPA (22).

The Western Research Hub for Physical Activity and Health

We are an established team of diverse scholars spanning seven different Faculties at Western University and a Community Advisory Council comprised of patient partners and community organization representatives with a variety of lived experiences and diverse perspectives based in London, Ontario, Canada. We are ideally positioned to be a national and world leader on implementation of physical activity recommendations with a multidisciplinary focus as evidenced by our strong links to community partners, clinical practices, access to physical activity testing and prescription, and the expertise across multiple Faculties and disciplines. Our mission is to advocate for and implement meaningful, sustainable and culturally relevant physical activity opportunities within our community and beyond.

The Western Research Hub for Physical Activity and Health (The Hub) will:

1. Advocate for and promote the WHO vision "More active people for a healthier world".
2. Mobilize knowledge as the Canadian hub (and research leader) of the GAPPA.
3. Provide academic leadership, collaboration and mentorship opportunities in this field locally, provincially, nationally and internationally.

Ultimately, our aim is to serve as a go-to-resource for physical activity implementation, assisting the WHO in their efforts to "provide global leadership and stronger regional and national coordination, and a whole-of-society response to achieving a paradigm shift in supporting and valuing all people being regularly active, according to ability and across the life course".

Development of the Hub

Research Team Formed – May 2021

The Western Research Hub for Physical Activity and Health was conceptualized by Dr. Jane Thornton and the Return to Health and Performance Lab. A multitude of junior and senior scholars at Western University came together to organize collective efforts to increase physical activity in our community. A Steering Committee of 10 faculty researchers was formed and patient engagement expert Dr. Dawn Richards was brought on.

Research Retreat Convened – June 2021

An inaugural research retreat was convened, bringing together a multidisciplinary and interfaculty team of over 30 researchers to discuss current projects, common research interests, and alignment of our work to answer the GAPPA. During this retreat, researchers identified potential collaborators, funding opportunities, terms of reference and finalized the vision statement for the Hub.

Community Advisory Council Finalized – August 2021

The GAPPA highlights the importance of a "whole of system" response including multisectoral partnerships and meaningful community engagement to tackle the physical inactivity epidemic. We formed an initial Community Advisory Council (CAC) consisting of a group of members including patient partners and community organization representatives from the London community living with and representing diverse experiences (see Appendix 4).

With the guidance of patient engagement expert Dr. Dawn Richards, CAC members were selected through an interview process which sought to identify and recruit different perspectives from individuals who bring perspectives as patients, policymakers, healthcare workers, and representatives of community organizations as well as people from under-represented groups. Our initial CAC was made up of 10 members including patient partners and community organization representatives from the London community living with and representing diverse experiences. The CAC meets regularly with our research team, bringing important and varied perspectives to co-design our implementation strategy using an integrated approach.

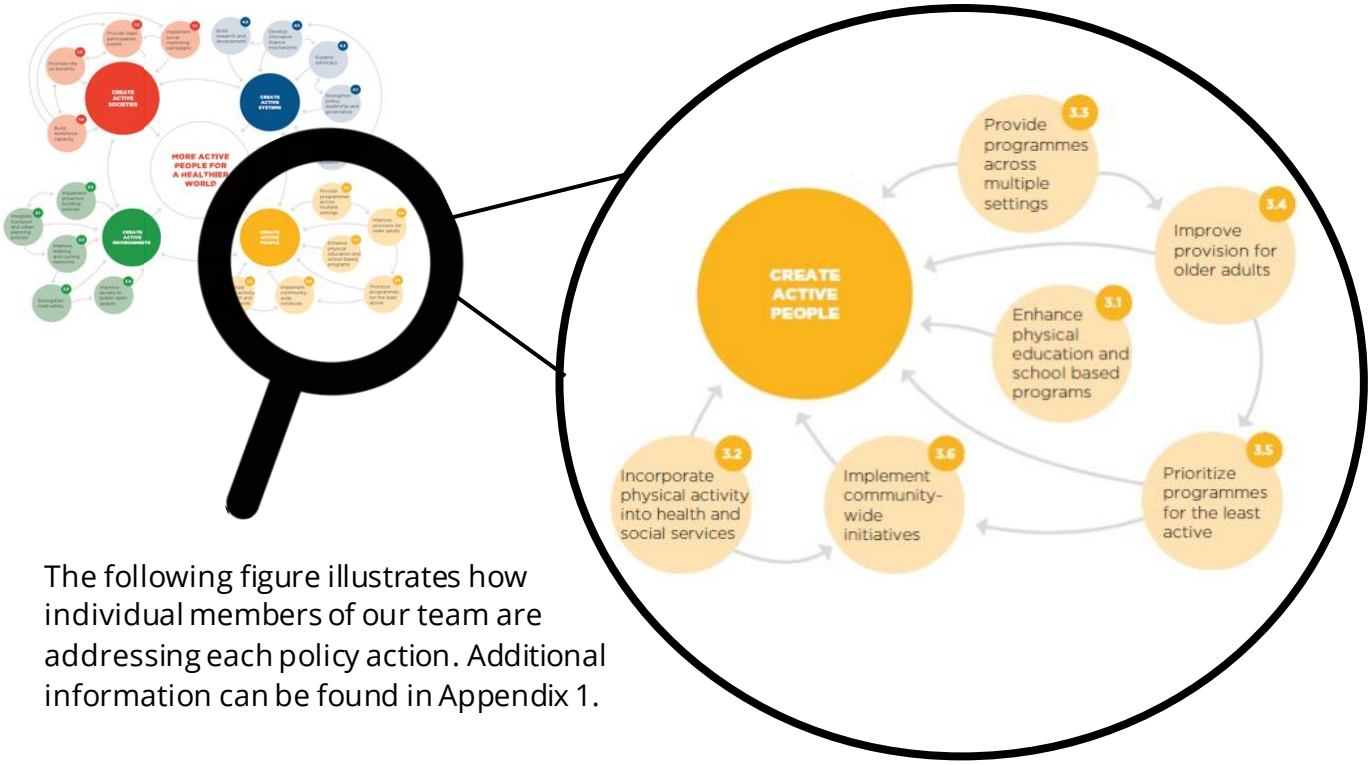
Environmental Scan Conducted – Fall 2021

