HUMAN & ENVIRONMENTAL PHYSIOLOGY RESEARCH UNIT

NEWSLETTER

HOME OF OPERATION HEAT SHIELD CANADA

Generating the knowledge to help Canadians adapt and prepare for rising temperature extremes

SEPTEMBER 2025 • VOLUME 4 • ISSUE 3

THE SUMMER EDITION

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NEWS AND NOTEWORTHY

WHY EXTREME HEAT HITS HARDER FOR PEOPLE WITH SCHIZOPHRENIA — AND HOW WE CAN HELP

Extreme heat can endanger anyone's health, but its impact is especially severe for people with underlying conditions that make it harder to stay safe. During the 2021 Western North America "Heat Dome" people in British Columbia living with schizophrenia faced a three-fold higher risk of death, far exceeding the risk associated with other common heat-sensitive conditions like diabetes and heart disease. Our new critical review, led by Dr. Nathalie Kirby, explores possible reasons why.

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NEWS AND NOTEWORTHY (CONTINUED)

WHY EXTREME HEAT HITS HARDER FOR PEOPLE WITH SCHIZOPHRENIA – AND HOW WE CAN HELP

Drawing on evidence across physiology, clinical psychology, and public health, we map three intertwined drivers of risk:

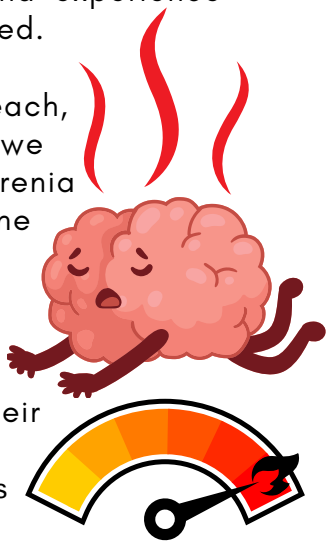
1. Physiological Alterations: Schizophrenia can impair one's ability to regulate body temperature due to altered nervous system control, cardiovascular dysfunction, challenges with fluid-regulation, and chronic inflammation.

2. Behavioral & Cognitive Factors: Impaired capacity for decision-making, temperature perception, and self-care are all barriers to cooling behaviours and can exacerbate heat susceptibility. Medication effects and co-occurring substance-use disorders may also play a role.

3. Social Inequities: Factors like low socioeconomic status, housing insecurity, social isolation, healthcare biases, and lack of access to cooling resources or targeted emergency alerts considerably limit protective adaptations.

Together, these forces compound heat health risks in ways that we are just beginning to understand, especially in susceptible populations like persons with schizophrenia.

Why this matters for you and your community: Social disadvantages can multiply heat health risks. Many individuals with schizophrenia live alone and experience reduced social contact, and it's harder to stay safe when you're isolated. During the Heat Dome, the majority of those who died were socially isolated, underscoring the life-saving value of neighbour checks, outreach, and low-barrier supports. Safer, healthier communities are built when we look out for one another. If someone you know is coping with schizophrenia or other severe mental health disorders, something as simple as a phone call, a knock on the door, or offering a cool space can make a life-saving difference during extreme heat.



We hope that the information in our paper encourages everyone to see beyond the stigmas associated with mental health conditions in their every day lives, and especially when environmental disasters strike, exposing unequal health risks. By showing compassion in public spaces and supporting people living with schizophrenia and other conditions, we create a culture of care that protects the strength of our whole community.

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NEWS AND NOTEWORTHY (CONTINUED)

WHY EXTREME HEAT HITS HARDER FOR PEOPLE WITH SCHIZOPHRENIA – AND HOW WE CAN HELP

What's new here is both the interdisciplinary evidence base and the frameworks we've built for action. This paper brings together insights from physiology, psychiatry, and public health into a single reference point; one that partners, caregivers, and policymakers can use to better protect people with schizophrenia when extreme heat strikes. To support implementation, we developed two open resources for health partners to adapt locally: a Guidance Document for assessing heat susceptibility and supporting a heat-safe strategies, and a Personal Heat Preparedness Plan designed for people with schizophrenia and their support networks to use before and during periods of extreme heat.

This project was a collaboration between the University of Ottawa's Human & Environmental Physiology Research Unit, and researchers and clinical experts at the Centre for Addiction and Mental Health, the University of Toronto, the University of British Columbia, and the BC Centre for Disease Control. By working across universities, clinics, and public health agencies, our team aimed to create specific and evidence-based tools that communities, caregivers, and policymakers can put into practice right away.

CLICK HERE TO READ THE FULL OPEN-ACCESS ARTICLE!

