



BodyCAP
Your e-health partner

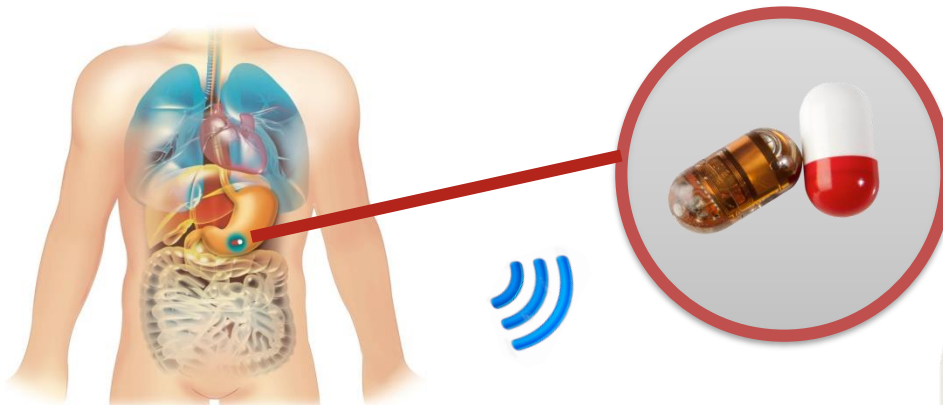
Innovative solutions for Health



e-Celsius[®] Performance: Human core temperature monitoring

e-Celsius Performance[®] is an ingestible pill that continuously monitors and records core body temperature.

The pill **wirelessly** transmits the gastro-intestinal temperature to a monitor: e-Viewer Performance[®].



The device is safe, non invasive and **easy to use**, leaving the gastric system after one or two days, depending on individual transit time





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Key benefits of the device:

An accurate core temperature measurement

Accurate and reliable core temperature monitoring is critical for subjects facing hot/cold environments or extreme physical efforts.

Scientific publications indicate that external measurement methods such as axillary, temporal or tympanic temperature are not accurate in assessing core body temperature in harsh conditions.

The e-Celsius Performance solution allows to monitor your at-risk subjects and assesses the effectiveness of cooling methods and acclimatization processes.

A user-friendly solution

The solution has been designed in order to be highly agile and to avoid any data loss.

An internal memory is embedded in the pill in order to ensure data monitoring without the athlete having to carry any cumbersome items (belt, monitor...). At the end of the recording session all the data are automatically transmitted to the monitor as soon as it is in range of the subject.

Use case:

Hypothermia prevention

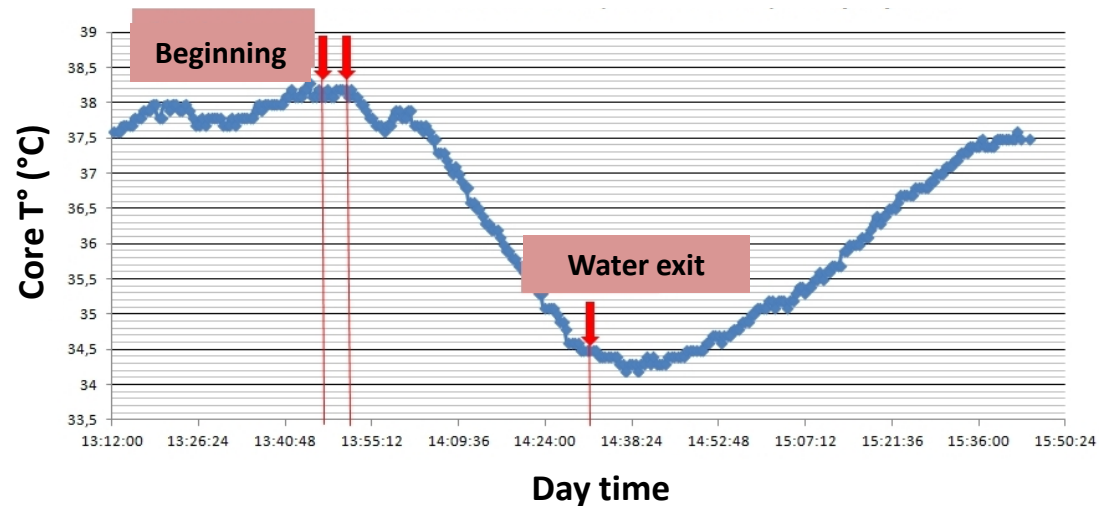
The monitoring of core temperature in all sport situations, which are likely to involve hypothermic risks, allows to study individual coping skills in critical environments:

- Ice water diving
- Long distance swimming
- Rescue divers



Core temperature kinetic during swimming training in cold water (9.2°C).

