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# The Role of Hydration in Managing Hypertension and Diabetes



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# Introduction

Workplace hazards vary across different industries and types of jobs. There is one, however, that can be present in any setting, regardless of the work being performed: dehydration.

The Mayo Clinic defines dehydration as the situation in which “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.”

While dehydration can occur from clinical causes such as vomiting and diarrhea, perspiration is the most common cause of dehydration in the workplace. Workers who don’t drink enough fluids to compensate for this loss will become dehydrated.

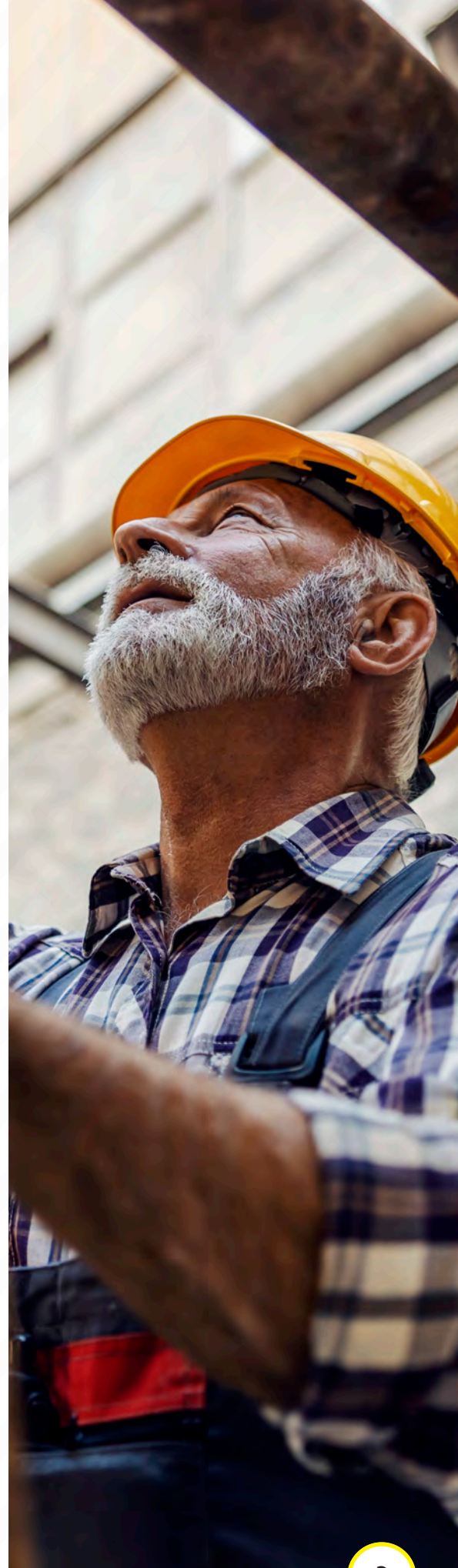
There are serious consequences regarding dehydration. One 2018 study found that subjects who experienced 2% body weight loss from dehydration suffered from significant cognitive and motor impairment - from simple motor disturbances to a decreased visual-motor tracking. These impairments, even if temporary, could have serious adverse effects on a worker’s safety and productivity.



## Dehydration and Blood Pressure

Dehydration can also lead to a rise in blood pressure due to the fact that our bodies retain more sodium when we do not drink enough water (with proper hydration, excess sodium leaves the body through perspiration). This increase in sodium concentration causes the body to shut down some of its capillary beds (the network of blood vessels where nutrients, gases, and waste are exchanged). As a result, the same volume of blood has to be moved through a smaller number of vessels, leading to an increase in the blood pressure.

In turn, elevated blood pressure places us at risk for heart attack, stroke, and other health conditions. Since dehydration is generally chronic, it should be considered and monitored as a workplace health and safety hazard. To avoid the health conditions and risks associated with dehydration, especially hypertension, employers and safety professionals should ensure that employees stay properly hydrated.





## Combating Dehydration with Electrolyte Drinks

Electrolyte drinks seem like a great choice for ensuring workplace hydration. Not only do they provide water, but they also supply the body with essential minerals. Electrolyte drinks are often encouraged as a mandatory companion alongside water to combat intense physical activity. In fact, many safety professionals now consider electrolyte replenishment products to be a significant part of a complete hydration plan for critical situations that involve physical exertion or during extreme activities.

Electrolyte drinks consist of water enhanced with minerals (such as sodium chloride and potassium) which are intended to replenish electrolytes lost through perspiration. Sweat contains a combination of these and other electrolytes, but sodium is the primary electrolyte present in a significant amount lost. On average, we can lose up to 1 gram of sodium (the equivalent of approximately 2.5 grams of salt) for every liter of sweat.

