

EARTH
NETWORKS



WEATHER SAFETY
WARMUP



HEAT STRESS AND LIGHTNING STRIKES HEALTH RISKS

WEATHER SAFETY WARMUP WEBINAR SERIES

LET'S GET STARTED! BUT FIRST – HOUSE-KEEPING NOTES



- This webinar is being recorded and will be sent out shortly after the webinar
- Have audio or visual issues? Try closing and reopening GoToWebinar
- Have a question? Use the chat box and we will get to the question at the end of the session
- Want to learn more? We have additional sessions scheduled.
- You can also provide feedback, suggest a topic or ask a question by emailing us at info@earthnetworks.com

GUEST



SAM ZHAO

Attending Physician

Division of Emergency Medicine

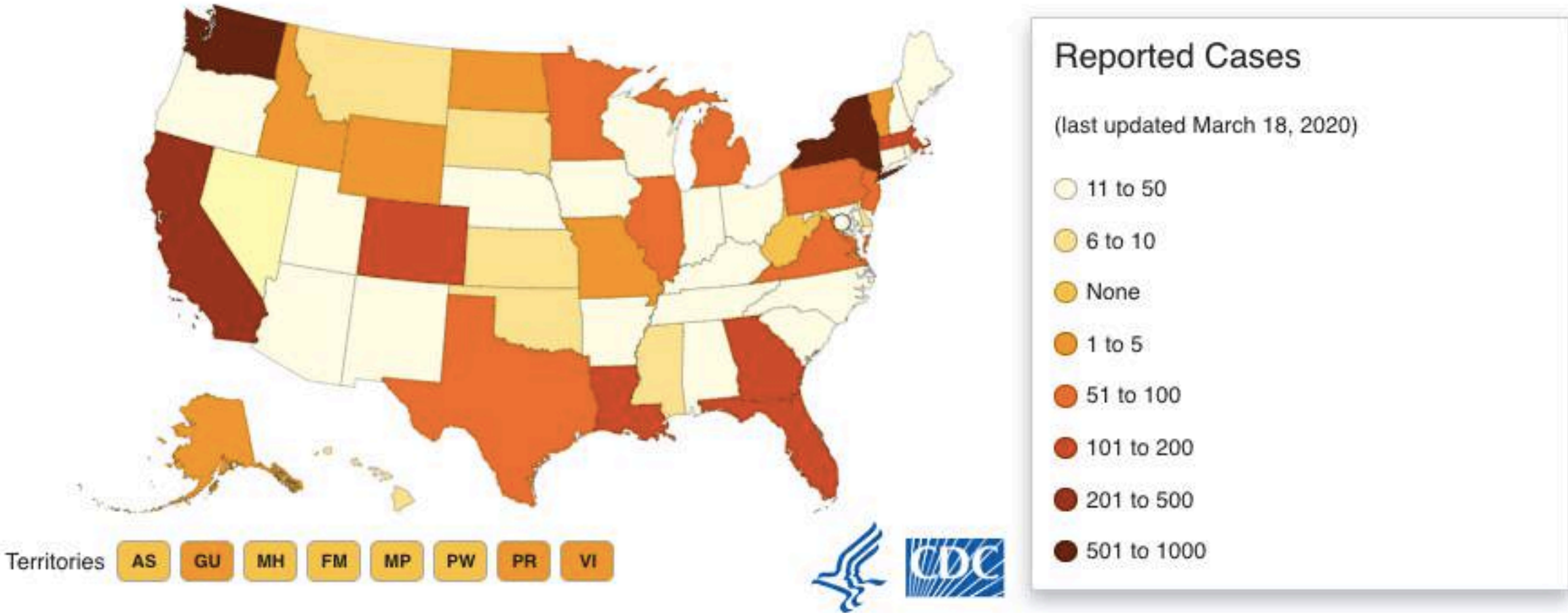
Children's National Hospital, Washington, DC

POLL QUESTION

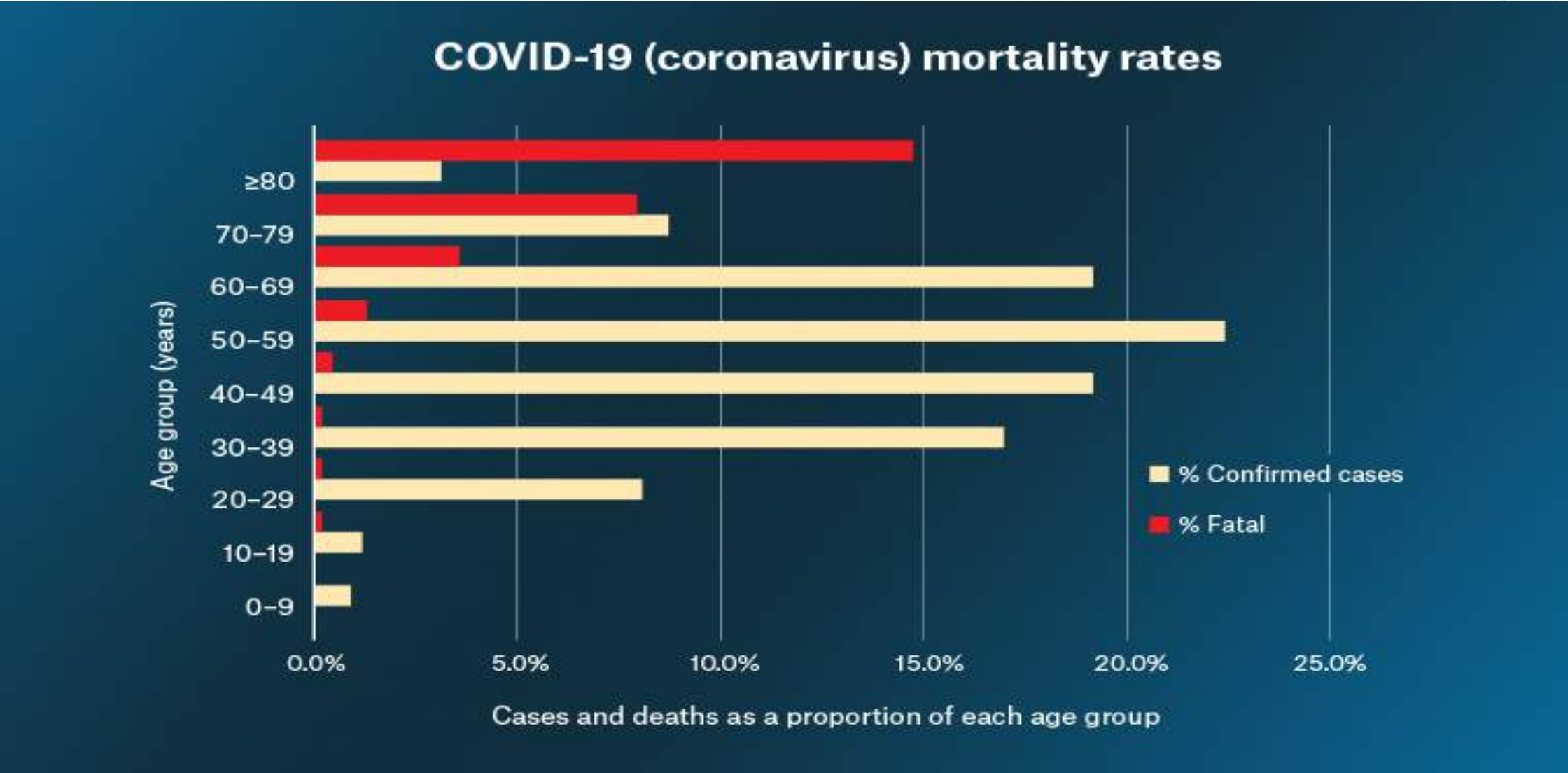


Do you already have a policy to prevent
weather-related injuries?