To identify and mobilize existing strengths at Western, our team conducted an environmental scan of physical activity implementation research at Western University. To identify researchers involved in physical activity implementation, members of the research team developed a list of keywords based on the GAPPA, Objective 3: Create Active People and the accompanying six policy actions (Appendix 5). A list of faculty members was compiled based on the department sites on Western University's website, and a definition of implementation agreed upon (23–25).

Thirty-eight researchers were identified, nine of whom were already members of the Hub; the remaining 29 were invited to be collaborators. The scan identified Objective 3.1 (Physical activity implementation in educational settings) as an area of relative strength at Western as 14 researchers were found to have published a total of 26 articles on this topic. The scan also revealed that more connections and partnerships could be fostered, particularly within physical activity implementation and stakeholder consultation for historically marginalized and vulnerable groups to address policy action 3.5 (newcomers, racialized groups, individuals living with chronic disease and/or disabilities).

The Hub's first Focus: Create Active People

The expertise and current work of our team led us to first focus on addressing the GAPPA's Objective 3: Create Active People. Some researchers work in areas that address other GAPPA objectives as well. As we continue to grow, our team aims to address all four policy actions of the GAPPA.



The following figure illustrates how individual members of our team are addressing each policy action. Additional information can be found in Appendix 1.

Adapted from the WHO 2018 (22).

