

Hypothermia

(Low Body Temperature)

Basics

OVERVIEW

- “Hypothermia” is the medical term for low body temperature
- Hypothermia is a condition in which the core body temperature drops below that required for normal metabolism; can be primary—a healthy pet is exposed to overwhelming cold or secondary—when a system-wide illness is present
- Mild hypothermia (Stage I)—body temperature of 90–95°F (32–35°C)
- Moderate hypothermia (Stage II)—body temperature of 82–90°F (28–32°C)
- Marked hypothermia (Stage III)—body temperature of 75–82°F (24–28°C)
- Severe hypothermia (Stage IV)—body temperature less than 75°F (24°C)

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs
- Cats

Breed Predispositions

- Smaller breeds with increased surface area for heat loss

Mean Age and Range

- More common in newborn and senior pets

SIGNS/OBSERVED CHANGES IN THE PET

- Known prolonged exposure to cold ambient temperatures
- Possibly history of disappearance from home or of trauma
- Cold, unresponsive pet

Mild Hypothermia Stage I (Body Temperature of 90–95°F; 32–35°C)

- Sluggishness (lethargy)
- Weakness
- Vigorous shivering (variable)
- Variable heart rate, rhythm, and blood pressure
- Light pink to pale gums and moist tissues of the body (known as “mucous membranes”)
- Confusion, agitation, or mental dullness
- Variable respiratory rate

Moderate Hypothermia Stage II (Body Temperature of 82–90°F; 28–32°C)



- Collapse
- Reduced shivering (variable)
- Slow heart rate (known as “bradycardia”)
- Low blood pressure (known as “hypotension”)
- Pale gums and moist tissues of the body (mucous membranes)
- Muscle and joint stiffness
- Mental dullness, stupor, or coma
- Wobbly, incoordinated or “drunken” appearing gait or movement (known as “ataxia”)
- Decreased reflexes (known as “hyporeflexia”)
- Decreased depth and rate of breathing

Marked Hypothermia Stage III (Body Temperature 75-82°F; 24-28°C)

- Near the point of death (known as being “moribund”)
- Cold skin with fluid buildup (known as “edema”)
- Loss of shivering (variable)
- Slow, irregular heartbeats (known as “bradyarrhythmias”) with low blood pressure (hypotension)
- Pale gums and moist tissues of the body (mucous membranes)
- Muscle and joint stiffness
- Coma with fixed and dilated pupils
- Lack of reflexes (known as “areflexia”)
- Decreased depth and rate of breathing
- Fluid buildup in the lungs (known as “pulmonary edema”)
- Breathing stops (known as “respiratory arrest”)
- Heart stops (known as “cardiac arrest”)

Severe Hypothermia Stage IV (body temperature less than 24°C)

- No vital signs, cardiac arrest

CAUSES

- Prolonged exposure to cold ambient temperature (normal responses overwhelmed)
- Impaired ability to regulate body temperature (such as in newborns, older pets, pets with low levels of thyroid hormone [known as “hypothyroidism”])
- Impaired behavioral responses—as seen in newborns or sick, debilitated, or injured pets
- Surface heat loss—as in newborns and small pets—by evaporation, conduction, convection, radiation losses
- Inadequate heat generation—as in newborns and pets with extreme weight loss and muscle wasting
- Serious illness

RISK FACTORS

- Disease of the hypothalamus, the part of the brain that regulates appetite and body temperature
- Very young or old age
- Low body fat and glycogen storage carbohydrate
- Burn injury
- Injury or disease of the brain
- Low levels of thyroid hormone (hypothyroidism)
- Condition in which levels of acid are increased in the blood due to the presence of ketone bodies secondary to diabetes (known as “diabetic ketoacidosis”)
- Generalized bacterial infection (known as “sepsis”)
- Trauma
- General anesthesia and surgery
- Administration of certain medications (such as beta-blockers, barbiturates, and narcotics)

Treatment

HEALTH CARE

- Emergency inpatient intensive care until normal body temperature is reached and the pet is stable
- Active external rewarming using warm blankets, heating pads, radiant heat, warm baths, or forced warm air, warmed intravenous fluids is used in pets with mild-to-moderate hypothermia
- Rewarming for pets with severe hypothermia may include breathing warm, humidified oxygen, administration of warmed intravenous fluids, and various techniques where warmed fluids are used to flush out the stomach (known as “gastric lavage”) or urinary bladder (known as “bladder lavage”) or other body cavities
- Anticipate possible further drop in body temperature during initial rewarming (minimize by warming trunk before limbs)
- Breathing support may be necessary

ACTIVITY

- Pets with mild hypothermia should be encouraged to be active, as muscle activity will generate more body heat

DIET

- The pet’s nutritional needs and ability to eat will determine the route of feeding, such as normal feeding by mouth, tube feeding, or intravenous feeding—withhold oral intake until alert

Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Oxygen supplementation may be provided via a face mask or endotracheal tube
- Dextrose supplementation to intravenous fluids is indicated in pets with low blood sugar (known as “hypoglycemia”)

Follow-Up Care

PATIENT MONITORING

- Continuous core body temperature during rewarming
- Monitoring of electrocardiogram (ECG, a recording of the electrical activity of the heart) and blood pressure to assess status of circulatory system during rewarming will be done hourly
- Frequent assessment of blood tests, such as packed cell volume (PCV, a means of measuring the percentage volume of red blood cells as compared to the fluid volume of blood) and total solids (a quick laboratory test that provides general information on the level of protein in the fluid portion of the blood), blood sugar, and electrolyte (chemical compounds, such as sodium, potassium, chloride) status
- Daily monitoring of other blood tests (such as blood urea nitrogen or BUN, urine concentrating ability, clotting tests, and liver tests) will be done in severely affected pets
- Observe for development of frostbite

PREVENTIONS AND AVOIDANCE

- Avoid prolonged exposure to cold, especially with at-risk pets (such as small pets, older pets)
- The veterinarian will warm the pet and monitor body temperature in anesthetized pets

POSSIBLE COMPLICATIONS

- Further drop in body temperature may occur during rewarming
- Return of cool blood to the heart may lead to irregular heartbeats (cardiac arrhythmias)
- Severely low body temperature (severe hypothermia) may cause the heart to stop beating (known as “cardiac arrest”)
- Frostbite

EXPECTED COURSE AND PROGNOSIS

- Varies with severity of low body temperature (hypothermia), underlying cause, and health status of the pet

Key Points

- Avoid prolonged exposure to cold, especially with at-risk pets (such as small pets, older pets)

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