Emergency Nursing

**HEAT STROKE**

Heat stroke is an acute medical emergency caused by failure of the heat-regulating mechanisms of the body. The most common cause of heat stroke is prolonged exposure to an environmental temperature of greater than 39.2°C. It usually occurs during extended heat waves, especially when they are accompanied by high humidity.

**Management of heat stroke**

* Use cool sheets and towels and continuous sponging of patient with cool water.
* Apply to the neck, groin, chest and axilla while spraying with tepid water.
* Cover patient with cooling blankets for temperature regulation.
* Immerse the patient in a cold water bath.
* During cooling procedures, an electric fan is positioned so that it blows on the patient to augment heat dissipation by convection and evaporation.
* Monitor patient’s temperature constantly with a thermometer placed in the rectum to evaluate core temperature.
* Monitor patient’s status throughout treatment carefully, including vital signs, ECG findings (for possible myocardial ischemia, myocardial infarction and dysrhythmias), central venous pressure (CVP), and level of responsiveness, all of which may change with rapid alterations in body temperature.
* A seizure may be followed by recurrence of hyperthermia. To meet tissue needs exaggerated by the hypermetabolic condition, 100% oxygen is administered.
* Endotracheal intubation and mechanical ventilation to support failing cardiopulmonary systems may be required.
* IV infusion therapy of normal saline or lactated Ringer’s solution is initiated as directed to replace fluid losses and maintain adequate circulation.
* Fluids are administered carefully because of the dangers of myocardial injury from high body temperature and poor renal function. Cooling redistributes fluid volume from the periphery to the core.
* Measure urine output frequently, because acute tubular necrosis may occur as a complication of heat stroke from rhabdomyolysis (myoglobin in the urine).
* Blood specimens are obtained for serial testing to detect bleeding disorders, such as disseminated intravascular coagulation (DIC) and for serial enzyme studies to estimate thermal hypoxic injury to the liver, heart and muscle tissue. Permanent liver, cardiac and CNS damage may occur.
* Additional supportive care may include dialysis for renal failure, antiseizure medications to control seizures, potassium for hypokalemia and sodium bicarbonate to correct metabolic acidosis. Benzodiazepines (eg, diazepam) or chlorpromazine (Thorazine) may be prescribed to suppress seizure activity.
* Educate patient regarding the prevention of heat stroke.

**FROST BITE**

Frostbite is trauma from exposure to freezing temperatures and freezing of the intracellular fluid and fluids in the intercellular spaces. It results in cellular and vascular damage. Frostbite can result in venous stasis and thrombosis. Body

parts most frequently affected by frostbite include the feet, hands, nose, and ears. Frostbite ranges from first degree (redness and erythema) to fourth degree (full-depth tissue destruction).

**Management of Frost bite**

* The goal of management is to restore normal body temperature.
* Remove constrictive clothing and jewelry that could impair circulation.
* Remove wet clothing as rapidly as possible. If the lower extremities are involved, the patient should not be allowed to ambulate.
* Controlled yet rapid rewarming is instituted. Frozen extremities are usually placed in a 37°C to 40°C circulating bath for about 30- to 40-minute spans. This treatment is repeated until circulation is effectively restored.
* During rewarming, an analgesic for pain is administered as prescribed, because the rewarming process may be very painful.
* To avoid further mechanical injury, the body part is not handled. Massage is contraindicated.
* Once rewarmed, the part is protected from further injury and is elevated to help control swelling.
* Sterile gauze or cotton swab is placed between affected fingers or toes to prevent maceration and a bulky dressing is placed on the extremity.
* Use a foot cradle to prevent contact with bed linens if the feet are involved.
* Conduct a physical assessment with rewarming to observe for concomitant injury, such as soft tissue injury, dehydration, alcohol coma or fat embolism.
* Problems such as hyperkalemia (eg, from release of potassium in the damaged cells) and hypovolemia, which occur frequently in people with frostbite, are corrected.
* Risk of infection is also high, therefore, strict aseptic technique is employed during dressing changes and tetanus prophylaxis is administered as indicated.
* Nonsteroidal anti-inflammatory drugs (NSAID) is prescribed for its anti-inflammatory effects and to control pain.
* Additional measures that may be carried out when appropriate include the following:
* Whirlpool bath for the affected body parts to aid circulation and débridement of necrotic tissue to help prevent infection.
* After rewarming, hourly active motion of any affected digits is encouraged to promote maximal restoration of function and to prevent contractures.
* Discharge instructions also include encouraging the patient to avoid tobacco, alcohol and caffeine because of their vasoconstrictive effects, which further reduce the already deficient blood supplied to the injured tissue.

