



COMMONWEALTH of VIRGINIA

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Hydration and Dehydration Health & Safety Alert

Hydration

Getting enough fluids every day is important for good health and wellness. The body requires fluids to work properly and the body's needs are met primarily through the consumption of water and other non-caffeinated beverages. Daily fluid intake (total water) is defined as the amount of water consumed from foods, plain drinking water, and other non-caffeinated beverages. Daily fluid intake recommendations vary by age and gender (Mayo Clinic, 2020). So how much fluid does the average, healthy adult living in a temperate climate need? The National Academies of Sciences, Engineering, and Medicine (2005) determined that an adequate daily fluid intake is:

- 15.5 cups (3.7 liters) of fluids for men
- 11.5 cups (2.7 liters) of fluids a day for women

These recommendations cover fluids from water, other non-caffeinated beverages and food. About 20 percent of daily fluid intake usually comes from food and the rest from beverages. Consumption of adequate fluids:

- Helps to keep the body's temperature within normal range (97.0 to 99.0) (Cleveland Clinic, 2020).
- Lubricates and cushions joints.
- Protects and acts as a shock absorber for organs, muscles, tissues and bones.
- Rids the body of wastes through urination, perspiration, and bowel movements.

Foods High in Water Content

About 20% of our daily intake comes from fluids consumed through the foods we eat (Guelinckx, et al., 2018). Broths, soups, stews, chili, smoothies, milkshakes, ice cream, popsicles, jello, applesauce, vegetables, seafood, pasta, beans, fruits and fruit cups, can all contribute to daily fluid intake. The table below list foods that have the highest water content.

Food	Water Content
Cucumbers	96%
Celery	96%
Squash	96%
Pineapple	95%
Blueberries	95%
Iceberg Lettuce	95%
Tomatoes	94%
Zucchini	94%
Spinach	93%
Pears	92%
Broccoli	90%
Grapefruit	90%
Melon	89%
Brussel sprouts	88%
Oranges	86%
Apples	85%

Dehydration

What is Dehydration?

Dehydration is a condition caused by the loss of too much fluid from the body. Body water is lost through the skin, lungs, kidneys, and GI tract. Dehydration occurs when the loss of body fluids is greater than the volume of fluids being taken in (i.e. intake versus output), and the body does not have enough fluids to work properly (Mayo Clinic, 2019). When too much water is lost from the body, the organs, cells, and tissues fail to function as they should, which can lead to dangerous complications. If dehydration isn't corrected immediately, it could cause shock or death (Healthline, 2019).

Causes of Dehydration

People with ID/DD (intellectual and developmental disability) are more likely to experience: loss of appetite; nausea and vomiting; poor oral health; and/or they may lack the ability to chew food due to medical conditions; all of which can elevate their risk of dehydration. In addition, individuals who need assistance with drinking or eating and those who have an impaired response to thirst impulse are more likely to experience dehydration.

- Diarrhea and vomiting. Chronic diarrhea or acute diarrhea (diarrhea which comes on suddenly and violently) can cause a severe loss of water and electrolytes in a short amount of time. If vomiting occurs along with diarrhea, the individual will be at even greater risk of dehydration.
- Illness, including fever, infections, or other common illnesses, can increase the potential to become dehydrated. The severity of dehydration can increase if fever in addition to diarrhea and vomiting are present.
- Excessive exertion and perspiration. Loss of fluid occurs in the body with sweating. When a person is active and fluids are not replaced throughout the activity, dehydration can occur. Hot, humid weather increases the amount a person perspires and increases the amount of fluid that is lost.
- Increased urination. This may be due to undiagnosed or uncontrolled diabetes. Certain medications, such as diuretics and some blood pressure medications, also can lead to dehydration, generally because they cause increased urination.
- Advanced age reduces a person's ability to retain water and the thirst response.

Risk Factors for Dehydration

Dehydration can happen to anyone. However, there are groups of people who are considered at higher risk than the general population.

Infants and Young Children cannot verbalize thirstiness, nor obtain a drink when they are thirsty. Children also lose higher amounts of fluids when they suffer a fever or other symptoms such as diarrhea and vomiting. Older children sometimes do not want to stop enjoying activities long enough to get a drink.

People with chronic medical conditions are at risk for dehydration. Diseases such as diabetes and chronic kidney disease increase the risk for dehydration (Mayo Clinic, 2019). Dysphagia also increases the risk for dehydration. In a study conducted among people suffering with swallowing difficulties, the prevalence ranged from 44%

to 75% depending on the population, setting, and criteria used to define dehydration (Reber, Gomes, Dahn, Vasiloglou, & Stanga, 2019).

