Patient 10

- 16 y/o male
- Trec 104.6°F (40.3°C)

Patient 11

- 50 y/o male
- Trec 107.1°F (41.7°C)

Patient 12

- 25 y/o female
- Trec 107.9℉ (42.2℃)

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Patient 13

- 23 y/o male
- Trec 107.3°F (41.8°C)


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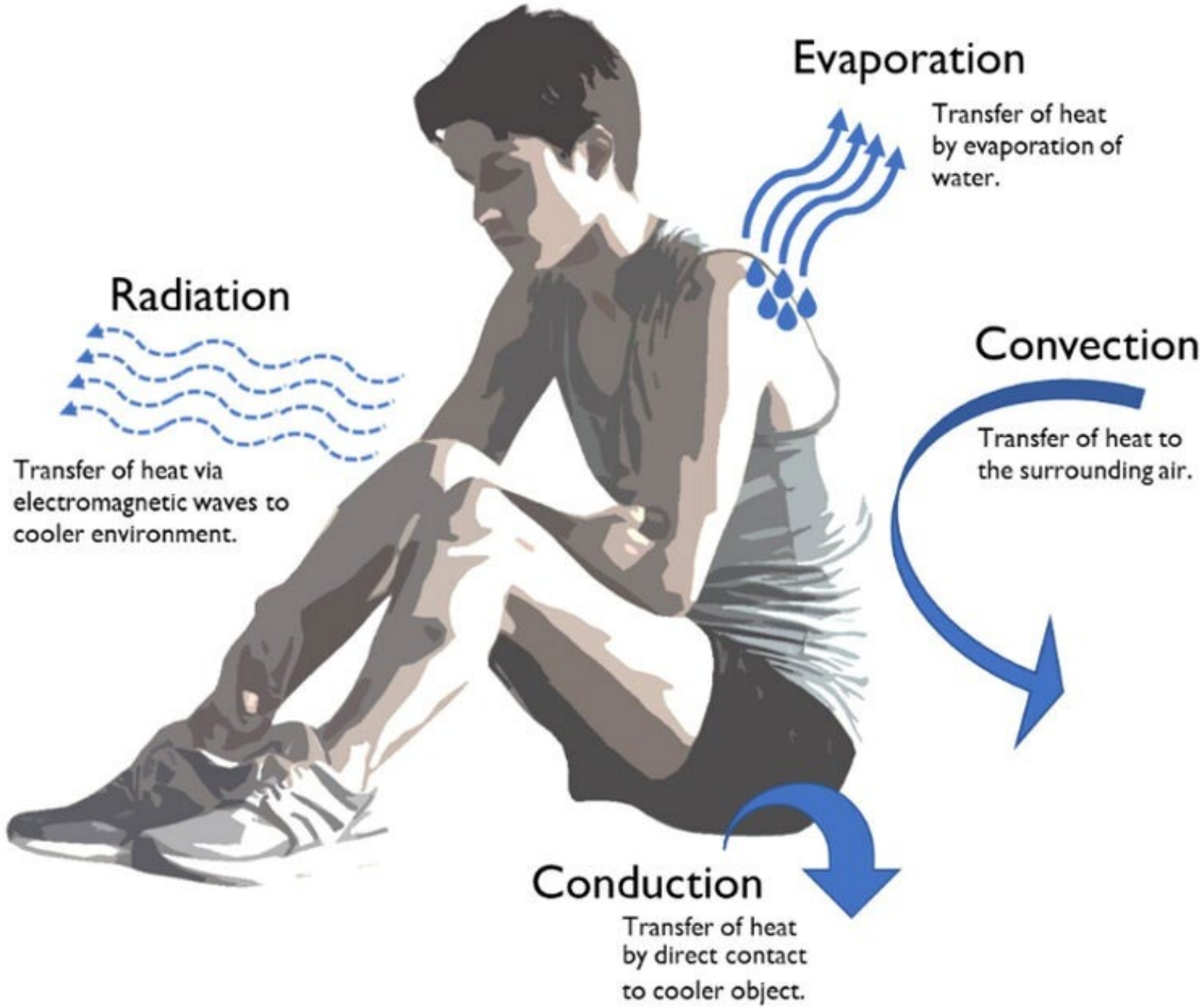
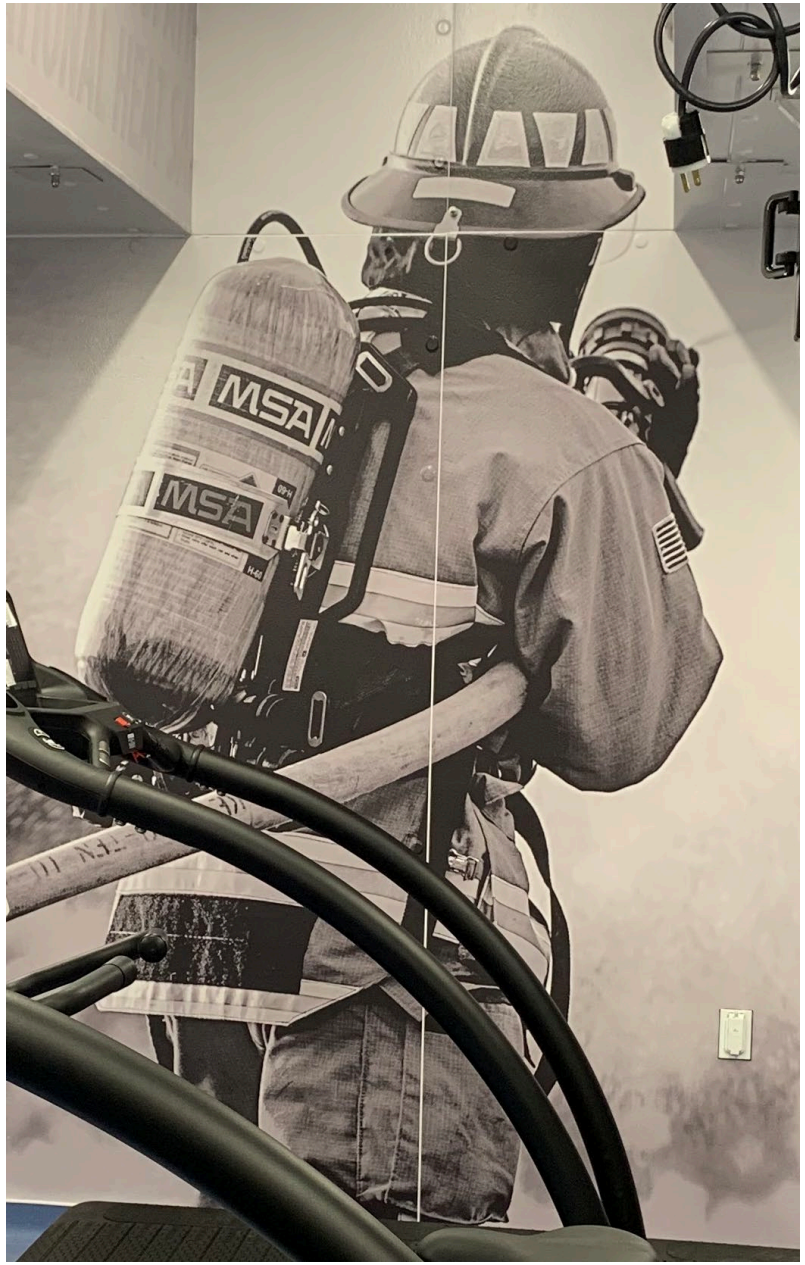
Neurological dysfunction review

