

# Heat and Cold Emergencies

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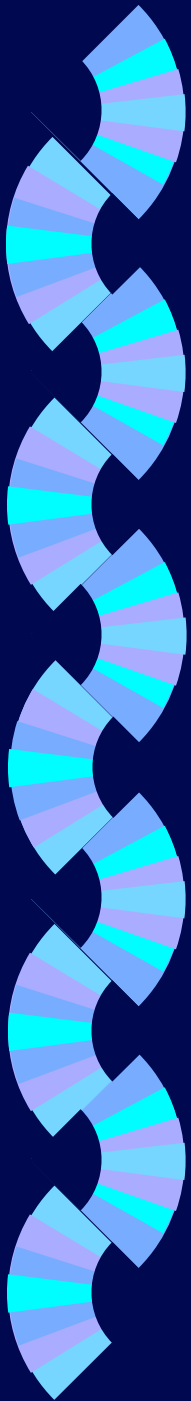
# Heat/Cold Emergencies

- ▶ **Metabolism runs best at 98.6°F**
  - $\uparrow T^0$  -  $\uparrow$  Metabolic rates; cell damage
  - $\downarrow T^0$  -  $\downarrow$  Metabolic rates; cell damage



# **Body Temperature Maintenance**

**Balancing  
Heat Production, Heat Loss**

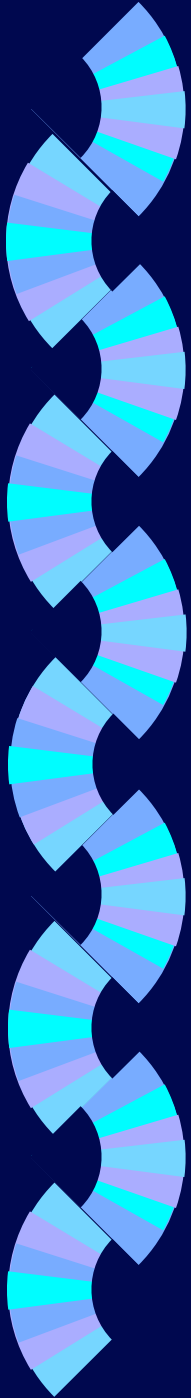


## Heat Production

- ▶ Metabolism
- ▶ Movement of Large Muscles
- ▶ Shivering

## Heat Loss

- ▶ Radiation
- ▶ Conduction
- ▶ Convection
- ▶ Evaporation
- ▶ Respiration



- ▶ **Heat Production  $>$  Heat Loss =  
↑ Body Temperature**
- ▶ **Heat Loss  $>$  Heat Production =  
↓ Body Temperature**



# Heat/Cold Illness

## Results from:

- ▶ **Effects of  $\uparrow$  or  $\downarrow$  body temperature**
- ▶ **Effects of attempting to compensate for changes in heat production, heat loss**