Age is a component of dehydration. Immobility decreases intake of fluids due to the inability to obtain fluids independently or sometimes elderly individuals are completely dependent upon others. Fluid reserves can decrease as well as the thirst mechanism is less acute (Mayo Clinic, 2019). Age along with increased chronic illnesses and medication use make for the perfect storm of dehydration. A six-month study of nursing home residents revealed that 2/3 of residents had a previous diagnosis of dehydration (Reber et al., 2019). As people age, oral muscles changes and the ability to produce saliva decreases (Chadwick & Jolliffe, 2009).

Medication regimen also plays a role in dehydration. Common drugs that compound the risk of dehydration diuretics, laxatives, and chemotherapy. Diuretics work by removing fluid and salt from the body through urination. Diuretics are prescribed for medical conditions such as hypertension, congestive heart failure, or edema. An example of diuretics (not all-inclusive) Lasix, Diuril, Chlorothiazide.

Laxatives provide temporary relief of constipation, but can put an individual at greater risk for dehydration. Generally, laxatives do not remove excessive fluid from the body if taken as prescribed. However, when taken in much higher dosages they cause diarrhea. Example of laxatives (not all-inclusive) include Docusate and Dulcolax.

Chemotherapy drugs can cause vomiting and diarrhea. Chemo affects everyone differently. It depends on the regimen and amount of drugs prescribed to treat the disease. Severity of side effects may vary (Bossi, et al., 2018).

Level of mealtime supports plays a role in dehydration. A study of IDD individuals receiving mealtime supports revealed that 11.5% of the individuals had dysphagia; and 39% lacked the skills needed to eat independently; which included being unable to get food and drink to their mouths; abnormal eating; stuffing the mouth; food refusals or limited food choices (Ball et al., 2012). Other factors in the IDD population that affected the ability to consume food or drink were dentition, dementia, stroke, epilepsy, and gastric issues (Chadwick & Joliffe, 2009). The ability of caregivers to manage mealtime supports for risky behaviors (such as overstuffing the mouth) is critical in nutritional and hydration status (Ball et al., 2012).

Gastrostomy Feeding Tube (G-Tube) nutrition is commonly used to increase calorie intake, improve hydration, increase weight gain, and improve quality of life for individuals with intellectual and developmental disabilities. However, it can place individuals at risk for dehydration if the amount of fluids are not adjusted during times of illness. Hydration should be reviewed and adjusted accordingly by the dietitian

and/or PCP if the individual is experiencing fever, infections, wound healing, and gastrointestinal upset. Hydration protocol along with nutrition and routine will ensure that individuals are receiving the recommended hydration calculated by the dietitian (Parris, McCray & Copland, 2019).

People who spend time outside in hot weather are at risk for dehydration. The skin's function and purpose is to sweat and then evaporate to cool off the body. When the outside air is hot and humid, the skin cannot function properly to cool off, thus the body's temperature rises. This produces the risk for a heat-related illness. Use caution when individuals are out in warm or hot weather. Many individuals with intellectual and developmental disabilities cannot verbalize thirst, and many do not have the ability to obtain a drink independently. Individuals rely on staff to provide hydration and recognize when they need to move to a cooler environment. Some individuals with genetic disorders or some type of brain injury or damage (e.g. cerebral palsy, traumatic brain injury, etc.) may not have the ability to regulate their body temperature due to the area of the brain that is affected and therefore they may be at high risk for dehydration (Osilla & Sharma, 2019).

Factors which can contribute to Dehydration Include:

- Physical Exertion (the more exertion, the greater the risk).
- Warm or hot weather exposure.
- Prolonged sunlight exposure.
- Fever (body temperature over 101 degrees).
- Vomiting.
- Diarrhea.
- Excessive urination.
- Consumption of certain medications (e.g. diuretics, blood pressure medications, antihistamines, migraine medications, etc.).
- Age (infants and the elderly are at higher risk).
- People with chronic diseases (e.g. diabetes).
- Individuals who are medically fragile.

Signs and Symptoms of Dehydration in Infants and Young Children *(Any Sign or Symptom of Dehydration in an Infant or Young Child is An Emergency)*

- Dry mouth and tongue.
- No tears when crying.
- No wet diapers for three hours.
- Sunken eyes, cheeks.
- Sunken soft spot on top of skull.
- Listlessness or irritability.
- Darkened, yellow, concentrated, or strong smelling urine (Check the color of the urine in the toilet, or in their diaper, if the individual is not yet potty-trained).

Signs and Symptoms of Mild or Moderate Dehydration in Adults

- Thirst.
- Dry or sticky mouth.
- Not peeing very much.
- Dark, yellow, concentrated or strong smelling urine (Check the color of the urine in the toilet, or in adult brief, if the individual is incontinent.)
- Dry, cool skin.
- Headache.
- Muscle cramps.