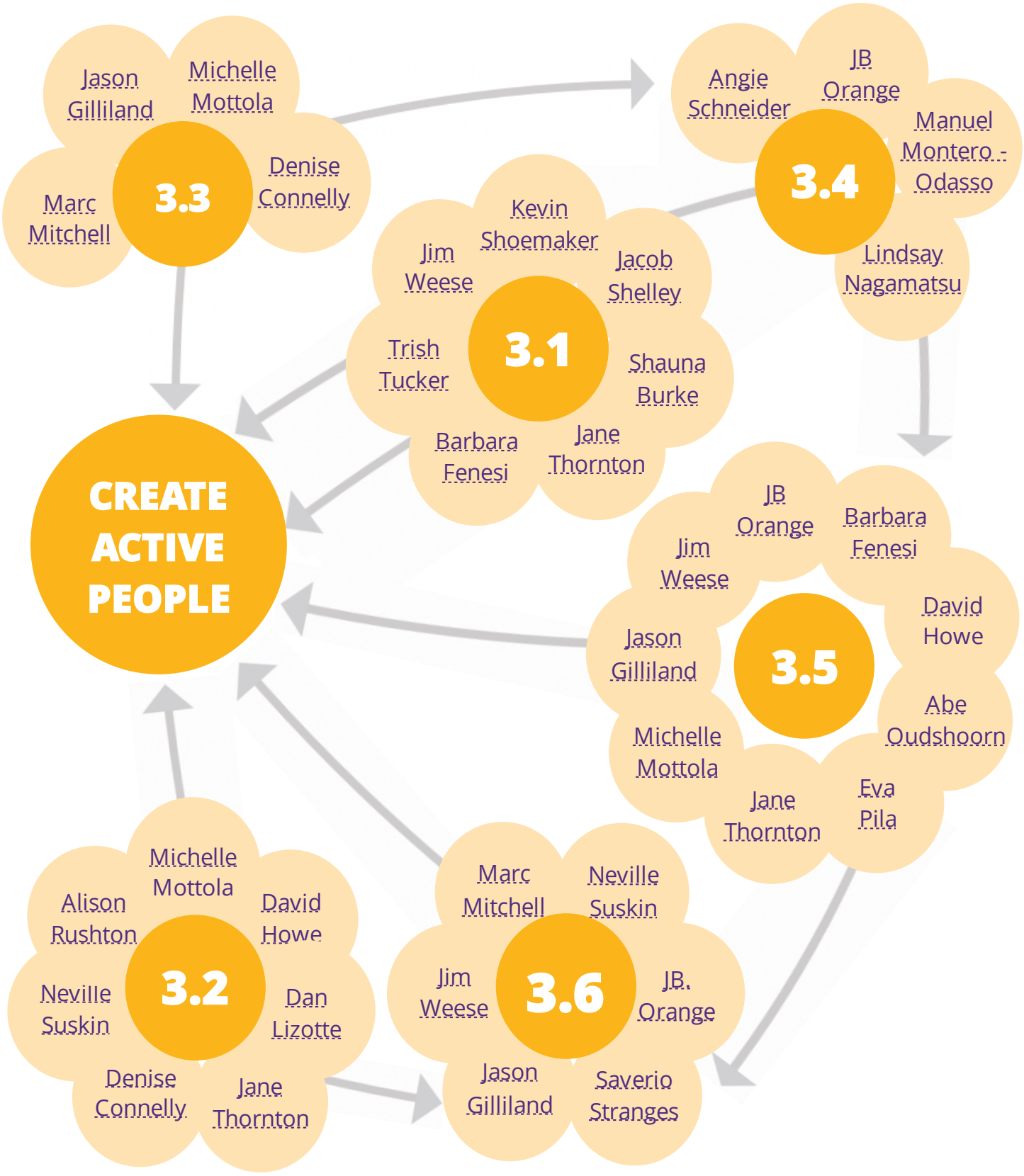


Figure 5: Summary of the six policy actions addressing the GAPPA's Objective 3 and which of the Hub collaborators are addressing each policy action
(Adapted from WHO 2018 (22)).

Knowledge in Action

To ensure our knowledge is widely accessible and available to our end users, we have taken a variety of approaches to disseminating our work including the launch of a website and two collaborative events as outlined below.

My Active Ingredient Website

Informed by the CAC, our team developed and launched a "peer-to-peer" physical activity website "My Active Ingredient" (myactiveingredient.org). The website provides free, curated and easy-to-use physical activity resources that have been submitted to the website through a standardized submission process. The user-friendly interface allows individuals and groups to find movement as medicine resources specific to the treatment of their health condition(s) or to address specific barriers. We envision that it will become an essential tool to promote physical activity for patients and the public.

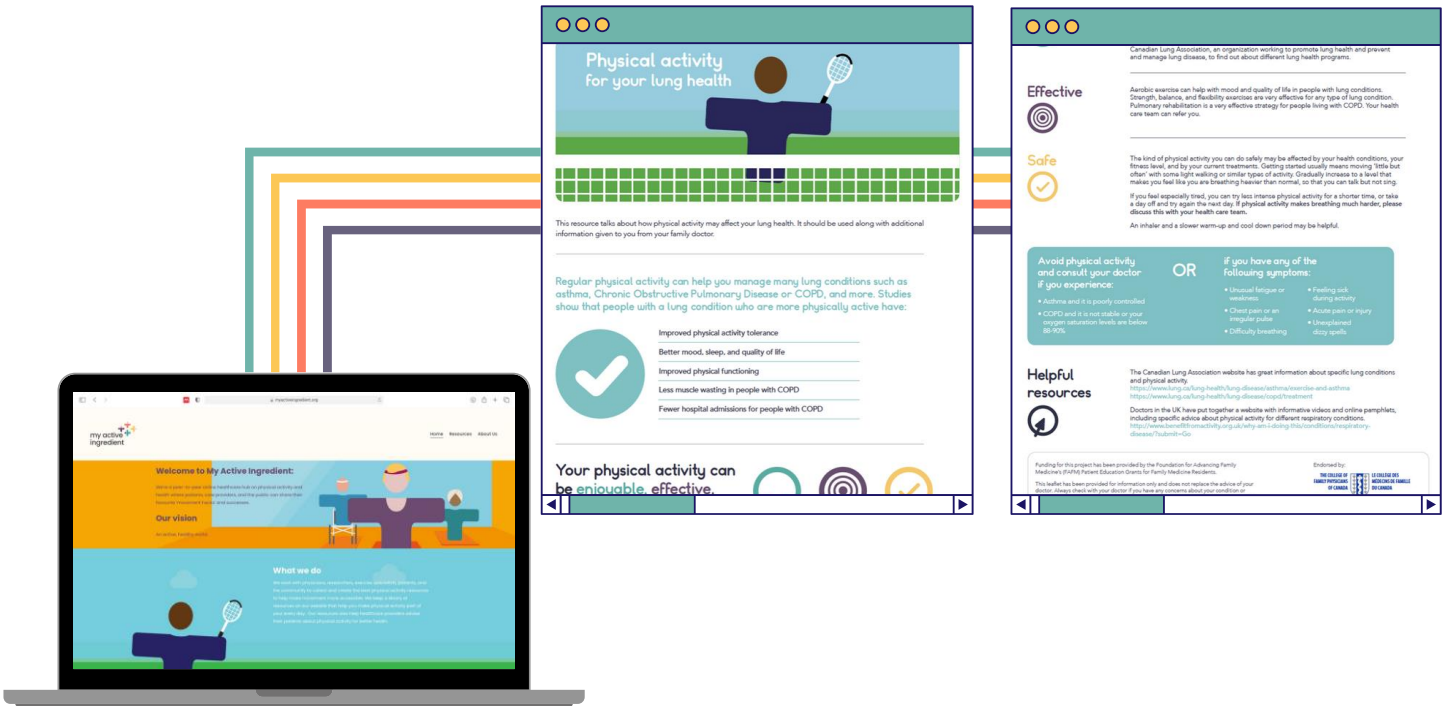


Figure 6: My Active Ingredient home page and example of a physical activity resource

Western Internal Summit – Event 1

We hold yearly internal summits with our Steering Committee, Faculty Collaborators, and Community Advisory Council. The Summit's goals are to:

1. Highlight current initiatives led by Western researchers that address the WHO GAPPA (outlined in previous section)
2. Collectively establish the Hub's priority actions for the next 2 years.

