What the Latest Research Tells Us About Hydration

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Working under the hot sun, around searing pipes, over hot fluid tar, or in other sweltering settings is all in a day's work for some men and women. Add in some coveralls, heavy workwear, and PPE, then set them to work completing physical tasks all day and heat is most certainly going to be an issue.

Dehydration is the key risk when working in the heat, and it can creep up in severity before the more obvious symptoms start manifesting. In fact,

10-20% of your body water can be lost before headache and fatigue sound the alarm.

Before Thirst: 6 Key Signs of Dehydration Workers Should Know.

We need to pay attention to staying hydrated when we work, because it is all too easy to overlook. But to do that effectively, we need to understand how hydration works.

Hydration Basics

Let's take a trip back to high school biology class and review the basics.

Your body needs constant throughput of water to function properly. It is a component of basically every biological process, and our major constituent element – we are water (and a bit of other stuff). Our bodily machinery uses a large volume of water on a daily basis and that water has to be constantly replaced. Hot environments and hard work increase the water demand, as well as the rate at which we can become dehydrated.

Why does dehydration strike so readily? It might seem counterproductive for our bodies to continue expelling water as waste through urination and sweat even when dehydrated, but it is a medium for transporting waste products out of the body. Without enough water, that metabolic waste would accumulate in the blood, cells, and kidneys, creating an array of issues – some potentially serious.

Diuretics like caffeine add to the issue by chemically telling your body to excrete more sodium in the urine. And where sodium goes, so does water. Coffee, caffeinated soft drinks, and energy drinks might alleviate thirst in the short term but ultimately contribute to hypovolemic dehydration, though only in a relatively minor way.

Two Types of Dehydration

When the heat is on, we get thirsty, but the terms *"thirsty"* and *"dehydrated"* aren't interchangeable. Thirst is symptomatic – it describes the sensation coming from progressive dehydration. But the loss of body water itself manifests in two different basic forms: **hypovolemic** and **hypertonic** dehydration.

Hypovolemic Dehydration

Hypovolemic (*literally meaning "low volume"*) is a situation in which a person loses extracellular fluid volume until basic functions start to become impaired. In clinical

literature, this process isn't even considered true dehydration, since you're low on more than just water. Workers are likely to face this most common type since the major modes of water loss (*urination and sweating*) excrete both salts and water.

Electrolytes: What They Are and Why They Matter for On-the-Job Hydration

In the simple mechanical sense, hypovolemia means your heart has to pick up the pace to move the blood around your body as there is simply less of it to go around. Blood vessels constrict to increase the pressure of the fluid left in the vessels. Blood becomes thicker and harder to move, adding to the strain on your cardiovascular system. This all adds up to a condition that can spell trouble for your organs, and produce the telltale paleness, confusion, and a racing pulse as hydration decreases.

One of the simple tests for hypovolemic dehydration is to measure the capillary refill rate by squeezing a fingertip and measuring the time it takes for the color to return. Slow refill indicates a dehydrated state.

Hypertonic Dehydration

When water is diminished but salts stay the same, it can result in something called hypertonic dehydration. Too little water in the body results in an increased concentration of electrolytes like potassium and sodium (hypernatremia).

Hypernatremic depletion can be addressed by drinking water, but perhaps preferably by water with added electrolytes to help the balance return to normal levels.

Hydrate Smartly

While it's clear you have to proactively and deliberately deal with dehydration, there can be too much of a good thing. It's not a matter of just consuming all the fluids you can you can – glass after glass of water or sports drinks can contribute to a host of other problems.

Hyponatremia describes a condition in which electrolytes have been depleted and body water is out of balance with its salts. It results from the concentration of salts in your body becoming too dilute from excessive water intake. Again, in this case, you may continue to feel thirsty, but what the body really needs is to balance electrolytes by replacing those that were lost. Water alone may even exacerbate the problem by further flushing minerals from the body. *Electrolyte-enriched drinks* are useful in such a condition. They are formulated to replace the salts lost through sweat and urination.

Rethinking Eight Glasses of Water

The rule of thumb has long been that it takes eight glasses of water per day to properly hydrate. That's it. I'm not sure if those are metric or imperial glasses, but that was long the conventional recommendation.

Today, we know there is a whole lot of variation from one person to the next, and the old recommendation doesn't hold water anymore.

Furthermore, scientists now know that we gain a good amount of water from the food we eat, particularly fruits and vegetables, so hydration depends on more than merely drinking water.

It's Not All About Fluids: 5 Factors That Can Lead to Dehydration

People have such diverse body sizes, activity levels, environmental surroundings, and water utilization that a guess-and-check method seems to be a better recommendation to assess hydration needs. The best indicator: urine color.

Some employers have even taken to posting a urine color chart in bathrooms as a prompt to help workers monitor their own hydration. That doesn't really help those of us using the portable toilets, but at least there is some indication that employers are starting to pay attention to the risk from dehydration. That's progress.