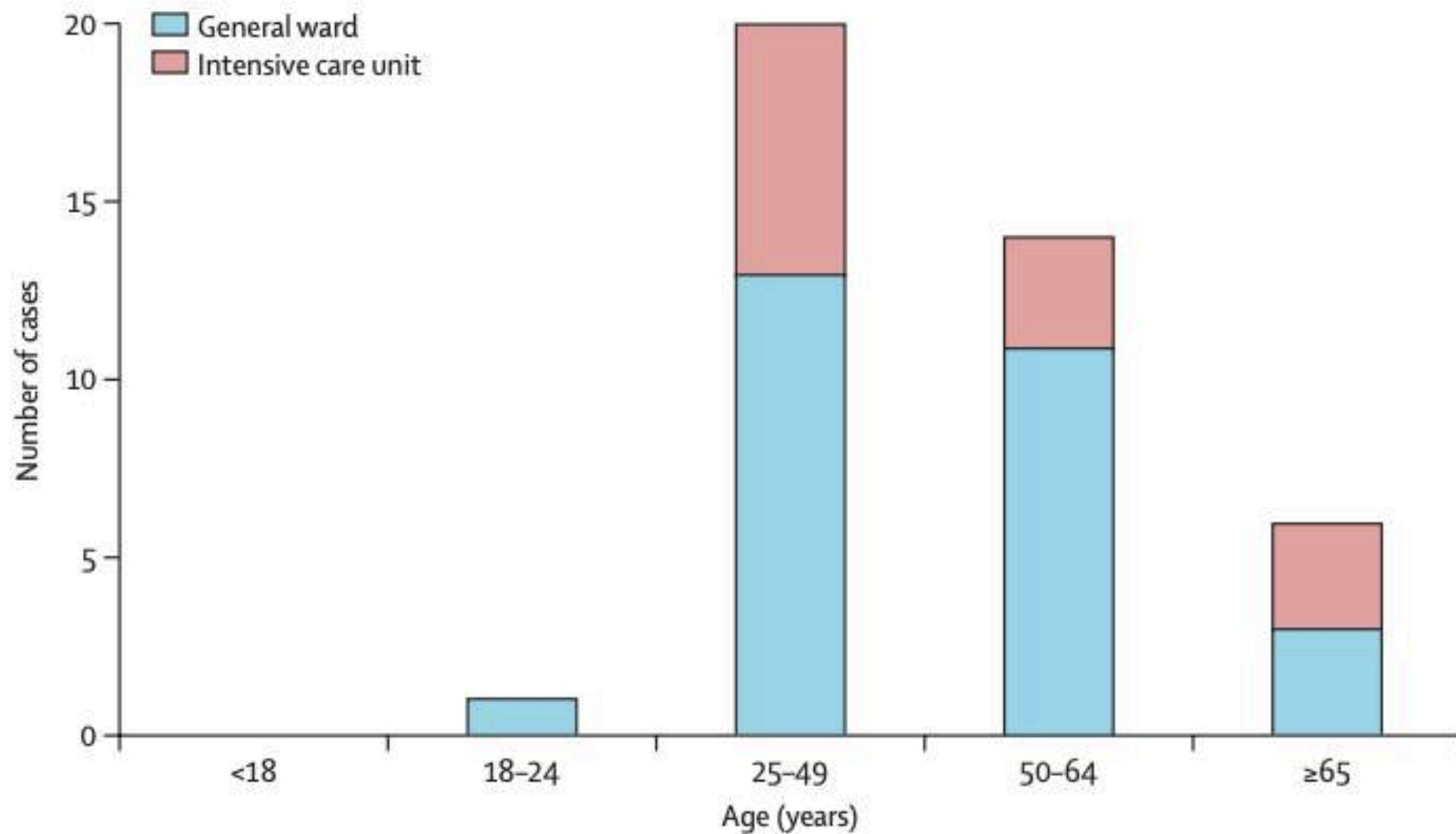
REPORTED CASES AS OF MARCH 18



MORTALITY RATES



AGE DISTRIBUTION



OBJECTIVES

- Recognize health risks associated with heat stress and lightning strikes
- Describe long term health impacts related to heat stress and lightning strikes
- Identify prevention tips and first aid recommendations in the event of an incident