**NEAR DROWNING**

Near drowning is defined as survival for at least 24 hours after submersion that caused a respiratory arrest. The most common consequence is hypoxemia. Drowning is the second most common cause of unintentional death in children

younger than 14 years. Factors associated with drowning and near drowning include alcohol ingestion, inability to swim, diving injuries, hypothermia, and exhaustion. The majority of drowning events occur in pools, lakes, and bathtubs.

**Management of near drowning**

* Therapeutic goals include maintaining cerebral perfusion and adequate oxygenation to prevent further damage to vital organs.
* Immediate cardiopulmonary resuscitation is the factor with the greatest influence on survival.
* The most important priority in resuscitation is to manage the hypoxia, acidosis and hypothermia. Prevention and management of hypoxia are accomplished by ensuring an adequate airway and respiration, thus improving ventilation (which helps correct respiratory acidosis) and oxygenation.
* Monitor arterial blood gases to evaluate oxygen, carbon dioxide, bicarbonate levels and pH. These parameters determine the type of ventilatory support needed.
* Use of endotracheal intubation improves oxygenation, prevents aspiration and corrects intrapulmonary shunting and ventilation–perfusion abnormalities (caused by aspiration of water).
* If the patient is breathing spontaneously, supplemental oxygen may be administered by mask. However, an endotracheal tube is necessary if the patient does not breathe spontaneously.
* Because of submersion, the patient is usually hypothermic. A rectal probe is used to determine the degree of hypothermia.
* Prescribed rewarming procedures (eg, extracorporeal warming, warmed peritoneal dialysis, inhalation of warm aerosolized oxygen, torso warming) are started during resuscitation. The choice of warming method is determined by the severity and duration of hypothermia and available resources.
* Intravascular volume expansion and inotropic agents are used to treat hypotension and impaired tissue perfusion.
* ECG monitoring is initiated, because dysrhythmias frequently occur.
* Insert an indwelling urinary catheter to measure urine output.
* Hypothermia and accompanying metabolic acidosis may compromise renal function.
* Nasogastric intubation is used to decompress the stomach and to prevent the patient from aspirating gastric contents.
* Monitor patient closely with serial vital signs, serial arterial blood gas values, ECG monitoring, intracranial pressure assessments, serum electrolyte levels, intake and output and serial chest x-rays.

**SNAKE BITES**

Snake venom consists primarily of proteins and has a broad range of physiologic effects. It may affect multiple organ systems, especially the neurologic, cardiovascular, and respiratory systems.

**Management of snake bite**

* Allow patient to lay down, removing constrictive items such as rings, providing warmth, cleansing the wound, covering the wound with a light sterile dressing and immobilizing the injured body part below the level of the heart.
* Airway, breathing and circulation are the priorities of care.
* Do not apply ice or a tourniquet.
* Initial evaluation in the emergency department is performed quickly and includes information about the following:
* Whether the snake was venomous or nonvenomous; if the snake is dead, it should be transported to the emergency department with the patient for identification.
* However, caution should be taken when handling the transported snake. Frequently, the patient and family transport the snake in a stunned, not dead, state.
* Where and when the bite occurred and the circumstances of the bite.
* Sequence of events, signs and symptoms (fang punctures, pain, edema and erythema of the bite and nearby tissues).
* Severity of poisonous effects.
* Assess vital signs.
* Circumference of the bitten extremity or area at several points; the circumference of the extremity that was bitten is compared with the circumference of the opposite extremity.
* Laboratory data (complete blood count, urinalysis and coagulation studies).
* There is no specific protocol for treatment of snake bites. Generally, ice, tourniquets, heparin and corticosteroids are not used during the acute stage.
* Corticosteroids are contraindicated in the first 6 to 8 hours after the bite because they may depress antibody production and hinder the action of antivenin (antitoxin manufactured from the snake venom and used to treat snake bites).
* Parenteral fluids may be used to treat hypotension. If vasopressors are used to treat hypotension, their use should be short term.
* Surgical exploration of the bite is rarely indicated.
* Observe the patient closely for at least 6 hours.