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DRINK TO YOUR HEALTH:

ALL YOU NEED TO KNOW ABOUT HYDRATION

AN ERGODYNE WHITE PAPER



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// DON'T SWEAT IT

You don't have to work in Dry Beaver Creek, Arizona or Nowata, Oklahoma to know why water is a winner. During warm weather, we lose aqua even through simple, unconscious acts like breathing and walking around. Consider a hard day's work in warm weather, and it's no wonder adequate hydration is a daily concern for many workers.

Water plays an essential role in people's overall health. It helps the average person maintain a safe body temperature and assists in regulating our metabolism. According to the Mayo Clinic, "water flushes toxins out of vital organs, (and) carries nutrients to your cells ..."¹ The benefits of drinking water go beyond quenching thirst. Inadequate water intake can lead to serious health problems – up to and including death.

// DEHYDRATION DANGERS

Heat-related illnesses such as heat rash, heat cramps, heat exhaustion, and heat stroke are closely associated with a worker's hydration level.² Since heat stress is a widely recognized hazard, states including California^{3,3a} and Washington⁴ have established specific workplace drinking water requirements as a major part of heat stress workplace controls. These regulations compel employers to provide a combination of facilities, such as shade or rest areas; work practices, including breaks, emergency plans, and employee training; and, of course, readily available drinking water. OSHA standards for both general industry and construction activities, as well as various safety guidelines, mandate that adequate drinking water is available to workers at all workplaces and jobsites.^{5,6}

Dehydration risks are more commonly recognized for work performed outdoors in warm temperatures or for work in hot indoor environments like foundries, bakeries, boiler rooms, kilns, etc. But they also exist for those toiling away in indoor jobsites with poor airflow or workers who wear special, protective clothing – such as non-permeable HAZMAT suits – as they face additional challenges.

Still, experts say many workers in temperate environments don't stay sufficiently hydrated. Even cold environments present their own challenges, since cool, dry air rapidly absorbs moisture from breath and perspiration evaporates quickly. This could increase the risk of hypothermia under some conditions.

// THIRSTING FOR KNOWLEDGE

Workers should be able to recognize key signs of dehydration in themselves and others, including:

- » Thirst
- » Fatigue
- » Muscle Cramps
- » Nausea, Dizziness, or Confusion
- » Excessive Perspiration
- » Hot, Dry Skin (an inability to sweat)

A buddy system is one way to notice small changes in co-workers before symptoms escalate. Basic indicators of dehydration include thirst and a change in urine patterns. Since water is the main component of urine, infrequent urination and/or darker urine are both signs to increase water consumption. Water and weight loss are interconnected: losing a pound during work or exercise may present a loss of 16 ounces of water!

Since every person has a different body composition, it is important for individuals to be able to recognize changes from their "normal" condition, the side effects of any prescription meds they may be taking, and their medical conditions. These are potential issues that employees should be encouraged to discuss with their personal physicians.

// TOO MUCH OF A GOOD THING

If hydration is such a good thing, then more water must be better, right? Well, not exactly. The body loses one of its key electrolytes – sodium – through sweat. Drinking too much water during high intensity activities can dilute the sodium level in your blood, resulting in a condition called hyponatremia.^{7,8} Since sodium helps to regulate water levels in our cells, a rapid or sudden change in sodium concentrations can affect cellular pressure, resulting in a number of serious conditions – some of which are fatal.

In the workplace, hyponatremia may be brought on by drinking too much water or being overworked for too long.



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Symptoms of hyponatremia include:

- » Nausea and vomiting
- » Headache
- » Confusion
- » Loss of energy
- » Irritability
- » Muscle weakness, spasms, or cramps
- » Seizures

A person with signs of hyponatremia should immediately seek emergency medical care. Again, this condition can be further complicated by certain medical conditions and use of certain prescription medications. Workers under medical care or treatment should check with their doctors before engaging in hot or high-intensity work, or a change in this type of work, to see if they are at risk for overhydration or underhydration.

// VISIT THE WATERING HOLE

So, how much water does one actually need to consume? That answer varies depending on unique factors including age, physical size, personal health, work environment, etc.

It is also important to note the role of conditioning and acclimatizing to new work conditions or environments.⁹ Workers who may be new to a particular task, job, or even the country may need time to acclimate to their new work environment.

Many health and safety authorities recommend drinking water before exertion or exposure to hot or dry work environments, to avoid placing workers in a water deficit condition. Others advise people to drink whenever they feel thirsty, which requires a readily available supply of drinking water.

Published guidelines generally recommend budgeting a quart of water per hour of active work or exercise for an average adult. Many suggest distributing this intake amount over an entire workday. For example, drinking a cup of water every 15 minutes or so will ensure your body maintains a healthy level of hydration and helps to avoid a bloated feeling caused by drinking lots of water at once.

Extreme or unusual work situations may call for oversight by safety or medical staff, or even pre-placement health screening, in order to assess risk, and to monitor employee health.

