Project Echo for Pediatric Care 2020-2022
Heat Exhaustion: Ice, ice (the) baby
August 20, 2020
Allie Hurst, MD, MS
Provided by the University of Wisconsin–Madison Interprofessional Continuing Education Partnership (ICEP)

Intended Audience:
Emergency care professionals, including but not limited to, emergency room personnel, transportation specialists and emergency trauma coordinators. This includes MDs/DOs, RNs, APRNs, and Physician Assistants.

Objectives:
As a result of this educational regularly scheduled series, learners will be able to:

1. Objectively assess pediatric patients in emergencies.
2. Determine if the pediatric patient needs to be transferred to a specialty provider.
3. Collaborate with members of the healthcare team to assist pediatric patients in maintenance of chronic conditions without transfers.
4. Effectively communicate with interprofessional team members to provide patient-centered pediatric care.

5.

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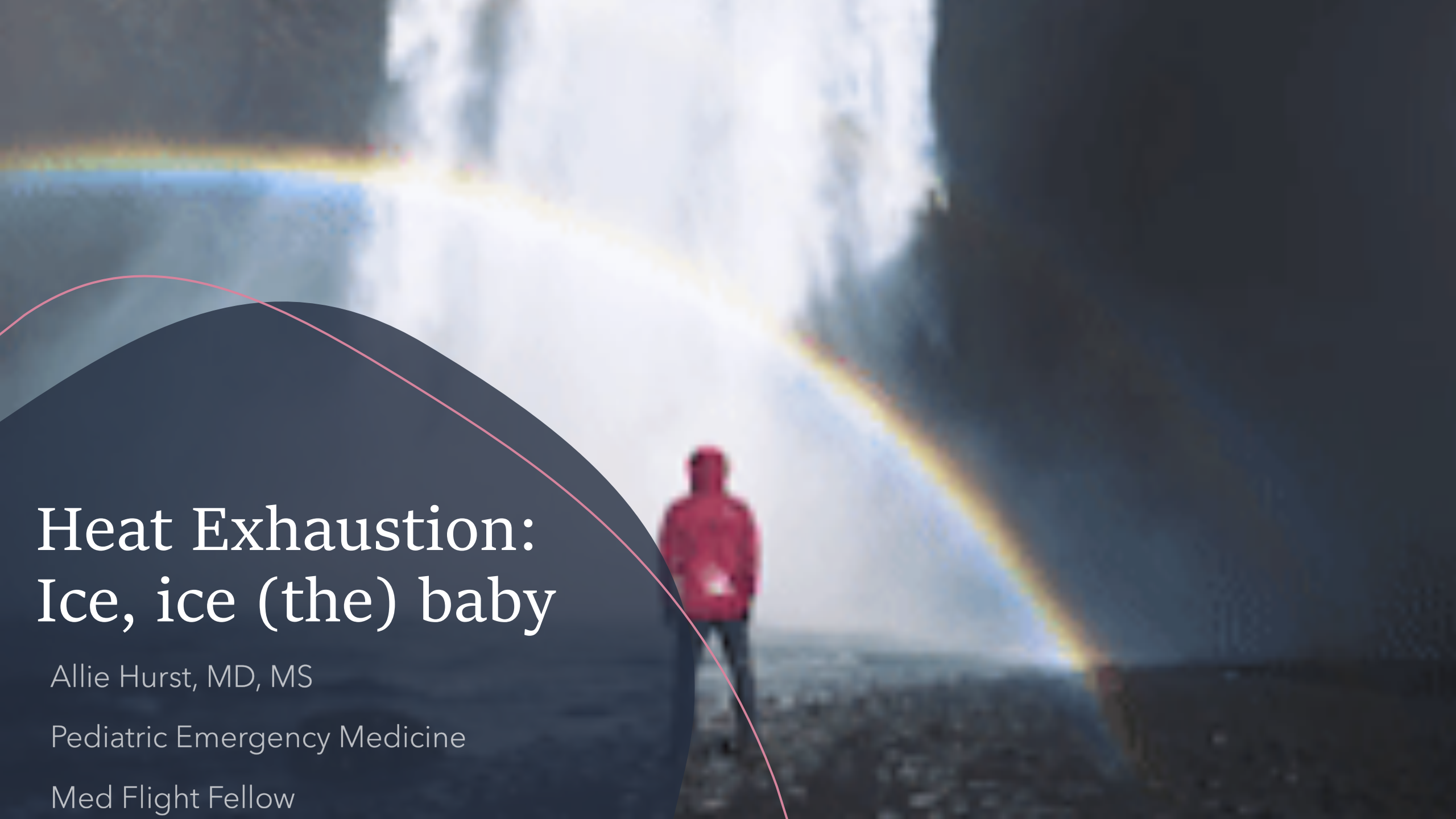