A portion of each meeting is dedicated to focus groups to discuss advancing physical activity implementation at Western University and in the City of London.

For the first Summit, attendees (n=49) were randomly assigned to one of four groups. Feedback from each group was collated and sorted according to the six policy actions with GAPPA Objective 3. Drawing from the feedback received, we developed a list of actions for the Hub to focus on moving forward, detailed in the following section. Attendees identified organizations and individuals from the wider London community to invite to be part of the Hub (e.g., city councillors, local Indigenous organizations, local Health Units, pharmacies, graduate students and health promoters).

Input from this broad spectrum of individuals is critical to ensure that the Hub's priorities and strategic actions are applicable and relevant to all stakeholders.

ACTIVE for Health Symposium – Event 2

The ACTIVE (Activity, Community, Translation, InnoVation & Engagement) for Health symposium is a city-wide, community event that brings together researchers, community members, local organizations and patient partners to discuss physical activity implementation in London. The first symposium was funded by the CIHR Healthy Cities Research initiative which aims to build understanding on how we can make cities healthier for all. The purpose of the first Symposium was to:

1. Share existing Western-led research in physical activity implementation.
2. Highlight best practices, existing resources/tools and success stories in physical activity implementation within the London community.
3. Provide a platform for knowledge exchange and capacity building amongst researchers and community stakeholders.
4. Strengthen/establish partnerships and facilitate collaboration between Western University researchers and community stakeholders.
5. Engage individuals and organizations representing the underrepresented groups.

We partnered with our CAC as well as Equity, Diversity, and Inclusion (EDI) Collaborators to ensure the inclusion and engagement of underrepresented groups. The CAC co-developed a suggested list of discussion topics, invitees, speakers and were also invited to participate as speakers at the symposium. Members of the research team, CAC and trainees were invited to speak, conduct workshops and present posters to share their research and

expertise. The symposium was hosted in a hybrid format to allow in-person and virtual attendance; all sessions were recorded. At each symposium, registrants are invited to participate in a survey which aims to determine best practices for physical activity implementation in London. Additionally, we aim to determine whether the ACTIVE for Health symposium results in new partnerships between researchers and the community.

This annual symposium will enable the Hub to create innovative research that links education, patient related outcome measures, best practice, and implementation science.

Lessons learned from our Community Advisory Council

CAC members indicated that being a part of the research team, shaping research questions, and contributing to the decision-making process motivated them to participate in the CAC. They felt as though being able to provide feedback and input from their unique perspectives was the most important contribution to this project, and the majority felt that their contributions were reflected in the projects we worked on over the last year. Flexible meeting times and a direct line of communication with the rest of the research team made it easier for members to participate, additionally honoraria were appreciated and made members feel valued. Our Patient Engagement Model (Figure 7) reflects our learnings through our work with the CAC.

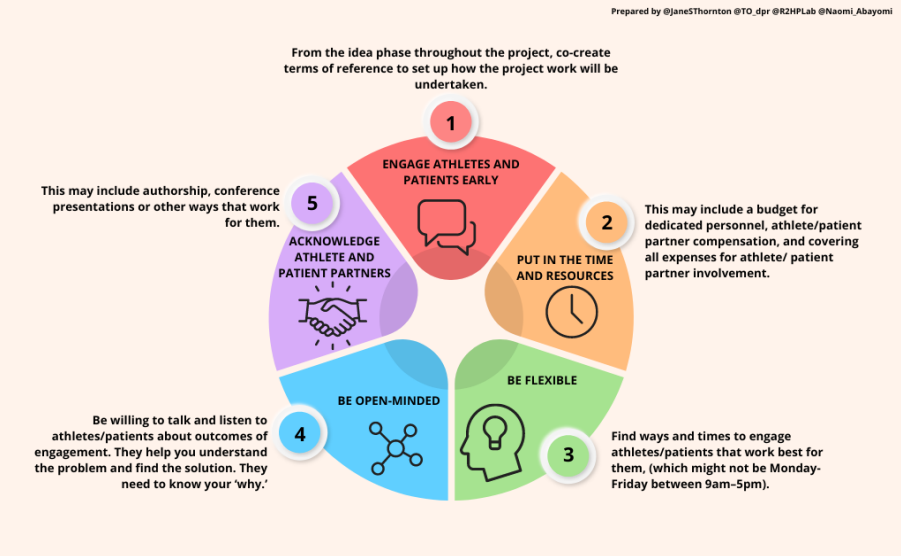


Figure 7. Patient engagement model.

