THE IMPORTANCE OF HYDRATION

VITAMINS • MINERALS • AMINOS

THE NEED FOR FLUIDS

Almost every bodily process requires water to function. The human body can survive for a far longer period without food than it can without water.

The body cannot produce water by itself, so any fluid lost must be replaced. The amount required depends on body size, metabolism, climatic conditions, the food we eat and activity levels. Fluid deficiencies will eventually lead to Dehydration, Heat Stress and Fatigue (DHF).

WHAT IS MILD DEHYDRATION?

- 50 to 60% of workers report to work in a mildly dehydrated state (1-4% of body fluid)
- Workers can sweat anywhere from 500ml to 2.5L per hour
- For every 1% increase in dehydration, the heart rate increases by 4 beats per minute

HOW DO WE LOSE FLUID?

The body may lose fluids in a variety of ways:

- Breathing
- Vomiting Diarrhea
- Urinating Sweating

The rate at which fluid is lost may be increased by intensified physical exercise, and hot or humid weather conditions.

THE HUMAN BODY IS 60-70% WATER

- Heart: 79%
- Skin: 64%
- Brain: 75%
- **Blood: 83%**
- Lungs: 80%
- Kidneys: 83%

WHAT IS DEHYDRATION?

Dehydration adversely affects work productivity, safety and morale.¹ Loss of fluids can affect cognitive abilities, reduce performance and slow reaction times. This can lead to reduced output and careless work practices which may contribute to serious accidents in the workplace.

At just 1% dehydration, productivity reduces by about 12%. At 2% dehydration, heart rate increases by 8 beats per minute (bpm) which increases perception of effort and reduces body performance by up to 30%.

At 3% dehydration, heart rate increases by 12bpm and performance is reduced by 25-50%. Reaction time is also slowed to levels similar to that of having a 0.08 Blood Alcohol Content (0.03 above the legal driving limit).

At 0.08 BAC (Blood Alcohol Content) drivers are five times more likely to be in a car accident. Similarly, the more dehydrated workers become, the more a Loss Time Incident (LTI) is likely to occur.

Dehydration occurs when fluids and nutrients are lost from the body at a faster rate than they are replaced. This results in an imbalance of the essential components of an efficiently working body.

Blood consists of 80-90% water and is responsible for the efficient transportation of vital nutrients around the body. Any imbalance reduces the efficiency of our bodies.

STAGES OF DEHYDRATION

Symptoms of dehydration are difficult to determine in the early stages, but can include dryness of the mouth and thirst, dry warm skin, dizziness, or cramping in the arms and legs.

As dehydration increases, signs may include:

- IrritabilityDrowsiness
- Skin inelasticity
- Facial flushing
- Irrational thinking
- Increased pulse rate
- Darker urine
- Passing less urine than normal
- Sunken eyes

FLUID REPLACEMENT

Drinking water replaces lost fluids but not essential salts, minerals, carbohydrates and amino acids needed to maintain optimum performance and productivity.

Sweat contains water, and essential salts known as electrolytes. In a thermally stressful environment like a mine site where workers can sweat anywhere from 1L-2.5L per hour, a specially formulated mixture of electrolyte salts is required to replace fluid losses and re-establish the correct fluid-electrolyte balance.

Electrolyte drinks increase water retention by 25%-40% compared with drinking water, assisting workers to avoid dehydration.

The addition of other ingredients such as Amino Acids will help the body to maintain stamina during prolonged physical activity.

 Drink 250mls of water every 15 minutes in warm environments

 Outdoor Workers: For every 3 cups of water, drink 1 cup of THORZT (3:1)

Indoor Workers: For every 6 cups of water, drink 1 cup of THORZT (6:1)

Increase electrolyte intake when experiencing extreme sweating

HYDRATION GUIDE

The following chart is a guide that outlines when to hydrate based on the colour of your urine. If your urine matches the colours numbered 1, 2, or 3 you are hydrated, but keep drinking fluid. If your urine matches the colours numbered 4 through 8 you are dehydrated and need to drink far more fluid.



Disclaimer: This chart is designed to be a guide only. Consider seeking medical advice if urine colour falls within 7 - 8 range. Vitamin supplements, alcohol and certain diets may affect urine colour.

Fluid requirements vary remarkably between workers and the actual task at hand. Fluid losses are affected by:

- Genetics: Some people innately sweat more than others
- Body size: Larger people tend to sweat more than smaller people
- Fitness: Fitter people sweat earlier in exercise and in larger volumes
- **Environment:** Sweat losses are higher in hot, humid conditions
- Work Intensity: Sweat losses increase as work intensity increases
- Lifestyle Factors: Diet, alcohol consumption etc.

Each kilogram (kg) of weight lost is equivalent to approximately one litre (L) of fluid. During hot weather we should be drinking fluid constantly, even if we are not thirsty.