Heat Exhaustion: Ice, ice (the) baby

Allie Hurst, MD, MS

Pediatric Emergency Medicine

Med Flight Fellow

Disclosures

- Nothing to disclose

Objectives

- Review cause of heat exhaustion
- Identify signs and symptoms in pediatric patients
- Discuss treatments

https://www.nytimes.com/2020/08/04/science/randall-munroe-xkcd-temperature.html

Case:

- 5 yo M presenting with dizziness, headache, nausea
- Playing on trampoline most of today, no known trauma
- When c/o headache, patient vomited in the driveway and MOC activated EMS via 911

What w first on arriv

- 1) Zofra
- 2) IV pla
- 3) Move
- 4) Send

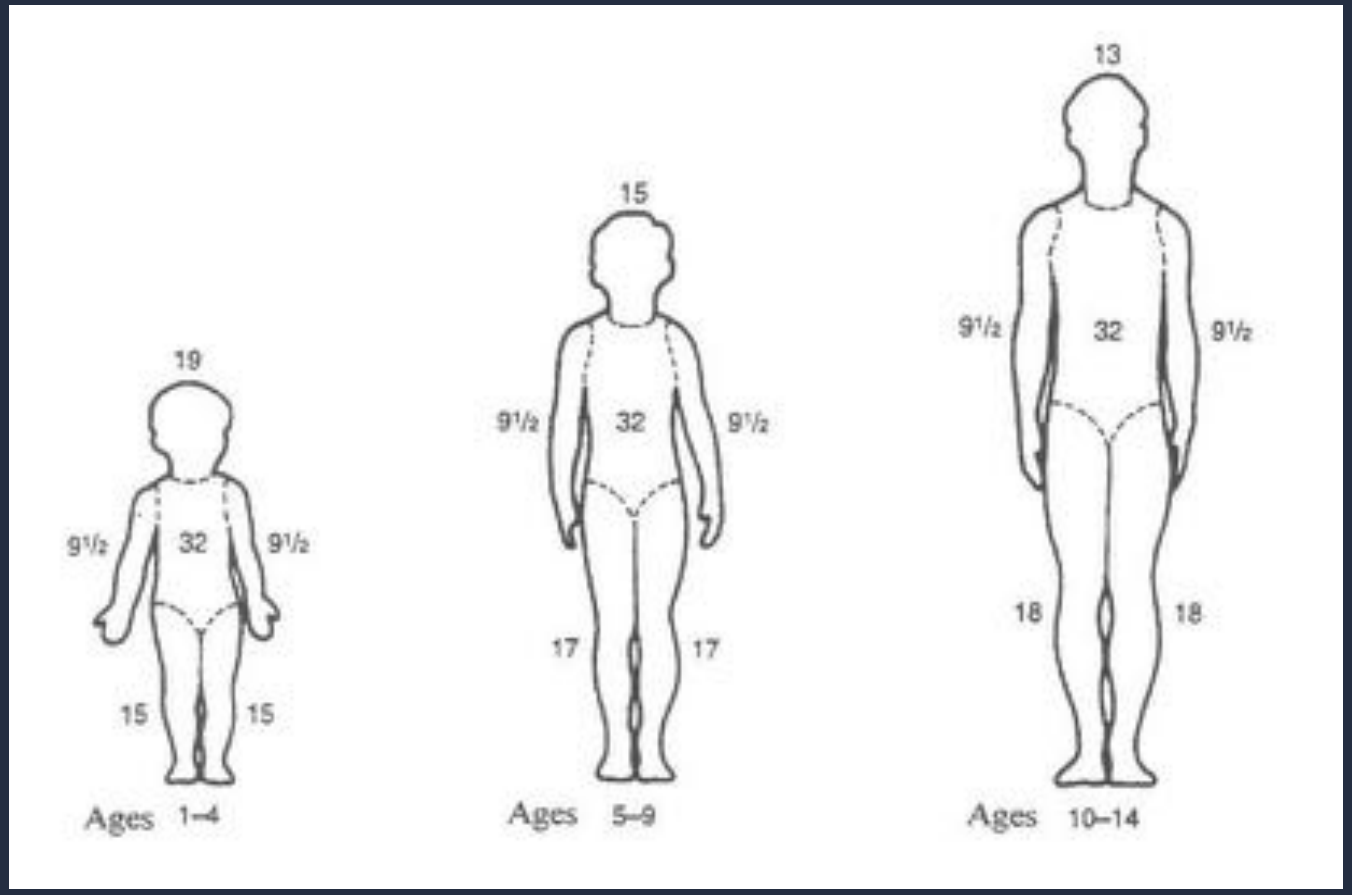
https://www.wayfair.com/Propel-Trampolines--Kinetic-12-Round-Backyard-Trampoline-and-Safety-Enclosure-K126BE-I1036-K~W002677190.html?refid=GX107983233626-W002677190&device=c&ptid=1044362625072&network=g&targetid=pla-1044362625072&channel=GooglePLA&ireid=69436392&fdid=1817&gclid=CjwKCAjwm_P5BRAhEiwAwRzSO2I3dAwn7mfAEn2gC6dMefs1kF8BqqsioxrPYi0TdUk5d5IHGzHvEBoCDmIQAvD_BwE