Plain, cool water is the ideal choice of most hydration experts. California's standard defines cool as "cooler than the ambient temperature but not so cool as to cause discomfort." Sweetened and caffeinated drinks are less effective at replenishing lost fluids, and alcohol can dehydrate (workplace liability concerns aside).

// COOLING YOUR CREW

Employers can use any number of strategies to promote adequate worker hydration:

» **ACCESS TO WATER:** The most basic control, required by many health and safety regulations, is providing a readily accessible supply of cool, potable water. At fixed locations, installation of water fountains, bubblers, or coolers near break areas will encourage employees to drink more frequently. Note: taps and hoses used for drinking water must be separate from those used for washing or industrial purposes.

At remote locations, insulated coolers or a supply of bottled water should be provided. For those engaged in highly mobile activities, or working at heights, portable hydration packs ensure workers stay hydrated while performing their tasks.

» **PROVIDE AN INCENTIVE:** Additionally, employers can provide reusable water bottles as a constant, convenient reminder to drink when thirsty. Reusable water bottles also help to cut down on the waste of disposable containers.

» **SET UP SHELTER AND ENFORCE WORK BREAKS:** Providing readily available refuge from the elements is another strategy to reduce fluid loss. This means shade for workers, fans to circulate air, cooling stations in hot environments, heaters in cold environments, and hydration stations.

Changing shift schedules so employees don't work during the hottest or coldest parts of the day can reduce the risk of dehydration. In cold environments, "cooling down" isn't necessary – however, allowing time for hydration and rest is important, especially in temperatures and locations where water has to be protected from freezing.



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- » SUPPLY APPROPRIATE CLOTHING AND PPE: Wide-brimmed hats can block the sun's rays, and loose-fitting or vented clothing keep workers cool and reduce evaporative heat loss. Pay special attention to tasks that require impermeable or other protective gear that can accelerate sweating and water loss.

Absorptive or evaporative cooling aids, such as vests, bandanas, and helmet liners will aid in combating dehydration in hot environments. Wearing a moisture-wicking base or other layer while working in cold environments can help as well.

- » EDUCATE YOUR WORKERS: Training and awareness are essential. By understanding the risks of dehydration and taking preventative action before workers are exposed, employers can put in place emergency procedures for someone who may be suffering from conditions associated with over- or under-hydration. But more importantly, they can prevent these conditions.

Ultimately, proper hydration – on and off the jobsite – is one of the keys to living a healthy and productive life. Water may not be the most exciting beverage in the world, but it's the gas that makes your engine go. So, drink it if you got it. Cheers!

// NOTES, REFERENCES AND MORE

1. Mayo Clinic: Water: How much should you drink every day?
<http://www.mayoclinic.org/water/ART-20044256>
2. OSHA-NIOSH INFOSHEET: Protecting Workers from Heat Illness
<http://www.cdc.gov/niosh/docs/2011-174/>
3. State of California: Heat Illness Prevention
<http://www.dir.ca.gov/DOSH/HeatIllnessInfo.html>
- 3a. State of California:
Heat Illness Prevention Regulation Amendments
<http://www.dir.ca.gov/dosh/documents/Heat-Illness-Prevention-Regulation-Amendments.pdf>
4. State of Washington: Outdoor Heat Exposure
<http://www.lni.wa.gov/Safety/topics/atoz/heatstress/default.asp>
5. OSHA Safety and Health Topics: Heat Stress
<http://www.osha.gov/SLTC/heatstress/index.html>
6. OSHA Occupational Heat Exposure: Standards
<https://www.osha.gov/SLTC/heatstress/standards.html>
7. Mayo Clinic: Hyponatremia
<http://www.mayoclinic.org/diseases-conditions/hyponatremia/basics/definition/con-20031445>
8. Wikipedia: Hyponatremia
<https://en.wikipedia.org/wiki/Hyponatremia>
9. NIOSH Science Blog - Adjusting to Work in the Heat: Why Acclimatization Matters
<http://blogs.cdc.gov/niosh-science-blog/2014/07/14/acclimatization/>

// ADDITIONAL RESOURCES

NIOSH: Preventing Heat-related Illness or Death of Outdoor Workers
<http://www.cdc.gov/niosh/docs/wp-solutions/2013-143/>

NIOSH Safety and Health Topic: Heat Stress
<http://www.cdc.gov/niosh/topics/heatstress/>

OSHA Technical Manual: HEAT STRESS
http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html

Occupational Safety and Health Standards -
General Environmental Controls
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9790

OSHA Safety and Health Regulations for Construction - Sanitation
https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10624

New York Times: For Athletes, the Risk of Too Much Water.
http://well.blogs.nytimes.com/2015/08/26/for-athletes-the-risk-of-too-much-water/?_r=0



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THIS DOESN'T HAVE TO BE THE END OF THE ROAD, DEAR FRIEND.

Now that you've read our white paper on the year-round importance of hydration, drink in our full cup of Chill-Its® Hydration Packs, Bottles and more. Prepare to have your thirst for tenacious safety innovation quenched.

MORE QUESTIONS?

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