

# Heat Stress: Are You At Risk?

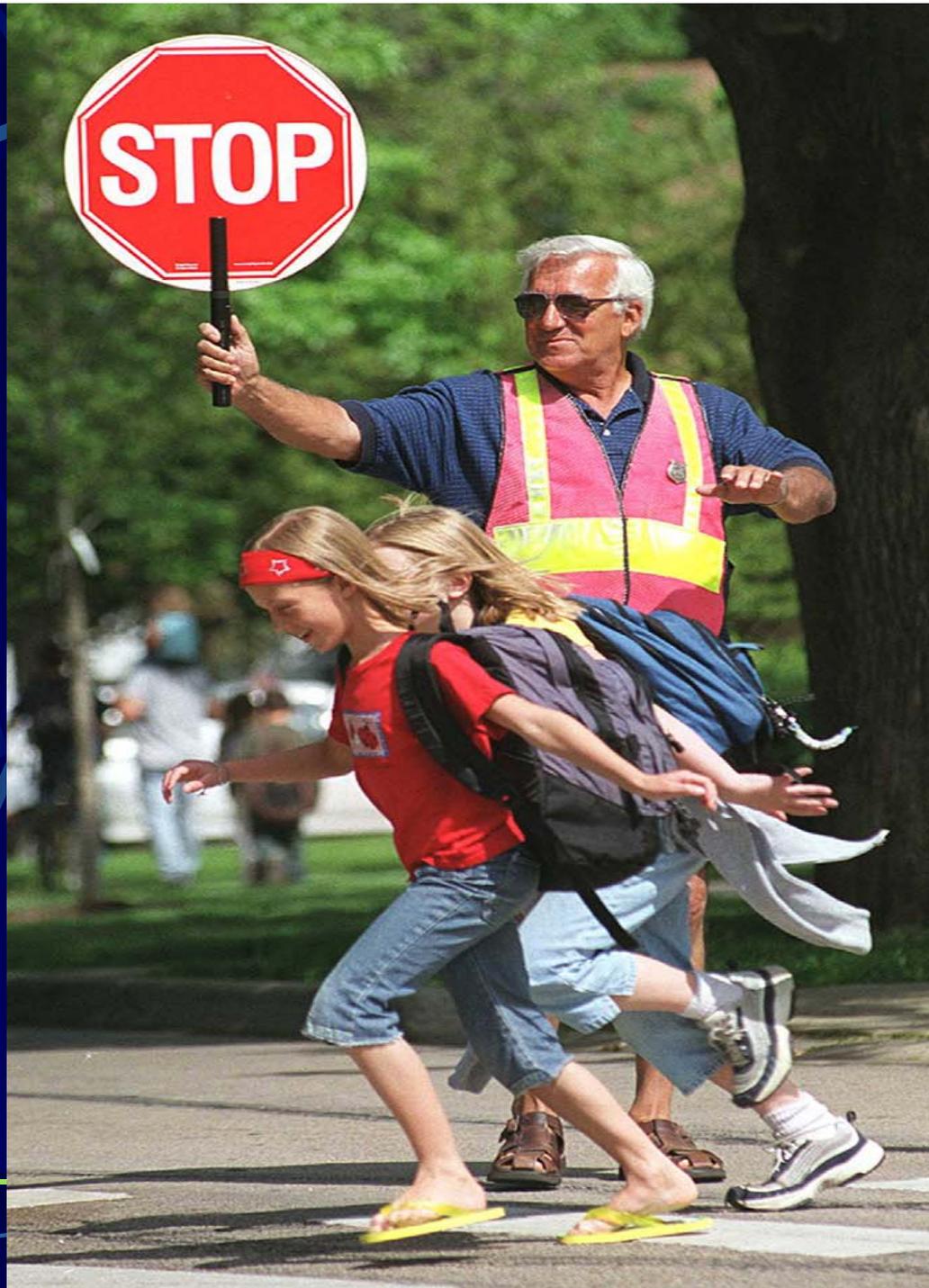
*Mesa Fire Department*

**Heat stress:**

**Are you at Risk?**

*Mesa Fire Dept.  
Aug. 2009*

8/14/2009





In Australia and the United Kingdom you would be known as the Lollipop Man/Woman

# *Topics*

- **Heat Related Facts**
- **Body Temperature Regulations**
- **Environmental Impact**
- **Risk Groups/Medical Conditions/Medications**
- **Types of Heat Injuries**
- **Heat Injury Treatment**
- **Prevention Methods**