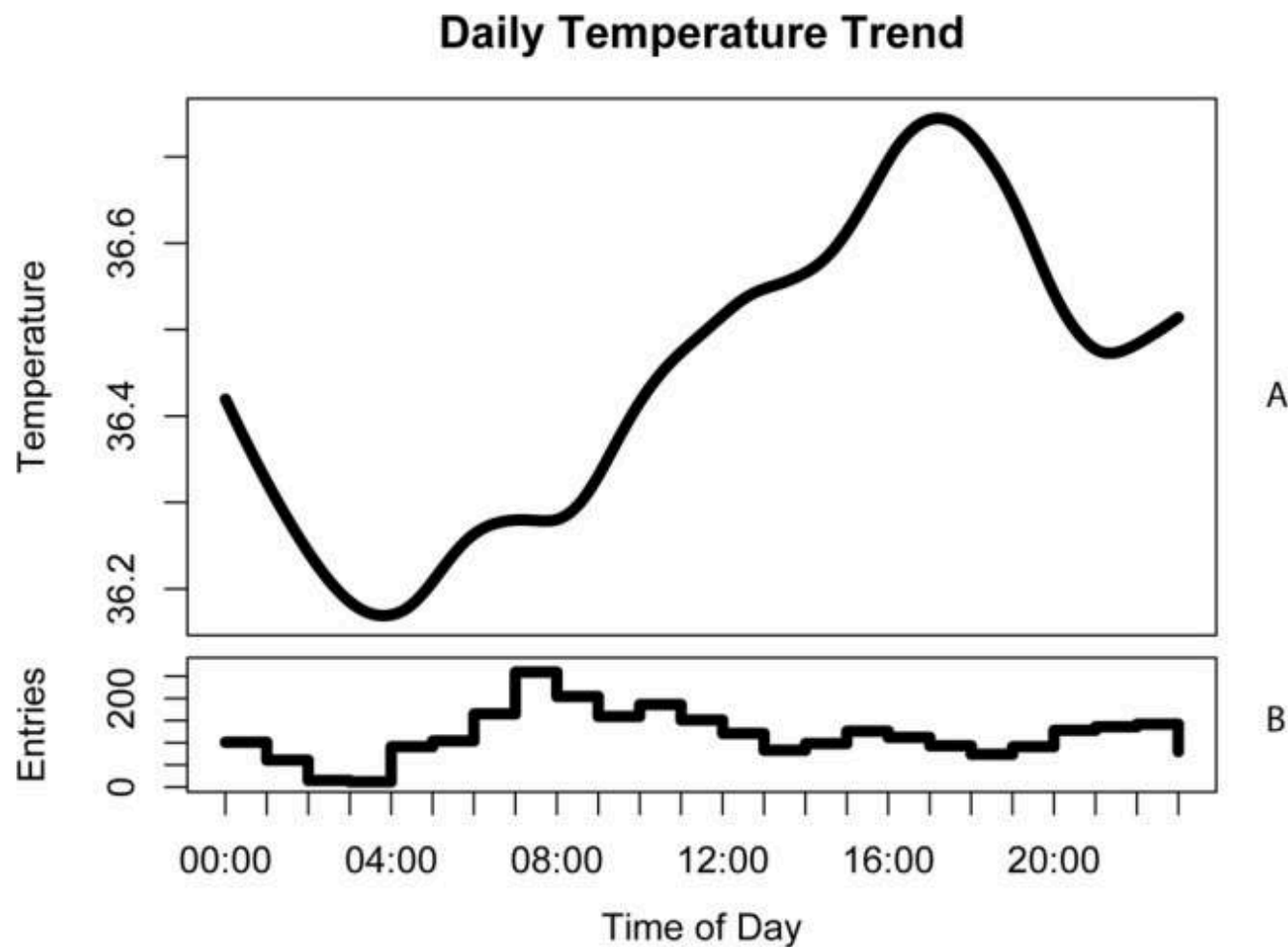
WHAT IS NORMAL?

- **Carl Wunderlich (1815-1877)**
- **37° C or 98.6° F**



BUT IS THIS CORRECT?

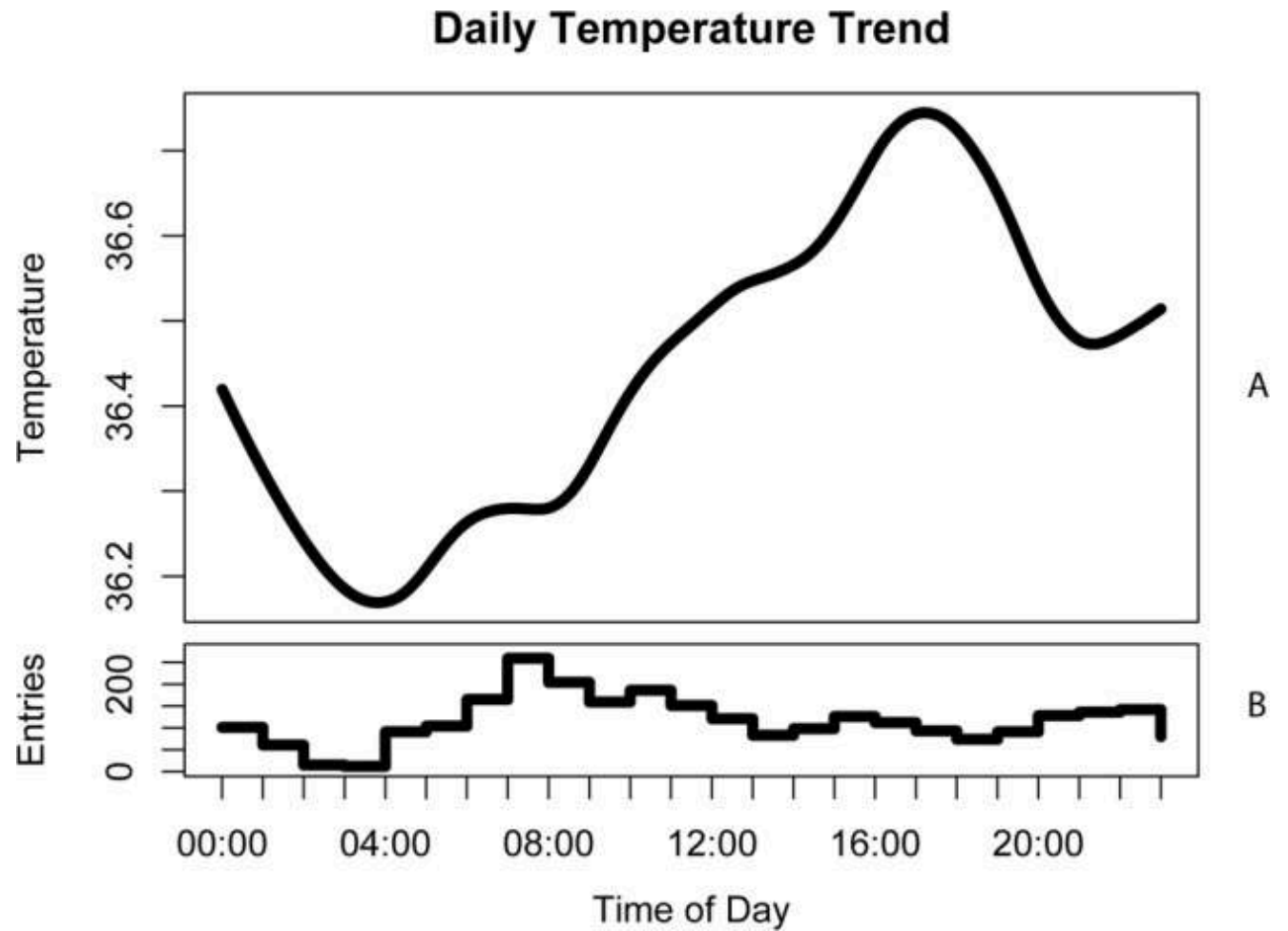
- **Philip A. Mackowiak:**
36.8° C or 98.2° F
- **Jonathan S. Hausmann:**
36.5° C or 97.7° F



PEDIATRIC DATA

James M. Chamberlain:

- 3 days to 10 years:
36.8° C or 98.2° F
- 11 years and older:
37.5° C or 97.7° F



WHAT HAPPENS WHEN IT'S TOO HOT?

