Welcome to today’s webinar:

**MS and Heat Intolerance – Research Findings**

Your Presenter is Ollie Jay
Your Facilitator is Jen East

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**Housekeeping**

Thanks for joining us for this webinar – welcome!

You will be able to:
- hear the presenter
- see the slides
- see the presenter

You do not need to have camera or microphone.

We cannot see you or hear you today, but our system tells us that you are online.
Control Panel

Control panel appears on the right of screen

If you are using a Mac, a tablet or an iPad, you need to look for the control icons across the top, side or bottom of your screen;

Click to minimize or maximise

Click the down arrow on the Questions pane to open

Type in your question and click send

Multiple Sclerosis Limited

Handouts

Handouts have been sent separately. This contains a copy of the slides presented today and possibly other relevant reading material depending on the topic

The webinar will be recorded and will be available on our website: www.ms.org.au via the Webinar library

Multiple Sclerosis Limited
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Acknowledgement

We acknowledge and pay respect to the traditional custodians past and present on whose lands we meet today.

We acknowledge the deep feelings of attachment and the relationship of Aboriginal people to country and respect the cultural authority of the elders in each community.
Introduction to Presenter

Ollie Jay is an Associate Professor in Thermoregulatory Physiology, and Director of the Thermal Ergonomics Laboratory, in the Faculty of Health Sciences at the University of Sydney, and Lead Researcher of the Charles Perkins Centre (CPC) Research Node on Climate Adaptation and Health.

His research activities primarily focus on developing a better understanding of the physiological and physical factors that determine human heat strain and the associated risk of heat-related health problems during work and/or physical activity, as well as among the general population during heat waves.

Research Update

The information presented today is based on research findings and does not include management strategies.

Individuals should seek further advice regarding their situation by contacting MS Connect on 1800 042 138.
Informed Choice

This presentation has been prepared and is presented by an independent expert.

The views presented are not necessarily the views of Multiple Sclerosis Limited.

Individuals are encouraged to seek further advice regarding the relevance of the information presented for their situation.

MS and Heat Intolerance: Research Findings

Ollie Jay

Thermal Ergonomics Laboratory & Charles Perkins Centre (CPC)

Faculty of Health Sciences, The University of Sydney, AUSTRALIA
↑ MS symptoms

Exercise and MS

35 - 36°C
37°C
32 - 33°C
Core

35.0°C
36.0°C
37.0°C
38.0°C
39.0°C
40.0°C
**Thermoregulation control**

- **Set point**
- **Anterior hypothalamus**
- **Posterior hypothalamus**
- **Warm signal**
- **Cold signal**
- **Vasodilation sweating**
- **Vasoconstriction shivering**
- **Receptors**
- **Skin**
- **Effectors**

*Parsons, 2003*

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**Skin blood flow**

**SKIN BLOOD FLOW**

- **Vasodilatation**
  - Dilation of the vascular smooth muscle cells allows a greater peripheral blood flow and increase in thermal conductivity

- **Vasoconstriction**
  - Blood flow in the periphery (limbs) is drastically reduced due to increased sympathetic activity
Sweating

**SWEATING**
- Increases heat loss via evaporation
- 1 gm sweat = 2427 Joules
- Eccrine glands (Forehead, back, palms)
  - heat dissipation
- Apocrine glands (axillary and pubic regions)
  - odours

**PILOERECTION**
- Hairs “stand on end” in order to trap still air layer against skin
- Arrector pili muscles attached to the hair follicle involuntarily contract

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Research: Thermoregulation and MS

Dr. Georgia Chaseling
Mr. Tim English
Prof. Michael Barnett
Prof. Steve Vucic
Dr. Josh Barton
A/Prof. Scott Davis (USA)
Dr. Davide Filingeri (UK)

2015-18 Incubator grant
2018-20 Project grant
**Uhthoff’s Phenomenon**

- An increase in core temperature of 0.5°C causes a temporary worsening of MS symptoms?
- Large individual variability
  - Thermoregulation differences?

**Higher Tcore at rest?**

- Sumowski & Leavitt, 2014
- Leavitt et al. 2015
Core body temperature

$T_{\text{tympanic}}$

$T_{\text{esophageal}}$

$T_{\text{rectal}}$

32°C 37°C

Chaseling et al. (2019) Mult Scler Rel Disord

![Core body temperature diagram](image_url)
Allen et al. (2017) J Neurophysiol

Chaseling et al. (2019) In Preparation

Chaseling et al. (2019) In Preparation

Thermosensory analyser

Thermode
Cold water ingestion

Filingeri et al. (2017) Exp Physiol

Does cold water ingestion improve exercise tolerance with MS in the heat?