# *Body Temperature Regulation*

- **Internal Thermostat** → **98.6 degrees**
- **Sweat Mechanism** → **Evaporation**
- **Blood to surface of the skin** → **Dissipation**
- **Increase Breathing** → **Less Helpful**

# *Risk Factors For Heat Injury*

- Environment
- Age
- Occupation
- Psychological
- Pharmacologic
- Congenital Conditions
- Preexisting Conditions

# Environmental Impact

## Uncontrollable

### ● Weather

- Hot
- Humid
- Windless

**Relative Humidity (%)**

°F	40	45	50	55	60	65	70	75	80	85	90	95	100
110	136												
108	130	137											
106	124	130	137										
104	119	124	131	137									
102	114	119	124	130	137								
100	109	114	118	124	129	136							
98	105	109	113	117	123	128	134						
96	101	104	108	112	116	121	126	132					
94	97	100	102	106	110	114	119	124	129	135			
92	94	96	99	101	105	108	112	116	121	126	131		
90	91	93	95	97	100	103	106	109	113	117	122	127	132
88	88	89	91	93	95	98	100	103	106	110	113	117	121
86	85	87	88	89	91	93	95	97	100	102	105	108	112
84	83	84	85	86	88	89	90	92	94	96	98	100	103
82	81	82	83	84	84	85	86	88	89	90	91	93	95
80	80	80	81	81	82	82	83	84	84	85	86	86	87

**Heat Index (Apparent Temperature)**

**With Prolonged Exposure and/or Physical Activity**

### Extreme Danger

Heat stroke or sunstroke highly likely

### Danger

Sunstroke, muscle cramps, and/or heat exhaustion likely

### Extreme Caution

Sunstroke, muscle cramps, and/or heat exhaustion possible

### Caution

Fatigue possible

# *Risk Groups - Medical Conditions and Medications*

## **High Risk Groups**

- Very old & young
- Physically unfit

## **Medical Conditions**

- Neurological disorders
- Cardiovascular disease
- Diabetes
- Obesity

## **Medications/Drugs**

- Stimulants
- Diuretics
- High blood pressure
- Antihistamines
- Alcohol
- Thermogenics

# *Heat Stress Emergencies*

- **Heat Cramps**

- Not life threatening
- Cause: dehydration

- **Heat Exhaustion**

- Can be life threatening
- Cause: dehydration

- **Heat Stroke**

- **Immediately life threatening**
- Not likely in otherwise healthy adults

# *Sunburn*

- **Causes:**  
**dehydration plus  
increases risk of  
skin cancer**

- **Prevention:**
  - 1. Sunscreen**
  - 2. Drink fluids**
  - 3. Proper clothing**

# *Heat Cramps*

- Fluid & electrolyte loss (low sodium diet)
- Usually abdomen, arms & leg muscles
- Stop activity & find shade
- Water or sports drinks
- Seek medical attention if needed

# *Heat Exhaustion*

- Fluid loss (dehydration)
- 1 or more days high heat
- Heavy sweating
- Pale skin
- Weakness, dizziness, nausea & vomiting
- Find cool place
- Drink cool water
- Cool water on skin & fan
- 911 if needed

# *Heat Stroke*

- Unable to regulate temperature
- Red, hot, dry skin
- Headache, dizziness & nausea
- Confusion, disorientation or unconsciousness
- Move to cool place
- Cool skin rapidly
- Water only if person can self-administer
- Call 911
- **Recent death of 14 y/o at South Mtn.**

# *Best Defense Is A Good Offense*

- **Drink fluids**
- **Schedule activity early**
- **Protect yourself from the sun**
  - Wide-brimmed hat, sunscreen ( $\geq$ SPF 15)
- **Wear lightweight, light-colored, loose-fitting clothes**
- **Use engineering controls when possible**

