
FEVER

DEFINITION:

- Body temperature is the degree of hotness or coldness of a body or environment.
- It is the somatic sensation of heat or cold. It is the degree of or intensity of heat of a body in relation to external environment.
- The body temperature is the difference between the amount of heat produced by body processes & the amount of heat lost to the external environment.

Temperature Regulation

- **Body Temperature = Thermogenesis–Heat Loss**

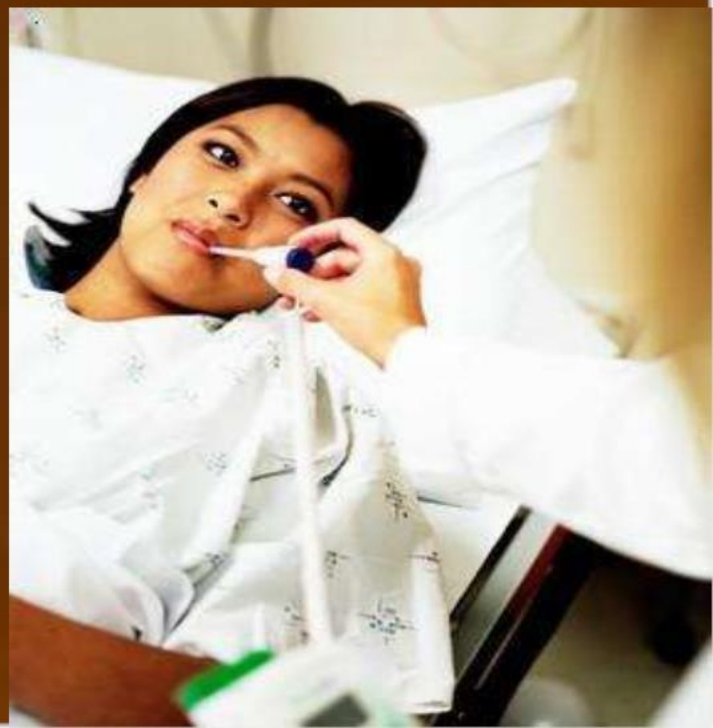
TYPES OF TEMPERATURE:

- **Core temperature-** it is the temperature of internal body tissues below the skin & subcutaneous tissues. The sites of measurement are rectum, tympanic membrane, esophagus, pulmonary artery & urinary bladder.

TYPES OF TEMPERATURE

- **Surface body temperature-** it refers to the body temperature of external body tissues at the surface that is of the skin & subcutaneous tissues.

SITES



PHYSIOLOGY OF THERMOREGULATION-

It is precisely regulated by physiological & behavioral mechanisms in number of ways:-

- **Neural control**
- **Vascular control**
- **Skin in temperature regulation**
- **Behavioral control**

FACTORS AFFECTING BODY TEMPERATURE

AGE

EXERCISE

HORMONAL LEVEL

STRESS

CIRCARDIAN RHYTHM

ENVIRONMENT

FEVER

✓Fever is an elevation of body temperature that exceeds normally daily variation and occurs in conjunction with an increase in the hypothalamic set point for e.g. $37^{o}C$-$39^{o}C$.

CAUSES OF FEVER

- ✓ Hot environment.
- ✓Excessive exercise.
- ✓Neurogenic factors like injury to hypothalamus. Dehydration after excessive dieresis.
- ✓As an undesired side effect of a therapeutic drug.

CAUSES OF FEVER

- ✓ Chemical substances e.g. caffeine and cocaine directly injected into the bloodstream.
- ✓ Infectious disease and inflammation.
- ✓ Severe hemorrhage.