- Cerebellar ataxia/Unsteadiness
- Cognitive dysfunction
- Agitation
- Seizures
- Disturbance of consciousness from lethargy to coma

Patient 14

- 41 y/o female
- Trec 111.6°F (44.2°C)


Evaporation
Transfer of heat by evaporation of water.
Radiation
Transfer of heat via electromagnetic waves to cooler environment.
Convection
Transfer of heat to the surrounding air.
Conduction
Transfer of heat by direct contact to cooler object.



Occupational Heat Safety Lab

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Patient 15

- 17 y/o male
- Trec 112.8℉ (44.9℃)

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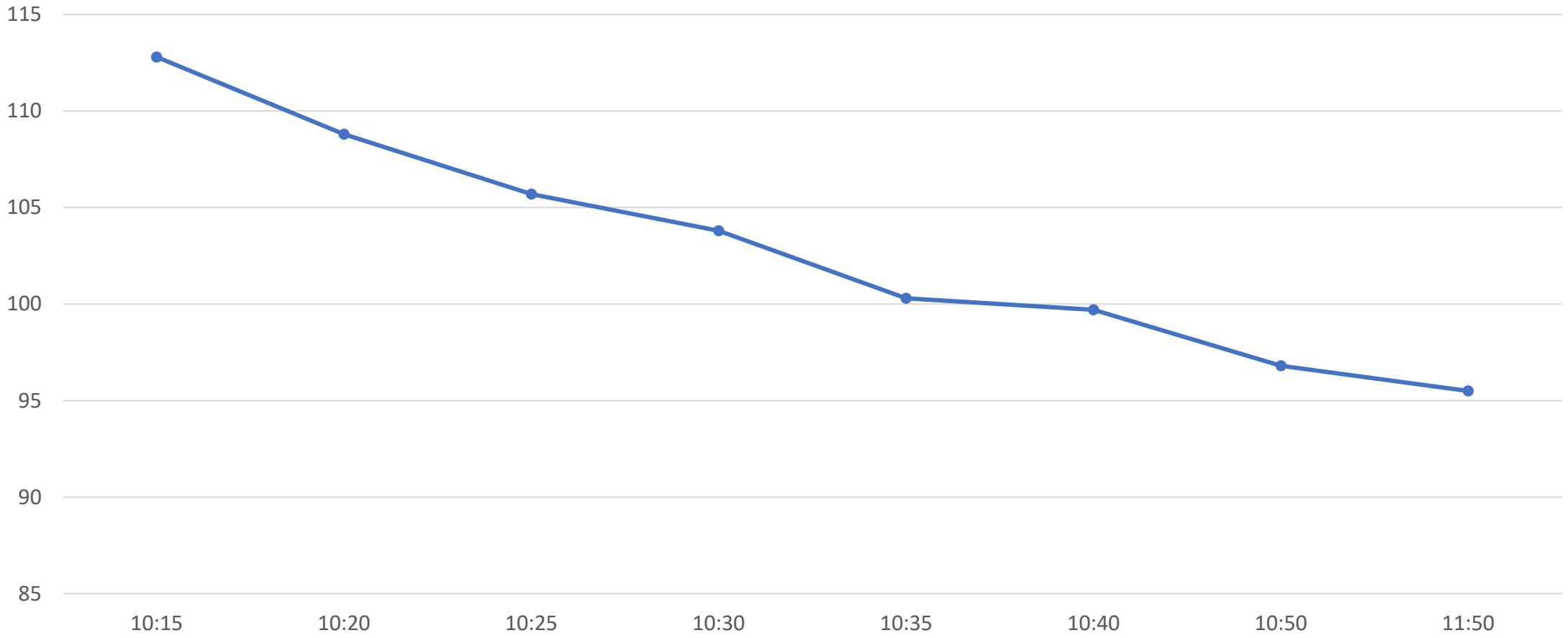
Trec


