HUMAN & ENVIRONMENTAL PHYSIOLOGY RESEARCH UNIT

# NEWSLETTER

## HOME OF OPERATION HEAT SHIELD CANADA

Generating the science to help Canadians adapt and prepare to rising temperature extremes



## **NEWS AND NOTEWORTHY**

THE WORLD'S FIRST DAYLONG HEAT WAVE SIMULATION TRIALS COMPLETED AND NEXT PHASE OF TRIALS COMMENCING SEPTEMBER 2022.

As record setting heat continues to impact the lives of Canadians from coast to coast, the Human and Environmental Physiology Research Unit continues to conduct leadingedge research to develop heat protection solutions and advice to safeguard the health and well-being of vulnerable men and women during hot weather. In December 2018, with the support of Health Canada and the Canadian Institutes of Health Research (CIHR), the Human and Environmental Physiological Research conducted a series of large-scale trials aimed at understanding how vulnerable adults respond to an extreme heat event. This recently completed work (May 2022) has led to the establishment of safe indoor temperature limits and the generation of new guidance on the use of emergency cooling centres to safeguard the health and well-being of the most vulnerable during an extreme heat event. On September 2022, in partnership with CIHR and Health Canada as well as local (e.g., Ottawa Public Health, Toronto Public Health) and provincial (e.g., Ontario Ministry of Health) health agencies, the Human and Environmental Physiological Research will expand its work to develop evidence-based heat protection solutions and advice (e.g., use of air conditioning, fans, limb immersion in cool water, others) to protect the health of heat-vulnerable Canadians.

#### A SPECIAL THANK YOU

Our work would not be possible without the help of the amazing participants who have given of their time and energy. To all those who have participated or will be participating in the next phase of our work, thank you! As more frequent and intense deadly heat waves are predicted across Canada in the next decades, you are helping to save countless lives across Canada and the world.

#### THE JULY EDITION

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# A MESSAGE FROM THE DIRECTOR

The world's first research trials evaluating how the body responds to extreme heat events completed at the Human and Environmental Physiology Research Unit.

In May 2022, we achieved an important milestone - the completion of a multi-year project directed at understanding the physiological responses of older adults and individuals with common chronic disease exposed to a daylong heat event. This included work aimed at defining safe indoor temperature limits and understanding the effectiveness of cooling centres to protect the health and well-being of vulnerable individuals. The completion of this work comes on the heels of BC Coroner's report into the deaths of 619 adults in British Columbia caused by the extreme heat event in the summer of 2021. The report (BC Coroner report June 7 2022) raised many questions about our preparedness to protect and safeguard the lives of Canada's most vulnerable in the face of rising global temperatures. Our research, which was recently featured in the Globe and Mail (globe and mail uOttawa research on heat exposure), is playing a critical role in assisting our partners at Health Canada develop heat action policies and messaging that will save lives. This includes using the work to assist various local (e.g. Ottawa Public Health, Toronto Public Health), provincial (e.g., British Columbia Centre for Disease Control, Institut National de Santé Publique du Québec) and national (National Collaborating Centre for Environmental Health) health agencies across Canada generate tools to assist Canadians protect themselves during an extreme heat event (health checks during extreme heat events).

This work, however, would not have been possible without the unparalleled support of the hundreds of volunteers like you who generously provided their time and energy to assist in this important work. Without your important contribution this work would not have been possible.

While this stage of our work has come to an end, we are moving forward with the next phase of this work. It will be directed at evaluating the efficacy of alternative cooling interventions during day-long simulated heat events (e.g., fans, air conditioning, limb immersion in water and other strategies) to protect against dangerous increases in body temperature during exposure to extreme heat. This knowledge is needed to support the development of consensus-based heat mitigation solutions and messaging which are still lacking today. We hope that you may be interested in participating once again (or in other studies, see Recruitment Corner on page 4). I would welcome you to email me (gkenny@uottawa.ca) if you are interested in participating. The project would commence September 2022 and continue over the next couple of years. My team and my partners across Canada welcome your involvement.