GRADES OF FEVER:

1) low grade fever: 37.1-38.2C(98.8-100.6F)

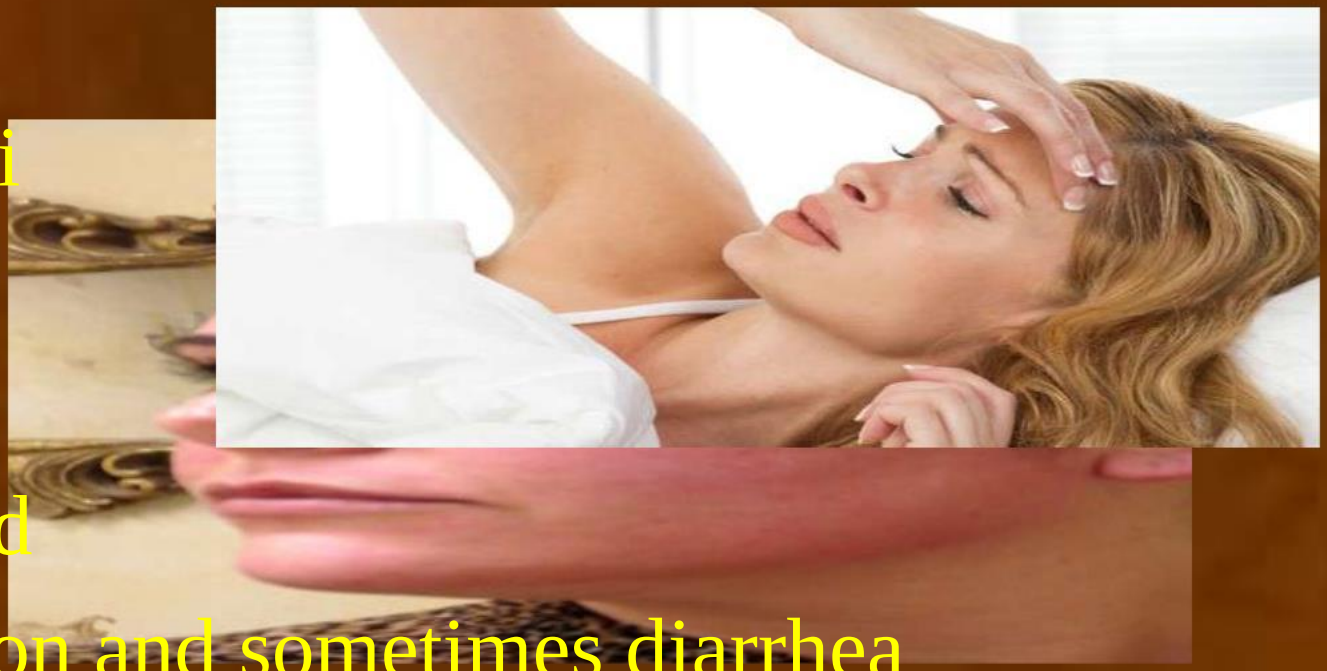
2) high grade fever: 38.2-40.5C(100.6-104.9F)

3) hyperpyrexia: >40.5C(104.9F)

SIGNS & SYMPTOMS OF FEVER:

Symptoms-

- Flushed face



- hot dry ski
- anorexia
- headache
- nausea and
- constipation and sometimes diarrhea
- body aches
- scant highly colored urine.

SIGNS & SYMPTOMS OF FEVER:

Clinical signs-

- Increased heart rate, respiratory rate and depth
- shivering; pale cold ski
- cy

HYPERTHERMIA:

✓ It is elevated body temperature due to failed thermoregulation that occurs when a body produces or absorbs more heat than it dissipates. Temperature ranges - >37.5-38.3degree Celsius (99.5- 100.9 degree Fahrenheit).

CAUSES OF HYPERTHERMIA SYNDROMES:

i.Heat stroke: prolonged exposure to sun or high environmental temperatures. These condition causes heat stroke – a dangerous heat emergency with a high mortality rate.

