

# Hydration / Dehydration

## Water for health and performance

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Nearly all the bio-chemical reactions that occur in body cells depend on water and electrolyte (sodium, potassium, calcium, chloride, phosphorous, magnesium, etc.) balance. These balances are not only vital to maintaining life but also affect physical and mental performance.

Water is the most abundant component of the body (60% + by weight). I believe it was Mike Colgan of the Colgan Institute who referred to the body as a "Hairy protein bag full of water". This bag of water has many holes which allow for leakage. These holes include skin pores which allow for perspiration (skin leakage) the kidney / bladder system which expels wastes carried by water and the respiratory system which must be moist or breathing would be very dry and painful. Adequate hydration is very important in the maintenance of body temperature. When muscles contract they generate heat which must be dissipated from the core to the body surface and adequate water to maintain adequate blood volume is vital.

Blood, kidney, heart and lungs are made of 80% or more water. Muscle, spleen, brain, intestines, & skin are 72 - 75% water. Even bones are 22% and fat tissue is 10% water. On a normal, moderate temperature, inactive day you would lose 1.5 liters (6 glasses) of water through kidney filtration (urine production) and another 0.750 - 1 liter (3 - 4 glasses) through the skin and respiration. So an average person needs 8 - 9 glasses per day just to replace average losses. It is true you get some of that from fruits, vegetable, other beverages and food. Caffeinated, alcoholic and many carbonated beverages have a diuretic effect and actually increase the daily fluid requirements. One should choose pure water or high quality sport beverage in some circumstances.

Naturally, daily fluid requirements will vary with environmental conditions, clothing and exercise intensity and duration.

Even mild dehydration - 1% of body - which would represent approximately .75 to 1 litre of water (1% of 75 Kg = 750 ml.) can create a reduction in muscle performance and start to show dehydration symptoms. Early symptoms are headaches, dry eyes, drowsiness, loss of concentration, irritability. Muscle cramps are also a sign of inadequate fluid replacement and electrolyte loss, particularly calcium and magnesium. Even "Lactate threshold" - an indicator of maximal work performance ability is lowered which is not a good thing in high intensity, endurance competition. Thicker blood, fast heart rate, negative changes in blood pressure are other symptoms.

Don't wait until you are thirsty to decide to drink. Fluid replacement is part of a daily plan. Thirst is a sign - too late - of dehydration, performance is already impaired.

You actually lose significant fluid just sitting in an air conditioned car or office. Frequent drinks of water during a long automobile trip will reduce apparent road fatigue. The same applies to sitting at your desk. A friend has a water bottle holder mounted on the dash of car to encourage convenient hydration while driving.

One last point - cool beverages are absorbed better than room temperature or warm beverages.