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# HOW DO I HEAT ACCLIMATE BEFORE THE TOKYO PARALYMPIC GAMES?

## AN ATHLETE GUIDE

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**INTERNATIONAL PARALYMPIC COMMITTEE**

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# PREPARING FOR THE HEAT AT TOKYO 2020

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1. The temperature and humidity in Tokyo may make it **challenging for daily living** – never mind sport participation

2. If you live in a cooler climate than Tokyo **it will take some days for your body** to be able to adapt to the heat

3. Using **Heat Acclimation** you can stimulate your body to **make adaptations in advance** of travel to Tokyo

4. It is **important to plan how and when** you do this and discuss this with your sports team and support staff



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# WHY DO I NEED TO HEAT ACCLIMATE?

1. Heat acclimation has been **shown to improve sports performance** in the heat

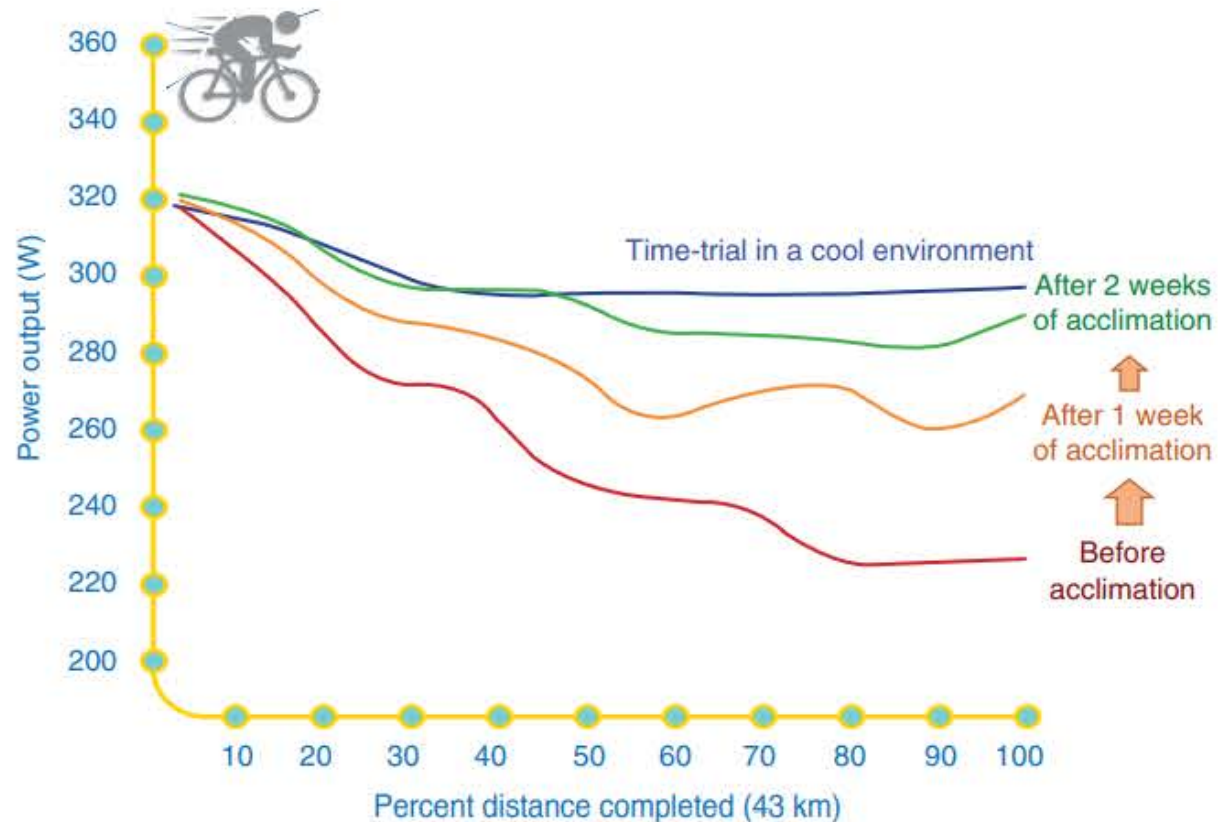
2. Heat acclimation **improves how comfortable you feel** and helps you **make better decisions**

