

The FAR Reaching EFFECTS of DEHYDRATION

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At first glance a few key statistics related to water intake and composition are important to note: the human body contains roughly 11 gallons of water broken down into these fractional parts: blood is 85% water, muscle is 80% water, brain is 75% water and bones are 25% water.

With the value and percentage of water making up nearly 66% of the human body it plays a tremendously important role in normal physiological function(s). This is largely why dehydration, when present, can lead to a number of critical problems including: migraines, constipation and even kidney stones.¹ Lack of water in the body can also take a toll on the health of your BRAIN, affecting mood and overall cognitive and emotional function. When dehydrated a person may be more prone to feelings of fatigue, anxiety and irritability.

Dehydration Shrinks Your Brain

About three-quarters of your brain is water and when the body is dehydrated your brain volume actually decreases. It is this shrinking process to which medical researchers attribute dehydration headaches. Mild or temporary dehydration can alter the brain's function and impact mood as shown in a 2013 British Medical Journal study.² 20 healthy women in their mid-20s were fluid deprived for 24 hours. While no clinical pathology was observed in the biological parameters such as urine, blood and saliva, thirst and heart rate did increase and urine output was drastically reduced. As expected, the urine also becomes darker in color.

The authors of the study noted this, about mood effects in their subjects:

“The significant effects of (fluid deprivation) on mood included decreased alertness and increased sleepiness, fatigue and confusion. The most consistent effects of mild dehydration on mood are on sleep/wake parameters...”²

The good news here is that within 20 minutes of drinking some water, effects such as those detailed above are reversed. Dehydration-induced headaches are also rapidly alleviated once you rehydrate. Interestingly, cold water absorbs 20% faster than room temperature water, so to increase the speed of recuperation it would seem prudent to have chilled water for this recovery process.

A study from Harvard University found more than half of American children are dehydrated, which can have serious consequences for their health and academic performance 3, 4, 5. About a quarter of kids in the U.S. don't drink enough water, daily. Boys were 75% more likely to be low in hydration status as compared to girls. This apparent link shows that boys tended to select more sugary beverages than girls did.⁶

Impaired Driving Similar to Being Fatigued or Intoxicated

When your cognitive functions take a hit and your ability to concentrate declines, there can be serious problems that result when a driver takes the wheel. Research from Loughborough University shows drivers that were

dehydrated made twice the amount of errors during a two-hour drive compared to hydrated drivers, similar to driving drunk.^{7,8} For these tests, hydrated drivers drank 6.7 ounces of water every hour, compared to dehydrated drivers who received only 25 mL per hour.

As reported by the Daily Mail: During normal hydration tests, there were 47 driving errors. That number rose to 101 when the men were dehydrated – the same mistake rate as when drivers were either sleep deprived or at the drink-drive limit. The researchers...think dehydration leads to reduced brain activity as well as a drop in alertness and short-term memory...”⁹

The WHOLE BODY suffers when you're dehydrated

Dehydration is typically rated as mild, moderate or severe depending upon percentage of water loss the body experiences. There are quite a number of blood markers contained within our normal testing that can highlight this for you and your doctor. These include but are not limited to: RBC value variations (MCH, MCHC), electrolyte imbalances (Sodium, Potassium, etc.) and even changes in kidney panel values (BUN, Creatinine, etc.).

Other ways to evaluate your body for dehydration include:

- Urinary frequency – most people urinate between 4-7 times per day, depending on bladder size and amount of urine for release. If you urinate less than 4 times or not at all then you need to drink more water.
- Urine color - this is one of the easiest ways to determine your hydration status. The color of the urine is determined by concentration of waste in the fluid. The more water you have in your body for your kidneys to mix with waste products, the lighter in color your urine will be. You should be drinking enough water for your urine to be a light yellow color. Darker colors can mean that the kidneys are being forced to work too hard. While not a common finding among sedentary citizens, over-hydration can become a problem especially in endurance athletes if they consume way too much water. This situation can also create additional stress on the kidneys and other fluid regulatory pathways in their system.
- Odor – urine should be nearly odorless. The scent of the urine will be dependent on a few factors including hydration status, foods eaten in the past 24 hours and whether or not an infection is present. The more concentrated the urine is the stronger your urine will smell of ammonia.

An important note here is that medications and UTIs (urinary tract infections) can also change the color and odor of the urine. If you have an infection, urine may appear cloudy and/or tinged with blood. An abnormally sweet odor from your urine may indicate that you have a high level of glucose in your urine from an uncontrolled diabetic state. Other conditions that affect urine's odor can include liver and gall bladder disorders. Therefore having an in-office dipstick urine test done annually is suggested for anyone interested in maintaining a watchful eye on their health.

How much water is recommended? There are various ways to calculate this daily intake to the ounce. One that Take2Healthcare staff uses is this, drink 1 quart of clean, filtered (reverse osmosis) water for every 50 pounds of body weight per day. Do not exceed 3 quarts of day, regardless of body weight. Athletes and those working outside during summer temperatures may require more daily water to satisfy urine color requirements.

Staying on top of dehydration can prevent unnecessary driving accidents, brain imbalances and even the need for hospitalization. Getting your blood and urine analyzed on an annual or semi-annual basis can also allow you to stave off major health problems before they start.

Contact us if you'd like to learn more about what our testing (through board certified clinical nutritionists) can do for you...

References:

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