P.J Pourantru, Miribel, 11/10/16



Added value:

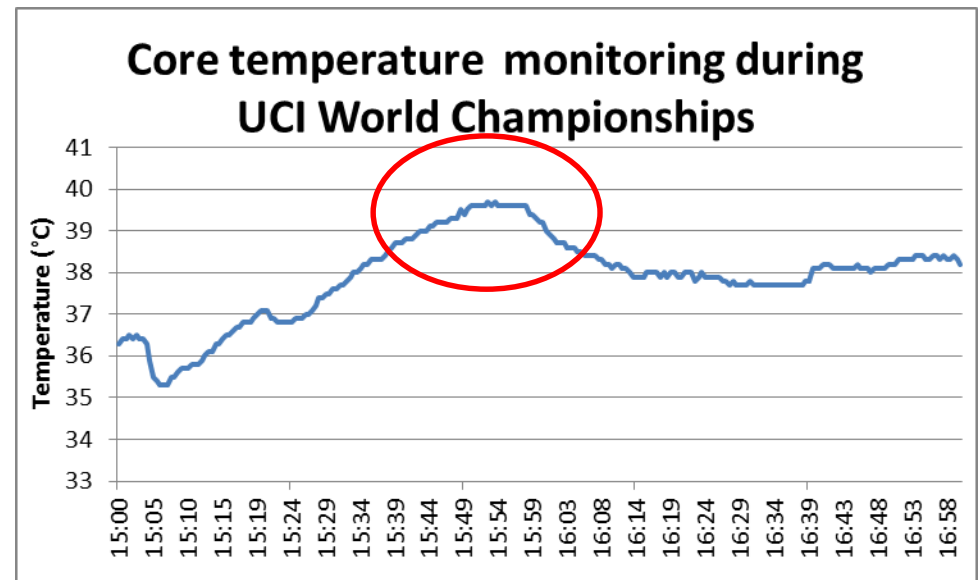
- Equipment assessment
- Evaluation of Individual thermoregulatory capacity
- Health protection

Cases of uses:

Hyperthermia / heat stroke prevention

Long duration exercises performed in the heat induce a raise in core temperature that could range from hyperthermia to heat-strokes:

- Long distance running/cycling,
- Military operations
- ...