Here is what we heard from some of our partners:

"I enjoy being part of the decision process, discussing ideas with peers, and seeing those ideas flourish into final polished results that will help the greater community."

- Community Partner (Tanya I)

"Participation resonates in a positive ripple effect!"

- Community Partner (David S)

"I feel perspectives such as mine may not be sought out very often in research of any kind and I am glad that is changing and I want to be a part of that change."

-Community Member (Paula R)

"It is invaluable to include those who will be benefiting from your final product during the developmental stages because they can provide insight to what they need and how they need it."

- Community Member (Paula R)

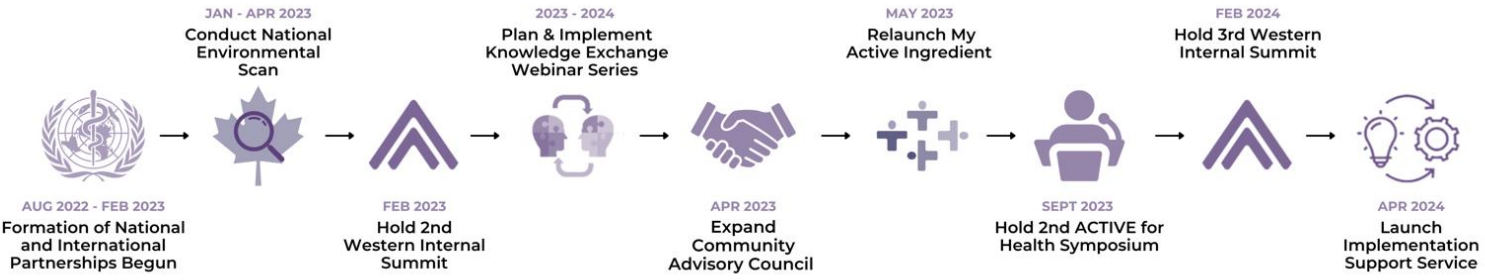
"..we are not there to tell [researchers] what to do but to offer our thoughts on behalf of the Patient community and from our life skills that we attain during our careers etc."

- Patient Partner (Kirk P)

Next Steps

Timeline and Milestones

As recommended by the GAPPA, we have identified strategic responses to the GAPPA policy actions over short, medium and longer term. The following figure outlines our future milestones that we have set for our medium and long-term responses to the GAPPA.



Priority Actions of the Hub

The Hub has made significant strides in identifying the strengths of Western University and City of London in physical activity implementation, as well as securing buy-in from research, patient, and community partners on priority actions to focus on over the next two years (2023 – 2024) in order to advance our collective goal of addressing the GAPPA.

Feedback gathered during the Western Internal Summit led to the development of a list of priority actions for the Hub. This list was circulated to the initial Steering Committee and Community Advisory Council for review and endorsement. **The CAC and Steering Committee ranked the actions based on two factors: 1) importance and 2) feasibility.** A composite score was calculated to prioritize actions. Each strategic action is presented below according to its rank and highlighting the relevant GAPPA policy actions it addresses.

1.  Engage and establish partnerships with key stakeholders (3.1 – 3.6)
2.  Harmonize messaging about physical activity among healthcare providers (3.2)
3.  Explore post-pandemic opportunities to support mental health and behaviour regulation of children (3.1)
4.  Address infrastructural barriers to physical activity resources and programming (3.3, 3.6)
5.  Invest in and promote active travel to schools and workplaces (3.1, 3.3, 3.6)
6.  Explore the use of technologies and digital tools to promote physical activity equitably (3.3)
7.  Support social connectedness and mental health of older adults through physical activity programming within community and institutional settings (3.2, 3.4)
8.  Ensure that individuals receiving institutional care (e.g., hospital, long term care) can access equipment and resources to support movement and physical activity during their stay (3.2, 3.4)

The Hub will undertake the following steps to support our members:

Launch Implementation Support Service

The Hub will pilot an Implementation Support Service to faculty and community collaborators. This service will support individuals and organizations conducting physical activity implementation at Western and/or in the City of London and beyond. Collaborators working on projects specifically aimed at one or more of the GAPPA objectives and Hub policy actions will be encouraged to connect with the Hub to obtain implementation support from our team in the form of:

1. **Advice** from our Coordinator and investigators based on experience and expertise
2. **Resources** such as frameworks and toolkits developed by our team
3. **Tips** on project management and how to avoid common pitfalls
4. **Regular meetings** to troubleshoot implementation-related barriers

5. **Networking support** to help connect with partners who have expertise in the topic as well as relevant community and/or patient partners to consult on the work
6. **Two Seed grants** of up to $5,000/grant to help fund these projects. Funding applications will be reviewed and selected by both the research team and the CAC.
7. **Knowledge translation** assistance and guidance

Form and strengthen national and international partnerships

We are conducting an environmental scan at the national level to identify and engage researchers throughout Canada who are working on physical activity implementation. These partnerships will allow us to share best practices and further advance research in physical activity implementation, with a focus on engaging underrepresented individuals/ organizations. Numerous knowledge exchange activities including annual Summit Meetings, webinars, podcasts and educational modules will help unite researchers with community stakeholders and patient partners. An open access publication coupled with international conference presentations, lay summaries and infographics will allow us to share our approach to physical activity implementation and process for building connections between researchers, patients and community stakeholders. Altogether, our initiative as a Hub will facilitate collaboration and create an impetus of implementation which can be scaled up beyond London.

