**Case Study: Hyperthermia**

**Case Presentation**

It was August 12 in Dallas and the fifth straight day that would have a high temperature above 100°F. Carl was running some errands and decided to stop by his mother's house. Carl's mother, Mary, was eighty years old and in pretty good health. She was able to keep up with her housekeeping and still tended a small garden in her backyard. Just that morning, Carl had told his mother not to spend too much time working in the garden today. Carl knew that the heat could be dangerous, especially to the elderly, and her mother's place didn't have an air conditioner, but Carl felt that his mother was alert enough to know her own limits.

When Carl reached his mother's house, he found his mother unconscious on the couch in the living room. All of the windows in the house were closed. Carl immediately tried to wake his mother and was able to get her to say a few words, but Mary seemed delirious. Carl grabbed the telephone and called for help. The emergency services operator instructed Carl to apply cold wash cloths to his mother's forehead and face and if possible to position his mother in front of a fan while using a spray bottle to spray lukewarm water on her skin.

When the paramedics arrived Mary was conscious but confused and feeling nauseous. At the hospital the doctor told Carl just how lucky he was to have visited Mary at that moment. He informed Carl that Mary had suffered heat stroke, a form of hyperthermia and that Carl's quick action at the house had saved his mother's life. Mary was making rapid progress to recovery but was being given fluids and electrolytes intravenously and was going to stay in the hospital overnight for observation.

**Case Background**

Hyperthermia occurs when the body temperature increases without an increase in the set point of the thermoregulatory center in the hypothalamus. Heat exhaustion and heatstroke are two common forms of hyperthermia. Symptoms of heat exhaustion include thirst, fatigue, profuse sweat, and giddiness or delirium. Individuals with heat exhaustion generally have a normal or only slightly elevated body temperature and the symptoms are the result of the loss of water and electrolytes. Symptoms of heatstroke include a temperature of 104°F, absence of sweating, and loss of consciousness. If untreated, heat exhaustion precedes heatstroke, and heat stroke is often fatal. Treatment for hyperthermia consists of reducing the body temperature to normal. Special attention is placed on reducing the temperature of the brain as tissue damage can result if the body temperature rises above 109°F.

1. Define homeostasis and describe how it relates to hyperthermia.

2. Explain why elderly individuals with poor circulation would have a greater risk of suffering heat exhaustion or heatstroke.

3. Explain why spraying water on the skin while sitting in front of a fan would lower body temperature.

4. You should avoid treatments that induce shivering or vasoconstriction when attempting to lower a person's body temperature in response to hyperthermia. Why?