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## **Comparison of novel core temperature measuring methods with conventional methods: Telemetric intestinal temperature**

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### **Introduction**

Several different methods for measuring core temperature are available. Telemetric capsules measuring the temperature in the intestines is becoming a popular method. Several studies have compared this method to esophageal temperature and rectal temperature (1) (2). However, currently new methods for telemetric core temperature registration became commercially available, e.g., produced by eCelcius (3) and MyTemp (4). This studies compares those methods to esophageal and rectal temperatures.

### **Methods**

Nine health male participants will complete the protocol given in Table 1. During the core temperature registration phase the core temperature will be measured using several different methods, among those esophageal and rectal as references. Several different new methods will be included in the present study, among those the eCelcius Performance (telemetric intestinal temperature).

Table 1: The measurement protocol.

| Tasks                 | Duration (min) | Ta (°C) | RH (%) | Power output (W) | Core temperature registration |
|-----------------------|----------------|---------|--------|------------------|-------------------------------|
| 1 Welcome             | 30             |         |        |                  | no                            |
| 2 Resting             | 120            | 24      | 50     | 0                | no                            |
| 3 Acclimation         | 15             | 30      | 50     | 0                | yes                           |
| 4 Submaximal exercise | 30             | 30      | 50     | 130              | yes                           |
| 5 Resting             | 5              | 30      | 50     | 0                | yes                           |
| 6 Maximal exercise    | 10             | 30      | 50     | Maximal exercise | yes                           |
| 7 Resting             | 30             | 30      | 50     | 0                | yes                           |
| 8 Shower, etc.        | 20             |         |        |                  | no                            |

### **Results**

The results will be presented at the conference.

## References

1. **Teunissen, L.P.J., de Haan, A., de Koning, J.J., & Daanen, H.A.M. (2012).** Telemetry pill versus rectal and esophageal temperature during extreme rates of exercise-induced core temperature change. *Physiological Measurement*, 33(6), 915–24. <http://doi.org/10.1088/0967-3334/33/6/915>
2. **Byrne, C. & Lim, C.L. (2007).** The ingestible telemetric body core temperature sensor: a review of validity and exercise applications. *British Journal of Sports Medicine*, 41, 126–133. doi:10.1136/bjism.2006.026344
3. <http://www.bodycap-medical.com/en/product/ecelsius-performance>
4. <http://www.mytemp.nl>