

Hyponatremia Sometimes called **water intoxication**, **overhydration**, or **hyperhydration** is the imbalance of water to salt in the body. Hyponatremia is a condition in which the amount of sodium (salt) in the blood is lower than normal. Sodium is found mostly in the body fluids outside the cells. It is very important for maintaining blood pressure. Sodium is also needed for nerves, muscles, and other body tissues to work properly. Drinking too much water causes the sodium in your body to become diluted. When the amount of sodium in fluids outside cells drops, water moves into the cells to balance the levels. This causes the cells to swell with too much water. Brain cells are especially sensitive to swelling, and this causes many of the symptoms of hyponatremia. In particular hypotonic hyponatremia is caused from excess water intake, including excessive tap water in infant feed resulting, excessive water ingestion during swimming or a near drowning incident, drinking too much water during athletic training/competition, and binge drinking of dilute alcoholic drinks (potomania). Beer potomania is from massive consumption of beer which is poor in solutes and electrolytes. Hyperhydration, rather than dehydration, may pose a greater health risk to athletes, according to two articles in a British Medical Journal written by Tim Noakes, MD. Of the University of Cape Town in South Africa. Heat-induced dehydration rarely causes athletes to collapse during workouts or competition. In most cases, the culprit is exercise-associated postural hypotension (a drop in blood pressure). Misperceptions about dehydration have been driven in large part by marketing of sports drinks. People have been misled ... to believe that they need to drink to stay 'ahead of thirst' to be optimally hydrated. In fact, relatively small increases in total body water can be fatal. A 2% increase in total body water leads to generalized edema that can impair physical and mental performance. Healthy athletes face barely any risk of dehydration during competition in an endurance event. Serious health risks — including inhibition of voluntary motor activity and paralysis — occur only when total body water decreases by 15% or more, which would require 48 hours in the desert with no water. On June 11, 2012, a 30 year old paddler competing in the 260-mile 50th Annual Texas Water Safari race died from hyponatremia from drinking too much water during the competition despite being admitted to the San Antonio Military Medical Center after being stricken.

Symptoms of hyponatremia include dizziness, muscular weakness, neurological impairment, nausea, vomiting, headache, confusion, lethargy, fatigue, loss of appetite, slurring of speech, restlessness, irritability, spasms or cramps, paralysis seizures, and decreased consciousness or coma inhibition — if not reversed— death by respiratory arrest. Body temperature is usually normal in hyponatremia, which differentiates this condition from heat stroke or heat

First Aid The first step in the approach and evaluation of hypotonic hyponatremia is to determine whether emergency therapy is warranted. Guide treatment by the size of the victim, the duration of the overhydration, and the degree and severity of the symptoms. If the symptoms are mild, loosen all clothing, attempt to reduce the person's body temperature by rubbing ice cubes on the soles of the person's feet and the palms of his hands, and apply a towel dipped in cold water to the person's forehead. If conscious help the person drink orange juice or a drink containing electrolytes. If the symptoms are severe, call 911 or get the person to a hospital for intravenous therapy & medicine.

Hypernatremia Hypernatremia is the medical term for high levels of sodium in the blood and is a very common electrolyte disorder. The most common cause of hypernatremia is dehydration. When there is too little water in the body, sodium levels increase and can affect many different organ systems. High sodium results in cellular dehydration, and the symptoms can be as wide ranging as dizziness to vomiting to death in severe cases. There are three main causes of hypernatremia, according to "The New England Journal of Medicine." The 1st is when there is fluid loss from the body because of sweating, inadequate hydration or diarrhea. The 2nd cause is inadequate production of the hormone arginine vasopressin by the pituitary gland, resulting in excess water loss from the kidneys in the disease diabetes insipidus. The 3rd cause is if large amounts of a liquid are consumed that contain higher sodium concentrations than those in the body, such as sea water. Hypernatremia affects the central nervous system most prominently, which has cascading consequences on the rest of the body. The development of hyperosmolality (increase in concentration of body fluids and urine) from the water loss can lead to neuronal cell shrinkage and resultant brain injury. Loss of volume can lead to circulatory problems. Rapid free-water replacement can cause cerebral (brain) edema (fluid in the tissues between the body's cells). **Dehydration** is a state of **hypernatremia**. Dehydration (hypohydration) occurs when you use or lose more fluid than you take in, and your body doesn't have enough water and other fluids to carry out its normal functions. If you don't replace lost fluids, you will get dehydrated. Common causes of dehydration include vigorous exercise, especially in hot weather; intense diarrhea; vomiting; fever or excessive sweating. Not drinking enough water during exercise or in hot weather even if you're not exercising also may cause dehydration. Anyone may become dehydrated, but young children, older adults and people with chronic illnesses are most at risk. You can usually reverse mild to moderate dehydration by drinking more fluids, but severe dehydration needs immediate medical treatment. The safest approach is preventing dehydration in the first place. Keep an eye on how much fluid you lose during hot weather, illness or exercise, and drink enough liquids to replace what you've lost. Children have an increased chance of becoming dehydrated because: a greater portion of their bodies is made of water; they have a high metabolic rate, so their bodies use more water; their kidneys do not conserve water as well as an adult's kidneys; a child's natural defense system that helps fight infection (immune system) is not fully developed, which increases the chance of getting an illness that causes vomiting and diarrhea; and children often will not drink or eat when they are not feeling well.

Symptoms Initial symptoms of hypernatremia include: loss of appetite, nausea, vomiting, generalized weakness, excessive fatigue, faintness, excessive thirst, and irritability. Symptoms of worsening hypernatremia include: muscle spasms, muscle tremors, swelling, irritability, excessive sleepiness, confusion, seizures, coma. Hypernatremia may occur in people with diabetes insipidus, a disease that causes excessive urine production. (It is not the same disease as diabetes mellitus, a disease resulting from impaired insulin production.)

First Aid For individuals who have a mild case of hypernatremia, just drinking plain water when thirsty may be all the treatment that is needed. In severe cases of hypernatremia, call 911 or get the person to a hospital so that the serum sodium in the blood can be tested and fluid can be provided intravenously with close monitoring of the concentration of sodium in the blood to ensure controlled rehydration along with possible administration of vasopressin which is an anti-diuretic hormone that causes the body to retain water and constrict blood vessels.