3. Heat acclimation is particularly **beneficial to athletes with a disability** who struggle in the heat

4. Heat acclimation will **reduce the risk of heat illness** – cramps, fainting, heat stroke



# HOW MUCH COULD MY PERFORMANCE BENEFIT<sup>5</sup> FROM HEAT ACCLIMATION?



*Most sports that have a significant aerobic element to their performance will be negatively affected by the Tokyo heat, but will also likely benefit from heat acclimation.*

Racinais et al (2019)



# DOES HEAT ACCLIMATION HELP PARALYMPIC ATHLETES?



7 consecutive days of Heat Acclimation (20 min arm-cranking + 40 min rest / simulated shooting) in 33°C and 65% rh



Heat acclimation for 7 days in spinal cord injured Paralympic athletes (Quad and Para):

- reduced resting and exercising temperature
- reduced heart rate
- reduced how hard exercise felt
- reduced how hot athletes felt

Eur J Appl Physiol (2013) 113:109–115  
DOI 10.1007/s00421-012-2417-6

ORIGINAL ARTICLE

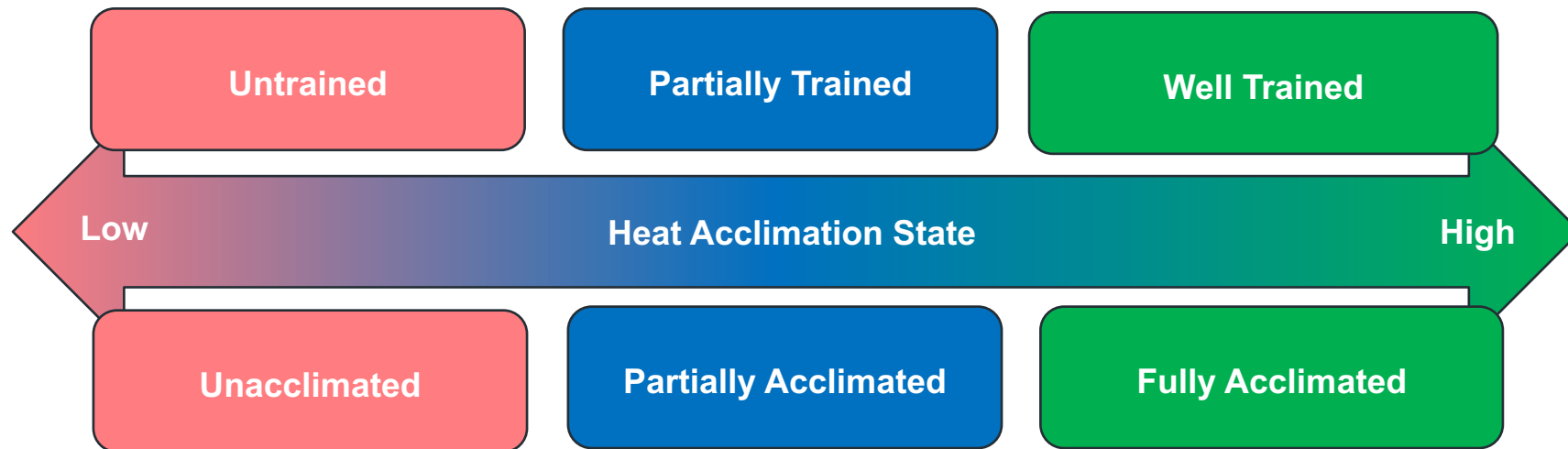
**Partial heat acclimation of athletes with spinal cord lesion**

Paul C. Castle · B. Pasan Kularatne · John Brewer · Alexis R. Mauger · Ross A. Austen · James A. Tuttle · Nick Sculthorpe · Richard W. Mackenzie · Neil S. Maxwell · Anthony D. J. Webborn