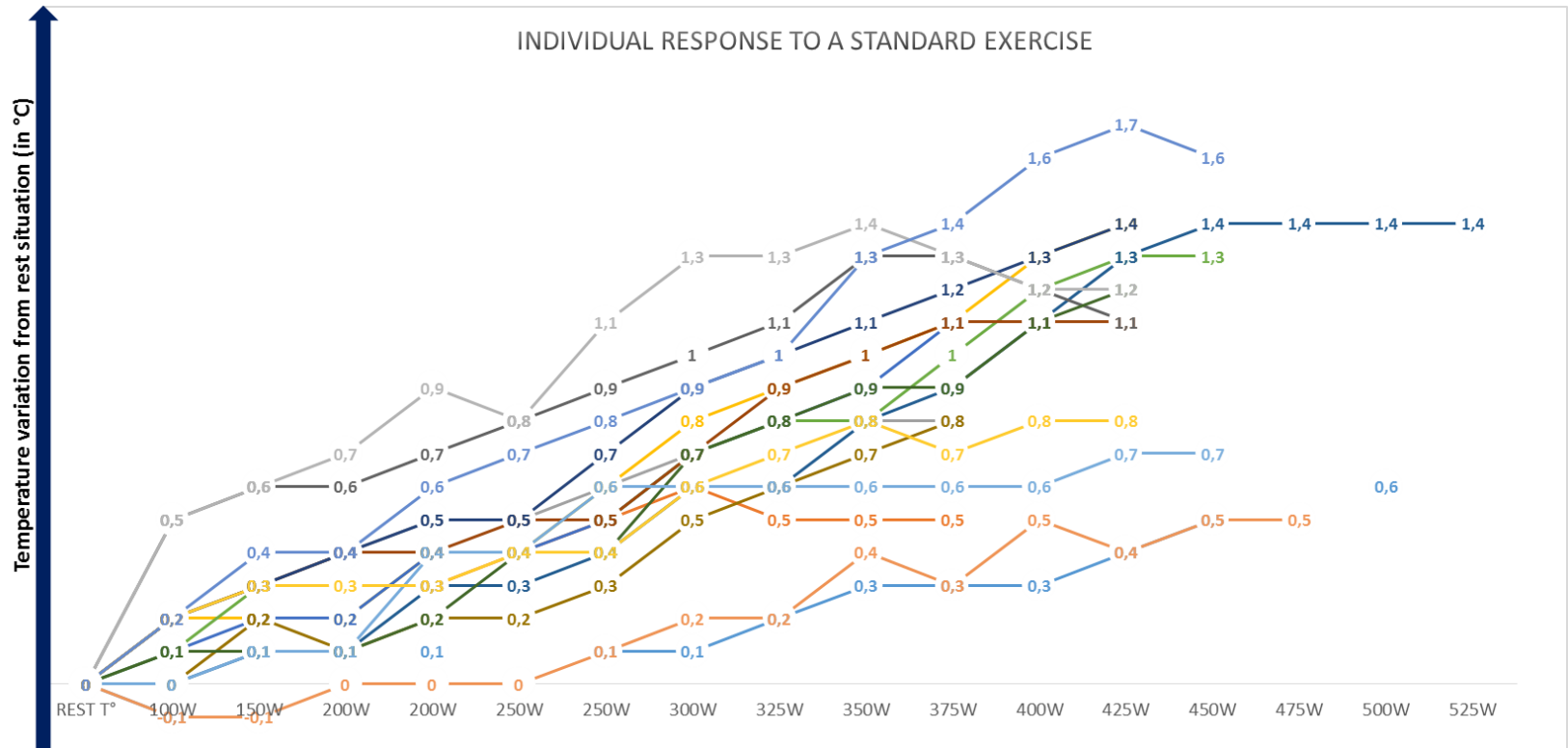
Added value:

- Health protection
- Equipment assessment
- Evaluation of the Individual thermoregulatory capacity => every individual is different

Cases of use:

Hyperthermia / Heat Stroke prevention

The system allows a better understanding of individual athlete thermoregulation profiles.



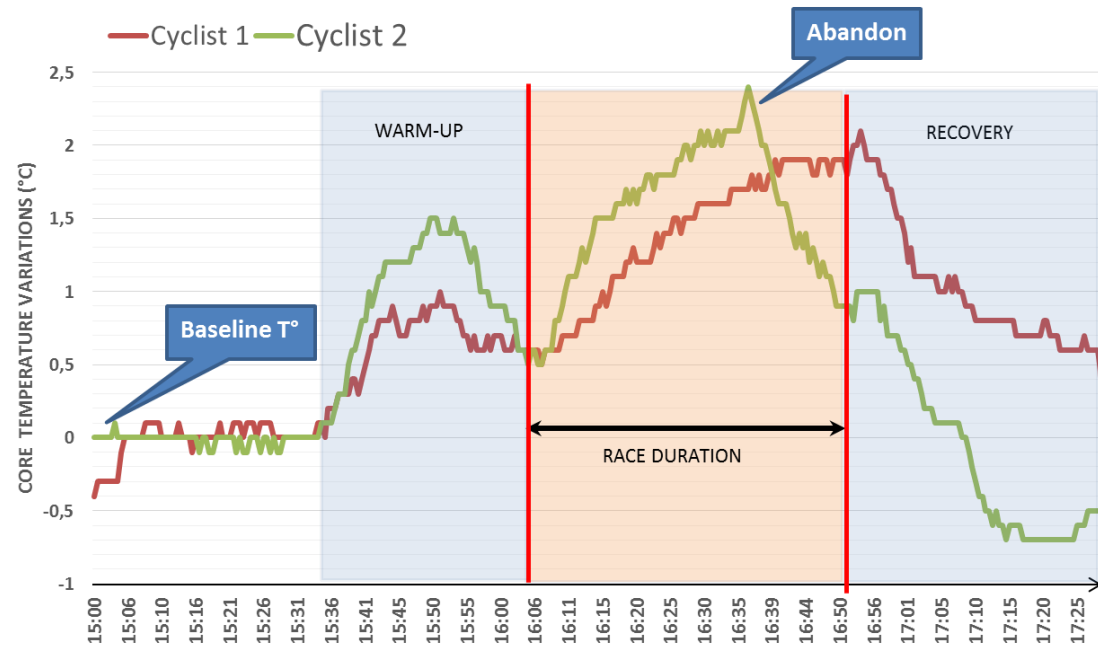
After individual characterization, an individual acclimation process may be planned.