Finally, we are hoping that you might be able to complete a heat stress survey (see page 5). This survey aims to better understand how you view the threat to health caused by exposure hot weather and what steps you take to protect yourself. We hope that you can participate in this short 15-20 min survey which is supported by our partners at Health Canada and the National Association of Federal Retirees.

On behalf of my team and our funding partners at Health Canada, thank you for your valuable contribution to our work.

**Dr. Glen P. Kenny** Director Human and Environmental Physiology Research Unit

# TIPS FOR STAYING SAFE IN HOT WEATHER

ARE YOU AND YOUR LOVED ONE'S READY FOR THE EXTREME HEAT?

If you know it is going to be hot, follow a few of these tips to help you and/or your loved one stay cool while staying indoors.

- Activate an air conditioner if available to keep the indoor temperature no greater than 26°C.
- Activate fans if the room temperature is *below 35°C*. While activating a fan above this temperature may make you feel a bit better, it won't help reduce your body temperature.
- Move to a cooler space within the home, such as a basement, if safe to do so.
- Draw any curtains, shades, or shutters to help block direct sunlight.
- Try to cover the windows with a blanket or cardboard if there are no curtains or shades.
- Open windows if the outdoor temperature is cooler than the indoor temperature such as during the nighttime. For your personal safety, only open windows on the upper level of your house at night.
- During the daytime, if you feel your home is overheating, open a few windows in your basement and upper level to create a cross-breeze and draw up cool basement air.
- Shut down any heat-generating devices such as appliances, electronics, lights, etc.
- Limit the amount of physical activity or work you perform as this will only add heat to your body.

If you are concerned about a loved one, perform a wellness check either by phone or in person using the step-by-step approach overviewed in heat health wellness guide co-developed by our team (see link below). Before conducting in-person or remote wellness checks, review the signs and symptoms of heat-related illness below and be familiar with how to respond. Remember that older adults are less able to sense and respond to heat than younger people, and they may not recognize that they are at risk of a heat-related illness. If you find that someone is showing signs of heat-related illness, take immediate action and call 911 if necessary. Do not delay your response.



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#### A NOTE FROM DR. ROBERT MEADE

## HEAT WAVE TRIALS OFFICIALLY COMPLETE

Our team at the University of Ottawa has completed data collection on our large series of day long heat wave simulation studies! The studies included 99 volunteers and 186 laboratory visits, for just under 2400 hours of data collection, making this perhaps the largest series of studies of this kind to date.

#### THANK YOU FOR YOUR PARTICIPATION IN THESE PROJECTS. WE ARE TRULY INDEBTED TO WILLING VOLUNTEERS SUCH AS YOURSELF.

Without you, we never would have been able to complete such an ambitious series of studies.

## Dr. Robert Meade

Post-Doctoral Fellow Human and Environmental Physiology Research Unit



# **RECRUITMENT CORNER**

## **RECRUITMENT STARTED** FOR PHASE II OF THE JOINT HEALTH CANADA - UNIVERSITY OF OTTAWA HEAT WAVE TRIALS

Starting September 2022, we will be commencing our second phase of trials directed at developing heat protection solutions and advice to safeguard the health and well-being of vulnerable Canadian. While visiting cooling centres and using electric fans and are commonlyrecommended strategies to protect heat vulnerable adults during hot weather, our preliminary work shows we lack a clear understanding of their effectiveness in preventing heat-related injuries or death. In this next phase of work, we will evaluate the efficacy of cooling centres, and fans (pedestal and ceiling) for protecting heat-vulnerable men and women during exposure to hot indoor temperatures occurring during an extreme heat event. This work will also include assessing other methods of cooling such as limb immersion in cool water to alleviate dangerous increases in body temperature.