115
110
105
100
95
90
85
10:15
10:20
10:25
10:30
10:35
10:40
10:50
11:50

Falmouth Football team captain 2023

Patient 16

- 23 y/o female
- Trec 107.1°F (41.7°C)

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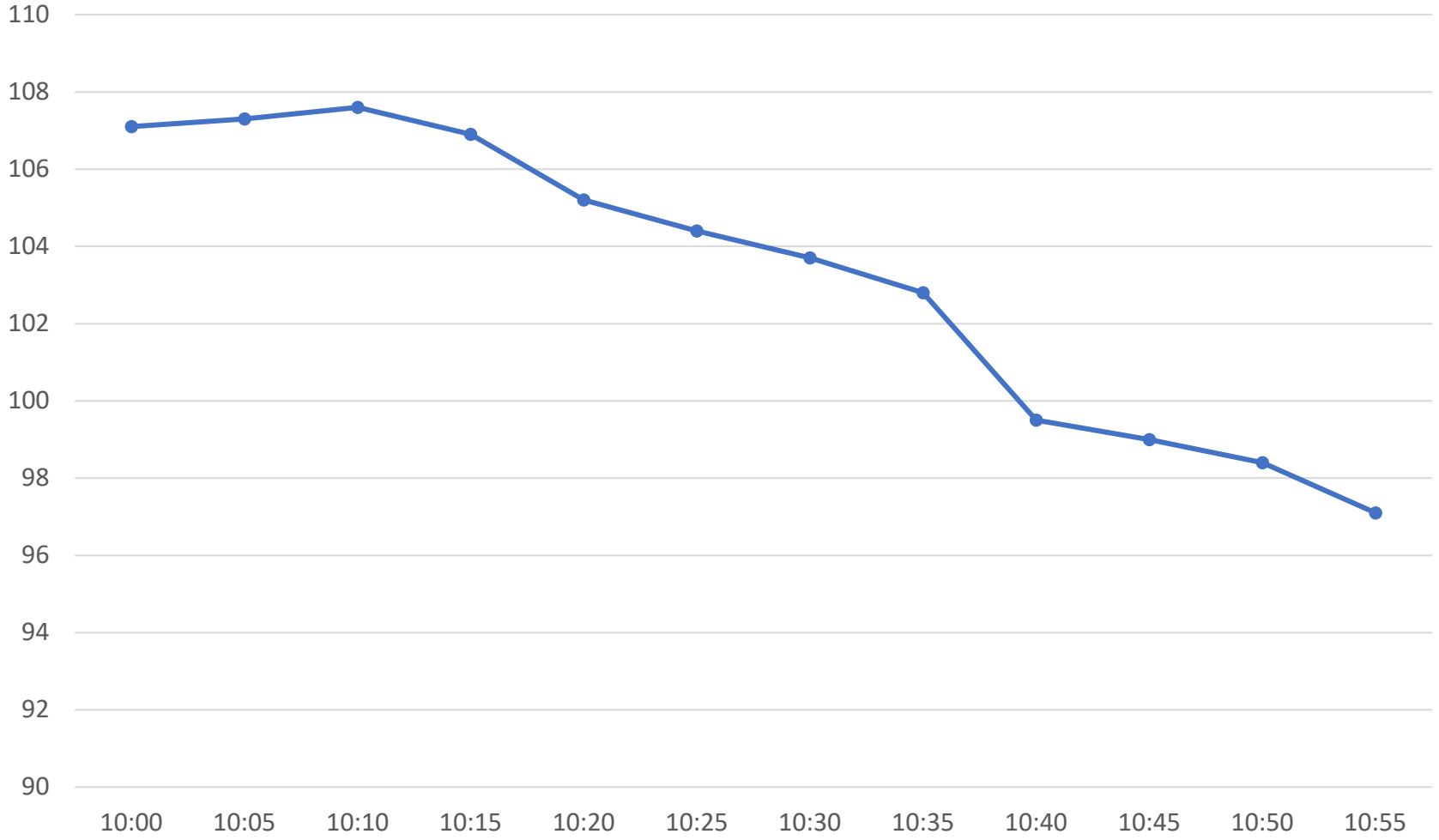
Trec


110
108
106
104
102
100
98
96
94
92
90
10:00
10:05
10:10
10:15
10:20
10:25
10:30
10:35
10:40
10:45
10:50
10:55

Controversy

- Patients with indwelling rectal thermistors can be monitored continuously without interrupting body cooling
- When an indwelling thermistor is not available, repeatedly measuring rectal temperature interrupts body cooling and reduces the overall cooling rate
- Simply continuing uninterrupted cooling until the victim clinically demonstrates a return to normal CNS function (e.g., “wakes up” with eyes open, normal behavior, and conversation), heart rate, and blood pressure may be a more effective cooling strategy in this clinical scenario