What is it?

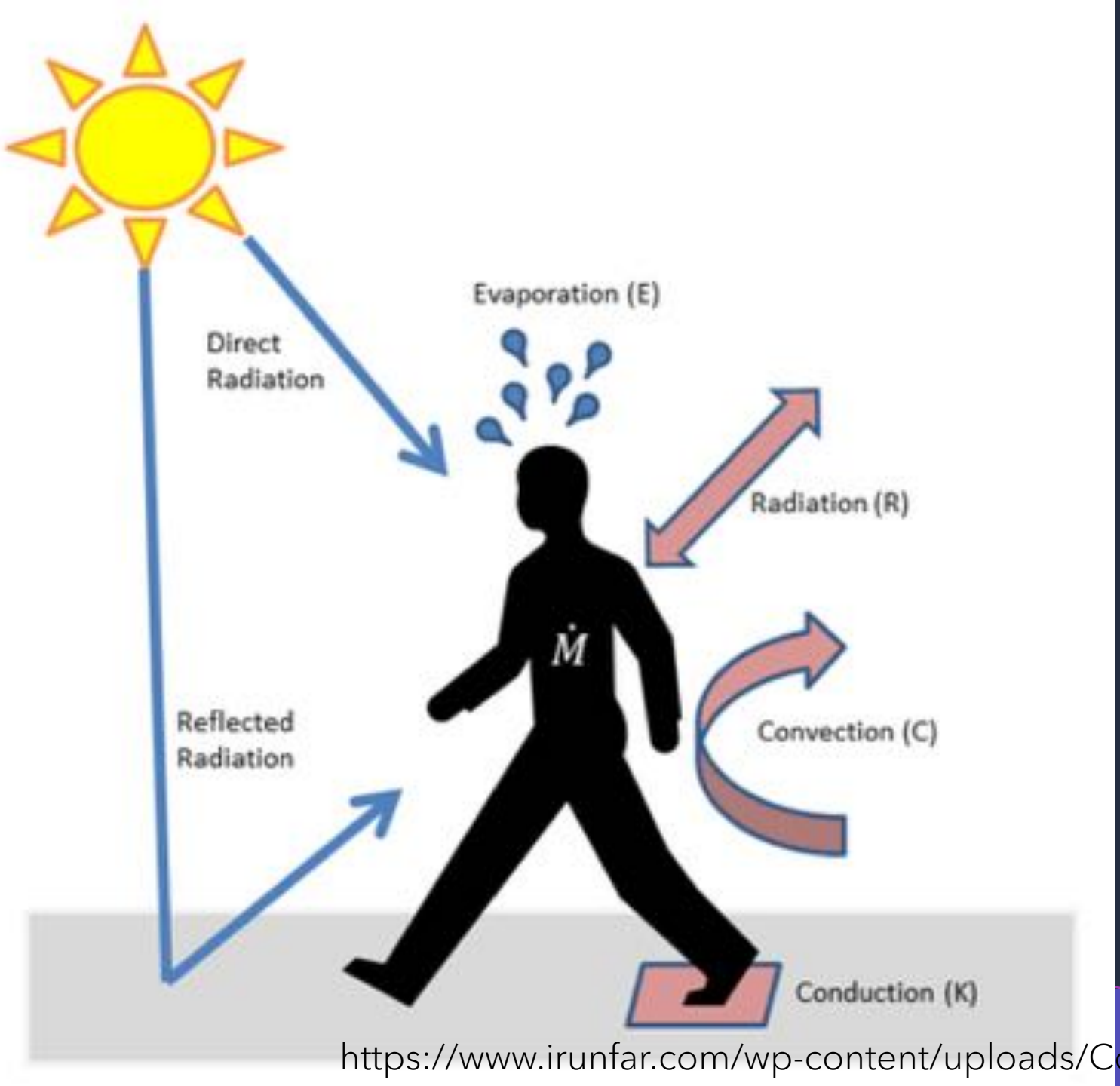
- Happens sometimes prior to heat stroke
  - Heat stroke 17-70% mortality depending on age, predisposing factors
- Evaporative cooling is primary heat loss mechanism
  - Not effective over 75% humidity
- Radiation, conduction, convection – doesn't happen when ambient temp > body temp
- Young children with different body surface areas than adults