# Heat Illness



# Heat Cramps

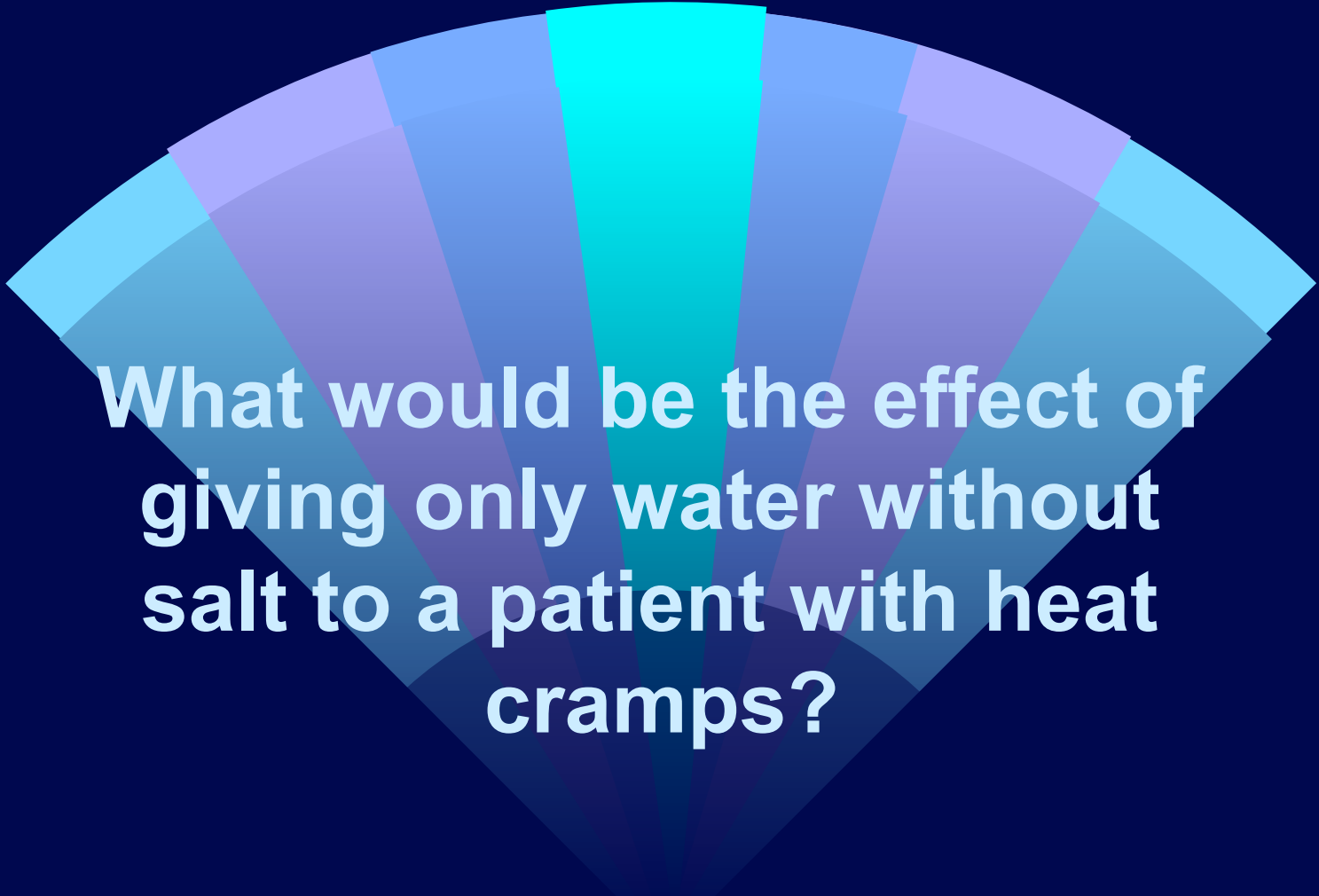
- ▶ **Due to ↑ salt loss from sweating**
- ▶ **Spasms in large muscle groups**
- ▶ **Patient awake, alert**





# Heat Cramps Treatment

- ▶ **Stop activity**
- ▶ **Cool environment**
- ▶ **Balanced salt solution**
- ▶ **Do not give salt or water alone**