Dr. Nathalie Kirby, PhD
Research Associate
University of British Columbia

A MESSAGE FROM THE DIRECTOR

BETWEEN EXTREMES: THE HAZARDS AND HEALTH EFFECTS OF HEAT AND COLD

Many of you are familiar with the health hazards of heat and cold. Cold exposure can cause health hazards like hypothermia (a dangerously low body temperature) and frostbite (freezing of body tissue), while heat exposure can lead to illnesses such as heat cramps, heat exhaustion, and heat stroke (a life-threatening condition where the body can no longer cool itself). Both extreme temperatures can cause severe physiological damage, stressing organs like the heart and kidneys, and increasing the risk of fatal outcomes. Yet, under controlled exposures these temperature extremes can provide health benefits. Cold exposure can reduce inflammation, muscle stiffness and fatigue, improve mood and focus, and boost circulation. Heat therapy can relax muscles, increase blood flow and flexibility, soothe chronic pain, improve sleep quality, and open pores to cleanse the skin. Both therapies release shock proteins, which can protect brain cells and bolster the immune system.

Heat therapy includes hot tubs, hydrotherapy, steam baths, sanariums, infrared saunas, Finnish saunas, and Waon therapy, all using elevated temperatures to promote relaxation, recovery, and healing through physiological responses like increased circulation and anti-inflammatory effects. While diverse in their specific application and environment (e.g., dry heat, steam, or water-based), these methods share the common goal of leveraging heat to support cardiovascular health, boost immune function, and alleviate pain. Heat therapy is increasingly recognized for its potential to promote health, extend lifespan, and improve the quality of life, particularly for older adults and those with chronic conditions who cannot exercise regularly. By improving thermoregulation and cardiovascular function, heat therapy also acts as a preventative measure against heat-related illnesses.

By contrast, cold therapy uses methods like cold showers, cold-water immersion (e.g., ice water plunges), cryotherapy machines, and topical applications. It can reduce inflammation, decrease muscle tension, and potentially improve mood and sleep. However, most of the research on whole-body cold therapy for wellness is limited and definitive evidence for many claims is still needed. While it can be beneficial for acute injuries and post-exercise recovery, it is not recommended for chronic conditions, and individuals with heart or vascular issues should avoid it. Like the adaptations seen with heat exposure, repeated exposure to cold can lead to improved thermoregulatory function.

While there are reported benefits to controlled thermal exposure, whole-body heat or cold therapy is not universally safe and carries risks. When using any form of heat or cold therapy, always consult a healthcare professional before starting these therapies to assess potential risks and ensure they are appropriate for your current health condition. If you are interested in learning more about heat therapies reach out to our team.

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A MESSAGE FROM THE DIRECTOR
(CONTINUED)

BETWEEN EXTREMES: THE HAZARDS AND HEALTH EFFECTS OF HEAT AND COLD

We are conducting studies on the use of brief cold and heat exposure to improve the body's resilience against the hazards of these extreme environments. As global warming changes the planet's climate pattern, increasing the intensity and frequency of temperature extremes such as heatwave and cold spells, finding ways to protect our health and build resiliency to these temperature extremes is important for our survival.

If you are interested in learning more about our work and would like to participate in some of studies aimed at understanding the impacts of temperature extremes please contact me at gkenny@uottawa.ca. As outline in Recruitment Corner (see pages 16-20), we have several new and on-going studies and we would welcome your involvement in these important studies. Of particular note, we are resuming our work aimed at defining indoor temperature limits during heat extremes (see page 17) and are seeking men and women 65-85 years to participate. This work will help define drive new legislation to protect vulnerable people across Canada during extreme heat events.

Dr. Glen P. Kenny

Director
Human and Environmental Physiology Research Unit

IN THEIR WORDS WITH LUTZ SUKSTORF

HEAR FROM OUR STUDY VOLUNTEERS ABOUT PARTICIPATING IN OUR RESEARCH STUDIES

Over 10 years ago, while at the Ottawa Rowing Club, a young lady came and made pitch looking for volunteers to participate in a heat study being run by a UOttawa lab. They were looking for older people (over 50), to be part of a thesis study, (Masters or PHd not sure which), but it sounded interesting. Little did I know what I was getting into! It has been a great experience over the years. I've lost count in how many studies I've take part in; how much blood has been drained from my body or how sweat has been drained in the name of science.

Meeting and making acquaintances with all sorts of folks (Post Docs, PHD candidates, Masters and Undergrads) from literally all over the globe (Australia, UK, Europe, US and of course Canada). I am amazed how far the HEPRU reach is and how well-known Dr Kenny and his lab are. Along aathe way, I've learned a lot about myself and what's happening to myself as I am aging. Being locked in a lab for three days and living in a pair of shorts, because it was so warm, with cameras watching you 24/7 was an interesting experience. As was being dunked in a hydrostatic tank of water to measure my body mass or sitting in chair for whole day with gale force fan blowing on you. All in the name of science.

My children have asked "Dad, why do you do this"? I tell them that I'm doing it for them, so that when they're my age and the guidelines are published helping older folks to deal the heat in with our warming climate, it will be based on real science. I even made T-shirt to get people to ask what's HEPRU, so I can pass the message of the importance of learning to deal with heat.

SPOTLIGHT FEATURE

HEAT EXTREMES ARE ENDANGERING THE HEALTH AND WELLBEING OF CHILDREN

As global climate change progresses, extreme heat is becoming an increasing concern for the children, especially those who are left unprotected by aging school buildings and childcare facilities without proper air-conditioning. Children's heightened vulnerability to heat stems from both physiological factors, such as less efficient thermoregulation paired with increased body heat production during activity, and their dependence on adults to recognize symptoms and provide protection from overheating.