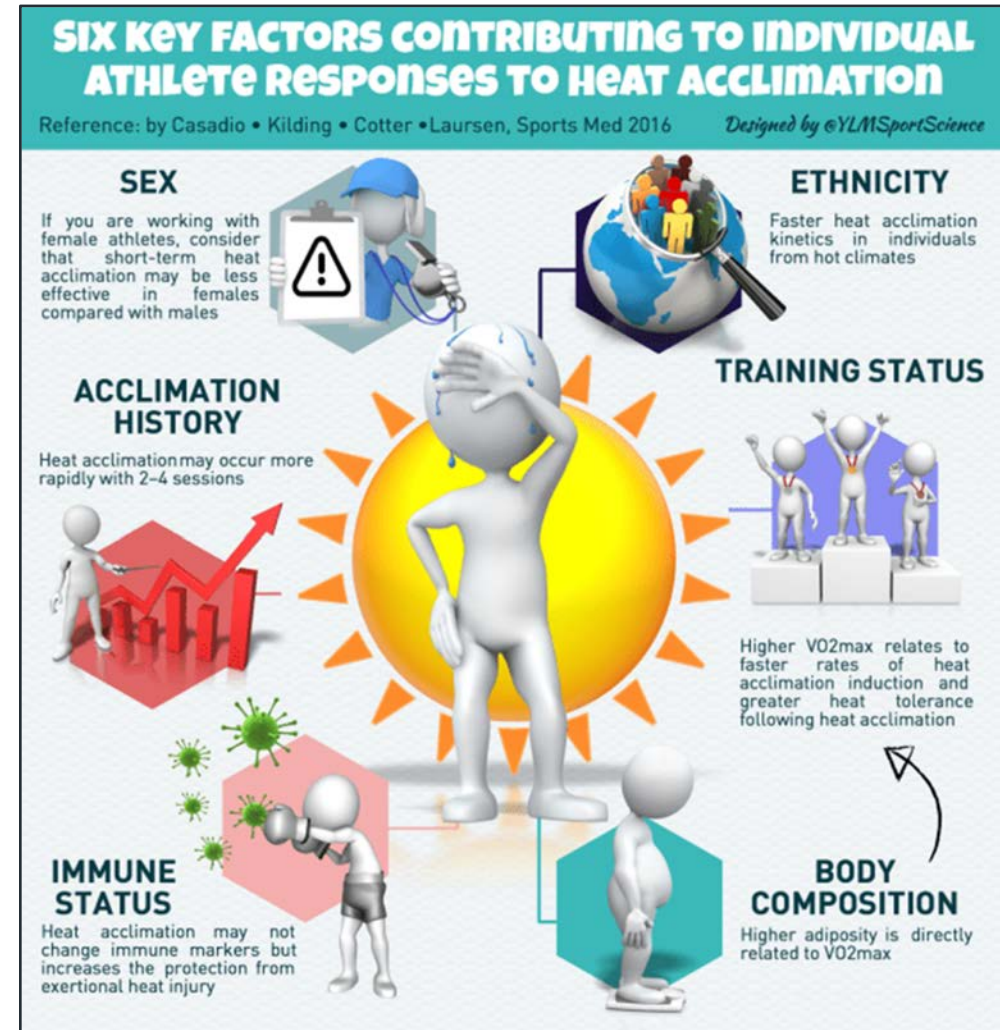
# WILL MY TRAINING HELP HOW HEAT ACCLIMATED I AM?

- *The fitter you are the better you will acclimate and you will tolerate heat better*
- *Even if your sport is not an aerobic one e.g. shooting or archery then improving your overall fitness will help you cope with the heat*