HEAT STROKE

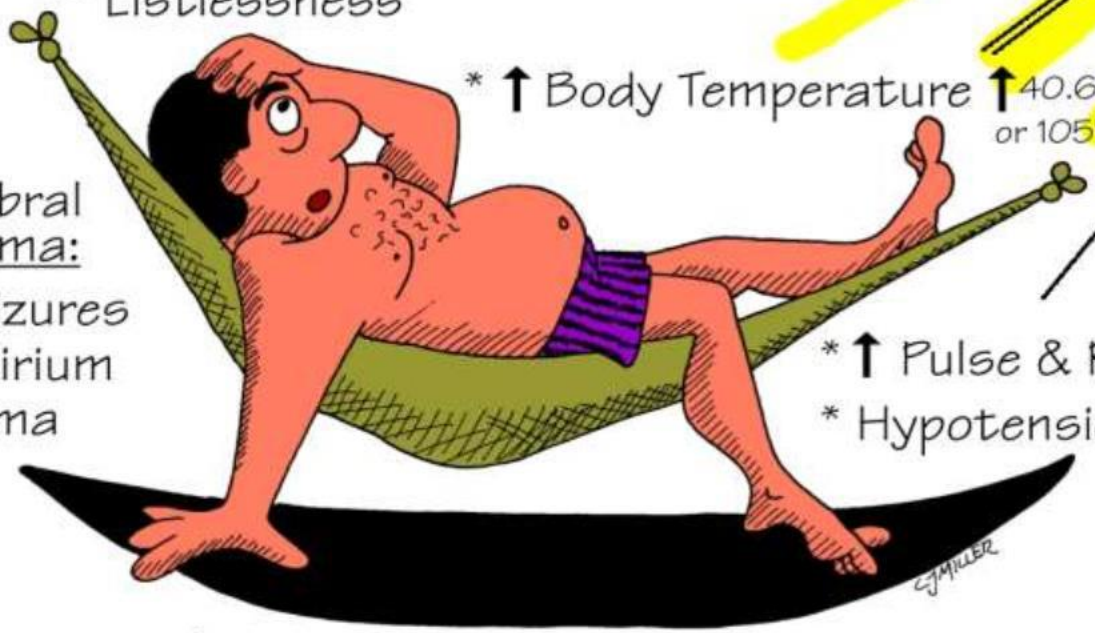
* Anxiety - Confusion
* Skin Hot & Dry
* Impaired Sweating
* Listlessness

* Na^+ and K^+ Depletion

* ↑ Body Temperature ↑ 40.6° C or 105° F

Cerebral Edema:
* Seizures
* Delirium
* Coma

* ↑ Pulse & Resp Rate
* Hypotension



(Management - Cooling, Rest, Fluid & Electrolyte Support.)

CAUSES OF HYPERTHERMIA SYNDROMES:

ii. Drug induced hyperthermia: due to increased use of psychotropic drugs e.g. Monoamine oxidizes inhibitors, tricycle antidepressants, amphetamines, phencyclidine, lys ergic acid diethylamide or cocaine, selective serotonin uptake inhibitors(SSRIs), MAO‘s(Serotonin Syndrome), use of narcoleptic agents like antipsychotic phenothiazine's, haloperidol (NMS),

CAUSES OF HYPERTHERMIA SYNDROMES:

iii. Endocrinopathy: thyrotoxicosis and pheochromocytoma can lead to increased thermogenesis

iv.Central nervous system damage: cerebral hemorrhage, status epileptics, hypothalamic injury can cause hyperthermia

DIAGNOSTIC FINDINGS:

- ✓**History taking**
- ✓**Physical examination**
- ✓**Laboratory tests**

i. Clinical pathology

ii. Chemistry

iii. Microbiology

iv. Radiology

MEDICAL MANAGEMENT:

- Acetaminophen: adult: 325-650 mg PO q 4-6 hrs. Children: 10-15mg/kg body weight q4-6 hrs.

- Ibuprofen (NSAID) - dosage: adult-200-400mg PO q6hrs; children: 5mg/kg body wt for temp. <102.5F; 10 mg/kg body wt. for temp 102.5F (not to exceed 40 mg/kg/day).

- Indomethacin and naproxen (NSAID).