HEAT CRAMPS

Involuntary muscle contractions

HEAT SYNCOPE

Loss of consciousness or collapse

HEAT EXHAUSTION

HEAT STROKE

AVERAGE 90+ DEGREE DAYS IN MAJOR CITIES IN THE REGION



City	Number of 90+ Degree Days
Phoenix, AZ	168
San Antonio, TX	113
Orlando, FL	106
Jackson, MS	93
Montgomery, AL	78
Columbus, GA	76
Little Rock, AR	73
New Orleans, LA	72
Oklahoma City, OK	68
Memphis, TN	67
Albuquerque, NM	62
Denver, CO	34



EXAMPLES OF HEAT RELATED INCIDENTS ACROSS THE COUNTRY

Blue Eye, MO

Right Angle Foundations

08/07/2019

Construction worker outdoors
feels ill and later dies

West Point, KY

Walter Ross & Shawn Morrison

07/27/2019

Roofer on construction site
feels ill and later dies

Delair, NJ

Aluminum Shapes, LLC.

07/21/2019

Metalworker near an oven feels
ill and later dies

Hondo, TX

Hellas Construction

07/22/2019

Construction worker at outdoor
field feels ill and later dies

Tampa, FL

Middleton High School

6/11/19

14-y.o. freshman collapses
during football conditioning and
later dies

College Park, MD

**University of Maryland, College
Park**

5/29/2018

Offensive lineman hospitalized
and died due to heatstroke

Austin, TX

University of Texas

9/8/2018

Offensive lineman hospitalized
due to heat-related illness

Bowling Green, OH

Bowling Green State University

9/29/2018

Football player hospitalized at
away game due to heat stress

HEAT EXHAUSTION

Observe in a cool environment

- Remove as much clothing as possible
- Active cooling (e.g., Mist-and-fan)

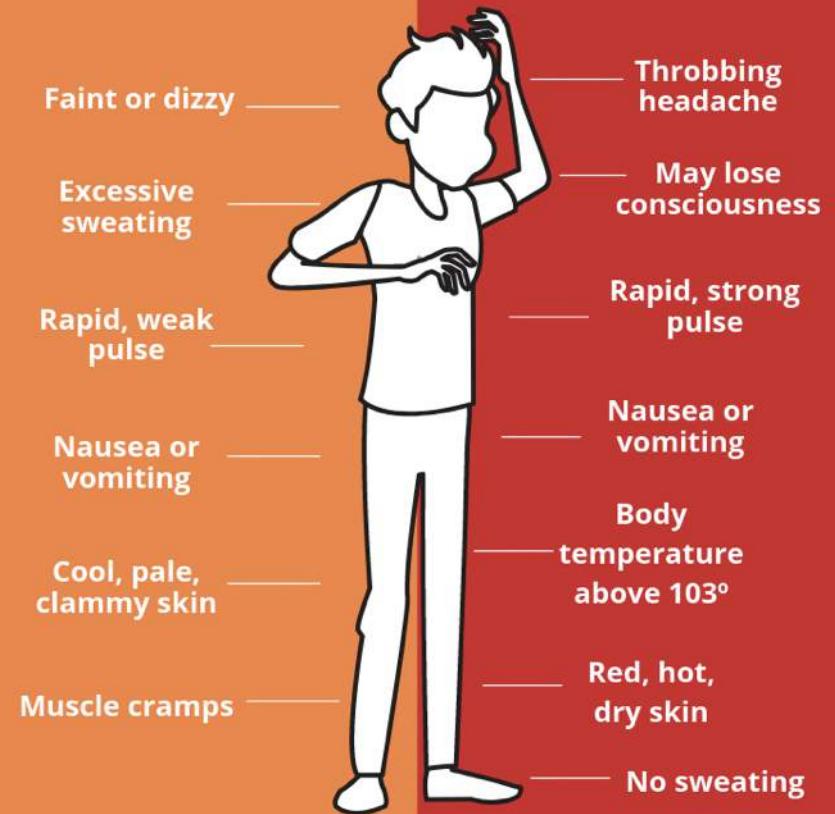
Oral hydration

- Reestablishes circulating volume
- Promotes sweating

Heat Exhaustion

OR

Heat Stroke



Help the person get to a cooler, air conditioned place. Encourage them to drink water if they're fully conscious.

Call 911
Take immediate action to help cool the person until help arrives

HEAT STROKE

Begin cooling as soon as possible

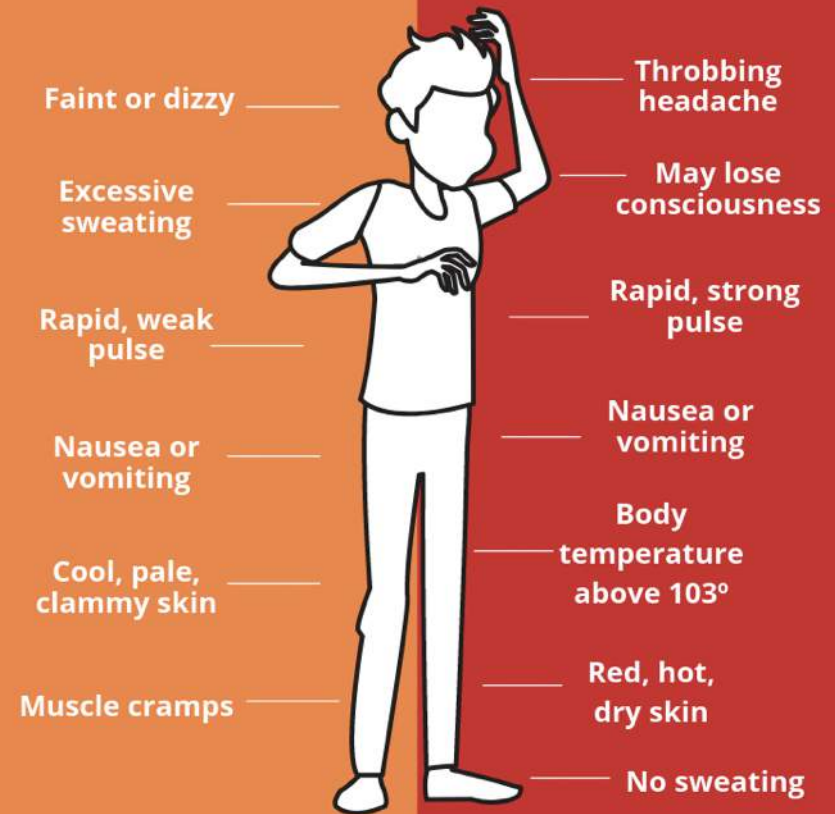
- *Cold water immersion for 15 to 20 minutes*
- Mist-and-fan
- Application of cold material to body
- Stop cooling before normal core body temperature achieved

Give fluids orally if patient is not confused, weak, or vomiting

Heat Exhaustion

OR

Heat Stroke



Help the person get to a cooler, air conditioned place. Encourage them to drink water if they're fully conscious.