Jardine DS. *Pediatr Rev*. 2007

Bytomski, JR., Squire, DL. Curr Sports Med Rep. 2003.



https://www.health.state.mn.us/communities/ep/surge/burn/tbsa.html



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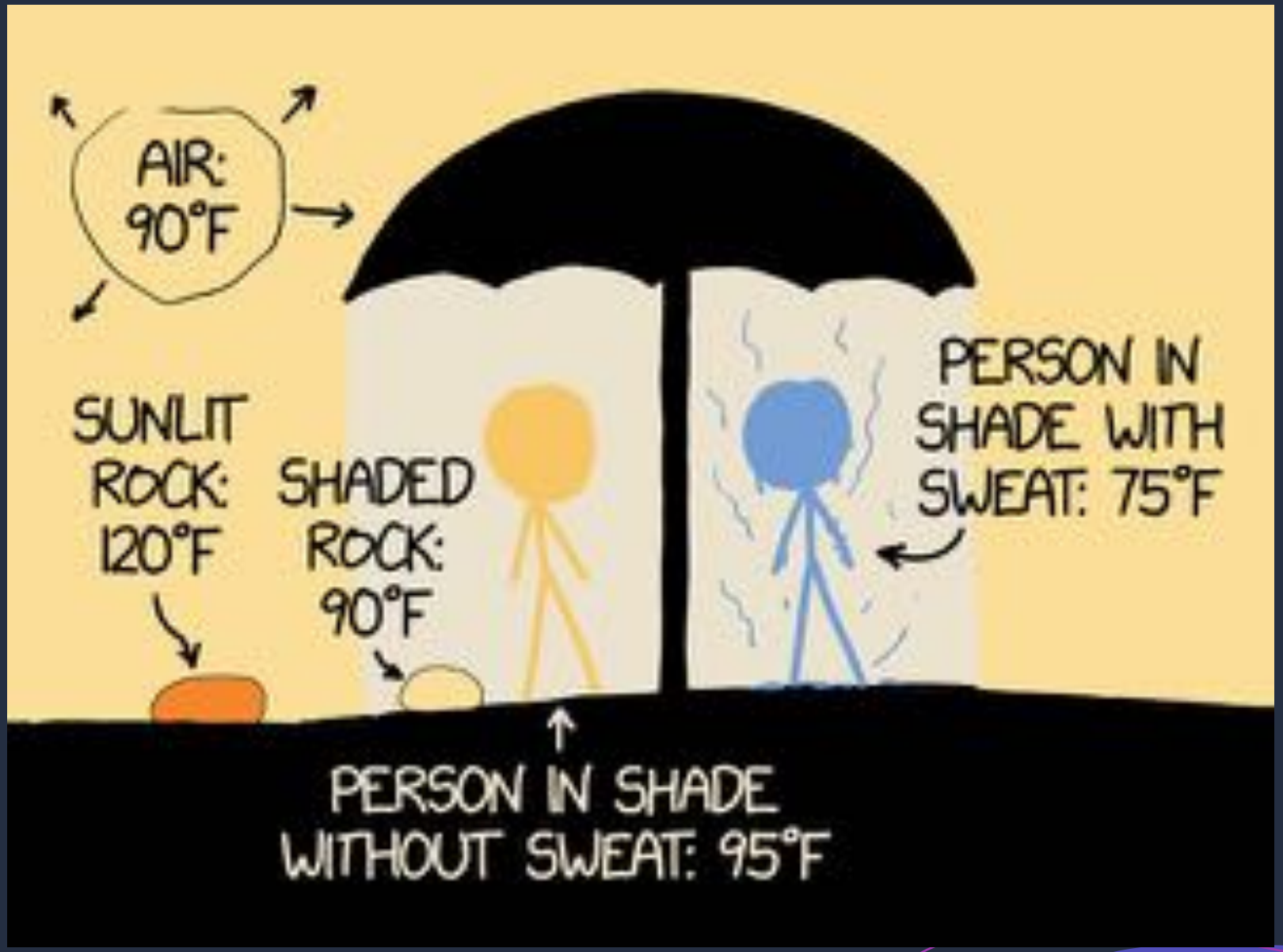


https://www.nytimes.com/2020/08/04/science/randall-munroe-xkcd-temperature.html

Case continued:

- Ambient temperature that day was 90 degrees with heat index 95
- 70-80% humidity
- Patient had decreased PO fluids due to playing outside most of day
- Decreased UOP

Signs and Symptoms

- Body temp 37- 40 degrees C*
- Tachycardia
- Sweating*
- Normal mental status*
- Vomiting/Nausea
- Headache
- Dizziness