4.186 J/g°C

250 mL: ~37 kJ
Cold water ingestion


30% increase in exercise tolerance

Cold water swilling

DRINK SENSORS
The effect of a hot or cold drink on your body is dictated by internal temperature sensors that trigger responses in your brain, rather than the direct warming or cooling effect of the liquid.

- Hot drink
- Cold drink
- Capsaicin
- Menthol

Cold water cools the blood heading toward the brain, altering its perception of temperature.

Chaseling et al. (2019) In Preparation
**Cold water swilling**

**Experimental Trials**

- **37˚C, 30% RH**
  - 37˚C Fluid
- **35˚C, 30% RH**
  - 7˚C swill
- **18˚C, 30% RH**
  - 37˚C swill

- Rectal temperature
- Skin temperature
- Local sweat rate
- Symptom severity
- RPE
- Thermal sensation

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**Symptom** | **n** | **P = 0.031** | **P = 0.001**
--- | --- | --- | ---
Fatigue | 13 | | |
Leg weakness | 5 | | |
Tingling | 3 | | |
Impaired vision | 4 | | |
Cramping | 3 | | |
Dizziness | 1 | | |
Foot numbness | 1 | | |
Spasticity | 1 | | |

Chaseling et al. (2019) In Preparation
**Aspirin**

Leavitt et al. (2018) Mult Scler J

9 min 28 s (ASP); 9 min 12 s (PLA)

**VOLUNTEERS NEEDED**

MS Research on Heat Sensitivity during Exercise and Balance

Have you been diagnosed with MS?
Are you aged between 18 – 60 years?
Do you experience sensitivities to heat?
Then please get in touch for more information

Tim English
Phone: +61 415 973 155
Email: tim.english@sydney.edu.au

$350

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**Thermal Perception**
Future Work...

Thank you for listening....

VOLUNTEERS NEEDED
MS Research on Heat Sensitivity during Exercise and Balance

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Questions

MS Connect
1800 042 138
msconnect@ms.org.au

Free E-books

Contact MS Connect to obtain login details
1800 042 138
Get Your Act Together

- Online Tool – designed to help you better manage your multiple sclerosis symptoms
- Focuses on some of the common symptoms of MS – emotions, fatigue, continence, cognition, pain and heat sensitivity
- Designed for people living in the ACT but includes useful information for all people living with MS
- Complete the tool to receive a personalized report (listing services, resources, tips etc)

Visit [www.ms.org.au](http://www.ms.org.au) and search Get Your Act Together

The National Disability Insurance Scheme

A major change to the way disability supports and services are funded and delivered

- Available to people who are: under 65, satisfy residency requirements and are able to demonstrate that their disability substantially affects daily living
- Promoting choice, control and social and economic participation
- Providing a whole-of-life approach
- It is not means tested
- Providing reasonable and necessary supports and services
- Ensuring equity of access
We can help you to

- understand the eligibility requirements
- understand the pathways to access the NDIS
- prepare for a planning conversation
- understand your current supports and any unmet need
- develop your goals

We are a ‘Registered Provider’

MS is a registered NDIS provider in NSW, ACT, Vic and Tas. MS is approved to provide:

- Preplanning prior to your conversations (All areas)
- Support Coordination/Connection – assistance to help make your plan active (All areas)
- Short term accommodation (Vic)
- Community Participation (NSW)
- Exercise physiology and personal training (NSW)
- Specialist Continence Assessment (NSW and Vic)
- Physiotherapy and Occupational Therapy (NSW and Vic)

Want to learn more? Please call MS Connect 1800 042 138
My Aged Care

My Aged Care is an Australian Government initiative, website and phone line to help you find about aged care services.

Available to people who are 65 years of age and over.

Why Contact My Aged Care?

✓ Information
✓ Assistance in mapping out your needs
✓ An assessment for further supports

Phone: 1800 200 422 Free call Australia wide

Website: https://www.myagedcare.gov.au

Other Services

MS Financial Assistance program

MS Financial Assistance program provides one-off funds for those facing financial hardship. The funds can be used to purchase equipment or air conditioners to promote quality of life and help with health related matters.
RESEARCH

Are you part of the MS community and interested in volunteering in a study?

We are looking for adults who:

• Have a confirmed diagnosis of Multiple Sclerosis

• Are able to walk 50m with or without a walking aid

• Are able to stand 1 minute unaided

• Have had no worsening of MS symptoms in the past 30 days

Interested, please contact Anna Butler on 0408368244 or ifims.melbourne@neura.edu.au


Thank you

MS Connect
1800 042 138
msconnect@ms.org.au
Please stay on after this webinar to complete a short survey.

Your feedback is important to us and will be used to improve our services.

Thank you for your time.