Call 911
Take immediate action to help cool the person until help arrives

WHAT ARE RISK FACTORS FOR HEAT-RELATED INJURIES?

- Young or old age
- Certain medications
- Occupational or recreational activities requiring strenuous exercise in hot or humid environments
 - Athletes
 - Firefighters
 - Military personnel



HOW CAN YOU PREVENT HEAT-RELATED INJURIES?

- Do not leave children in vehicles, even for short periods of time
- Wear loose, light clothing
- Take in more fluids and electrolytes than usual
- Avoid strenuous activity during extreme heat



WHAT ARE COMPLICATIONS OF HEAT STROKE?

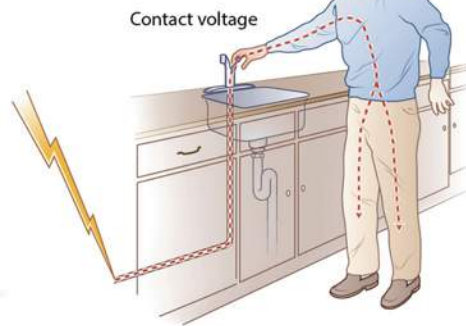
- Good prognosis if recognized and treated early
- Heart injury (bradycardia, hypotension, dysrhythmias)
- Muscle injury (rhabdomyolysis)
- Kidney injury (acute kidney injury)
- Brain injury (delirium, seizures)



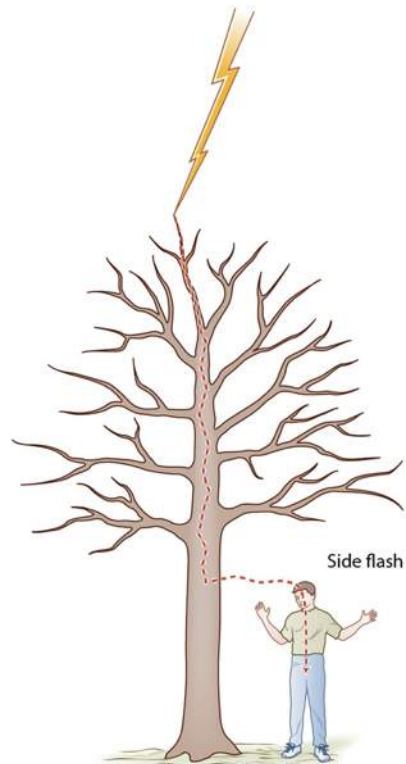
5 TYPES OF LIGHTNING INJURY



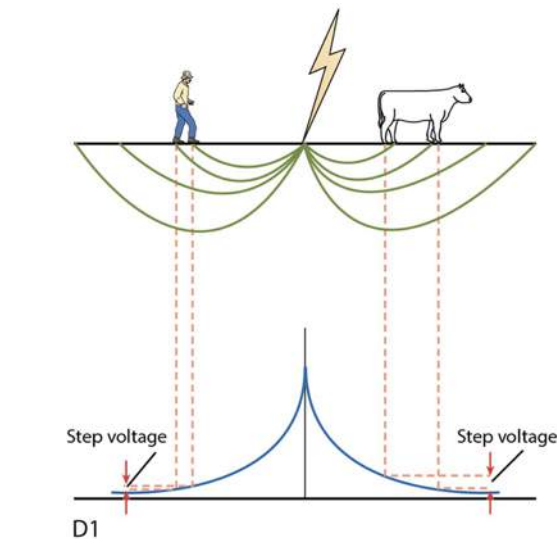
A Direct strike



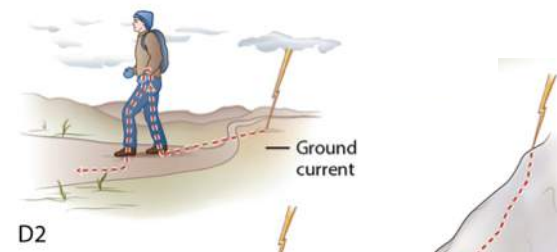
B



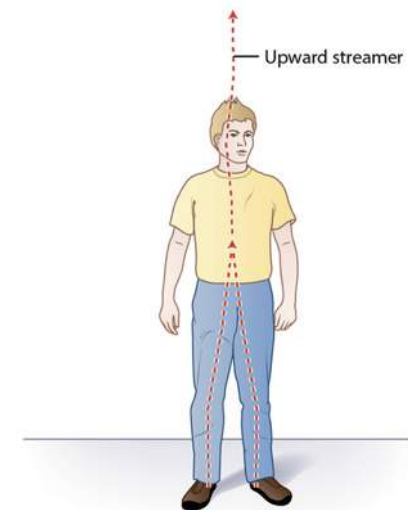
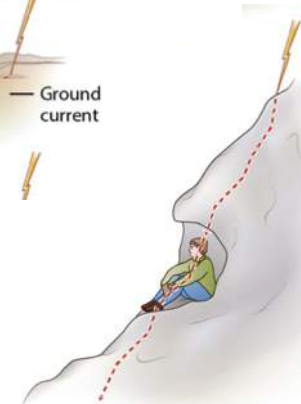
C