JSAMS
Journal of Science and Medicine in Sport

Case report

Core temperature and mental status of two runners experiencing exertional heat stroke after a road race

Rebecca M. Lopez [a,*], Julie K. Nolan [b], Susan W. Yeargin [c], Samantha E. Scarneo-Miller [d], Douglas J. Casa [e], John Jardine [e]

Journal of Science and Medicine in Sport 28 (2025) 350–353

KSI 77
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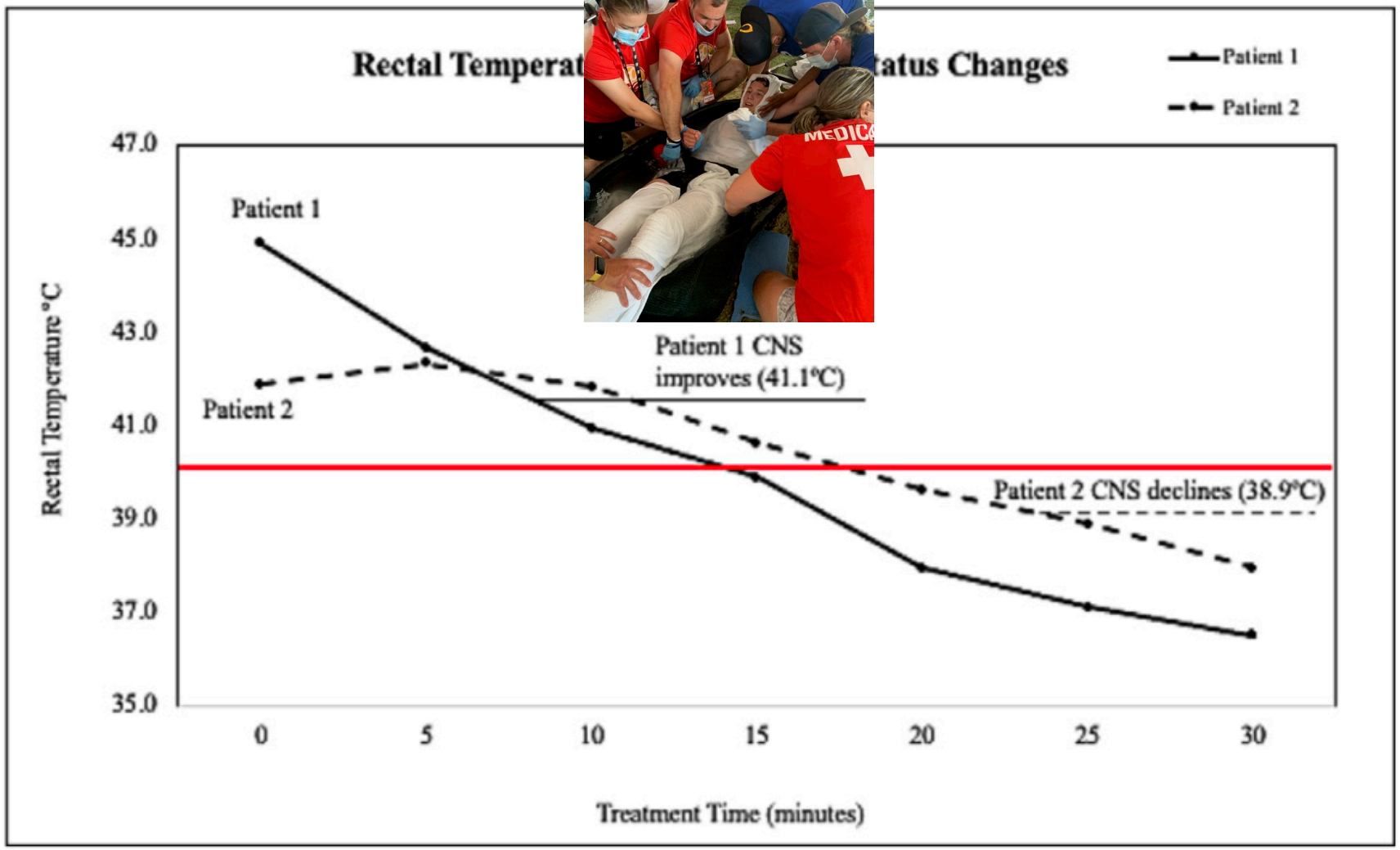
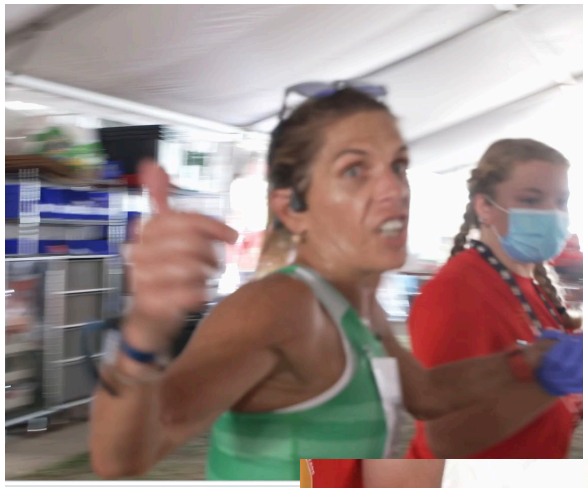
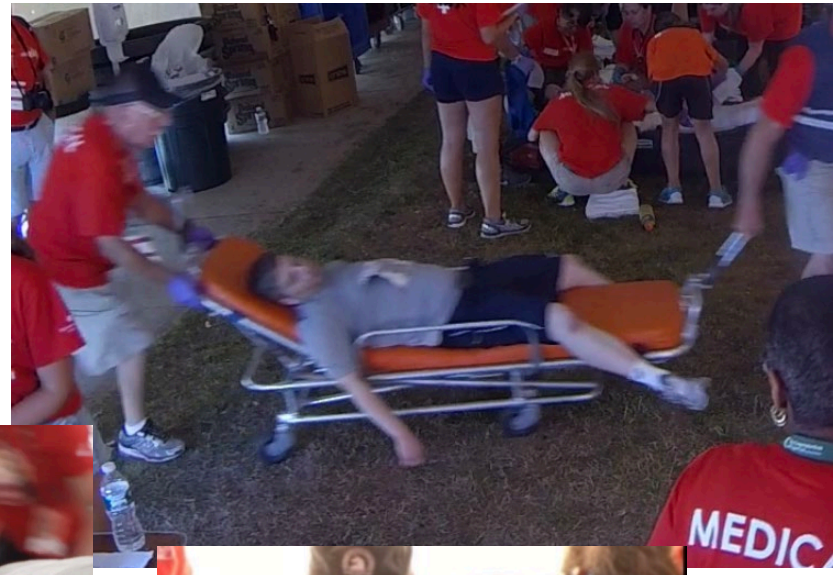
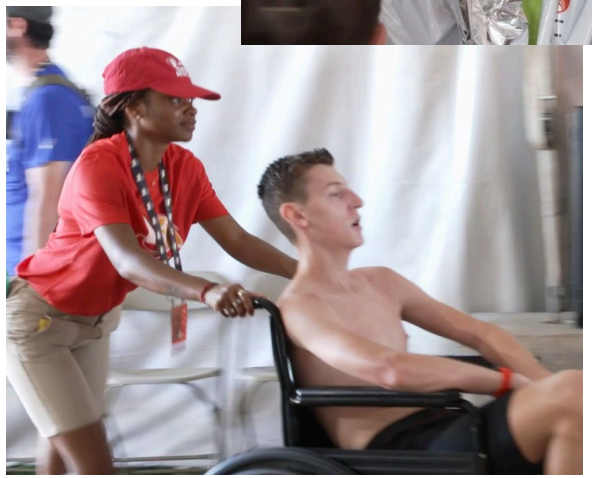
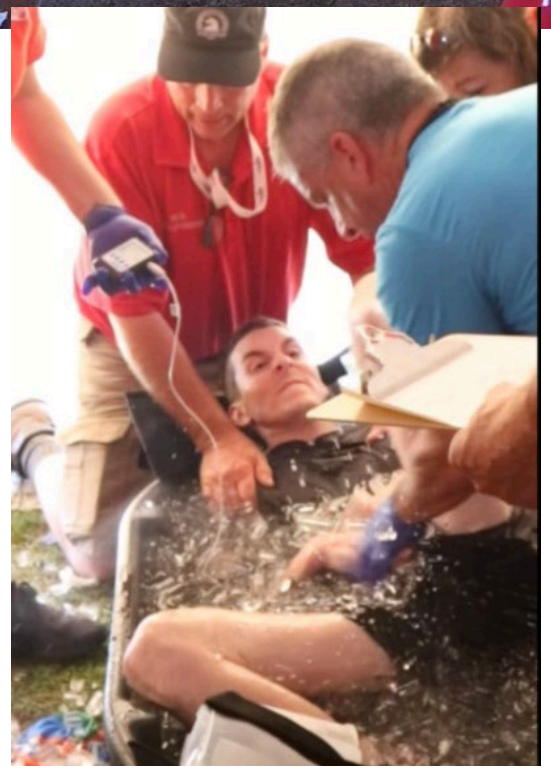