Signs and Symptoms of Moderate to Severe Dehydration in Adults

- Lack of urination.
- Very dry skin.
- Feeling dizzy.
- Rapid heartbeat.
- Rapid breathing.
- Sunken eyes.
- Sleepiness, listlessness, lack of energy, confusion or irritability.
- Fainting.
- Severe headache.
- Loss of consciousness.

The color of urine is a strong indicator of hydration or dehydration. The lighter the urine, the more hydrated the individual will be because the intake of fluids consumed has diluted the urine. The darker the urine, the more dehydrated the individual will be because the intake of fluids consumed has concentrated the urine.



In the picture below, the urine in the toilet farthest left is the most diluted, indicating the individual is well-hydrated. The urine in the toilet farthest right is the most concentrated, indicating the individual is dehydrated.



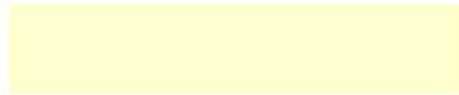
The handy chart below, can help you to determine if an individual is well-hydrated or dehydrated. In addition to color, the more concentrated urine is, the stronger smelling the urine will be. If an individual's urine looks a little concentrated, but they are not having any other symptoms, you should schedule an appointment with the individual's PCP as soon as possible. When scheduling the appointment, make sure the scheduler knows the individual's urine looks like he/she might be dehydrated. They may direct you to bring the individual in immediately, or they may direct you to take the individual to the ER for diagnostic testing. **If the individual's urine is concentrated and it looks like he/she may be dehydrated and he/she has any other symptoms of dehydration (headache, vomiting, diarrhea, listlessness, etc.), you need to call 911 immediately.**

This urine color chart is a simple tool you can use to assess if you are drinking enough fluids throughout the day to stay hydrated.

1



2



3



4



5



6



7



8



If your urine matches the colors numbered 1, 2, or 3 you are **hydrated**.

If your urine matches the colors numbered 4 through 8 you are **dehydrated** and need to drink more fluid.

Be Aware! If you are taking single vitamin supplements or a multivitamin supplement, some of the vitamins in the supplements can change the color of your urine for a few hours, making it bright yellow or discolored. If you are taking a vitamin supplement, you may need to check your hydration status using another method.

Your Nose Knows!

While some foods, like asparagus, can cause your urine to smell different, a strong smelling odor can also be a sign of dehydration.

Serious Complications from Dehydration

Complications of dehydration depend on the severity at which the individual is dehydrated. Individuals with mild dehydration may only require drinking water to replace fluids lost. Sports drinks can help restore electrolytes like potassium and salt balance lost in sweat and/or from medical issues such as diarrhea or vomiting (Johns Hopkins, 2020). However, be careful of carbohydrate content if the individual has diabetes. The label below demonstrates the amount of added sugars contained in some sports drinks.

Notice the difference in calories!

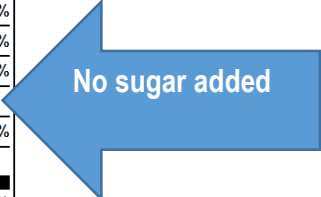
Nutrition Facts	
1 serving per container	
Serving Size	20 fl oz (591 mL)
Amount Per Serving	
Calories	140
<small>% Daily Value*</small>	
Total Fat 0g	0%
Sodium 270mg	12%
Total Carbohydrate 36g	13%
Total Sugars 34g	
Includes 34g Added Sugars	69%
Protein 0g	
Potassium 80mg	0%
<small>Not a significant source of saturated fat, trans fat, cholesterol, dietary fiber, vitamin D, calcium, and iron.</small>	
<small>*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.</small>	

WATER, SUGAR, DEXTROSE, CITRIC ACID, SALT, SODIUM CITRATE, MONOPOTASSIUM PHOSPHATE, GUM ARABIC, GLYCEROL, ESTER OF ROSIN, NATURAL FLAVOR, YELLOW 5



Nutrition Facts	
Serving Size	1 Bottle (591 mL)
Amount Per Serving	
Calories	5
<small>% Daily Value*</small>	
Total Fat 0g	0%
Sodium 270mg	12%
Total Carbohydrate 2g	1%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 0g	
Potassium 80mg	0%
<small>Not a significant source of saturated fat, trans fat, cholesterol, dietary fiber, vitamin D, calcium, and iron.</small>	
<small>*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.</small>	

WATER, CITRIC ACID, SODIUM CITRATE, SALT, MONOPOTASSIUM PHOSPHATE, MODIFIED FOOD STARCH, NATURAL FLAVOR, SUCRALOSE, GLYCEROL, ESTER OF ROSIN, RED 40, ACESULFAME POTASSIUM, CARAMEL COLOR



Heat injury. If an individual is exercising vigorously and perspiring heavily and their fluids are not being replaced, it may result in a heat injury, ranging in severity from mild heat cramps to heat exhaustion, or potentially life-threatening heat stroke.