MEDICAL MANAGEMENT:

- Aspirin: adult 325-650 mg PO q6hrs; children 10-20 mg q 6hrs.
- Gluco corticosteroid: potent antipyretic inhibit PGE2 synthesis.
- Mepridine, morphine sulphate, chlorpromazine used in severe hyperthermia patient ’s.

NURSING MANAGEMENT OF FEVER AND HYPERTHERMIA:

ASSESSMENT-

- Monitor vital signs.
- Assess skin color and temperature.
- Monitor white blood cell count, hematocrit value, and other pertinent laboratory reports for indication of infection or dehydration.

NURSING DIAGNOSIS:

1) During chill phase: Risk for altered body temperature as evidenced by shivering and feeling cold

2) During fever phase: Hyperthermia as evidenced body temperature >38.5C, irritability, increased respiratory rate and dry skin

NURSING DIAGNOSIS:

3)Altered comfort as evidenced by restlessness

4) Altered nutrition related to fever as evidenced by anorexia and lack of food intake

5) During Flush phase- Altered fluid & electrolyte balance related to excessive sweating

NURSING MANAGEMENT OF FEVER AND HYPERTHERMIA:

- Provide adequate nutrition and fluids to meet the increased metabolic demands and prevent dehydration.
- Reduce physical activity to limit heat production especially during the flush stage.
- Provide a tepid sponge bath to increase heat loss through conduction.
- Provide dry clothing and bed linens.

NURSING MANAGEMENT OF FEVER AND HYPERTHERMIA:

- Remove excess blankets when the client feels warm, but provide extra warmth when the client feels chilled.
- Measure intake and output.
- Administer antibiotics as ordered.
- Provide oral hygiene to keep the mucous membranes moist.

FEVER OF UNKNOWN ORIGIN:

- ✓ Fever of Unknown Origin(FUO) was defined by Peterson & Benson in 1961 as having following features-
- ✓ temperature of > 38.3 degree Celsius (>101 degree Fahrenheit) in several occasions.
- ✓ A duration of fever of > 3 weeks.
- ✓ Failure to reach a diagnosis despite one week of inpatient investigation.

CLASSIFICATION OF FUO:

Derrick and Street have purposed a new system for classification of FUO:-

- **Classic FUO:** E.g. infections, malignancy, inflammatory diseases, drug fever.

CLASSIFICATION OF FUO:

❖**Nosocomial FUO:** a temperature of >= 38.3 C (>=101 F) develops on several occasions in a hospitalized patients who are receiving acute care and in whom infection was not present at time of admission. For e.g. septic thrombophlebitis, sinusitis, drug fever.

CLASSIFICATION OF FUO:

❖**Neutropenic FUO:** a temperature of >= 38.3 C (>=101 F) develops on several occasions in a patient whose neutrophil count is < 500/micro liter.

CAUSES OF FUO:

- Infections
- Neoplasm’s
- Collagen vascular/ Hypersensitivity diseases
- Miscellaneous conditions
- Inherited and metabolic diseases
- Thermoregulatory Disorders

DIAGNOSIS OF FUO:

- History
- Physical examination
- Blood investigations-tumor markers, PPD for TB, serological studies, peripheral smears, multiple samples for culture and sensitivity
- X-Ray studies
- Bone marrow biopsy, Liver biopsy
- CT scan, MRI, ultrasonography.

TREATMENT:

- Continuous observation and examination.
- Do not start with immediate Antibiotic Therapy as it can delineate the cause of FUO.
- The debilitating symptoms are treated by NSAIDS and glucocorticoids.

TREATMENT:

- If neutropenia and vital sign instability are present then empirical therapy with fluroquinolone and piperacillin is given.