Heat stress negatively affects children's cognitive abilities, leading to impairments in memory and problem-solving, and disrupts their daily routines, contributing to emotional and behavioral challenges. It also interferes with sleep, which can exaggerate these effects, and triggers the body's stress response. These impacts are compounded by discomfort, fatigue, and the disruption of normal activities, all crucial for a child's well-being. Despite our general knowledge on the impacts of heat stress, our understanding of the physiological effects of heat exposure in children remains incomplete, limiting our ability to make informed, evidence-based decisions on the best strategies to implement to protect them. Given that children will increasingly be exposed to hot environments in school and at home, actions to safeguard their health are paramount.

This fall, Dr. Kenny and his team at the Human and Environmental Physiology Research Unit will be conducting a study to assess the physiological and cognitive responses in girls and boys aged 10-14 exposed to indoor overheating. The knowledge generated from the study will be used to provide recommendations on indoor temperature limits in schools and childcare facilities. If you know of a friend or family member with children who would like to participate in this study, please contact Dr. Kenny directly at gkenny@uottawa.ca. Parents or guardians can remain with their child throughout the trial.

FRESH OFF THE PRESS

Validating new limits for human thermoregulation.

Robert D. Meade, Fergus K. O'Connor, Brodie J. Richards, Emily J. Tetzlaff, Katie E. Wagar, Roberto C. Harris-Mostert, Theo Egube, James J. McCormick, and Glen P. Kenny

CLICK HERE TO READ MORE!

An exploratory assessment of regional cutaneous vasodilator responses to local heating in young and older females.

Caroline Li-Maloney, Gregory W. McGarr, Kelli E. King, Naoto Fujii, Tatsuro Amano, and and Glen P. Kenny

CLICK HERE TO READ MORE!

Pregnancy and extreme heat events: A rapid review of evidence related to health outcomes, risk factors and interventions.

Caroline Li-Maloney, Katie E. Wagar, Emily J. Tetzlaff, and Glen P Kenny

CLICK HERE TO READ MORE!

Knowledge, Awareness, Practices, and Perceptions of Risk and Responsibility Related to Extreme Heat: An Exploratory Survey of Older Adults in Canada.

Emily J. Tetzlaff, Robert D. Meade, Fergus K. O'Connor, and Glen P. Kenny

CLICK HERE TO READ MORE!

Brief extreme passive heat exposure leads to elevated biomarkers of systemic inflammation and acute kidney injury in older vs young adults.

Maria Vliora, James J. McCormick, Kelli E. King, Paraskevi Gkiata, Antonia Kaltsatou, Andreas D. Flouris, Glen P. Kenny

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Irisin and betatrophin responses to 9 h of passive heat exposure: Influence of age, hypertension, and type 2 diabetes.

Joel M Garrett, James J. McCormick, Kelli E. King, Robert D. Meade, Pierre Boulay, Ronald J. Sigal, Fergus K. O'Connor, and Glen P. Kenny

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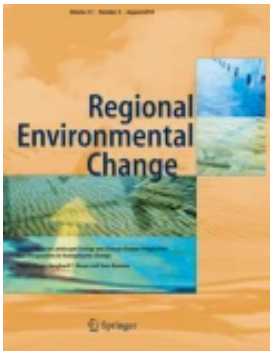
FRESH OFF THE PRESS

Women in the midst: an intersectionality study of Canadian climate change, poverty and health media reporting.

Yaa Serwaa-Akoto Amoah, Leanne M. Lacap, Emily J. Tetzlaff, Mariya Bezgrebelna, Amber J. Fletcher, Lyrique Richards, Zuhal Ahmadi, Glen P. Kenny, Mariam Farooq, Jolly Noor & Sean A. Kidd



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Effect of pedestal fan use on serum stress biomarkers in older adults exposed to simulated daylong indoor overheating.

Ben J. Lee, Thomas McCarthy, Fergus K. O'Connor, Sarah L. Davey, C. Douglas Thake, James J. McCormick, Kelli E. King, Pierre Boulay, Robert D. Meade, Glen P. Kenny

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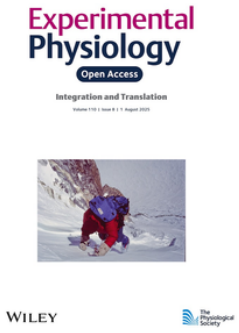
Intestinal epithelial injury and inflammation after physical work in temperate and hot environments in older men with hypertension or type 2 diabetes.

Ben J. Lee, Tessa R. Flood, Sophie L. Russell, James J. McCormick, Kelli E. King, Naoto Fujii, Tatsuro Amano, Sean R. Notley, Glen P. Kenny



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Humans exercising in the heat: A review on sweat models and a comparison to recent experimental datasets.

Robin de Korver, Boris R. M. Kingma, George Havenith, Kalev Kuklane, Glen P. Kenny, Robert D. Meade, and Arjan J. H. Frijns

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Climate change and schizophrenia: Implications and directions.