# *Fluid Replacement*

## **Facts**

- **60% body weight is water**
- **2-3% loss of body water will cause impairment**
- **Thirst reflex very late mechanism**

## **Guideline**

- **Drink before, during & after activity**
- **How much you drink is variable**

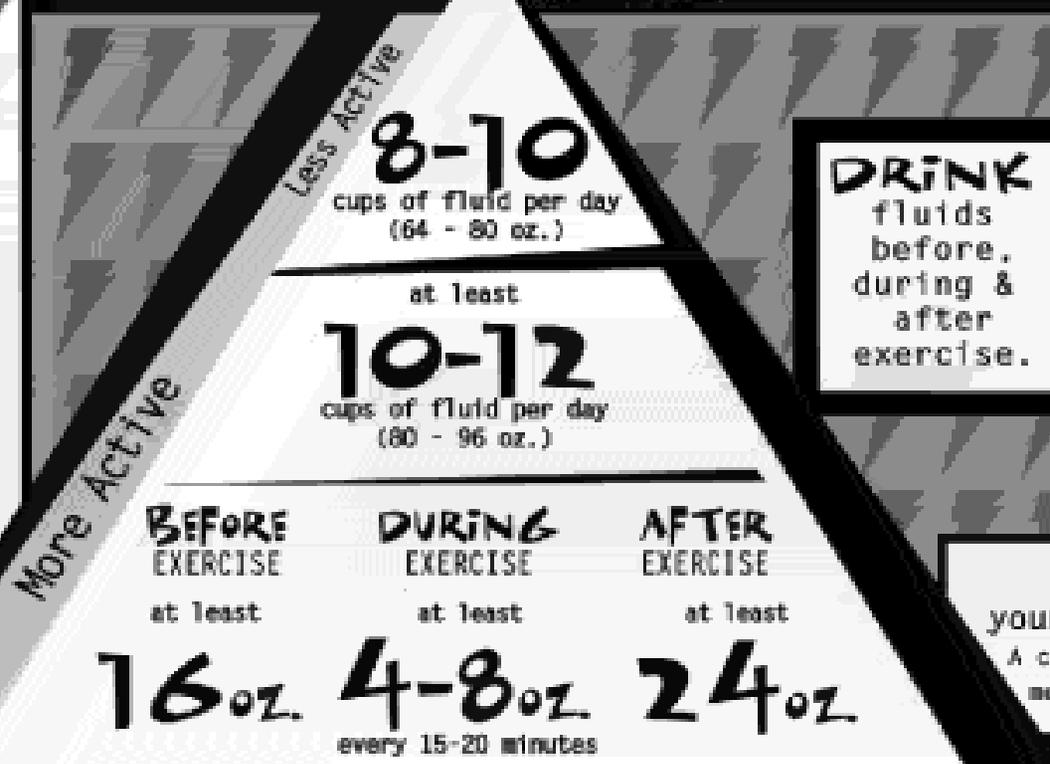
# Fluid Replacement Guidelines

## WHY DO YOU NEED TO DRINK?

Inadequate fluid intake can cause dehydration, which leads to reduced performance and heat illness.



# FLUID PYRAMID



**DRINK** on a schedule, not just when thirsty. When you feel thirsty, you've already lost important fluids and electrolytes and are dehydrated.

**DRINK** fluids before, during & after exercise.

**DRINK** the right fluids during exercise. Forget drinks with fizz & caffeine - choose a sports drink like Gatorade.

**CHECK** your hydration status. A clear, light-colored urine means you're well hydrated.

# *Hydration Is Personal*

## Monitor Your Urine Color

- Dark yellow or orange** → Significant fluid deficiency, drink!!!
- Bright yellow or orange** → Moderately dehydrated, don't stop yet
- Light yellow** → Slightly behind, keep drinking
- Clear** → OK for now but keep monitoring

# *Summary*

- **Drink lots of water before & during work**
- **Monitor the color of your urine**
- **Create shade if possible (hats, umbrella, etc.)**
- **Know the signs & symptoms of heat stress**