HEAT INJURY & PREVENTION – High Yield

WHY IS HEAT PREVENTION IMPORTANT

- Combat capability depends on **ability to adapt to environment**
- The body survives only within a **narrow range of core temperature**

EFFECTS OF HEAT ON THE BODY

- ↑ Body temperature →
- ↓ Mental efficiency
- ↓ Work done
- ↑ Errors

👉 Example:

- 100°F = 37.8°C تقريبًا Formula MENTAL EFFICIENCY (100°F – 32) × 5/9 = 37.778°C
- Even small increase in temperature → affects performance significantly

HOW THE BODY RELEASES HEAT

1. **Radiation**
- Heat transfer from hotter → cooler object through space
2. **Conduction**
- Direct heat transfer between molecules
3. **Convection**
- Heat transfer through moving air or fluid
4. **Evaporation** (MOST IMPORTANT 🔥)
- Heat loss by sweating → liquid to gas

INFLUENCING FACTORS

- Air temperature
- Surrounding temperature
- Sun radiation
- Relative humidity ❗
- Air movement
- Clothing (type & amount)
- Internal heat production

TYPES OF HEAT INJURIES

1. Heat cramps
2. Heat exhaustion
3. Heat stroke

HEAT CRAMPS

- Cause: Excessive **salt** loss

Features

- Painful muscle cramps (arms, legs, abdomen)
- Temperature may be normal
- May coexist with heat exhaustion

Prevention

- Acclimatization
- Proper nutrition
- Hydration

HEAT EXHAUSTION

- Cause: **Loss of salt + water**

Signs

- Skin: cool & moist
- Rapid pulse
- Low blood pressure

Symptoms

- Profuse sweating
- Headache
- Tingling in hands & feet
- Pallor
- Dyspnea
- Irregular heartbeat
- Loss of appetite
- Nausea & vomiting

👉 **Temperature**:

- May be lower than normal (due to hyperventilation)

Advanced Signs

- Trembling
- Weakness
- Poor coordination
- Clouding of consciousness → possible brief LOC

Prevention

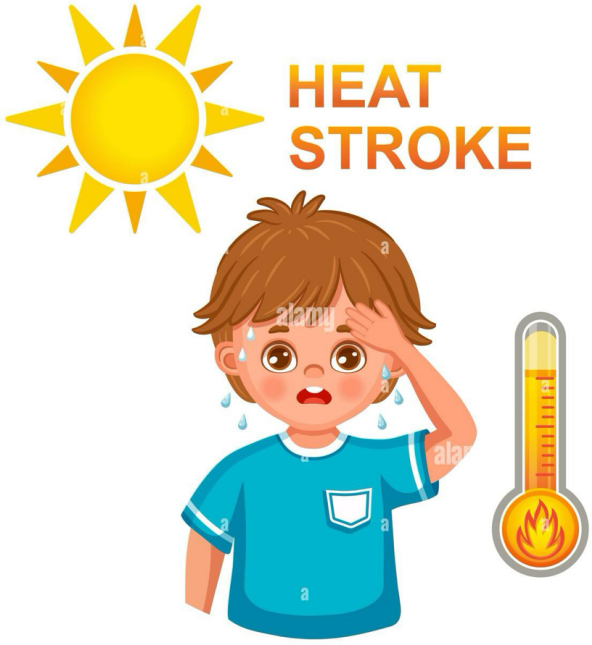
- Hydration
- Work/rest cycles

⚠️ **Important**:

- Patients are fragile → high risk of recurrence

HEAT STROKE (VERY IMPORTANT 🔥)

- **Medical emergency with high mortality**



Pathophysiology

- Failure of thermoregulation
- Heat loss mechanisms stop

Early Symptoms

- Headache
- Dizziness
- Delirium
- Weakness
- Nausea & vomiting
- Feeling excessively warm

Classic Signs

- Skin: hot, red, dry
- Temperature up to 106°F (~41°C)

Severe

- Collapse
- Loss of consciousness
- Coma
- Convulsions

👉 **Sweating**:

- May be present or absent

⚠️ **Important**:

- Often preceded by cramps or exhaustion
- High chance of recurrence

FIRST AID

Cramps & Exhaustion

- Move to shade
- Loosen clothing
- Give cool water slowly (large amounts)
- Cool body (pour water + fan)
- Elevate legs (exhaustion)
- Monitor patient
- Seek help if symptoms persist

Heat Stroke

- Immediate cooling (ASAP)
- Elevate legs
- Give water if conscious
- URGENT medical help

PREDISPOSING FACTORS

- Lack of **acclimatization (7–14 days, 2 hrs/day)**
- Overweight & fatigue
- Heavy meals / hot food
- Alcohol & drugs
- (e.g. atropine, antihistamines → ↓ sweating)
- Fever (including post-vaccination)
- Tight clothing

PREVENTION OF HEAT INJURIES

1. Hydration

- Sweat loss may exceed 1 quart/hour (~0.95 L)
- Drink small frequent amounts regardless of thirst
- Always provide adequate water

2. Acclimatization

- Start with first exposure
- Continue 2 × 50 min daily
- Reduce intensity for non-acclimatized
- Lost after 1 month without exposure

3. Physical Fitness

- Maintain good condition

4. Work/Rest Schedule

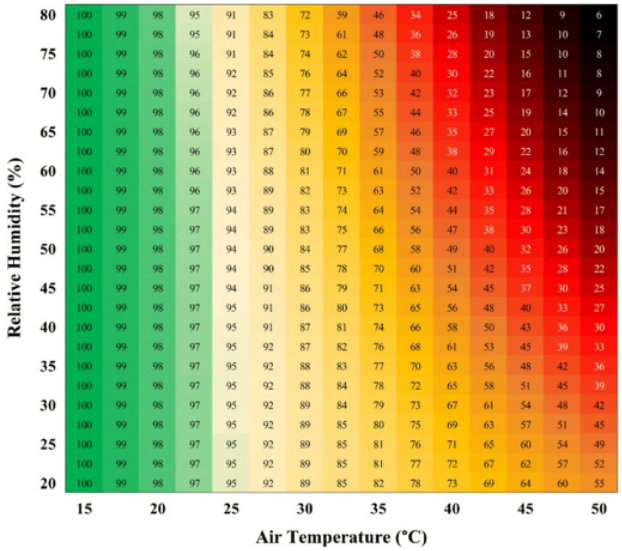
- Tailored to:
- Climate
- Physical condition
- Work demands

Recommendations

- Work during cooler hours
- Avoid direct sunlight
- Gradually increase exposure

5. WBGT Index (VERY IMPORTANT 🔥)

- Measures heat stress using:
- Temperature
- Humidity
- Wind
- Sun radiation



👉 **Important**:

- Heat injury 75> ممكن يصير حتى °F مع overexertion

👉 **Different from heat index:**

- WBGT = outdoor + sun
- Heat index = shaded areas

6. Clothing

- Loose clothing
- Minimal clothing when possible
- Consider WBGT

Key Exam Triggers 🔥

- Heat stroke = hot dry skin + emergency
- Heat exhaustion = cool moist skin
- Cramps = salt loss
- Evaporation = main heat loss
- WBGT = important measure
- Acclimatization = 7–14 days
- Hydration = small frequent amounts