Sean A. Kidd, Daniel Rosenbaum, Martin Rotenberg, and Glen P. Kenny

CLICK HERE TO READ MORE!

Susceptibility of persons with schizophrenia to extreme heat: A critical review of physiological, behavioural, and social factors.

Nathalie V. Kirby, Emily J. Tetzlaff, Sean A. Kidd, Eric E. Brown, Mariya Bezgrebelna, Liv Yoon, Sarah B. Henderson, Glen P. Kenny

CLICK HERE TO READ MORE!

HEPRU TEAM HIGHLIGHT

MEET DR. KATE HUTCHINS

We're excited to welcome Dr. Kate Hutchins, who recently joined the Human and Environmental Physiology Research Unit (HEPRU) as a postdoctoral fellow. Originally from Brisbane, Australia, Kate moved to Ottawa in June to join the team and brings with her a wealth of knowledge, experience, and a strong passion for impactful thermal physiology research.

Kate's research journey began early in her academic career. During her undergraduate studies, she volunteered in a research lab as soon as the opportunity arose, quickly discovering a passion for investigating areas that are often underrepresented in the literature. This led her to a Master's degree, where she explored the effect of menstrual cycle phase on cycling performance and pacing strategy in hot environments. That focus on female-specific physiology continued into her PhD, completed in May, which critically assessed the suitability of current exertional heat stroke guidelines for females. Her project was the largest laboratory-based investigation to-date on using cold water immersion to treat exertional heat stroke, involving over 80 participants and more than 127 experimental trials. The findings highlight the risks of applying guidelines derived from male participants to female populations without proper validation.

Throughout her postgraduate training, Kate has received multiple competitive scholarships, including fully funded university scholarships for her Master's and Doctorate. During her PhD, Kate also undertook an industry partnership, supporting an interdisciplinary team in the planning and execution of a clinical trial investigating wearable technology for continuous dehydration monitoring.

Kate has been fortunate enough to present her research at several national and international conferences (Netherlands, Canada, South Korea, Sydney). She has received awards for both her presentations and publications and was recently nominated for the 2025 Outstanding Thesis Award at her former university.

What drew Kate to thermal physiology is the real-world impact of the work. She is driven by the opportunity to inform public health guidelines, support evidence-based decision making, and highlight areas in need of further research. "When I learned more about the work happening at HEPRU, I knew I wanted to be part of it. This research is creating change and I'm grateful to contribute to such a forward thinking and impactful team."

Looking ahead, Kate is excited to continue advancing research that improves lives, strengthens evidence, and contributes to meaningful innovation

HEPRU TEAM HIGHLIGHT (CONTINUED)

MEET JASH KAUR SAINI

We're excited to introduce Jashan Kaur Saini, a fourth-year Honours Health Sciences student at the University of Ottawa currently completing her research project within the Human and Environmental Physiology Research Unit (HEPRU). Born and raised in Cremona, just outside of Milan, Italy, Jash grew up in a traditional Italian-Punjabi farming household, spending much of her childhood with her grandparents. Her upbringing emphasized compassion, service, and caring for the elderly, values that continue to guide her academic and clinical path.

Outside of academia, Jash works as a certified Personal Support Worker (PSW) in a long-term care facility in Ottawa, where she supports individuals with Alzheimer's disease, dementia, and complex neuropsychiatric conditions. She also previously worked as a lifeguard in underserved neighborhoods, gaining experience in high-pressure environments that required calm, quick decision-making. Together, these roles have shaped her interest in emergency care, neurodegeneration, and early intervention strategies that preserve quality of life. These experiences also taught her the importance of leading with respect and emotional awareness when supporting individuals in distress or crisis.

Her current research investigates the effect of a single bout of remote ischemic preconditioning (RIPC) on human skin blood flow, heat loss, and systemic vascular biomarkers. Using intradermal microdialysis and whole-body calorimetry, she is examining how RIPC influences cutaneous vasodilation, sweating, and thermoregulatory efficiency.

Looking ahead, Jash is passionate about identifying early physiological markers of neurovascular decline and developing strategies to prevent severe neurodegeneration.

She hopes to contribute to interdisciplinary research that bridges lab science and clinical care, especially in long-term care, aging, and recovery homes that support individuals, including youth, facing addiction and unstable housing. These are spaces where science can serve both mind and community.

CONFERENCE PRESENTATIONS

This year, our team attended the Annual Meeting for the American College of Sports Medicine (ACSM) in Atlanta, Georgia. As the largest conference for research in physiology, our team had the opportunity to showcase our leading-edge work on the international stage.

CELEBRATING OUR ACSM AWARD WINNERS

Sarah Johnson (Undergraduate Student Award, left), Gil Bourgois (Early Career Professional Award, middle), and Archana Weerasooriya (Master's Student Award, right) celebrating their ACSM EOPIG wins!

We are thrilled to announce that our team had an outstanding showing at the recent ACSM Environmental and Occupational Physiology Special Interest Group awards, taking home three of the four honors!