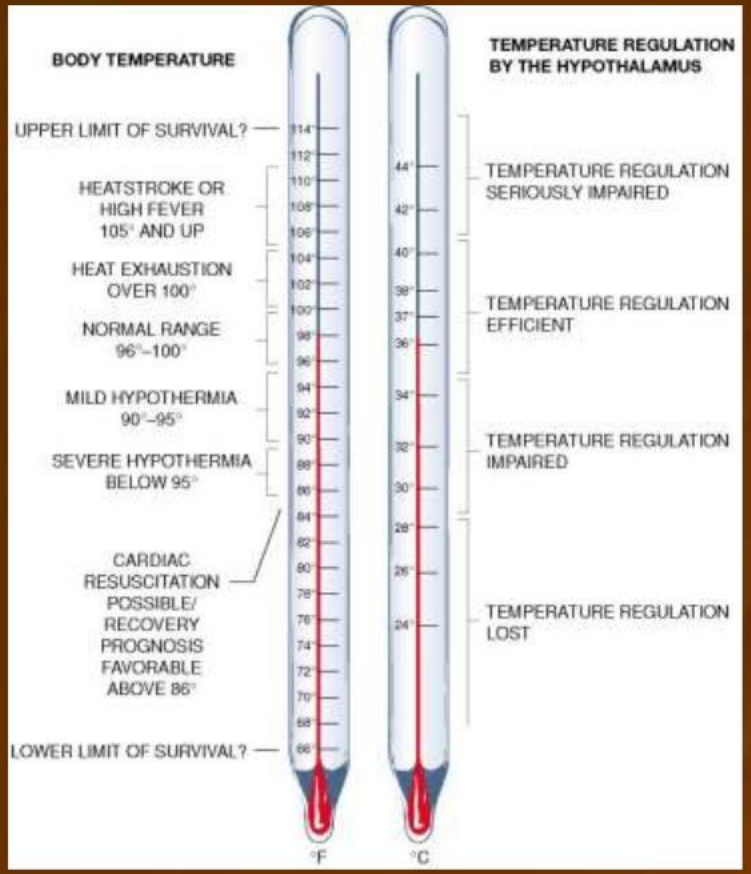
- When no underlying source of infection is found even after 6 months the prognosis is generally good.

HYPOTHERMIA:

❖Hypothermia is a state in which the
body
temperature is lower than 35 degree C
and
95 degree Fahrenheit. At this temperat
many of
the compensatory mechanism to conse
heat
begin to fall.

HYPOTHERMIA:

- **Normal Range:**
  - 96-100º F
- **Mild Hypothermia:**
  - 90-95º F
- **SevereHypothermia**
  - < 90º F



- **TYPES OF HYPOTHERMIA**

CAUSES:

- Exposure to cold environment in winter months and colder climates.

- Occupational exposure or hobbies that entail extensive exposure to cold for e.g. hunters, skiers, sailors and climbers.

- Endocrine dysfunction: hypothyroidism, adrenal insufficiency , hypoglycemia

CAUSES:

- Medications like
  ethanol, phenothiazines, barbiturates, benzodia zepines, cyclic antidepressants, anesthetics.

- Neurologic injury from trauma, Cerebral vascular accident, Subarachnoid hemorrhage.

- Sepsis

RISK FAC TORS FOR HYPOTHERMIA:

- Age extremes: elderly, neonates.

- Outdoor related,

- Drugs and intoxicants:
  ethanol, phenothiazine's, barbiturates, anesthetics, neuromuscular blockers and others.

- Endocrine related:
  hypoglycemia, hypothyroidism, adrenal insufficiency, and hypopituitarism.

RISK FAC TORS FOR HYPOTHERMIA:

- Neurologic related: stroke, hypothalamic disorders, Parkinson‘s disease, spinal cord injury.
- Multisystem: malnutrition, sepsis, shock, hepatic or renal failure.
- Bur ive dermatologic disorders.
- Im ilitati

Signs and Symptoms

- **MILD Hypothermia:**
  - **Lethargy**
  - **Shivering**
  - **Lack of Coordination**
  - **Pale, cold, dry skin**
  - **Early rise in heart rate, and respiratory rates.**

Signs and Symptoms

- SEVERE Hypothermia:
  - No shivering
  - Heart rhythm problems
  - Cardiac arrest
  - Loss of voluntary muscle control
  - Low blood pressure
  - Undetectable pulse and respirations

DIAGNOSIS:

- Measuring the core temperature at two sites- rectum & esophagus with the help of rectal probe & esophageal probe.