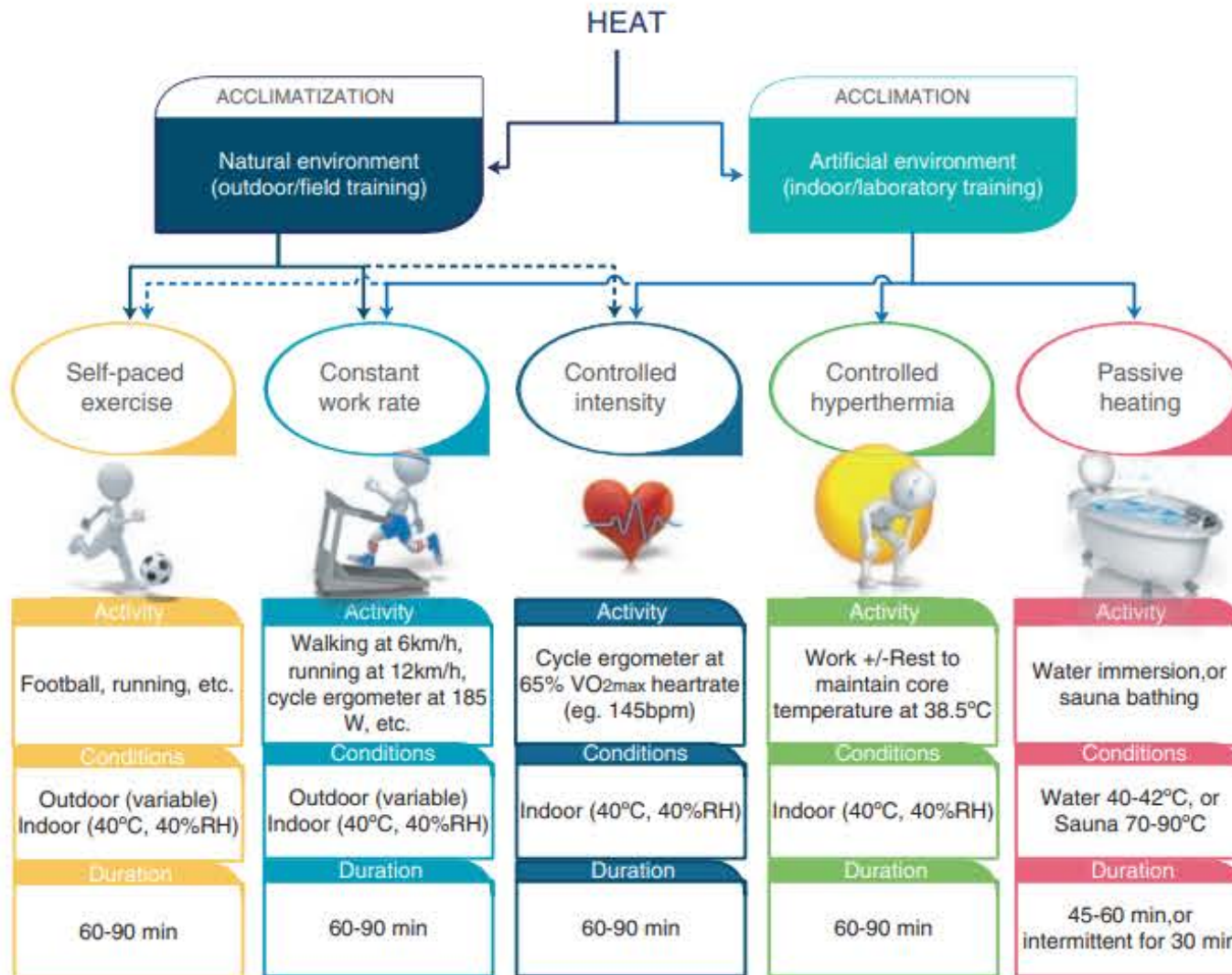
# WHAT OTHER FACTORS AFFECT HEAT ACCLIMATION?

- 1. Slower response in females**
- 2. Slower acclimation if you live in a cool climate**
- 3. Repeated acclimation = quicker response next time**
- 4. Fitter = faster acclimation**
- 5. Fatter = slower acclimation**





# HOW DO I HEAT ACCLIMATE?



- ***There are lots of ways for you to heat acclimate.***
- ***You need to decide which method work best for you based on:***
  - ***what is available***
  - ***your training priorities***
  - ***your disability***

Racinais et al (2019)