This study is looking for participants that meet the following criteria:

- Male and females
- 60-85 years of age
- With and without type 2 diabetes or hypertension
- May be physically active but not engaged in intense exercise training programs

Please contact Dr. Glen Kenny for more information at gkenny@uottawa.ca.

# RECRUITMENT CORNER (CONTINUED)

### COLD ACCLIMATION STUDY

Autophagy plays a critical role in the cell's ability to thrive during stress. As one of the body's main cellular defense mechanisms, autophagy promotes cellular survival by recycling damaged cellular components to be re-used as fuel and to rebuild structures during recovery. This mechanism, however, deteriorates with age which contributes to a reduced tolerance to cold exposure. In this 7 consecutive day cold acclimation study, we will be **examining how** repeated cold exposures may restore age-related reductions in autophagy.

This study is looking for participants that meet the following criteria:

- Males
- 18-30 years and 50-65 years
- Habitually active
- No underlying health conditions

Please contact Ph.D. Candidate Kelli King for more information at kking073euottawa.ca

## HEAT ACCLIMATION STUDY

Heat acclimatization is the improvement in heat tolerance that comes from gradually increasing the intensity or duration of work performed in a hot setting. Our NEW heat acclimation study is aimed at understanding the series of changes or adaptations that occur in response to heat stress in a controlled environment. These adaptations are beneficial to exercise and will allow the body to better cope with environmental heat stress. In this 8-consecutive day (+initial baseline assessment) study, we will be specifically investigating the effects of heat acclimation on whole-body heat loss and cellular tolerance to the heat.

This study is looking for participants that meet the following criteria:

- Male
- 60-80 years of age
- Habitually active

 No underlying health conditions Please contact Masters Student Kristina-Marie Janetos for more information at kjane092euottawa.ca.

# HOW DO YOU HANDLE THE HEAT?

NFW HEAT STRESS SURVEY

With the summer season fast approaching, we are conducting a Canada-wide online survey on the general public's knowledge, risk perceptions, attitudes and practices related to heat stress. Given that the frequency of heatwaves are projected to increase in frequency and severity due to rising global temperatures, public heat stress prevention and management are of critical importance to prevent adverse heat-health effects. The results of this survey will help increase awareness and knowledge about the importance of heat stress prevention and management programs and assist in directing the development of future programs and protections.

This survey is looking for responses from adults 50-85 years in Canada.

Contact Ph.D. Candidate Emily Tetzlaff at etetz085@uottawa.ca or Research Lead Dr. Glen Kenny at gkenny@uottawa.ca for more information.



💮 www.hepru.ca 🛛 gkenny@uottawa.ca

# **DID YOU KNOW?**



Schematic courtesy of Kathryn Blaze Baum and John Sopinski – The Globe and Mail©.

The Human and Environmental Physiology Unit houses the worlds only air calorimeter. The air calorimeter located at the University of Ottawa was originally developed by Jan Snellen during the 1970's at the Memorial University of Newfoundland. A world-recognized authority in the area of human thermo-dynamics, Snellen developed one of the very few specialized whole-body calorimeters in the world at that time. This was based on a calorimeter employed by Snellen in studies conducted during his tenure in South Africa (1967-1970). While at Memorial University, he performed a number of studies for clinical application as well as for the investigation of human thermoregulation. The calorimeter remained operational until his retirement in 1990, after which it was decommissioned. It was acquired by Dr. Glen P. Kenny in 1998 and re-engineered and upgraded. Valued at over \$6M, the calorimeter provides a very precise measurement of the heat dissipated by the human body. It has been employed in over 300 studies aimed at assessing the human heat stress response at the University of Ottawa. Dr. Kenny recently obtained a Canada Foundation for Innovation grant that will help upgrade the calorimeter, preserving this one-ofkind, made in Canada tool that will continue to help drive the advancement of evidence-based solutions to protect health and prevent disease caused by extreme heat for the next few decades.



Dr. Snellen looking into the opened calorimeter (1970).