Urinary and kidney problems. Prolonged or repeated bouts of dehydration can cause urinary tract infections, kidney stones and even kidney failure.

Seizures. If an individual is dehydrated, their electrolytes (potassium, sodium, etc.) are out of balance as well. Dehydration lowers the seizure threshold, which can result in an increase in the number of seizures an individual is experiencing. Individuals, who have an increase in seizure activity, may be experiencing dehydration (Nardone, Brigo & Trinko, 2016).

Low blood volume shock (hypovolemic shock). This is one of the most serious, and sometimes life-threatening, complications of dehydration. It occurs when low blood volume causes a drop in blood pressure and a drop in the amount of oxygen in the body.

When to Seek Help

Call your health care provider, go to the emergency room, or call the local emergency number (911) if you have any of the symptoms above.

Awareness of Risk

Awareness of risk is important, be alert to indicators or changes that might trigger dehydration and report those changes immediately. Anyone can become dehydrated, but the condition is especially dangerous for young children, older adults, medically fragile individuals, and/or individuals with chronic disease (diabetes, kidney disorders, seizures, etc.), and can become life-threatening very quickly.

It is important to include risk-lowering interventions into an individual's service plan (ISP) for those at high risk for dehydration. A PCP may write an order for an intake/output record for those individuals with a history of dehydration and/or hospitalization due to dehydration. Their intake/output record may also include instructions for visualizing the individual's urine either in the toilet or in their adult brief, if the individual is incontinent. For those at high risk, scheduling a consultative review with the individual's PCP, in order to specifically address lowering the risk for dehydration, is a good first step.

Things Caregivers Can Do to Lower the Risk of Dehydration

The challenge with maintaining adequate hydration is to getting individuals to drink more water or fluids. There are many reasons individuals may inadvertently decrease their fluid intake. Individuals with orders for thickened liquids may refuse to drink them because thickening agents may cause the mouth to feel coated. The Mayo Clinic Health System (2018) offers the following suggestions to increase fluid intake:

1. Encourage individuals to drink plenty of non-caffeinated fluids throughout the day.
2. Increase fluid intake when the weather is warm, hot and/or if individuals are physically exerting themselves.
3. Increase fluid intake if an individual is ill.

(If an individual is unable to eat or drink, seek help immediately.)

4. Add flavor to water - this may be in the form of flavor packets, a slice of cucumber, or a fruit wedge (lemon, lime, orange, grapefruit, etc.).
5. Make drinking a part of the schedule. Make getting a drink a routine event after every bathroom break and offer a cup of water with medications.
6. Encourage more fruits and veggies: many fruits and vegetables have a high concentration of water. Examples include cucumbers, watermelon, melons, squash, zucchini, lettuce, celery, etc.
7. Make fluid intake a game, use a wall chart to keep track of who can drink their recommended fluid intake for each day. People love a challenge! There could even be a small reward at the end of the day.
8. Encourage variety. We all enjoy choosing our favorite flavorful drinks. Alternating beverage choices with water helps individuals comply with a hydration plan.
9. Travel cups/bottles help keep hydration within reach. This also curbs the temptation of purchasing drinks such as soda. (Mayo Clinic Health System, 2018).
10. Limit sun exposure, (especially during summertime), when there is a higher risk for dehydration and heat stroke.
11. If an individual is on an outing in warm or hot weather, (in direct sunlight), schedule frequent hydration breaks in the shade or in air conditioned buildings to lower the risk of dehydration.
12. Pay very close attention to fluid intake in children, older adults, those with chronic health conditions, or those individuals who are medically fragile.
13. Anyone with a fever, vomiting, or diarrhea should drink plenty of fluids.
(If an individual is unable to eat or drink, seek help immediately.)
14. DO NOT wait for signs of dehydration. If an individual is experiencing vomiting and diarrhea, and/or if you think an individual may be experiencing dehydration or is having bouts of dehydration, contact the individual's PCP (primary care provider) **immediately**. Do this before the person becomes severely dehydrated.
15. Severe dehydration will require fluid replacement by IV solution. Recognition of signs of dehydration may prevent a hospitalization. **Severe dehydration is a serious medical condition which should be treated immediately** (Johns Hopkins, 2020).

Resources

- Mayo Clinic information on urine color: <https://www.mayoclinic.org/diseases-conditions/urine-color/symptoms-causes/syc-20367333>
- Cleveland Clinic urine infographic: <https://health.clevelandclinic.org/what-the-color-of-your-urine-says-about-you-infographic/>

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