# WHAT ARE THE KEY FEATURES OF EFFECTIVE HEAT ACCLIMATION?



↑ Core Temperature  
↑ Skin Temperature



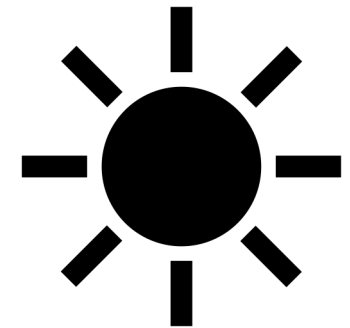
↑ Sweating



Get hot for  
60-90 mins



Heat acclimate  
for 7+ days



Simulate expected  
hot conditions

*Keep in mind “Get hot – stay hot” when trying to heat acclimate in each session.  
For inducing heat adaptations, the type of exercise does not appear to be as  
important (aside from athlete preference) as getting hot.*



# CAN I HEAT ACCLIMATE EVEN IF I DO NOT HAVE ACCESS TO A HEAT CHAMBER?



**YES!**



Sit in a Sauna after exercise



Wear sauna suits while exercising



Sit in a hot bath after exercise



Use a portable sauna!

*Anything that allows you to heat your body up more than it would normally, will offer some level of heat adaptation to you.*




Wear more clothes during training



# CAN HAVING A HOT BATH AFTER TRAINING REALLY HELP ME COPE WITH THE TOKYO HEAT? 12

## How to train cool - bathe hot

Practical and safety guidelines



**1** Exercise moderately for ~40 min in temperate conditions “feel warm but comfortable”

**2** Immediately take a hot bath in 40°C water for 15min

**3** Increase bath duration by ~5 min each day for a total of 6 days

**CAUTION**

**Safety guidelines**

- If in doubt, get out!
- You should feel “hot” in the bath but NOT “as hot as you can stand”
- Sit for a few min after getting out of the bath to recover/avoid light headedness

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Zurawlew, Walsh, Fortes and Potter Scand J  
Med Sci Sports 2016

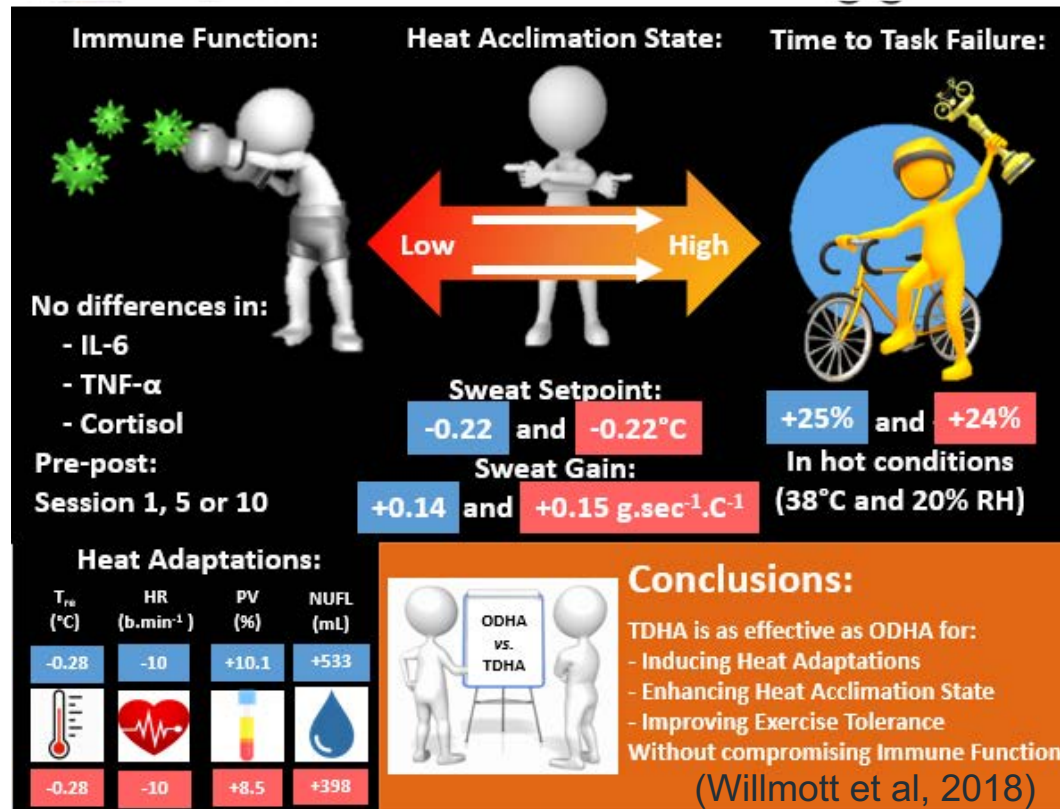
- *Passive heat acclimation e.g. sitting in hot bath or sauna can help*
- **BUT**
  - *Not as effective as exercise in heat*
  - *Also, important to practice exercising in the heat*



