

Maximum Hydration & Rapid Rehydration

Maximum Hydration

One effective way to delay the onset of detrimental effects of dehydration is by increasing your total body water and blood plasma volumes. Described below are four simple ways to significantly increase your capacity to carry water.

Frequent Exercise

Recent studies show that by engaging in almost any type of physical exercise on a regular basis you will realize, in very short order, as much as a 10-12% increase in your circulating blood plasma volume. Current research also indicates that with continued training, especially aerobic type training, there results an increase in the efficiency, the effectiveness, and the working capacity of the body's cooling mechanisms, especially the sweat mechanism.

As a direct effect of training, the well tuned firefighter will carry more water, sweat less while achieving greater cooling, and lose less salt via sweat enabling him or her to rehydrate more quickly, and completely.

A carbohydrate-Rich Diet

Carbohydrate is the performance fuel. This foodstuff fuel provides individuals with the energy to work, and the water we sweat. By consuming a diet that is rich (60%) in carbohydrates; fruits, vegetables, breads, cereals, grains, rice and pasta, you can increase your capacity to store carbohydrate by over 100%, and right along with it, significantly more water. Additionally, most fruits and vegetables contain large amounts of water (up to 96%), and therefore, represent an excellent source of both fuel, and water to enhance performance, and facilitate recovery.

Decrease Body Fat

Muscle tissue contains about 75% water, and fat cells contain less than 25% water. Consequently, the less lard, and more lean muscle tissue that you feature, the greater your percentage or, volume of water.

Fat also acts as a tremendous insulator, and excess fat imposes an absolutely useless additional burden upon your body. The consequences of an increased

percentage of body fat are a less efficient cooling mechanism, and an increased absolute workload. The results are an increased risk of injury, and an elevated rate of fatigue.

Acclimatization

The adage that has been applied to athletics for generations is that, “if you want to perform in the heat, than you better train in the heat.” The physiological basis for this old coaching tip is that by subjecting your body to an increased heat load, especially by working, or exercising in a heated, or hot and humid environment, that your body will adapt; increasing blood plasma volume, and improving the efficiency of your cooling mechanisms, especially the sweat mechanism. The benefits to be reaped from acclimatizing to heat are very similar to those obtained through training. In fact, the most dramatic improvements are realized in those humans that combine the two; exercising in the heat. However, before you begin exercising in the heat, you should first consult a physician for guidelines on training safely and intelligently in heated environments.

Rapid Rehydration

The constant replacement of bodily water lost via sweat, and respiration is absolutely essential for the maintenance of the circulating blood plasma volume, physiologic function, health, and performance. Generally, this is an easy task for the hydration-conscious firefighter, however, while in the performance of duty there are frequently times when continued, or, immediate rehydration is impossible. While operating at fires, emergencies, extended operations, or even when confined within an apparatus while responding to a series of alarm, firefighters are not afforded the opportunity to rehydrate themselves, yet, current research shows that they can lose bodily water at rates that exceed 2.5 quarts per hour! Marked dehydration can result and, for reasons of personal health and safety, must be remedied as soon as physically possible. Listed, and described, are the Dos and Don'ts of rapid rehydration designed to enable you to replace fluids as quickly and safely as possible.

Do's

Drink cold fluids.

The colder the better, down to 40 degrees.

Drink Dilute Beverages. Most common beverages, and some so-called “replacement fluids” contain much too high a concentration of sugar or some other nutrient to move swiftly from your stomach to the primary site of absorption in the small intestine. You can facilitate the process by diluting your chosen beverage with water. Ideally, your replacement fluid should contain less than

about 8% glucose, sucrose, or glucose polymer, and a small measure of salt (about 1/3 teaspoon of table salt; sodium chloride, per quart of fluid).

Drink until nearly full. At your first opportunity you should fill your stomach to about 75-80% of capacity by drinking approximately 20, or so, ounces of your chosen replacement fluid.

Continue Drinking. After initially filling your stomach to the point of being nearly full, you should supplement your initial intake by consuming an additional 6-8 ounces every 10-15 minutes. All totaled, during periods of exposure to heat stress, and while in recovery, you should ingest at least 1-2 quarts of fluid per hour.

Move about. The mechanics of moving about casually while in the period of recovery may actually facilitate the movement of fluid and enhance the rate of rehydration.

Don'ts

Do not drink hot beverages.

Do not drink concentrated beverages. Fluids that contain relatively high concentrations of either sugar, starch, protein, or fat tend to sit in your stomach and retard the process of rehydration.

Do not continue working at a high relative intensity. Working at intensities that exceed 75% of your maximum aerobic ability will retard the passage, and absorption, of ingested fluids which slows the rehydration process.

Do not consume beverages which contain caffeine. Caffeine is a drug that works decidedly against you. The consumption of caffeine, via food, drink or drugs (prescription or non-prescription), will contribute towards dehydration as opposed to rehydration.