D1



D2



E

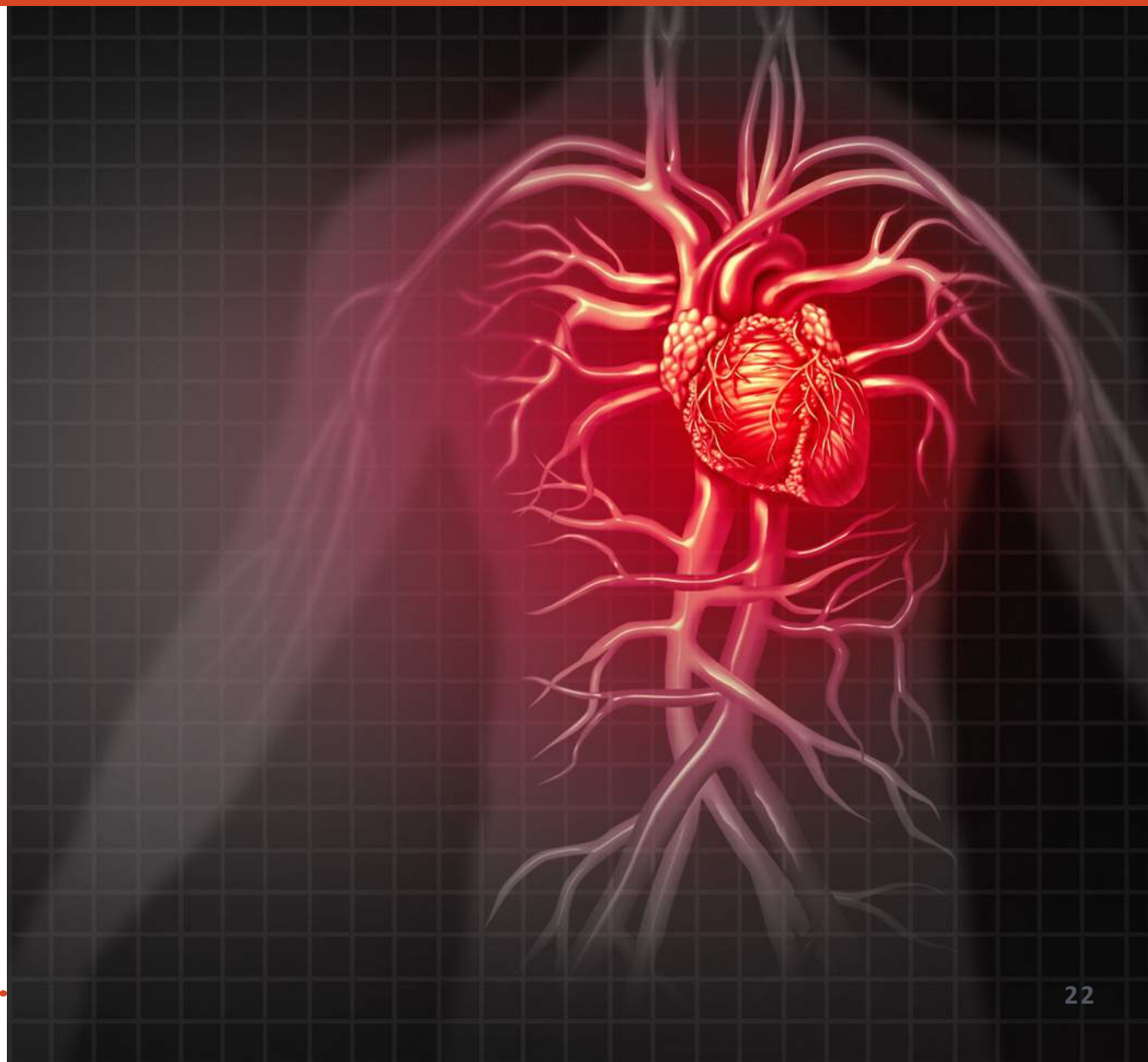
WHO IS MOST AFFECTED?

- Highest risk of injury in males 15 to 44 years old
- 300 injuries and 100 deaths per year in the United States
- Up to 74% of survivors have permanent disabilities



WHAT HAPPENS AFTER A LIGHTNING STRIKE?

- Sudden death is caused by cardiac or respiratory arrest



4 TYPES OF SKIN LESIONS



WHAT ARE OTHER LIGHTNING-ASSOCIATED INJURIES?

- Eye injuries
- Eardrum rupture
- Kidney injury
- Burns to the bones and deep tissue
- Temporary to permanent neurological disability



WHAT DO YOU DO AFTER A LIGHTNING-ASSOCIATED INJURY?

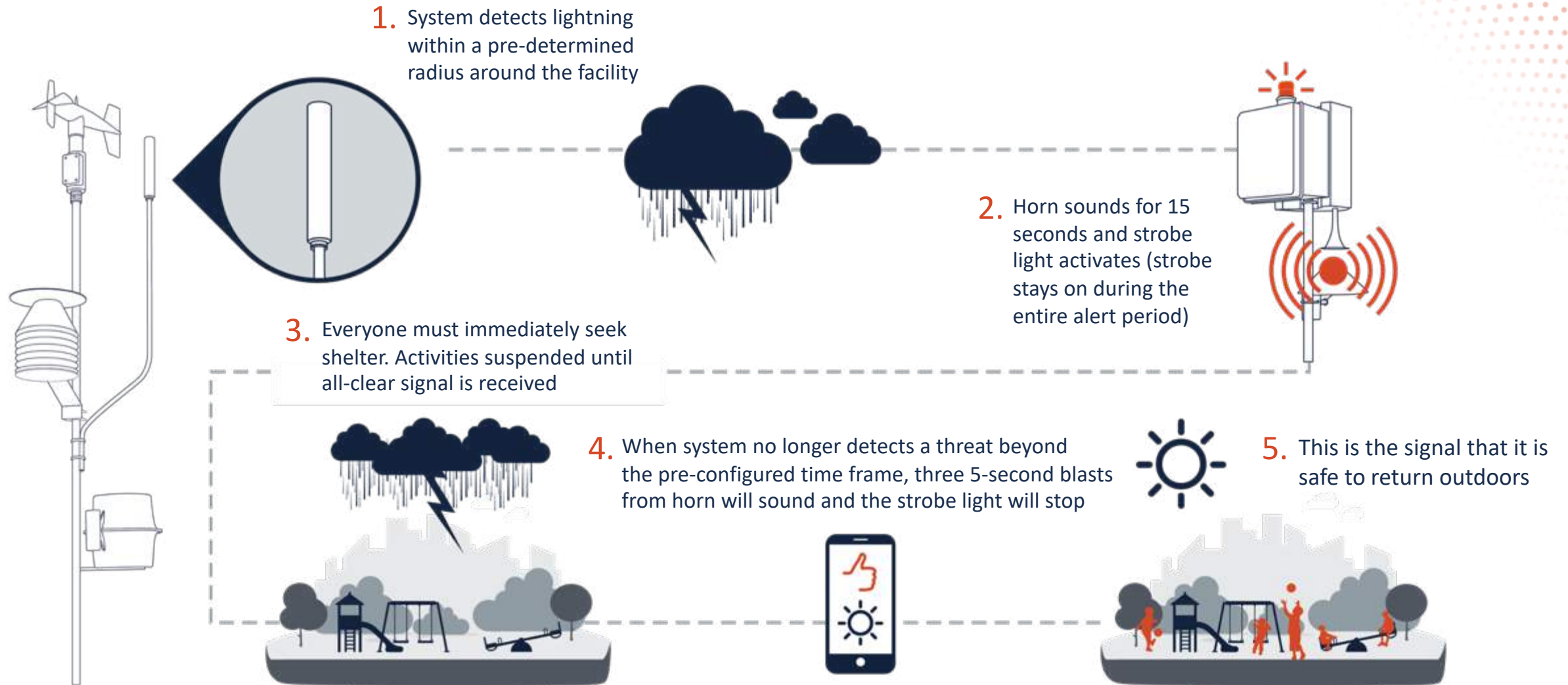
- Check for breathing and a pulse
- Start CPR immediately if either is missing
- Move the injured person into a protected area until EMS arrives