Conclusion

The Western Research Hub for Physical Activity and Health is the first and only collective of its kind aimed directly at addressing and implementing the WHO's GAPPA framework through a multidisciplinary team with proven expertise in physical activity and health. Together, Western University and the City of London are positioned to be a national and world leader on implementation of physical activity recommendations with an interdisciplinary focus, as evidenced by our strong links to community partners, clinical settings, access to physical activity testing and prescription, and expertise across multiple faculties. Creating and strengthening existing partnerships by sharing our progress and highlighting our research will help us achieve our objectives.

The Hub will create opportunities for capacity building and knowledge exchange, participatory research and cross-collaboration between Western University and the London community and scale-up of local initiatives. We will document our process for co-creating opportunities for physical activity implementation with patient partners and stakeholders, putting the City of London and Western University on the map as exemplars for other communities to follow. Ultimately, our innovative and interdisciplinary Research Hub will provide resources and facilitate access to physical activity, resulting in more Canadians staying active for more of their lives, with implications for population-level health.

Who we are

Report Authors

Dr. Jane Thornton

Dr. Thornton is the Director of the Hub, a Clinician Scientist and Canada Research Chair specializing in long-term athlete health and physical activity in the prevention and treatment of chronic disease. She is an Assistant Professor in the Department of Family Medicine, with cross appointments in the Department of Epidemiology & Biostatistics and School of Kinesiology.

Dr. Rory Vaughan

Dr. Vaughan graduated from University College Cork (UCC), Ireland, School of Medicine, in 2018 (MB,BCh). He completed his Masters in Public Health at UCC (2022) with a focus on physical activity as part of upstream solutions to chronic diseases. He is currently completing a Family Medicine Residency at Western.

Dr. Kristen Reilly

Dr. Reilly completed a Masters of Public Health (2013) followed by a PhD in Health Promotion (2019) focused on parent-led interventions for childhood obesity. She has worked as a physical activity researcher and knowledge translation specialist in academia and the non-profit sector ever since.

Dr. Rebecca Breau

Dr. Breau completed her Masters of Science (2018) and her PhD in Human Health and Nutritional Sciences (2021) at the University of Guelph and the University of Bremen (Germany), where her research examined physical activity levels in preschool-aged children.

Acknowledgements

The authors are grateful for the funding support from Western University and CIHR to create this Interdisciplinary Initiative. This paper would not have been possible without the thoughtful review and guidance by our co-Investigators. We are especially grateful to our Community Advisory Council members, who co-created our recommendations, and ensured this report stayed relevant to the needs and priorities of the community.

Prepared for: the WHO Physical Activity Unit and its members, policymakers, program managers and other researchers/healthcare providers.

Appendices

Appendix 1: How Hub members are working to Create Active People

Dr. Jane Thornton - *Return to Health and Performance Lab*
Dr. Thornton's team strives to Create Active People through multiple projects including a review to determine the best practices for school-based implementation strategies (3.1), two randomized controlled trials to support osteoarthritis and post-surgical patients through physical activity prescription (3.2), and an evaluation on implementation of the Provincial/Territorial Aboriginal Sport bodies' long-term sports participation pathway (3.5).

Dr. Shauna Burke
Dr. Burke's team examines child and adolescent health behaviours. They work in collaboration with Dr. Trish Tucker to develop and implement policies aimed at increasing children's physical activity levels (3.1).

Dr. Denise Connelly
Dr. Connelly's team examines the referral process of primary care practitioners for older adult patients to community exercise programs and what factors act as facilitators or barriers to this process (3.2). Additionally, they aim to explore the experiences of older adults searching an online database for community-based physical activity programs, to assess the completeness of this database, and provide feedback to improve program information and age-friendly access (3.3).

Dr. Barbara Fenesi- *The Working to Enhance Brain and Body Research Lab*
Dr. Fenesi works with teachers to identify barriers and facilitators of classroom physical activity and create training programs and resources to promote physical activity implementation within schools (3.1) (26). Her team is currently evaluating the efficacy of an evidence-based daily physical activity (DPA) toolkit among teachers (3.1). Dr. Fenesi also works with children and youth who have ADHD to identify ways to promote greater physical activity in their lives (3.1, 3.5).

Dr. Jason Gilliland - *Human Environments Analysis Laboratory*
Dr Gilliland's team undertakes community-based research to enhance appreciation of the social, economic, and environmental co-benefits of physical activity in a variety of ways addressing Objective 3. In collaboration with community partners, they oversee a program which provides free access to a wide variety of recreational programs to grade 5 students across the city (3.3,3.5,3.6).

Dr. David Howe - *The Health and Physical Cultures lab*
Dr. Howe's team explores various health (e.g., health care stakeholders, their values and interactions) and physical cultures (e.g., exercise, physical education, and organized sport) to uncover how they can positively and negatively impact wider systems of oppression disadvantaging social minorities (3.2, 3.5). This team critically examines how marginalized

populations are excluded from physical activity and sporting provision and how policies are seldom put into practice and hardly ever policed (3.5).

