Monitoring Parameters – Part 1

Monitoring Body Temperature

Angel Rivera, CVT, VTS(ECC)

Pathophysiology

The body maintains temperature homeostasis by balancing heat production with heat loss through a thermostatic feedback mechanism in the hypothalamus of the brain. During illness or central nervous system disorder this mechanism may be altered. Chemical substances released in disease can reset the thermoregulatory center, increasing the metabolic rate, producing and conserving heat and elevating body temperature. These chemicals may be pyrogens secreted by bacteria or cytokines associated with inflammation. Primary brain disease (e.g. cerebral edema, neurosurgery, brain trauma, or tumors) can reset the thermostat to a higher level.

Hyperthermia creates increased tissue oxygen requirements. The body responds by increasing ventilation to release body heat. Should the PCO2 decrease too low, cerebral vasoconstriction and brain hypoxia can result. Cardiac work and oxygen demands increase. Peripheral vasodilatation occurs in an effort to release heat. Damage to vascular cells can lead to disseminated intravascular coagulation, sloughing of gastrointestinal mucosa, bacterial translocation, and significant intravascular volume deficits.

Hypothermia results in a reduced metabolic rate and enzyme functions. There is a decrease in oxygen consumption and a decrease in the ability of hemoglobin to release oxygen to tissues. Hypothermia affects the cardiovascular system by causing peripheral vasoconstriction, decreased heart rate and hypotension. Gastrointestinal motility is decreased, and ileus may occur.

Assessment

Emergency patients should have temperature monitored several times daily. Patients with infections, excessive panting, hyperactivity, and postoperative patients should have their temperatures checked more frequently. Temperatures are ideally monitored from the same site, usually rectally. Other sites of monitoring include the axillary and inguinal region. These areas generally are 1-2 degrees lower than rectal temperature. Ear temperatures can be obtained using an ear probe. Serial temperatures taken from the same area are more important than single values.

Intervention

Any abnormal temperature must be reported to the veterinarian. The veterinarian will determine what aggressive methods are required to cool hyperthermic and warm hypothermic patients. Hyperthermic patients may benefit from being placed in front of a low current of air (blowing from a fan), laying on the metal surface of the cage or a grate without bedding or with cool towels, cool compresses in the inguinal and axillary regions, cool bathing, placing alcohol on the pads, and receiving cool intravenous fluids and enemas. Cooling measures should cease when the rectal temperature reaches103F in order to prevent overcooling.

Hypothermic patients can be treated by covering them with a warm blanket and placing warm water bottles around them. The patient can be placed under a heating lamp, but strict monitoring is essential to prevent burns. Circulating warm water blankets are preferred over heating blankets and lamps because there is less chance of accidental thermal burns. No surface heat should be provided without volume replacement, because vasodilatation from the heat may exacerbated their condition. Severe or prolonged hypothermia may require more aggressive approaches such as active core warming with IV warmed fluids, warm peritoneal lavage or intracolonic lavage with warm isotonic fluids. The recumbent patient should be turned every 2-4 hours to avoid thermal injury. Heating should be discontinued after the rectal temperature is low normal.