STIFLING INEQUITIES:
HEAT'S HEALTH BURDEN AND THE CLINICIAN'S ROLE

Dr. Vishnu Laalitha Surapaneni, MD, MPH
Assistant Professor, University of Minnesota Medical School

Minnesota Psychiatric Society
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Email: vsurapan@umn.edu
Twitter: @LaaliMD

EXTREME HEAT
THE LEADING CAUSE OF WEATHER-RELATED DEATHS

Infographic: Samantha Harrington for Yale Climate Connections | Sources: Ebi, (2021). Hot weather and heat extremes:
health risks. Westaway. (2015). Medicines can affect thermoregulation and accentuate the risk of dehydration and
heat-related illness during hot weather. World Health Organization.
HEAT RELATED HEALTH IMPACTS

- Heavy sweating
- Weakness
- Fatigue
- Headache
- Dizziness
- Nausea or vomiting
- Painting
- Irritability
- Thirst
- Decreased urine output

- Move to an air-conditioned environment.
- Lie down.
- Loose clothing or change into lightweight clothing.
- Sip cool, non-alcoholic beverages.
- Take a cool shower or bath, or apply cool, wet cloths to as much of the body as possible.
- Seek medical attention if symptoms worsen or last longer than one hour, or if the victim has heart problems or high blood pressure.

HEAT STROKE

- Very high body temperature
- Altered mental state
- Thrashing headache
- Confusion
- Nausea
- Dizziness
- Hot, dry skin or profuse sweating
- Unconsciousness

- Call 911 immediately and follow the operator's directions—this is a medical emergency.
- Reduce the person's body temperature with whatever methods you can: wrap the person in cool cloths, immerse them in a cool bath, or spray them with cool/hose water.
- After administering cooling methods, move the person to a cooler place.
- Do NOT give liquids.
- If there is uncontrollable muscle twitching, keep the victim safe, but do not place any objects in his or her mouth.
- If there is vomiting, turn the victim on his or her side to keep the airway open.

Heat-related hospitalizations associated with taking certain psychotropic medications (Bongers, Salahudeen, & Peterson, 2020)

Hotter temperatures associated with increased risk of poor mental health outcomes (Liu et al., 2021)

Warmer temperatures erode sleep inequitably around the world (Minor et al., 2022)

PSYCHOLOGICAL EFFECTS OF EXTREME HEAT

- Exacerbates mood, anxiety, and psychotic disorders
- Increased violence, aggression, and impulsivity
- Increased suicide risk & psychiatric hospitalizations (Thompson, Hornigold, Page, & Waite, 2018)

"STOP! Extreme Heat Danger sign in Death Valley National Park" by m01229 is marked with CC BY-NC 2.0.
CLIMATE CONSIDERATIONS IN MINNESOTA
HOT SPRING, HEAT INDEX & HEAT AWARENESS

Urban Heat Islands, Historic Redlining & Health

Urban Heat Islands

Heat worsens Air Quality

Source: Extreme Heat Map Tool, Metropolitan Council Local Planning Assistance
VULNERABILITY ASSESSMENT FRAMEWORK

Patient-Centered Extreme Heat Adaptation as a Clinician

Heat Safety Plan
- Limit Exposure
- Cool down
- Hydrate responsibly
- Adjust medication plan
- Know the warning signs
- Enlist help

Fig 1. Vulnerability Assessment Framework, figure adapted from Turner et al, 2003

Salas et al, 2019
EXTREME HEAT ADAPTATION RESOURCES

PATIENT-CENTERED EXTREME HEAT ADAPTATION AS A CLINICIAN & AN EDUCATOR

Number of heat-related hospitalizations

Heat index combines temperature and humidity to better measure what the temperature feels like to the human body. On days with high temperature and humidity, we may feel hotter than expected from the temperature on its own. Heat index and heat-related illnesses are related, in addition to other risk factors.
**Patient-Centered Extreme Heat Adaptation**

**As a Quality Improvement Project Leader**

Health systems as Cooling Centers

Air Conditioning Saves Lives!

**Green Cooling Measures**

Community-Led Urban Greening

Painting the town white!

Communicating extreme heat

**Patient-Centered Extreme Heat Adaptation**

**As an Implementation Researcher**

**Community-Led Urban Greening**

**Communicating extreme heat**
REFERENCES

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REFERENCES

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Slide 9- Resources:
https://www.lancetcountdownus.org/
https://www.americares.org/what-we-do/community-health/climate-resilient-health-clinics/
https://www.phi.org/thought-leadership/climate-and-health-posters/

Slide 10:
Number of heat-related deaths* annually in Minnesota, Minnesota Department of Health, https://data.web.health.state.mn.us/heat_deaths, Last accessed Sept 19, 2023

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