Dr. Dan Lizotte

Dr. Lizotte's research program investigates tailored social prescribing in primary health care, including physical activity opportunities (3.2). His research also aims to investigate and develop software tools to facilitate primary care practitioners as they match patients with interventions, including physical activity-related interventions, to combat social isolation (3.2).

Dr. Marc Mitchell

Dr. Mitchell's research spans the broader study of behavioural science and digital health to promote health behaviours including physical activity (3.3)(27). Much of this research has been in response to government and industry calls to incorporate digital solutions as part of a broad systems-based approach to promoting health behaviours and reducing the burden of preventable diseases (3.6).

Dr. Manuel Montero-Odasso

Dr. Montero-Odasso's team conducts research focused on "improving cognition to improve mobility" using pharmacological and non-pharmacological approaches such as physical exercise, cognitive training and non-invasive brain stimulation (3.4). Ongoing clinical trials seek to prevent cognitive decline and dementia in older adults at risk using physical exercises combined with cognitive training, and nutritional interventions (3.4).

Dr. Michelle Mottola

Dr. Mottola's research examines pregnant and postpartum individuals and continuously strives to include the best practice and healthy lifestyle approach to reduce chronic disease risk for pregnant individuals and their offspring. They work with the Arab Muslim community to co-design a nutrition and exercise intervention to improve chronic diseases, through a healthy lifestyle approach with improved physical activity (3.2, 3.3, 3.5).

Dr. Lindsay Nagamatsu

Dr. Nagamatsu's team works with older adults to examine the benefits of physical activity on cognitive function and brain health (3.4). Through co-designing interventions, they aim to develop and implement exercise interventions that are safe, accessible, inclusive and effective for older adults (3.4).

Dr. JB Orange - *The Canadian Centre for Activity and Aging*

Dr. Orange's team performs research on how to modify risk factors for the development of dementia, including the importance of physical activity (3.4). They provide evidence-informed educational courses for fitness leaders, healthcare professionals, family members and students in providing physical activity opportunities for older adults (3.4, 3.5, 3.6).

Dr. Abe Oudshoorn - *Street Soccer London*

Dr Oudshoorn's research focuses on homelessness prevention and intersectional understandings of homelessness. He has collaborated with Street Soccer London, Ontario, which promotes social inclusion within un- or under-housed populations via sport and physical activity, addressing Objective 3 (3.5) (28). The group takes an "everyone matters" approach to provide an environment where individuals experiencing homelessness and/or other challenges can find social support and community through physical activity.

Dr. Eva Pila

Dr. Pila's team examines the psychosocial and psychophysiological processes related to body image and physical activity experiences with a particular focus on girls and women (3.5).

Dr. Alison Rushton

Dr. Rushton's team seeks to increase physical activity and decreasing sedentary behaviour through the improvement of counselling by physiotherapists (3.2). Ongoing projects investigate an intervention to optimize physical activity adherence in patients with hip and/or knee osteoarthritis. Their work is informed by a qualitative study capturing the knowledge users voice deciding delivery style and treatment climate (29).

Dr. Angie Schneider, *The International Centre for Olympic Studies*

Dr. Schneider's research strives to examine opportunities in sport within older women with a focus on Equity, Diversity and Inclusion (EDI), addressing Objective 3 (3.4). Additionally, this work is conducted from an ethics and values-based analysis and can be applied to policy and frameworks.

Dr. Jacob Shelley

Dr. Shelley's work examines the proper limits and role of law in promoting public health and preventing chronic disease. He has collaborated on work addressing physical activity policies in childcare centres (3.1).

Dr. Kevin Shoemaker

Dr. Shoemakers' research focuses on human health and disease prevention with emphasis on the impact of physical activity on neurovascular coupling, and the associated mechanisms. His team has implemented a physical activity mentoring program to promote mental health in university students (3.1).

Dr. Saverio Stranges

Dr. Stranges conducts research driven by multisectoral approaches to promote healthy lifestyles for chronic disease prevention, for example via enhanced partnerships between public health and primary care (3.6). He has worked with both national and international organizations to inform policies around healthy lifestyles, including dietary and sleep patterns, physical activity, etc. (3.6).

Dr. Neville Suskin

Dr. Suskin's team has demonstrated real-world, cost-effective mortality and morbidity benefit through implementation of local and regional models of physical activity and exercise promotion in individuals post cardiac event or procedure (30,31) (3.2, 3.6).

Dr. Trish Tucker - *Child Health and Physical Activity Lab*

Dr. Tucker's team addresses Objective 3 through the implementation and evaluation of interventions aimed to increase physical activity participation among young children in childcare (3.1). Additionally, their work examines physical activity levels among young children with a disability to ensure their movement behaviours are also prioritized (3.1).

Dr. Jim Weese

Dr. Weese's research program is based on leadership in various areas including sport management. Dr. Weese has worked to increase women's presence in sport leadership and better experiences in sport for university athletes (3.1, 3.5, 3.6).