# DO I HAVE TO HEAT ACCLIMATE EVERY DAY AND CAN I HEAT ACCLIMATE QUICKER THAN 7 DAYS?

*Once or twice-daily every other day offers similar levels of heat adaptation and performance improvements*

**75%** of heat adaptations can be achieved in 4-6 days



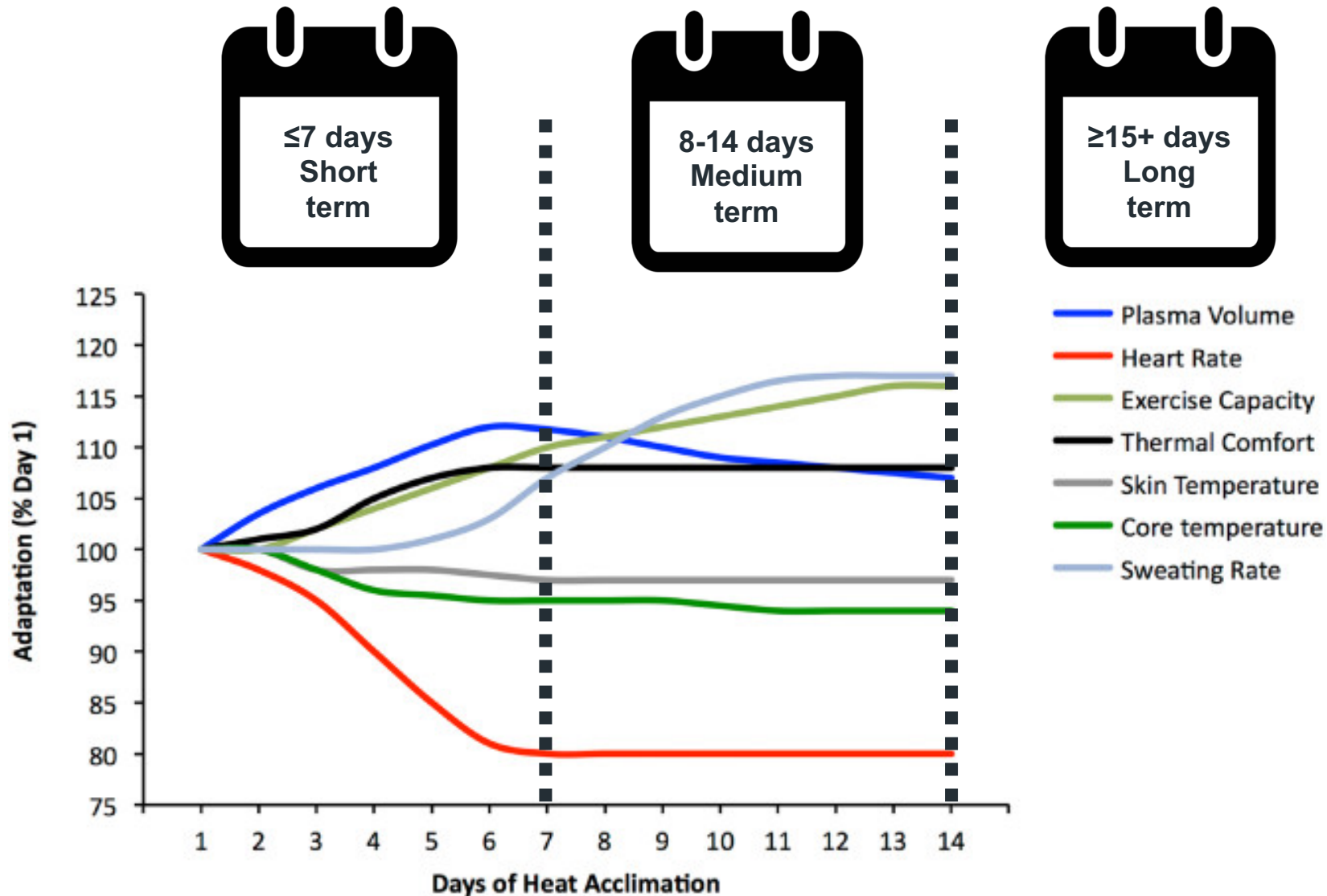
**Journal of Sports Sciences**  
 ISSN: 0264-0414 (Print) 1466-447X (Online) Journal homepage: <http://www.tandfonline.com/loi/rjssp20>