**What would be the effect of giving only water without salt to a patient with heat cramps?**



# Heat Exhaustion

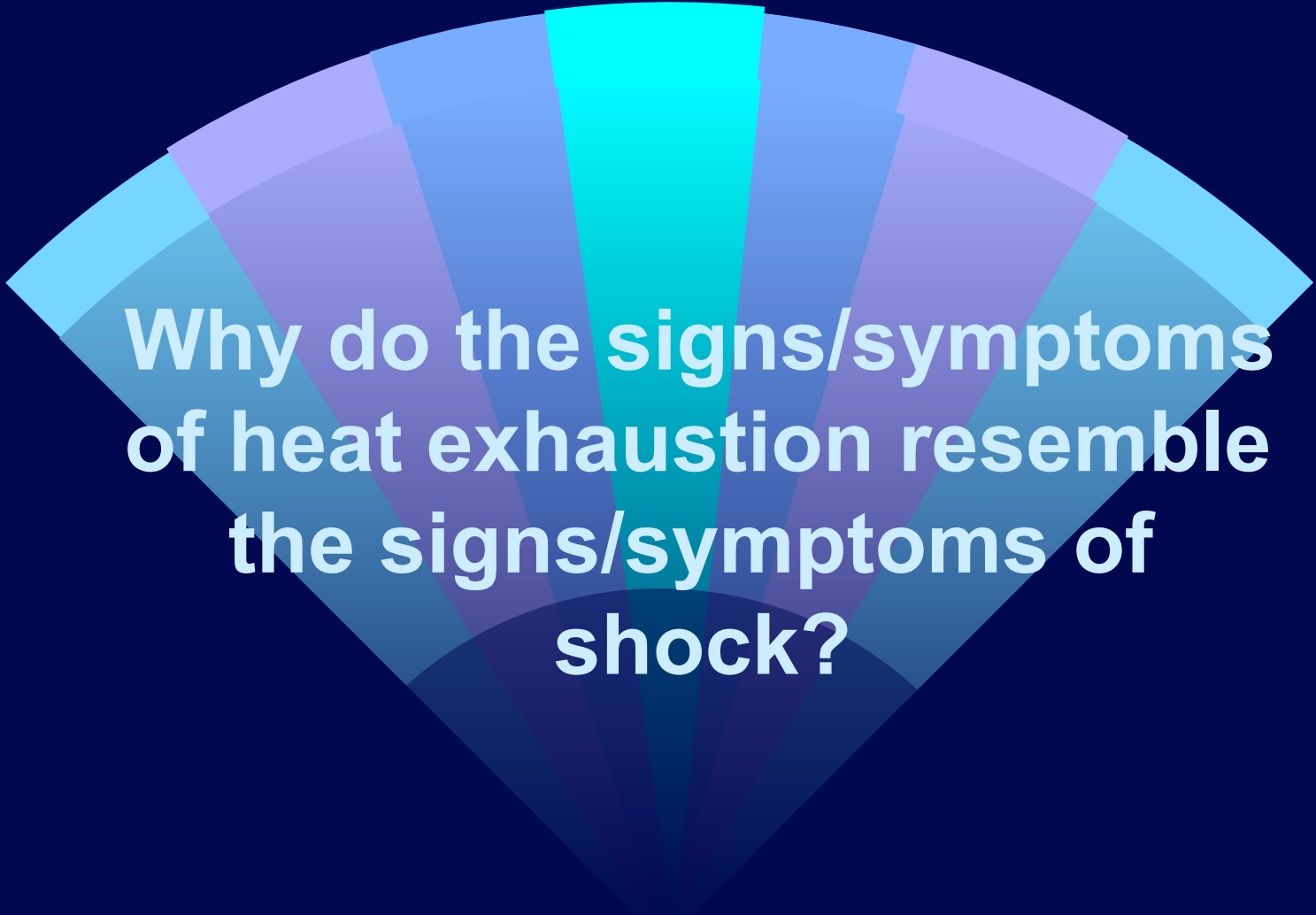
- ▶ **Sweating = ↑ Blood volume**
- ▶ **Vasodilation = ↓ Vascular volume**

Both decrease perfusion



# Heat Exhaustion Signs, Symptoms

- ▶ **Dizziness**
- ▶ **Weakness**
- ▶ **Faintness**
- ▶ **Headache**
- ▶ **Nausea, vomiting**
- ▶ **Pale, cool, moist skin**



**Why do the signs/symptoms  
of heat exhaustion resemble  
the signs/symptoms of  
shock?**



# Heat Exhaustion Treatment

- ▶ **Stop activity**
- ▶ **Cool environment**
- ▶ **Lie down, elevate legs**
- ▶ **Balanced salt solution orally, if not nauseated**
- ▶ **Transport if LOC ↓ or symptoms do not clear rapidly**