Rectal Temperat
tatus Changes
Patient 1
Patient 2
47.0
45.0
43.0
41.0
39.0
37.0
35.0
Rectal Temperature °C
Patient 1
Patient 2
Patient 1 CNS
improves (41.1°C)
Patient 2 CNS declines (38.9°C)
0
5
10
15
20
25
30
Treatment Time (minutes)









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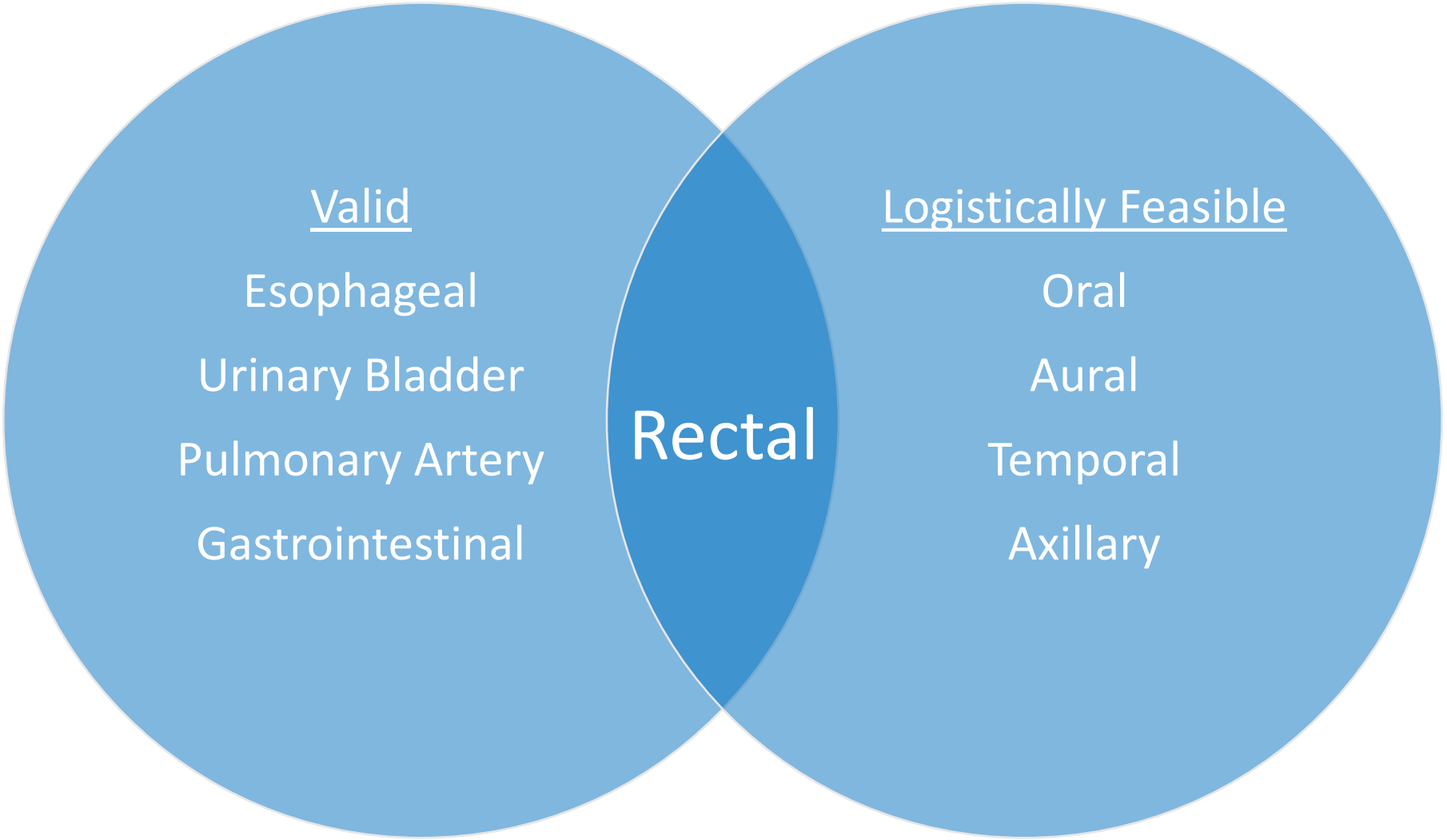
Body Temperature Assessment



Moran & Mendal, *Sports Med,* 2002; Casa et al., *JAT*, 2009

Importance of rectal temperature

- **Determine if it is or is not EHS**
  - Is it *heat exhaustion*?
  - Is it a *head injury?*
  - Is it *hyponatremia*?
  - Is it a *blood glucose issue*?
  - Is it *something else*?
- **Determine when to stop cooling**
- **Determine if EHS occurred**
  - Influence on recovery plans

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Cheers!

- 24 y/o male
- Trec 107.5℉ (41.9℃)