MANAGEMENT:

- continuous monitoring
- Rewarding
- supportive care.

REWARMING:

- **PASSIVE:** involves the use of blankets to cover body and head to trap heat being lost.
- **ACTIVE:** the application of outside heat to raise body temperature
  - External – heat blanket/forced hot air system
  - Internal – introduction of warm fluids into the body
    - Warm IVF, body cavity lavage, extracorporeal

REWARMING:

- Active Rewarming of MILD Hypothermia:
  - Active external methods:
    - Warm blankets
    - Heat packs
    - Warm water immersion (with caution)
  - Active internal methods:
    - Warmed IV fluids

REWARMING:

- Active Rewarming of SEVERE Hypothermia:
  - –Active external methods:
    - Warm blankets
    - Heat packs
    - Warm water immersion (with caution)
  - –Active internal methods:
    - Warmed IV fluids
    - Warmed, humidified oxygen

NURSING MANAGEMENT OF HYPOTHERMIA:

- Provide extra covering and monitor temperature.
- Cover head properly.
- Use heat retaining blankets.
- Keep patient‘s linen dry.

NURSING MANAGEMENT OF HYPOTHERMIA:

- Control environmental temperature.
- Provide extra heat source (heat lamp, radiant warmer, pads, and blankets).
- Carefully assess for hyperthermia or burn.
- Regulate heat source according to physical response.

FROST BITE:

❖Frost bite is the condition in which the tissue temperature drops below 0 degree Celsius. It results in cellular and vascular damage. Body parts more frequently affected by frostbite include the digits of feet and hands, tip of nose, and earlobes.

PREDISPOSING FACTORS:

- Contact with thermal conductors such as metal or volatile solutions
- immobility
- careless application of cold packs
- vaso constrictive medications

CLASSIFICATION OF FROST BITE:

- **First degree frost bite:** causes only anesthesia and erythematic.

- **Second degree frost bite:** appearance of superficial vesiculation surrounded by edema leads to very cold extremities.

CLASSIFICATION OF FROST BITE:

❖**Third degree frost bite:** hemorrhagic vesicles due to serious microvasculature injury which further leads to cyanosis.

SYMPTOMS:

- The injured area is white or mottled blue white, waxy and firm to the touch.
- There is tingling and redness followed by pallor and numbness of the affected area.
- There are three degrees: transitory hyperemia following numbness, formation of vesicles and gangrene.
- The affected area is insensitive to touch.

MANAGEMENT OF FROST BITE:

❖**Before thawing:** remove client from cold environment, stabilize core temperature, treat hypothermia, protect the frozen part and do not apply friction or massage.

MANAGEMENT OF FROST BITE:

- **During thawing:** provide parental analgesia e.g. keratolac & Provide ibuprofen 40 mg PO. Immerse part in 37-40 C circulating water containing an antiseptic soap for 10-45 minutes. Encourage patient to gently move the part.

MANAGEMENT OF FROST BITE:

❖ **After thawing:**

i) gently dry and elevate it.

ii) Apply pledges between toes; if macerated.

iii) If clear vesicles are intact aspirate the fluid or the fluid will reabsorb in days; if broken then debride and dress with antibiotic.

After thawing: Cond….

iv) **Continue analgesics Ibuprofen 400mg 8-12 hourly. Provide tetanus prophylaxis and hydrotherapy at 37C.**

v) The patient should be stimulated with orally administered hot fluids such as tea and coffee.

vi) The patient should not be allowed to smoke.

vii)Artificial respiration should be administered if the patient is unconscious.


• SUMMARY

- CONCLUSION

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Thank you ...