**Short-term heat acclimation prior to a multi-day desert ultra-marathon improves physiological and psychological responses without compromising immune status**

Ashley G. B. Willmott, Mark Hayes, Kirsty A. M. Waldock, Rebecca L. Relf, Emily R. Watkins, Carl A. James, Oliver R. Gibson, Nicholas J. Smeeton, Alan J. Richardson, Peter W. Watt & Neil S. Maxwell



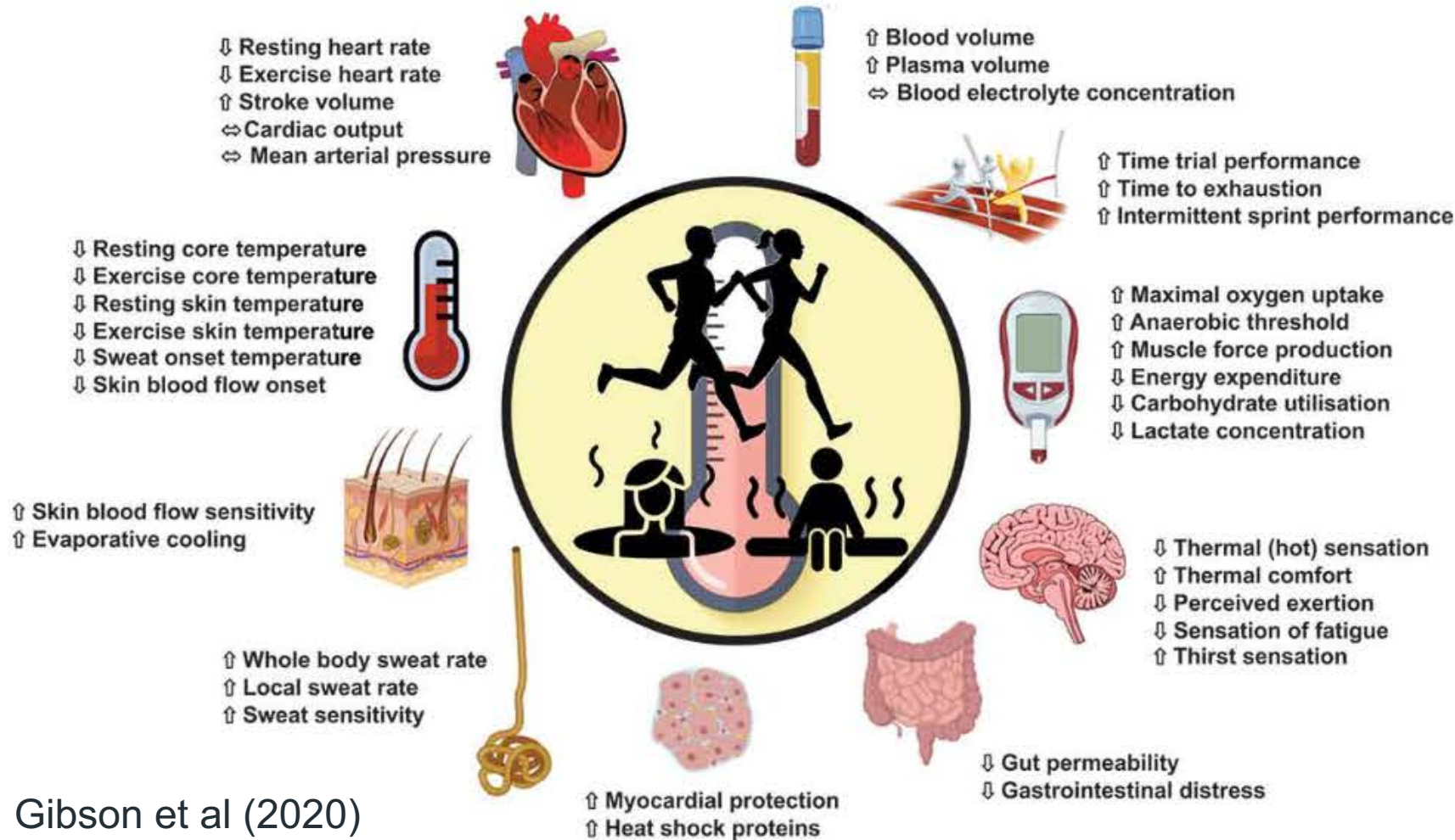
# HOW LONG DOES IT TAKE TO FULLY HEAT ACCLIMATE?



