



Safety Alert

From the International Association of Drilling Contractors

ALERT 01-21

HEAT RELATED CONDITIONS

Mechanics of Heat Related Conditions

Under normal conditions the body's ability to dissipate heat through the evaporation of sweat and convection of cooler air over the skin is sufficient to prevent heat-related conditions from developing. As the temperature and humidity rises, the effectiveness of the primary method of cooling by evaporation is reduced. Another important factor for heat-related health problems is insufficient intake of fluids (water and electrolyte solutions) during these conditions.

Causes of Heat Related Conditions

Age, weight, degree of physical fitness, degree of acclimatization (getting used to), metabolism, use of alcohol or drugs, and a variety of medical conditions such as hypertension all affect a person's sensitivity to heat. However, even the type of clothing worn must be considered. Prior heat injury predisposes an individual to additional injury.

It is difficult to predict just who will be affected and when, because individual susceptibility varies. In addition, environmental factors include more than the ambient air temperature. Radiant heat, air movement, conduction, and relative humidity all affect an individual's response to heat.

Signs, Symptoms and Treatment

Heat Cramps – Heat cramps usually develop during strenuous activity in a hot environment. Excessive sweating causes a loss of electrolytes, which causes cramping and pain in the legs, arms and abdomen. This condition is usually not an emergency and can be treated by:

- (1) Removing the person from the hot environment
- (2) Apply direct pressure on the cramping muscle
- (3) Gentle steady stretching
- (4) Rest
- (5) Fluid replacement with water and/or half strength electrolyte solutions.

Note: If the person does not show signs of improvement after being treated as listed above or develops other more serious signs and symptoms, they may need immediate medical attention.

Heat Exhaustion – Heat exhaustion occurs when excessive sweating and inadequate fluid intake causes a loss of the body's fluid volume. This low fluid volume results in inadequate blood circulation in the body. Early signs and symptoms may include fatigue, light-headedness, nausea, vomiting, headache and their skin is usually cool and pale. If left untreated they may develop classic signs of shock - increased heart rate, increased breathing rate and eventually low blood pressure.

Heat exhaustion can be treated by:

- (1) Removing the person from the hot environment to a cool location
- (2) Have them lay down with their feet elevated 8 to 12 inches

The Corrective Actions stated in this alert are one company's attempts to address the incident, and do not necessarily reflect the position of IADC or the IADC HSE Committee.

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(3) If they are alert and able to do so, have them drink diluted electrolyte solution.

Note: If the person does not show signs of improvement or develops other more serious signs and symptoms they may need immediate medical attention.

Heat Stroke – Heat stroke occurs when the body can no longer regulate its temperature. With heat stroke the body's temperature is very high (as high as 105 to 107 degrees). The skin will feel hot to the touch and is likely to be dry with a flushed to red color. The person will be disoriented, confused and possibly have a lowered level of responsiveness. **If this condition exists, activate your emergency response plan immediately.** Heat stroke must be treated immediately. Do the following while waiting for medical assistance:

- (1) Remove the patient from the hot environment and begin cooling them immediately by applying cool water directly to the skin (especially on the head, neck, underarm, groin and wrist area).
Caution: If medical assistance is delayed, prolonged extreme cooling may cause the person to develop hypothermia (low body temperature). DO NOT OVER COOL THE PATIENT.
- (2) Maintain an open airway and insure they continue to breath (apply oxygen if available and personnel are present who are qualified to administer).
- (3) Attempt to maintain responsiveness and be alert for possible seizure activity.

The best treatment is prevention. When working in hot and humid conditions, drink plenty of fluids (water and sports drinks). Don't wait until you are thirsty to drink. Wear natural fiber (cotton) clothing with long sleeves and long pants. Avoid tight fitting clothes and clothes made of synthetic fibers. Limit intake drinks that contain caffeine (coffee, iced tea, coke, root beer, etc.), also avoid heavy, high fat meals while on tour.

Heat Fatigue – A factor that predisposes an individual to heat fatigue is lack of acclimatization (getting used to heat). The use of a program of acclimatization and training for work in hot environments is advisable. The signs and symptoms of heat fatigue include impaired performance of skilled sensory-motor, mental, or vigilance jobs. There is no treatment for heat fatigue except to remove the heat stress before a more serious heat-related condition develops.

Heat Collapse ("Fainting"). – In heat collapse, the brain does not receive enough oxygen because blood pools in the extremities. As a result, the exposed individual may lose consciousness. This reaction is similar to that of heat exhaustion and does not affect the body's heat balance. However, the onset of heat collapse is rapid and unpredictable. To prevent heat collapse, the worker should gradually become acclimatized to the hot environment.

Heat Rashes – are the most common problem in hot work environments. Prickly heat is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by un-evaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

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