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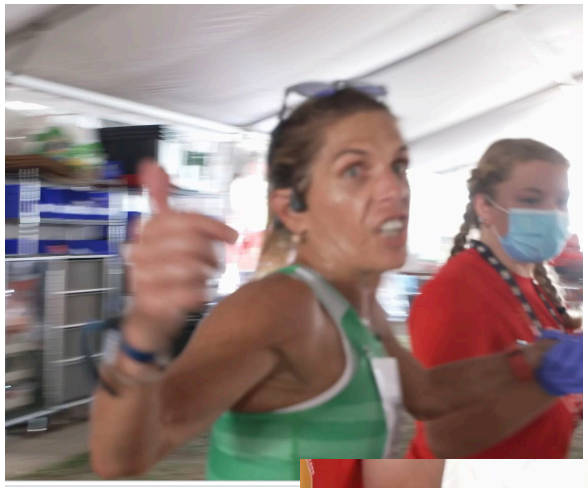
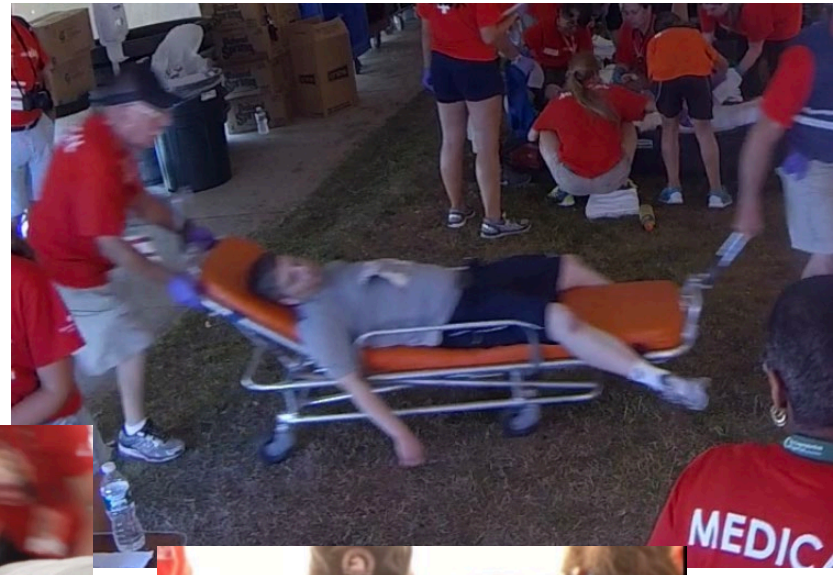
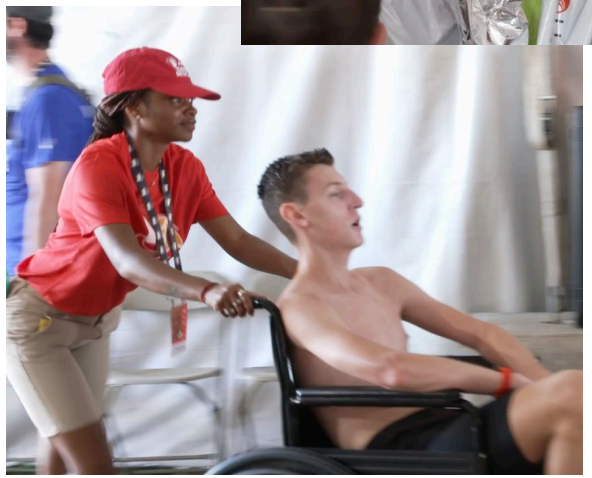
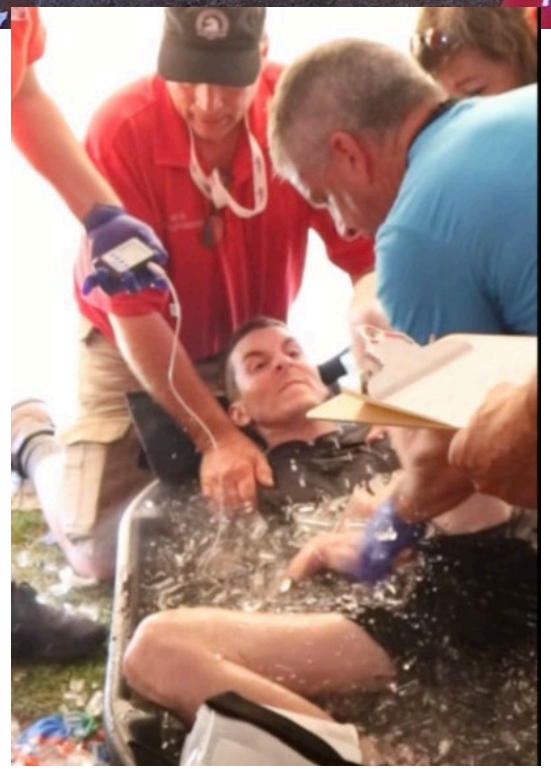
In summary…

- CNS dysfunction is one of the diagnostic criteria for exertional heat stroke
  - Cerebellum
- An elevated core temperature is the other
  - Rectal thermometry
- The correlation between CNS dysfunction and core temperature can be unpredictable









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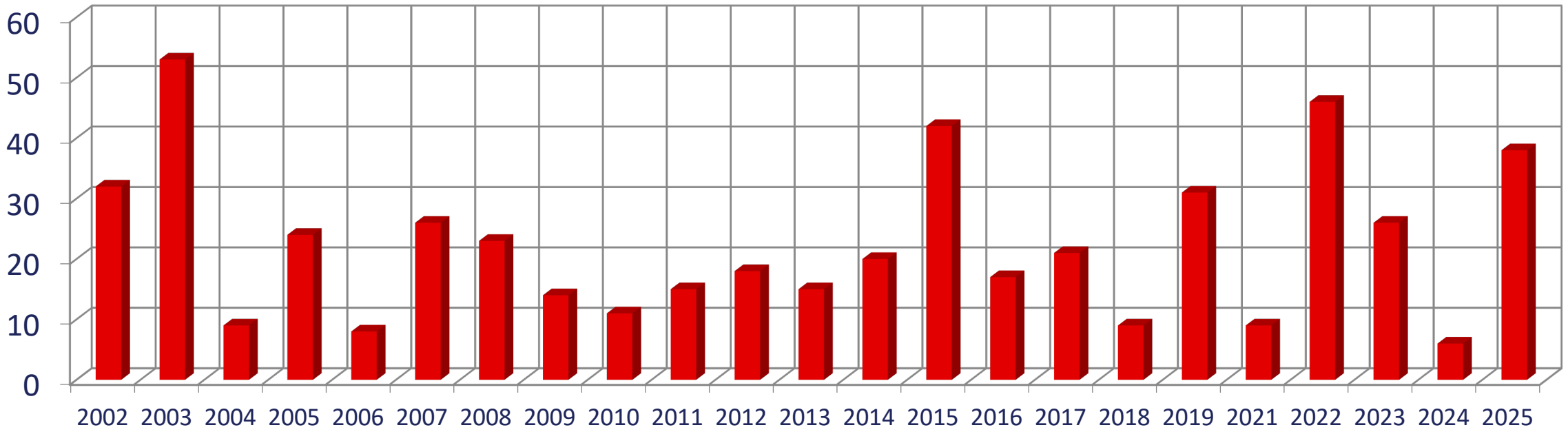
In summary…