- Gil Bourgois received the Early Career Professional Award, recognizing his exceptional contributions and emerging leadership in the field.
- Archana Weerasooriya earned the Master's Student Award, highlighting his outstanding research and dedication.
- Sarah Johnson was awarded the Undergraduate Student Award, celebrating her impressive achievements and promising future in environmental and occupational physiology.

Congratulations to all of our winners for their hard work, dedication, and the excellence they bring to our community!

CONFERENCE PRESENTATIONS

Our team had an impressive presence at this year's ACSM conference, presenting our work through eleven poster presentations and two rapid-fire oral presentations. From undergraduate students to postdoctoral fellows, our members demonstrated innovation, rigor, and passion in environmental and occupational physiology. The conference was an excellent opportunity to share our research, connect with the broader scientific community, and highlight the impact of the work that many of our readers help support as volunteers in our studies.

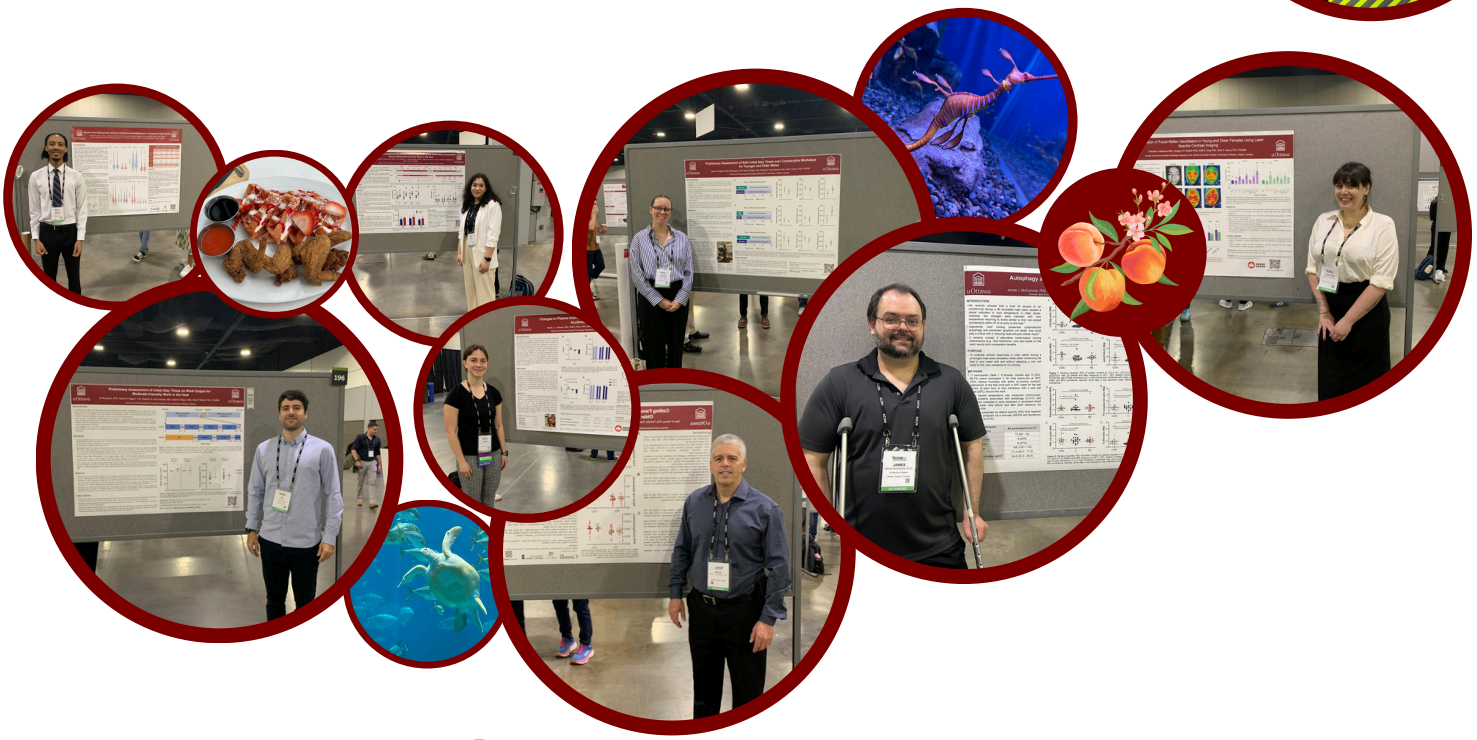
RAPID FIRE PRESENTATIONS

Effect of Cooling Centers on Renal and Gastrointestinal Stress in Older-Adults During Daylong Heat Exposure

Archana Weersasooriya, Ben J. Lee, Robert D. Meade, Sarah L. Davey, Charles D. Thake, James J. McCormick, Kelli E. King, and Glen P. Kenny

Heavy-Intensity Work in Uncompensable Heat Stress Conditions on Intestinal Strain in Young and Older Females

Tasfia Hussain, James J. McCormick, Kelli E. King, Roberto C. Harris-Mostert, Katie E. Wagar, Fergus K. O'Connor, Robert D. Meade, and Glen P. Kenny