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EARTH NETWORKS AUTOMATED ALERTING: HOW IT WORKS



LIGHTNING DETECTION & ALERTING INTEGRATION

OUTER – 25 Miles

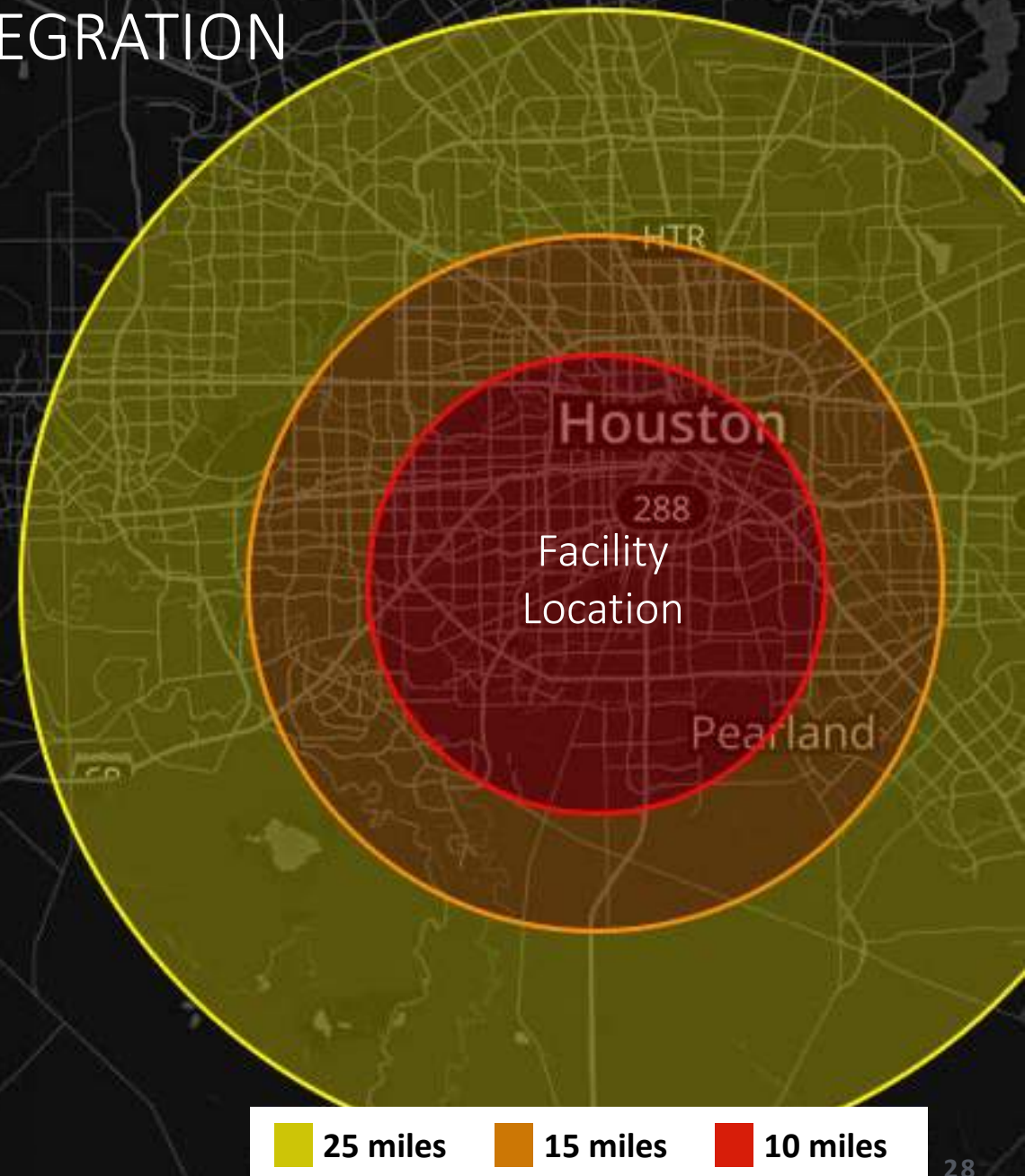
ALERT	Email warning sent to key admin: Public Safety Director / Facilities Manager
ACTION	Monitor the situation (Take note of potential severe weather movement)

MIDDLE – 15 Miles

ALERT	Text & email alerts are sent to key stakeholders: Safety team, ADs, Key Admins
ACTION	Monitor direction of storm
ACTION	Prepare to halt outdoor activities if required

INNER – 10 Miles

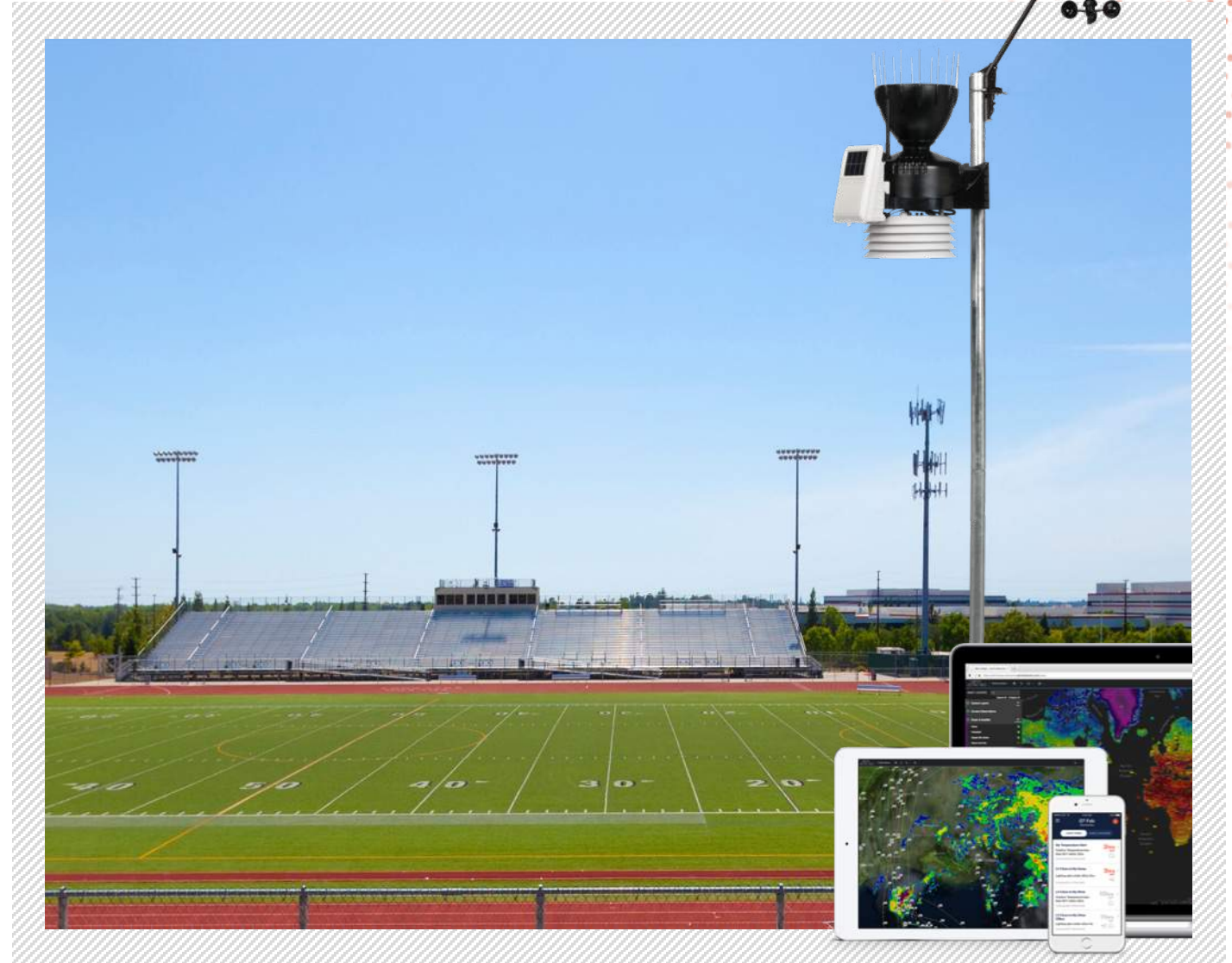
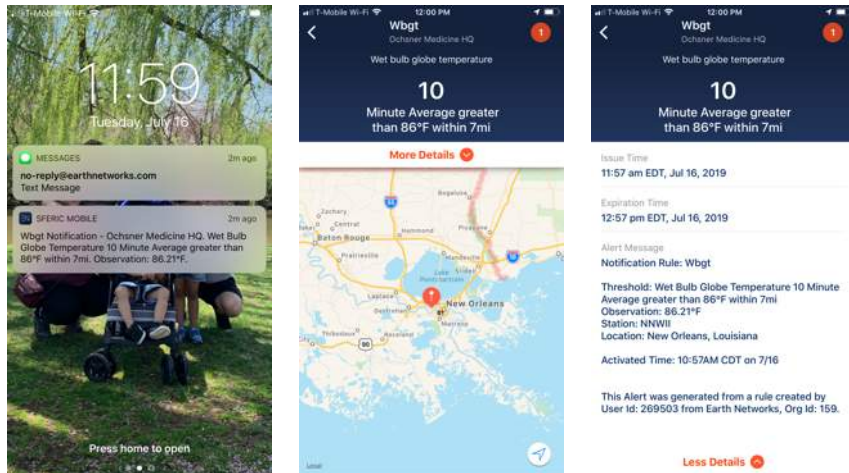
ALERT	Outdoor horn, system notification and strobes are activated
ACTION	All outdoor activities are halted
ACTION	General public head to designated indoor area for safety until all clear is given