Appendix 2: Western Research Hub for Physical Activity and Health Members

Name	Faculty	Department
Director		
Dr. Jane Thornton	Schulich School of Medicine & Dentistry	Family Medicine
Co-Investigators		
Dr. Barbara Fenesi	Education	
Dr. Jason Gilliland	Social Sciences	Geography
Dr. Dan Lizotte	Science	Computer Science
Dr. Michelle Mottola	Health Sciences	Kinesiology; Anatomy & Cell Biology
Dr. Lindsay Nagamatsu	Health Sciences	Kinesiology
Dr. Abe Oudshoorn	Health Sciences	Nursing
Dr. Eva Pila	Health Sciences	Kinesiology
Dr. Alison Rushton	Health Sciences	Physical Therapy
Dr. Jacob Shelley	Law	
Dr. Kevin Shoemaker	Health Sciences	Kinesiology
Dr. Saverio Stranges	Schulich School of Medicine & Dentistry	Epidemiology & Biostatistics
Dr. Neville Suskin	Schulich School of Medicine & Dentistry	Cardiology
Dr. Trish Tucker	Health Sciences	Occupational Therapy
Consultants		
Dr. Nicole Kaniki	University of Toronto	Director of Equity, Diversity and Inclusion in Research and Innovation
Mariam Hayward	Western University	Director, Knowledge Exchange, Impact and Equity, Diversity, Inclusion & Decolonization in Research
Collaborators		
Dr. Luis Altamirano-Diaz	Schulich School of Medicine & Dentistry	Paediatric Cardiology
Dr. Shauna Burke	Health Sciences	Health Studies
Dr. Rachel Calogero	Social Science	Psychology
Dr. Denise Connelly	Health Sciences	Physical Therapy
Dr. Tim Doherty	Schulich School of Medicine & Dentistry	Physical Medicine and Rehabilitation
Dr. David Howe	Health Sciences	Kinesiology
Dr. David Litchfield	Schulich School of Medicine & Dentistry	Research Infrastructure
Dr. Janet Martin	Schulich School of Medicine & Dentistry	Anaesthesia and Perioperative Care
Dr. Laura Misener	Health Sciences	Kinesiology
Dr. Marc Mitchell	Health Sciences	Kinesiology
Dr. Manuel Montero-Odasso	Schulich School of Medicine & Dentistry	Geriatric Medicine

Dr. Kambiz Norozi	Schulich School of Medicine & Dentistry	Paediatric Cardiology
Dr. JB Orange	Health Sciences	Communication Sciences & Disorders
Dr. Harry Prapavessis	Health Sciences	Kinesiology
Dr. Angie Schneider	Health Sciences	Kinesiology
Dr. Jim Weese	Health Sciences	Kinesiology

Appendix 3: Steering Committee Members (2021 - 2022)

Name	Affiliation
Dr. Jason Gilliland	Human Environments Analysis Laboratory, Social Sciences
Dr. Nicole Kaniki	Director of Equity, Diversity and Inclusion in Research and Innovation
Dr. David Litchfield	Schulich School of Medicine & Dentistry, Research Infrastructure
Dr. Michelle Mottola	Health Sciences, Kinesiology, Cell Biology
Dr. Abe Oudshoorn	Health Sciences, Nursing
Dr. Alison Rushton	Health Sciences, Physical Therapy
Dr. Jacob Shelley	Law
Dr. Kevin Shoemaker	Health Sciences, Kinesiology
Dr. Saverio Stranges	Schulich School of Medicine & Dentistry, Epidemiology & Biostatistics

Appendix 4: Community Advisory Council Members (2021 - 2022)

Name	Affiliation
Dawn Richards	Facilitator, Patient Partner
Kalyn Ante	Child and Youth Network, London
Joyce Castanza	Age-friendly Network London
Tanya Iwas	Human Environments Analysis Laboratory Youth Advisory Council (HEALYAC)
Michael Lampman	YMCA of Southwestern Ontario
Jacqueline Mboko	Newcomer and French-speaking communities in London
Kirk Patterson	Patient Partner, Lawson Health Research Institute
Paula Rawlinson	Patient Partner, Lawson Health Research Institute, Chair of the Family Advisory Council and Member of Patients' Council, Parkwood
Patricia Riccio	Patient Partner, Lawson Health Research Institute
Kathryn Schade	Patient Partner, Lawson Health Research Institute
David Stickland	Street Soccer London

Appendix 5: Environmental scan keywords

GAPPA Objective	Keywords	
3	Exercise Physical activity Sport as medicine Health promotion Sedentary behaviour Sport as health	Implementation Recreation Play Program Movement as medicine
3.1	Active school travel Outdoor play School-aged children Whole-of-school	Student Children Child
3.2	PA prescription Wearable technology Fitbit	Pedometer Accelerometer Activity tracker
3.3	PA prescription Wearable technology	Fitbit
3.4	Older adults Senior Geriatric Elderly	Healthy aging Long term care Residential care Retirement home
3.5	Marginalized populations Special populations Indigenous, First Nation Vulnerable Least active	Participatory action research Rural Maternal Postpartum
3.6	Community/ Communities "Whole-of-community"	Local government

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