	BWL	%DEHYDRATION	FLUID DEFICIT
Dehydration is calculated as Percentage Body Weight Loss (BWL): 1%BWL = 1% Dehydration The table shows Percentage Dehydration calculations based on an 80kg adult male.	0.8kg	1%	0.8L
	1.6kg	2%	1.6L
	2.4kg	3%	2.4L
	3.2kg	4%	3.2L

KNOW WHEN TO REHYDRATE

6 WARNING SIGNS OF DEHYDRATION IN THE WORKPLACE

People who work in industrial workplaces are always at risk of dehydration. With constant exposure to high heat and with extensive physical exertion required for their jobs, they face the hazard of losing too much body fluid and electrolytes. If no treatment is provided, simple dehydration may then escalate into a more serious condition.

But how will you know that you are experiencing dehydration? When would you need to rehydrate and replenish your electrolytes? Does feeling thirsty mean you are dehydrated? Well, to answer all these questions, we have compiled 6 warning signs of dehydration that you should watch for:

1. Heavy Sweating

While sweating normally occurs, especially if you are engaged in a physically intensive job, sweating out a lot of fluid may be a sign that you are getting dehydrated and fast. If this happens, make sure to replenish by drinking water or better yet, an electrolyte-formulated drink.

2. Dark Urine

You should look both on the regularity of your urination and the colour of your urine. If you haven't gone to the bathroom for about 2 hours, this means you haven't drunk any water. Also, if your urine appears darker like apple juice, instead of being pale, you may be dehydrated. However, this is not always the case as vitamin food supplements, alcohol and certain diets may also affect your urine colour. You can check out our hydration guide for a clearer picture of urine colour assessment.

3. Dry Mouth and Skin

If your mouth feels dry and sticky, this means that you are not drinking enough fluids for the day. Similarly, if your skin seems to be dry and has lost some elasticity, it is a clear sign that you are losing a lot of fluid inside your body. Make sure to rehydrate regularly all throughout the day to avoid these symptoms.

4. Dizziness

If you are starting to feel woozy and lightheaded while doing your work, it could be the effects of a dropped blood pressure due to being dehydrated. Remember that your blood is made up mostly of water. Thus, if you lose a lot of water without replenishment, you may feel dizzy and at worst, you'll become confused.

5. Headache

When dehydrated and with a dropping blood pressure, your body will have a hard time pumping blood and oxygen to your brain. This will then result into a headache. If this happens, make sure to take a break from what you are doing and rehydrate. Do not force your body to continue working as long as the headache stays to avoid further complications.

6. Confusion and Loss of Focus

Your brain is made up of more than 70% water. Thus, if you are dehydrated, your brain cells and nerves may not function properly. Short loss of memory and poor mental concentration may occur which can then result to poor work performance. Loss of proper focus may also result to accidents in the workplace that can cause serious injuries.

There is only one, effective way to counteract the effects of dehydration and prevent further complications. That is by replenishing the lost fluid from your body including the electrolytes.

HEAT STRESS MANAGEMENT

7 FACTORS OF A HEAT STRESS MANAGEMENT PLAN

There are numerous industries in which workers are required to work in hot conditions. Among the most common are mining, construction, and manufacturing. It is the job of safety professionals, managers and employer's working in these fields to outline a management plan that will protect their people from injuries or illnesses caused by heat stress. This will also help ensure the efficiency of operations which translates to maximum productivity.

However, a heat stress management plan should be comprehensive for it to be effective. It should cover all the factors that contribute to heat stress and the steps needed for prevention or treatment.

1. Education and Training

A comprehensive plan should be able to pinpoint an effective way to disseminate information about heat stress. Workers should be educated about the hazards of accumulating body heat due to working in a hot workplace, including the possible symptoms or signs to watch out for. There should also be trainings geared towards teaching the workers on what to do when heat stress strikes or on how to prevent it from occurring.

2. Workforce Monitoring

Heat stress management guidelines should also include the monitoring of every member of the workforce who might be exposed to high levels of heat. Managers or supervisors should be knowledgeable of the current state of their workers to know who are vulnerable. It is also important to know those who have medical conditions that can worsen due to heat stress.

3. Work Rate Monitoring

The bigger the workload a worker handles, the faster the accumulation of body heat. Thus, the rate of work performed by each member of the workforce should also be monitored. It is important to make sure that no one is overworking to avoid heat stress. Implementing scheduled resting periods will also be helpful.

4. Work Environment Monitoring

In addition to monitoring both the workforce and the work rate, it is also crucial to watch over the work environment. The level of heat and humidity should be kept on check so that adjustments on the workloads and resting periods can be made if necessary. Knowing the workplace environment can also help in creating a hydration policy for the workers.

5. Heat Acclimatisation and Physical Fitness

With permanent exposure and time, the human body has the ability to adapt to the high levels of heat in the workplace. This process is known as heat acclimatisation – which can be used by safety professionals or managers to enable workers to be resistant to hot and humid environments. Furthermore, being physically fit through regular physical activities that results in high sweat rates are proven to increase heat tolerance.

6. Body Cooling Strategies

The most effective way to avoid or treat high body heat is to cool it down. The strategies include wearing cooling vests, designating PPE-free areas, ingestion of crushed ice and proper hydration through electrolyte drinks.

7. Rest and Nutrition

Post-shift recovery is also important for workers who are always exposed to high levels of heat. Thus, they should be getting enough rest not only during the middle of the working hours but after each day of work. They should also eat the right food to recover their energy and their lost electrolytes.

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