- CNS dysfunction is one of the diagnostic criteria for exertional heat stroke
  - Cerebellum
- An elevated core temperature is the other
  - Rectal thermometry
- The correlation between CNS dysfunction and core temperature can be unpredictable
- Cold-water immersion is the gold standard for treatment of EHS

n=513



Effectiveness of Cold Water Immersion in the Treatment of Exertional Heat Stroke at the Falmouth Road Race

JULIE K. DEMARTINI[1], DOUGLAS J. CASA[1], REBECCA STEARNS[1], LUKE BELVAL[1], ARTHUR CRAGO[2], ROB DAVIS[2], and JOHN JARDINE[2]

[1]Department of Kinesiology, Korey Stringer Institute, University of Connecticut, Storrs, CT; and [2]Falmouth Hospital, Falmouth, MA

MEDICINE & SCIENCE IN SPORTS & EXERCISE®

n=274

Exertional Heat Stroke Survival at the Falmouth Road Race: 180 New Cases With Expanded Analysis

Rebecca L. Stearns, PhD, ATC*; Yuri Hosokawa, PhD, ATC†; Luke N. Belval, PhD, ATC, CSCS‡; David G. Martin, MS*; Robert A. Huggins, PhD, ATC*; John F. Jardine, MD*; Douglas J. Casa, PhD, ATC*

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doi: 10.4085/1062-6050-0065.23

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n=454

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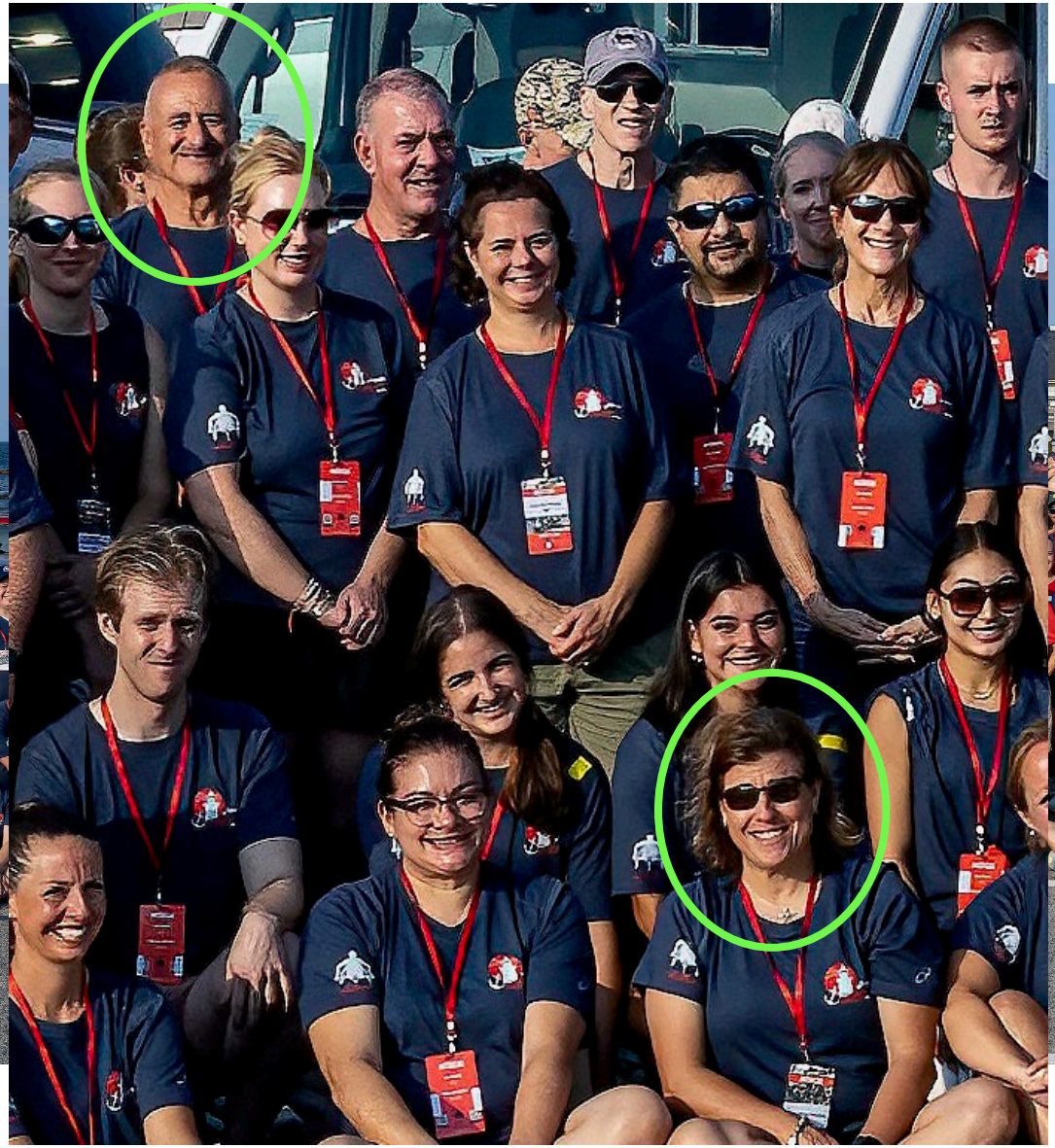

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