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Use cases:

Warm up – recovery process optimization

In the context of sports performance, thermoregulatory responses are very different among individuals. This takes the form of differences in thermoregulatory triggering mechanism thresholds and physiological responses (Heart-Rate drift...).



Added value:

- Process individualization
- Performance optimization
- Recovery optimization

FDJ pro cycling team, Team Time Trial - World Road Cycling Championship, (Richmond 2015)

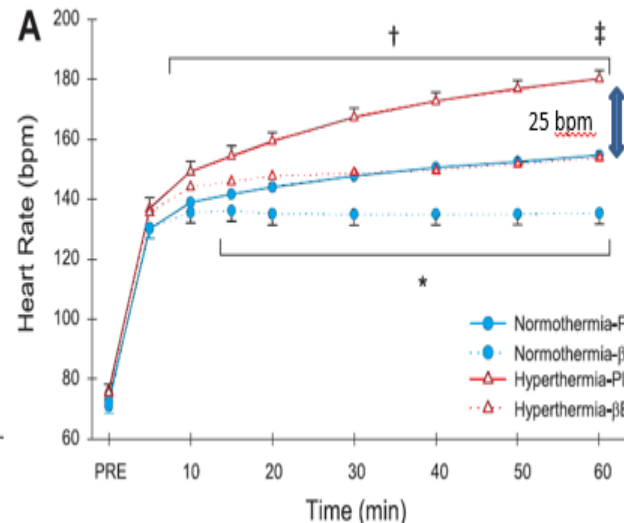
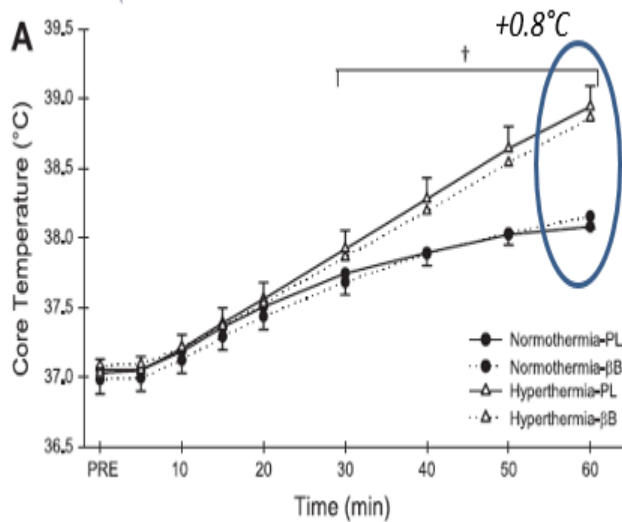
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Cases of use:

Performance optimization

Core hyperthermia is directly correlated to performance decline. The drift of heart rate due to heat exhaustion induces a direct misappropriation of the cardiovascular effort.

This loss can to avoided.