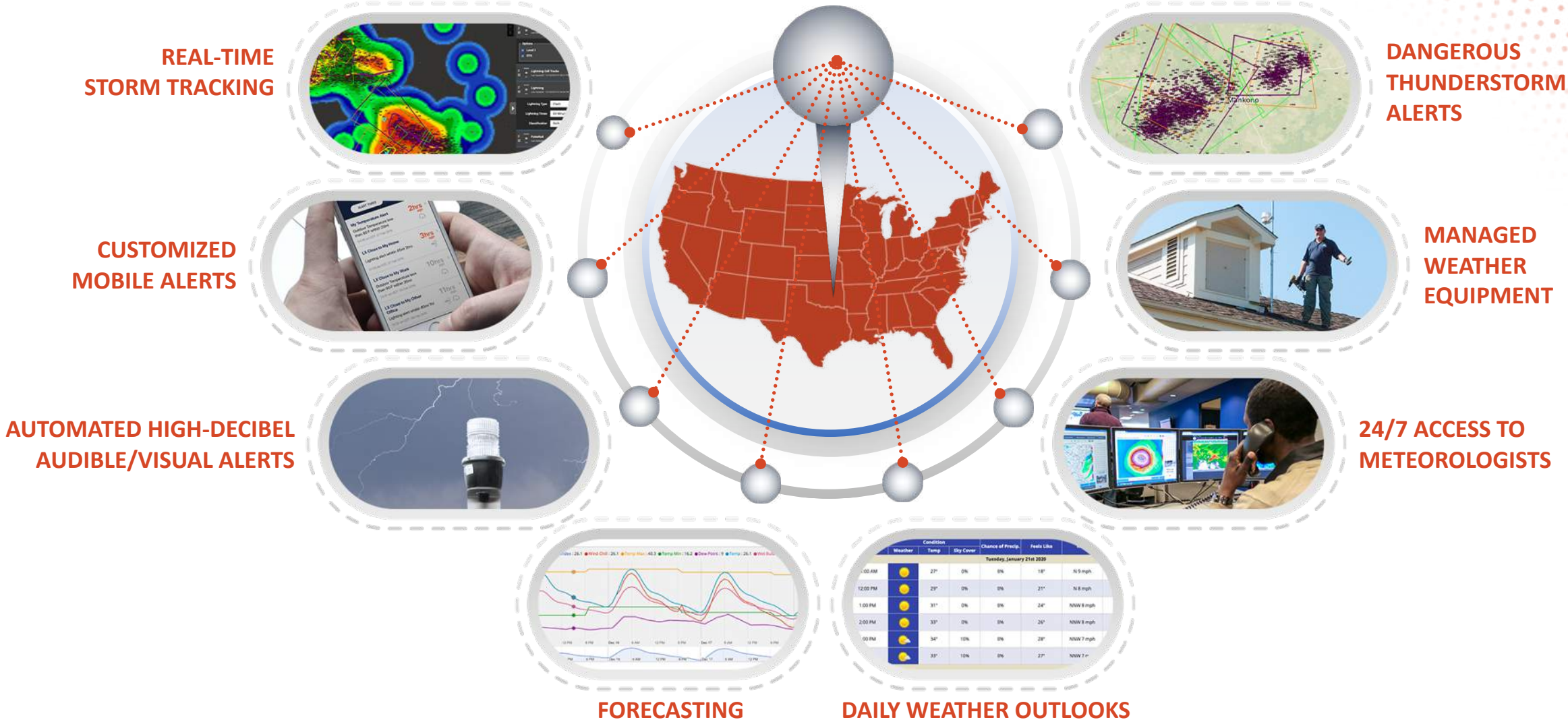
WET BULB GLOBE TEMPERATURE (WBGT) & HYPERLOCAL CONDITIONS (OPTIONAL)

PROFESSIONALLY MONITORED WEATHER STATION

- Campus-wide WBGT monitoring
- Mobile Alerting
- Automated & Accurate
- Online Weather Center with historic data and local forecast



TOTAL PROTECTION FOR SEVERE WEATHER



PROTECTING THOUSANDS OF CUSTOMERS WITH MILLIONS OF ALERTS



POLL QUESTION



Are you interested in learning more about automated lightning and WBGT alerting?

THANK YOU FOR WATCHING

QUESTIONS? COMMENTS? FEEDBACK?

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WARMUP

Contact us at info@earthnetworks.com