CONFERENCE PRESENTATIONS

POSTER PRESENTATIONS

Age-related Gastrointestinal and Inflammatory Responses when Performing Consecutive Days of Moderate-intensity Work in the Heat

Farah T. Mourad, James J. McCormick, Kelli E. King, Roberto C. Harris-Mostert, Katie E. Wagar, Fergus K. O'Connor, Robert D. Meade and Glen P. Kenny

Electric Fan Use on Autophagy and Apoptosis in Older Adults During an Extreme Heat Simulation

Kelli E. King, James J. McCormick, Fergus K. O'Connor, Robert D. Meade, and Glen P. Kenny

Preliminary Assessment of Safe Initial Stay Times Over Consecutive Workdays for Younger and Older Men

Sarah M. Taggart, Gil Bourgois, Katie E. Wagar, Roberto C. Harris-Mostert and Glen P. Kenny

Changes in Plasma Irisin and BDNF in Response to 7-Day Cold-Water Acclimation in Young Males

Sarah J. I. Johnson, Kelli E. King, James J. McCormick, and Glen P. Kenny

Physiological Strain in Older Adults During a Simulated Extreme Heat Event: A Case Study

Kelli E. King, James J. McCormick, Gil Bourgois, Sarah M. Taggart, and Glen P. Kenny

Autophagy and Apoptosis After Foot and Neck Cooling in Older Adults Exposed to Extreme Heat

James J. McCormick, Kelli E. King, Robert D. Meade, Emma R. McCourt, and Glen P. Kenny

Ceiling Fans During Bedrest as a Cooling Strategy for Older Adults During Indoor Overheating

Glen P. Kenny, Robert D. Meade, Kristina-Marie T. Janetos, Zuhal Ahmadi, Caroline Li-Maloney, Sarah K. Johnson, and Fergus K. O'Connor

CONFERENCE PRESENTATIONS

POSTER PRESENTATIONS (CONTINUED)

Serum Irisin Responses to Daylong Passive Heat Exposure in Young and Older Adults

Saeed Linton, James J. McCormick, Kelli E. King, Robert D. Meade, and Glen P. Kenny

Examination of Facial Reflex Vasodilation in Young and Older Females Using Laser Speckle Contrast Imaging

Caroline Li-Maloney, Gregory W. McGarr, Kelli E. King, and Glen P. Kenny

Preliminary Assessment of Initial Stay Times on Work Output for Moderate-Intensity Work in The Heat

Gil Bourgois, Sarah M. Taggart, Roberto C. Harris-Mostert, Katie E. Wagar, and Glen P. Kenny

Autophagy and Apoptosis during Consecutive Moderate-intensity Workdays in the Heat in Young and Older Males

Mikaël F. Kanaan, Kelli E. King, James J. McCormick, Roberto C. Harris-Mostert, Katie E. Wagar, Fergus K. O'Connor, Robert D. Meade, and Glen P. Kenny

RECRUITMENT CORNER

PROTECTING OLDER WOMEN DURING HEATWAVES

It is well established that heatwaves can be more harmful for women compared to men. During the Western Heat Dome of 2021, more women than men lost their lives, and internationally, it was found that 56% more women than men died during the 2022 European heatwave. The vast majority of these women were above the age of 60. In recent work, we showed that across the lifespan we experience a 5% reduction in our capacity to dissipate heat. However, women have a 4% lower heat loss capacity as compared to men.

There is an urgent need to develop heat-mitigation strategies that are tailored to older women to better protect them in future heat-waves. While air-conditioning provides the most effective protection from extreme heat, it is inaccessible for many Canadian women, due to financial cost and energy demands. Instead, improving heat tolerance may reduce the harm to women from extreme heat.

We are now looking for individuals who would be interested in our study aimed at assessing the benefits of a home-based strategy for improving heat tolerance employing heat therapy in the form of 7 consecutive days of warm-water immersion. We will assess whether this form of heat therapy mitigates the effects of a day-long exposure to heat on body temperature, the cardiovascular system, cognitive function and thermal comfort. This research has the potential to shape public health policy and provide an accessible way to keep women safe in the heat.

We are looking for individuals who meet the following criteria:

- Women 65-85 years of age
- May be physically active but not engaged in intense exercise training programs.

Please contact Dr. Glen Kenny at gkenny@uottawa.ca to participate.

RECRUITMENT CORNER

INDOOR HEAT STRAIN IN OLDER ADULTS: THE IMPACT OF ACTIVITIES OF DAILY LIVING AND CLOTHING

With the great contribution of many of our readers, we recently assessed the impacts of indoor overheating on physiological strain in older adults during a simulated heat wave. We determined that maintaining an upper indoor temperature limit of 26°C was protective for heat-vulnerable older occupants. This new indoor temperature upper limit was recently incorporated by Dr. Theresa Tam, Chief Public Health Officer of Canada, in her recently released report on Mobilizing Public Health Action on Climate Change in Canada.