- A rise of 0.8°C in core temperature leads to
- a rise of 25 bpm in submaximal HR
 - a significant decrease in stroke volume.

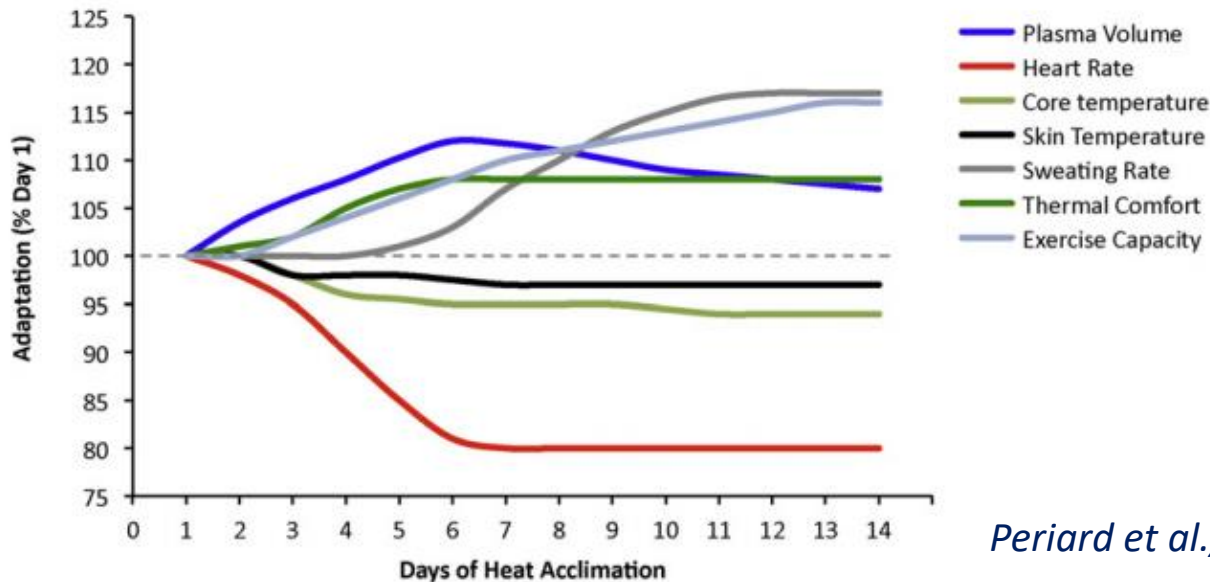
Matthews et al. 2010

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Cases of use:

Performance optimization

An individualized acclimation training protocol in warm environments involves a positive impact on the thermoregulatory capacities of the subject and leads to an increased performance in both standard **and** warm competitive environments.



Periard et al., 2016

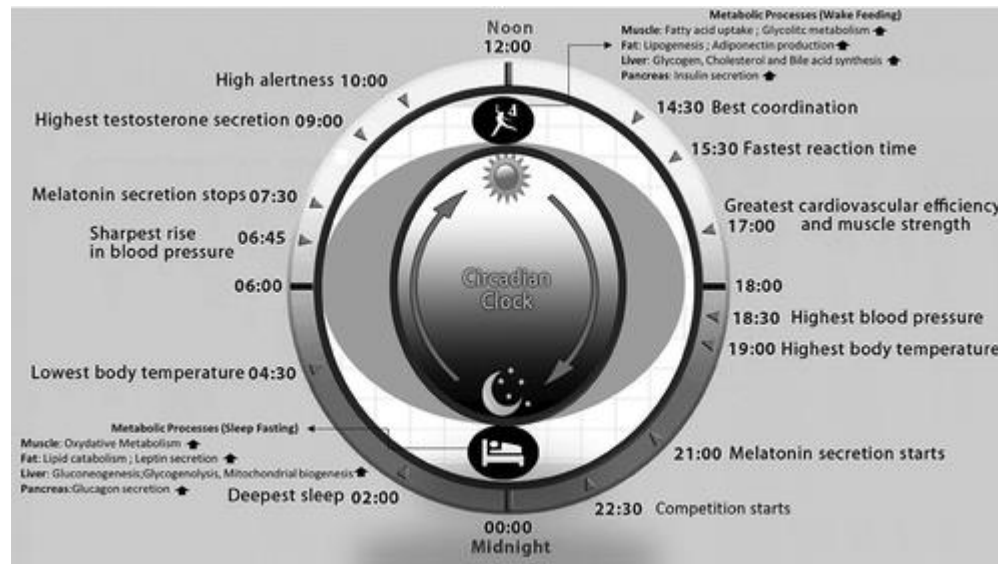
After 7 consecutive days of heat exposure, submaximal heart rate is reduced during exercise at a given work load. Core and skin temperatures are also both reduced, while sweat rate increases.