*Although maximizing heat adaptation through long term heat acclimation may seem the ideal, you need to balance this against your training needs... so an optimal heat acclimation plan is recommended.*



# WHAT HAPPENS TO MY BODY WHEN I HEAT ACCLIMATE?

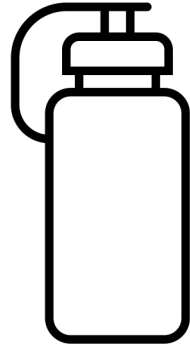


***A range of physiological adaptations will take place as a result of heat acclimation***

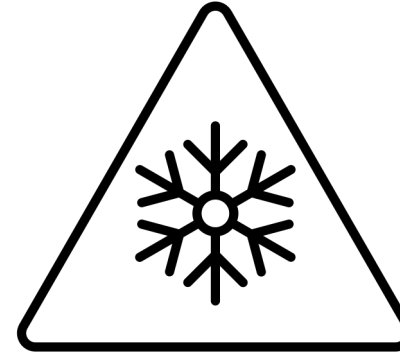


# SHOULD I DRINK WHILE HEAT ACCLIMATING AND DO COOLING AFTER HEAT ACCLIMATION?

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- No benefit of withholding fluid during short- or medium-term heat acclimation
- Drink Isotonic drinks to replace lost fluid
- Drink 150% of weight lost during exercise = e.g. lose 1kg = drink 1.5 liters fluid



- Too aggressive cooling immediately after heat acclimation may limit the benefit of heat adaptation you are trying to achieve.
- Try and cool down naturally unless you feel / are overheated, then cooling will be necessary.





# SUMMARY: WHAT CAN I DO TO HELP PREPARE FOR THE HEAT OF TOKYO?



## HEAT ACCLIMATE

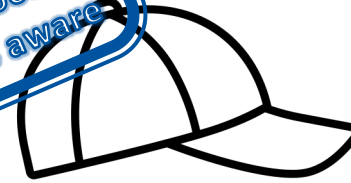
Develop a heat acclimation protocol with your coach to prepare yourself for the competition environment



## KEEP HYDRATED

Consume fluids little, but often and monitor your own hydration status

Coming Soon!  
Keep Hydrated  
Staying Cool  
Heat Illness aware



## STAY COOL

Use precooling, per (during exercise) cooling and post cooling to maintain core temperature and thermal comfort



## KNOW HEAT ILLNESS SYMPTOMS

Understand what the signs and symptoms of heat illness are so you can prevent them in you and your fellow athletes



# RESOURCES THAT SUPPORTED THIS PRESENTATION

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# HEAT ACCLIMATION IS THE MOST IMPORTANT COUNTERMEASURE ATHLETES SHOULD ADOPT BEFORE COMPETING IN THE HEAT

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**THANK YOU**

