

# Fluid Replacement FactSheet

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## Dehydration

Dehydration is a loss of fluids and electrolytes (important blood salts like potassium and sodium). Vital organs like the kidneys, brain, and heart can't function without a certain amount of fluids and electrolytes, which can be lost through sweat, urine, vomit and diarrhea. In the workplace it is important for employees who work in heat-stress environments to monitor their fluid intake and guard against dehydration.

## Signs of Dehydration

*Mild* signs of dehydration include:

- thirst;
- dry lips; and
- slightly dry mouth membranes.

*Moderate* signs of dehydration include:

- very dry mouth membranes;
- sunken eyes; and
- skin doesn't bounce back quickly when lightly pinched and released.

*Severe* signs of dehydration include:

- all signs of moderate dehydration;
- rapid, weak pulse (more than 100 at rest);
- cold hands and feet;
- rapid breathing;
- blue lips; and
- confusion, lethargy, difficult to arouse.

If someone becomes severely dehydrated; they need emergency medical care immediately. Intravenous fluids (IVs) will quickly reverse dehydration. In teenagers and adults with moderate dehydration, careful home treatment can be safe, but telephone contact with a physician is advised. Mild dehydration is safe to self-treat at all ages, as long as it doesn't worsen. Prehydration and rehydration are vital to maintaining cardiovascular health, proper body temperature, and muscle function.

## How Electrolytes Help

Electrolytes protect employees from heat stress. Electrolytes can appear in two forms; simple inorganic salts of magnesium, potassium, sodium, or calcium; or complex organic molecules.

Under ideal situations, electrolytes flow through muscle cells to keep them functioning normally. In the heat, however, these precious minerals are lost through sweat, which depletes muscle cells of fluids and weakens muscle tissue. While drinking water adequately rehydrates the body, it does not effectively and quickly replace the electrolytes needed to keep the body functioning properly.

Today, many employers have gone beyond keeping cool liquids and water on hand for employees to drink. They now provide electrolyte replacement drinks (like Gatorade or Powerade). Water still reigns as nature's perfect drink, but it takes a back seat to electrolyte replacement beverages in heat stress situations. Research shows that water is absorbed much more slowly by the body and cannot be retained in the extra-cellular cavity.

In fact, the rate of absorption of electrolyte replacement products compared with water is 98 percent faster in the first minute—and when employees have a heat-related illness, time can sometimes be the most critical factor.

In addition, at the onset of heat stress, many individuals actually experience a marked decrease in their body's natural thirst mechanism, causing them to drink less. Employers are choosing to provide electrolyte replacements, because employees prefer the taste compared to water.

The more they like the taste, the more likely they are to drink and keep themselves protected against heat-related illness and dehydration. If the body's electrolytes are not properly replaced, employees can experience a marked decrease in productivity placing themselves and their co-workers in a hazardous work environment without even knowing it. They can lose energy, become fa-



tigued, and poor judgment calls may be made. Muscle cramping, stupor, heat cramps or exhaustion—and at worst stroke—can occur.

Know the warning signs and keep employees educated to protect themselves and others around them. To prevent dehydration the American College of Sports Medicine suggests the following:

- Eat a diet high in carbohydrates and low in fat, and drink plenty of fluids (plain water or fluids without sugar, caffeine, or alcohol are the best).
- Drink 17 ounces (a little over 2 Cups) of fluid 2 hours before strenuous activity that will cause the loss of fluids.
- Drink fluids every 15 minutes during strenuous activity.
- Keep drinks cooler than air temperature on hand (a water bottle is ideal).

## **How much is enough?**

To get an idea of just how much to drink, an employee should know their weight after the workday. Any weight decrease is probably due to water loss. If there is a loss of two or more pounds during the workday or shift, drink 24 ounces of water for each pound lost.

## **What about Caffeine?**

Caffeine acts as a diuretic causing the body to excrete fluid instead of retaining it, so it is not wise to drink when trying to hydrate. If a dehydrated person drinks a beverage containing caffeine, such as teas, soda, and coffee, they can feel worse. Caffeine causes more urination, which can undo the benefits of drinking fluids.

## **What can be done to prevent dehydration?**

Early intervention is the best prevention. The body needs a constant source of fluids. Eight glasses of fluid a day are recommended to keep the body well hydrated.

## **How is the condition diagnosed?**

The diagnosis is usually based on the symptoms and a physical exam. When the dehydration is moderate or severe, blood tests are often done. These blood

tests give information on imbalance in body chemistry. This helps the health care provider to figure out the best type of fluid to give through an IV to correct the problem.

## **What are the long-term effects of the condition?**

There are usually no long-term effects with mild to moderate dehydration. Untreated severe dehydration may cause seizures, permanent brain damage, or death.

## **What are the risks to others?**

There are no health risks to others, but loss of fluids and electrolytes can cause an employee to experience a marked decrease in productivity and place themselves and their co-workers in a hazardous work environment without even knowing it. They will lose energy and be easily fatigued and poor judgment calls may be made. This can cause safety risks to an employee and their co-workers while in the workplace.

## **What is treatment for the condition?**

The treatment of dehydration is to rehydrate the body. This can be done by drinking fluids or by getting fluids through an IV. Drinking fluids usually relieves mild dehydration quickly. Moderate to severe dehydration may need to be treated with fluids given through an IV.

## **What are the side effects of the treatments?**

There are usually no side effects from either drinking fluids or getting them through an IV.

## **What happens after treatment for the condition?**

A person usually will feel much better once his or her body has been rehydrated.

## **How is the condition monitored?**

Dehydration is almost always caused by a specific event or disease. So it usually does not need long-term monitoring. A person who tends to take in too little fluid will be encouraged to drink consistently during the day and during strenuous or heat stress activities.

While the consumption of large amounts of cool water and fluid replacement drinks provide enough

fluids and electrolytes, many employers should combine other safety measures—ventilation, shielding, equipment modifications, and protective clothing—with a hydration program to keep employees safe when working in the heat. The Texas Department of Insurance, Division of Workers' Compensation (TDI/DWC) has the following publications to provide safety information:

- Heat Stress (Hazard Prevention)
- Preventing Heat-Related Injuries and Illness (Fact Sheet)
- Sun safety (Take 5)
- Welding Hazards (Work Programs)

Remember to practice safety, don't learn it by accident.

This fact sheet was published with information from the Occupational Health & Safety Administration, the American College of Sports Medicine, QuickCare.org, and the Texas Department of Insurance, Division of Workers' Compensation Commission.

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