# Heat Stroke

- ▶ Most serious heat-related illness
- ▶ Body temperature ↑ > 106°F
- ▶ Damage occurs to temperature regulating center in brainstem
- ▶ Sweating mechanism fails



# Heat Stroke Types

- ▶ **Classic**
- ▶ **Exertional**





# High Risk Groups

## Classic Heat Stroke

- ▶ **Elderly**
- ▶ **Chronic medical problems**
  - **Congestive heart failure**
  - **Obesity**
  - **Alcoholism**



# High Risk Groups

## Exertional Heat Stroke

- ▶ **Small children in closed vehicles**
- ▶ **Athletes, military recruits, construction workers, on hot humid days**



# Heat Stroke Signs/Symptoms

- ▶ **↑ Body temperature**
- ▶ **Hot, dry, flushed skin**
- ▶ **Absence of sweating**
- ▶ **Altered mental status**
  - **Confusion, irritability**
  - **↓ LOC**
  - **Coma**
- ▶ **Seizures**



**↓ LOC + Hot Environment  
equals  
Heat Stroke  
until proven otherwise**



# Heat Stroke Treatment

- ▶ High concentration O<sub>2</sub>
- ▶ Assist ventilations as needed
- ▶ Rapidly cool to 102°F
- ▶ Transport



# Cold Emergencies



# Frostbite

- ▶ **Localized cold injury**
- ▶ **Subfreezing temperatures**
- ▶ **Vasoconstriction occurs**
  - **Blood flow to distal circulation (nose, ears, fingers, toes)**
  - **Water in tissues freezes; tissue damage occurs**



# Frostbite Signs/Symptoms

- ▶ **Mild (frost nip): Red, burning areas**
- ▶ **Superficial: White, waxy, doughy-feeling**
- ▶ **Deep: Dead white, hard, no sensation**





# Frostbite Treatment

- ▶ **Remove from cold**
- ▶ **Dry areas gently, wrap in sterile dressing**
- ▶ **Transport**
- ▶ **If transport prolonged, rewarm rapidly in 100-105°F water**



# Frostbite Treatment

- ▶ Do NOT rub frostbite
- ▶ Do NOT allow refreezing
- ▶ Do NOT allow patient to smoke



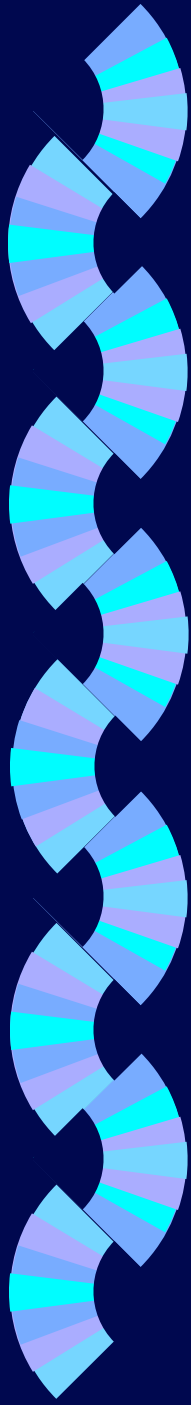
# Hypothermia

- ▶ **Generalized cooling of body**
- ▶ **Can occur at temperatures above freezing**



# Hypothermia Risk Groups

- ▶ **Homeless**
- ▶ **Alcoholics**
- ▶ **Elderly living in poorly heated homes**
- ▶ **Outdoor sports participants**



**↓ LOC + Cool Environment  
equals  
Hypothermia  
until proven otherwise**



# Hypothermia Treatment

- ▶ **Support airway, breathing**
- ▶ **100% O<sub>2</sub>--warmed, if possible**
- ▶ **Prevent further heat loss**
- ▶ **Do not aggressively rewarm**



# Treatment for Hypothermia

- ▶ **Avoid rough handling**
- ▶ **Transport**



**Hypothermia can cause apparent  
absence of vital signs**

**Always resuscitate  
You're not dead until  
you're warm and dead!**