So far, so good. If these drinks are used only to compensate for the sodium that has been lost (assuming there isn't already an excess of sodium in the body), this should pose absolutely no problem.

## Electrolyte Drinks and Hypertension

Unfortunately, we have to complicate that simple picture. Recall that an excess of sodium in the body can lead to a rise in blood pressure. According to the Million Hearts 2022 Initiative, 47.3% of the US adult population has hypertension, a finding that is backed up by MedAlertHelp's claim (citing WebMD) that 30 to 50% of people who were hospitalized due to COVID-19 have hypertension.

These numbers seem to suggest that the percentage of hypertensive adults in the US population has increased dramatically in recent months. Prior numbers placed the prevalence at about 33%.

Providing hypertensive employees with high sodium replacement options will significantly increase sodium intake, which may in turn elevate their blood pressure even more. Given the updated statistics, it's safe to assume that every other employee has high blood pressure. Offering or recommending options with elevated sodium content to an entire workforce has the potential of putting a large number of employees at risk.

Dehydration encourages the body to retain more sodium, which in turn can increase an individual's blood pressure. It follows that drinking more water will encourage the body to eliminate more of the sodium through perspiration, thus contributing to lowering the blood pressure. For hypertensive employees, drinking an appropriate rotation of water might provide not only some much needed hydration, but also a decrease in blood pressure.





## Electrolyte Drinks and Diabetes

Many typical electrolyte drinks contain carbohydrates (sugars), which help increase the speed that water is absorbed in the intestines. This makes them more effective at hydrating our bodies than plain water. However, those carbs can contain a substantial amount of calories – in fact, a 20 oz bottle can pack as much as 30 grams of sugar and around 120 calories which is close to what you might get from a regular can of non-diet soda.

If you exercise hard for an hour or two and medical conditions aren't a concern, a formulation like this helps you stay hydrated and the calories absorbed will be surpassed by the calories you've burned. But employees who typically spend 8 to 10 hours on the job in hot conditions and lose 1.5 to 2 L of fluid per hour through perspiration will typically drink multiple servings, which can easily cause sugar consumption to add up. According to the FDA, the daily value for added sugar (in a 2000 calories/day diet) is 50 grams. Consuming a second bottle or serving may put an employee over their recommended daily value - and this assumption doesn't factor in their intake from their regular meals.





A worker can easily need to drink more than 10 L of fluid over the course of a full shift and, given the sugar content of most standard electrolyte drink formulations, it would be contraindicated to compensate for all or most of this water loss with this many carbohydrates.

It should be noted that dehydration can also lead to high blood sugar (since fluid loss increases the concentration of a solution), so the problem exacerbates if some of your employees have diabetes, which is statistically likely. According to the CDC, 26.8 million US adults (10.4% of the adult population) have been diagnosed with diabetes (with an estimated 7.2 million additional undiagnosed cases), while another 88 million adults (34.5% of the adult population) have pre-diabetes. In these cases, the best alternative is plain water supplemented with a sugar-free, low-sodium electrolyte solution.



## Conclusion

Due to HIPAA privacy concerns it may be impossible to ask your employees if they have hypertension, diabetes or other medical preconditions. But given the statistics, it is very likely that a number of your employees do. That's why it's important to consider these factors when selecting an appropriate electrolyte replenishment program for your workplace.

When looking for an electrolyte product to help your workforce, it's extremely important to consider the ingredient and nutritional information that meet the entire safety needs of your workers. Hydration solutions are critically important for many jobs, but a high-sodium product may cause more harm than good when given to workers dealing with hypertension.

Likewise, sugar-based formulations may encourage workers to stay hydrated by being flavorful and palatable, but for workers who are diabetic or pre-diabetic a beverage with a high concentration of sugar can have negative effects that could be avoided with no-sugar or low-sugar formulations.

Many electrolyte drinks are typically marketed as sports drinks, and there's a reason for that since they are designed for the intense physical training that athletes undertake and many times, the shorter timeframe they undergo the activity. Their contents reflect certain needs of those athletes, right down to the high sodium and sugar contents.

People performing labor-intense jobs do physically demanding work, they're in essence industrial athletes, but their jobs typically entail longer hours, more extreme conditions and a vast array of jobsite safety elements to consider. Therefore, employers should look for hydration solutions formulated specifically for the needs of the workplace and can handle them day-in and day-out. By opting for drinks that have lower sodium concentrations and making electrolyte solutions with low sugar content available for those who need it, employers can keep their workforce properly hydrated without placing hypertensive, diabetic, and pre-diabetic employees at risk.

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