However, this recommendation did not consider the added heat burden associated with increases in internal heat production accompanying activities of daily living or the restriction to heat loss caused by clothing insulation. A key recommendation by many health agencies worldwide to prevent heat-related illnesses in older adults is to "stay cool during hot weather for example, stay in a cool space indoors, avoid strenuous activity, wear lightweight clothing, and drink cool water regularly throughout the day". Older adults do not sense heat as well as their younger counterparts. Consequently, they are likely to overdress despite high indoor temperatures. In other cases, individuals may wear heavy and/or dark-coloured garments due to cultural or religious norms and may not align with the need to dress lightly during very hot weather. Moreover, many individuals may be unaware of the consequences of increases in physical activity on heat gain and may therefore not adjust their normal day-to-day activity levels to prevent potentially dangerous rises in body temperature. Consequently, this may necessitate a lowering of recommended upper indoor temperature limit during a heat event.

This September, with the support of Health Canada, we will commence the next stage of our work aimed at determining if refinements in the upper indoor temperature limit may be needed to accommodate increases in physical activity associated with activities of daily living or clothing insulation while indoors. The study involves four separate visits involving a daylong (8-hours) exposure to the recommended indoor temperature upper limit of 26°C while either resting daylong or performing activities of daily living (simulated by performing light-intensity exercise each hour and while wearing light or heavier clothing insulation).

We are looking for individuals who meet the following criteria:

- Men & Women 65-85 years of age
- May be physically active but not engaged in intense exercise training programs.

Please contact Dr. Glen Kenny at gkenny@uottawa.ca to participate.

RECRUITMENT CORNER

REVITALIZING YOUR CELLS: THE INFLUENCE OF AGING ON CELLULAR TOLERANCE TO COLD WATER IMMERSIONS

Cold-water plunges are making waves - from backyard ice baths to viral social media challenges, people are willingly dunking themselves into chilly water in the name of health. Proponents claim benefits ranging from boosted mood to improved recovery and resilience, but how does the body really respond to repeated cold exposure? Our recent research at HEPRU has shown that repeated exposures to cold exposure via an acclimation can improve our tolerance to cold exposure at a cellular level by stimulating the cellular protection mechanism of autophagy in young males. However, it remains unclear how these cellular protection mechanisms respond in older males and females.

Autophagy is a vital self-cleaning and protection process found in nearly all human cells, which increases during physiological stress. Evidence suggests there may be age- and sex-related differences in how autophagy is activated, possibly influenced by factors such as hormones and cellular aging. It is well established that the function of autophagy declines with aging, but in our upcoming study we aim to determine if autophagic function can be restored in older adults through repeated cold-water exposure.

If you're looking to prepare for this winter with a refreshing cold-water plunge, we are actively recruiting participants! This study will involve 8 visits to the laboratory which includes a preliminary session (to assess aerobic capacity and body composition) and 7 cold-water immersions on 7 consecutive days.

We are looking for individuals who meet the following criteria:

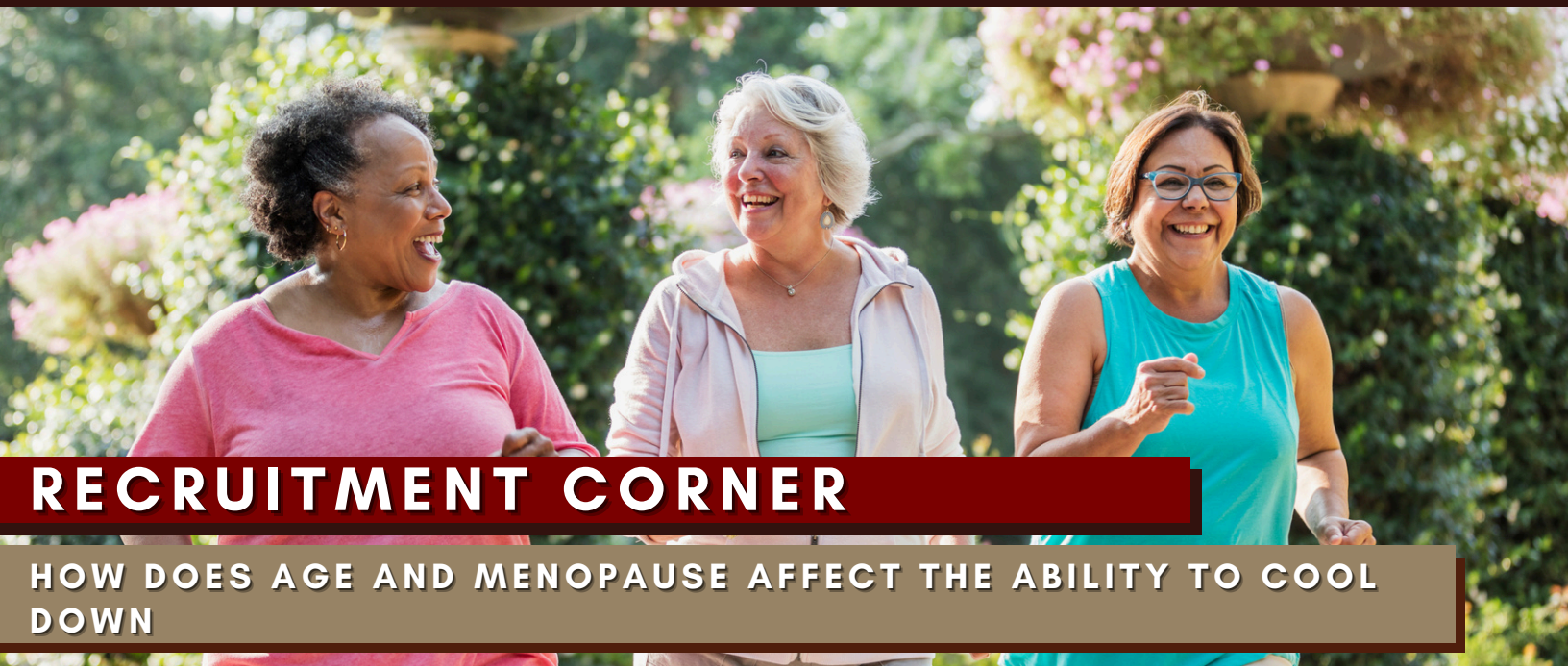
- Men & Women 60-75 years of age
- May be physically active but not engaged in intense exercise training programs.
- No history of cardiovascular disease or type 2 diabetes