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Cases of use:

Preventing, quantifying and avoidind the Jet Lag effect on physical performance

Circadian synchronization is a key point for performance in elite athletes. After travelling across time zones, the time needed to recover a synchronized rhythm is individual and ranges from 2 to 10 days depending on the subject's travel conditions.



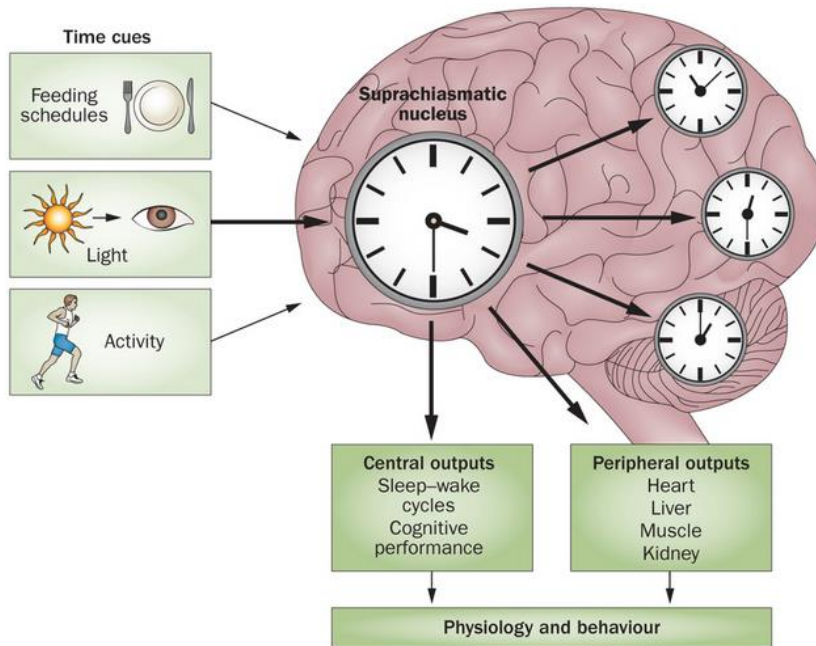
Relationship between psychobiological aspects and circadian rhythms over 24 hours (Rosa et al., 2016)

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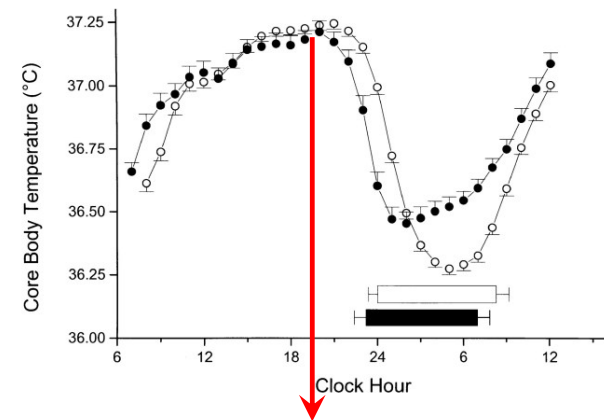
Case of uses:

Sleep, circadian rhythms, and athletic performance

A good night's sleep and an inner body Clock regulated to evening time are important factors for athletes, who are determined to perform their very best. Margins are small between success and failure, and the stakes are high.



Circadian rhythm rest temperature is the main index of individual rhythmicity



Day time physical performance peak

Duffy et al. 1998



BodyCAP

Le compagnon santé connecté.