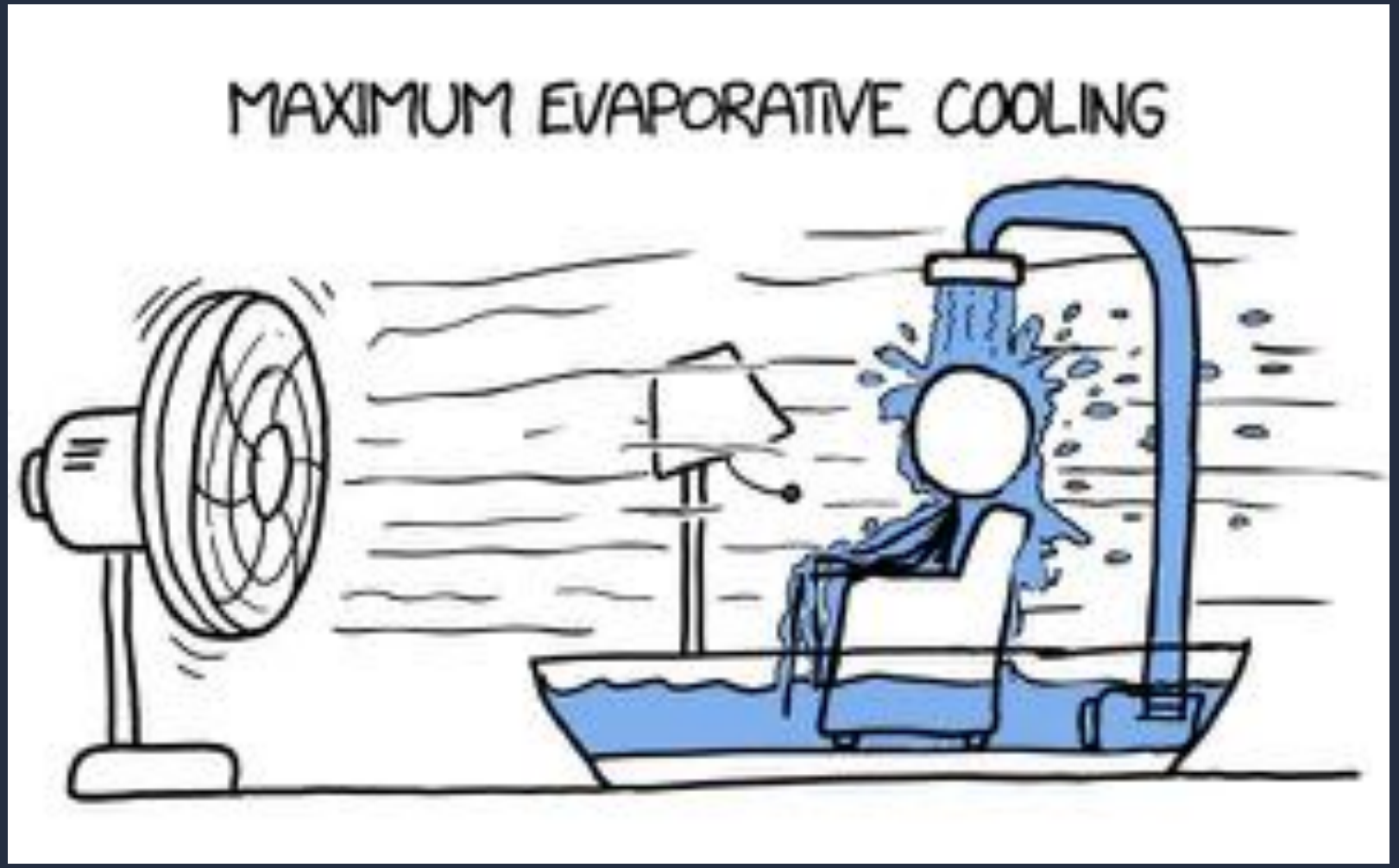
https://twitter.com/midclassfancy/status/1165321550066851840

Treatment

- Pre-hospital:
  - Cooling * Evaporative
  - Normotonic rehydration
  - Stop exercising
- Hospital:
  - IV Bolus (NS or LR) 20ml/kg
  - Cooling – remove clothing, apply wet cloths
  - +/- check electrolytes (hypo/hyperNa)
  - Measure core temp

Jardine DS. *Pediatr Rev*. 2007

Lipman GS, Eifling KP, Ellis MA, et al. *Wilderness Environ Med*. 2014



https://www.nytimes.com/2020/08/04/science/randall-munroe-xkcd-temperature.html

Case:

- On EMS arrival, patient c/o nausea
- Once in cool(er) ambulance, perked up, playing with rubber bands, chatting
- On arrival to ED, symptoms completely resolved
- VS: Temp 37.8 HR 80 RR 24 BP 100/64 Sat 98% RA

Prevention

- Check heat index – warn about prolonged outdoor exercise/exposure on heat index days
- Hydration – electrolyte drinks encourage drinking in peds up to 90% compared to unflavored water
- Loose, lightweight clothing
- Frequent breaks
- Acclimatize (takes up to 14 days)

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Case:

- Exam otherwise unremarkable

- Patient given PO electrolyte fluids without return of nausea, vomiting, headache

https://goodanranch.org/tag/dog-heat-stroke/

Summary

- Ineffectual internal cooling functions
- Causes vital sign changes
- Can lead to heat stroke
- Treatment focused on removal from heat source, cooling, and rehydration

What would you do for this patient first on arrival?

- 1) Zofran
- 2) IV placement, bolus
- 3) Move to cool environment
- 4) Send him back to the trampoline

Questions?