Please contact Dr. Glen Kenny at gkenny@uottawa.ca to participate.

Learn more about how cold-water immersion affects our health at www.hepru.ca

The Effect of 7-Day Cold Water Acclimation on Autophagic and Apoptotic Responses in Young Males

Temperature-Dependent Relationship of Autophagy and Apoptotic Signaling During Cold-Water Immersion in Young and Older Males



RECRUITMENT CORNER

HOW DOES AGE AND MENOPAUSE AFFECT THE ABILITY TO COOL DOWN

HEPRU's research has demonstrated that aging is associated with large reductions in the body's ability to lose heat—which can result in marked elevations in body temperature and a greater strain on the cardiovascular system during a heat stress. HEPRU is committed to continue exploring the mechanisms that contribute to these impairments in heat loss. Furthermore, there is a lack of research on whether menopause—which is a normal part of the aging process—is a factor in how women respond to heat stress. Women have diverse experiences of menopause that may further impact how they deal with heat.

As part of a follow-up on our previous research, we are investigating how aging modifies the regulation of blood flow in the skin during exercise, as this is one of the primary mechanisms by which we lose heat.

We are also seeking to better understand the effects of menopause on heat tolerance during exposure to heat at rest. The studies are currently focused on assessing the separate effects of hot flashes and type 2 diabetes on heat loss responses.

We are looking for individuals who meet the following criteria:

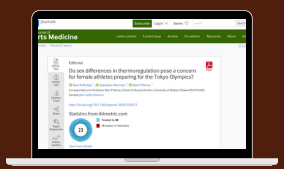
- Women 60-85 years of age
- No history of cardiovascular disease or type 2 diabetes

Additionally, if you are interested in our menopause-related studies we are looking for post-menopausal women 50-69 years of age with:

- Type 2 diabetes **OR**
- Currently experiencing severe or frequent hot flashes

Please contact Dr. Glen Kenny at gkenny@uottawa.ca to participate.

Learn more about how age and sex affect thermoregulation at www.hepru.ca



Do sex differences in thermoregulation pose a concern for female athletes preparing for the Tokyo Olympics?

The relation between age and sex on whole-body heat loss during exercise-heat stress

RECRUITMENT CORNER

INVESTIGATING THE IMPACT OF ACUTE HYPOXIA AND HEAT ON OCCUPATIONAL PERFORMANCE AND HEALTH

Occupational environments characterized by both heat stress and high altitude pose significant health and performance challenges. Workers exposed to these combined stressors, such as those employed in regions with high elevations and frequent heat waves, are particularly susceptible to impaired physical performance, diminished cognitive function, and increased risk of heat- and hypoxia-related illnesses (e.g., heat exhaustion, heat stroke, acute mountain sickness).

Despite the prevalence of such combined environmental stresses, current occupational guidelines often address hypoxia and heat stress independently, neglecting the interplay between these factors. This oversight potentially places places individual living and working at altitude at greater risk of experience adverse health outcomes due to inadequately informed guidance on the impacts of heat at altitude and the mitigation strategies that should be implemented.

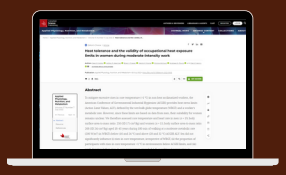
Our research aims to address this critical gap by examining the physiological and cellular responses to concurrent acute hypoxia and heat exposure, seeking insights to inform more effective occupational safety standards and practices. The outcomes of this study will directly contribute to better protecting the health and performance of workers in challenging environmental conditions.

We are looking looking for individuals who meet the following criteria:

- Men and women aged 18-30 or 60-75 years
- Healthy, habitually active (not endurance trained)

Please contact Dr. Glen Kenny at gkenny@uottawa.ca to participate.

Learn more about our occupational heat stress research at www.hepru.ca



Heat tolerance and the validity of occupational heat exposure limits in women during moderate-intensity work

Initial stay times for uncompensable occupational heat stress in young-to-older men: a preliminary assessment

uOttawa

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