**Hydration @ MIT**

**Why is hydration so important?**

Nearly 60% of our body’s weight is made-up of water, so it is no surprise that hydration is essential to life. Water is crucial to almost every body function, including body temperature regulation, nutrient metabolism, organ function, waste elimination, physical performance, and cognitive functioning.

Since water is so central to the human body, the consequences of having too little can range from uncomfortable to devastating symptoms. The state of using and/or losing more water than you take in is called **dehydration**.

You can become dehydrated for many reasons such as excessive respiration (talking a lot or breathing quickly), sweating (during sport or a humid day), vomiting or diarrhea, and alcohol consumption. It is important to remember that you may need to drink more when experiencing these circumstances.

Some signs and symptoms of dehydration are listed below.

- Headache
- Dizziness
- Fatigue
- Thirst
- Dry or sticky mouth
- Darker yellow urine
- Dry, cool skin
- Muscle cramps
- Fast heartbeat
- Fast breathing
- Irritability or confusion

**Dehydration Influences Athletic and Academic Performance**

Dehydration impairs your ability to function at optimum mental and physical capacity. Even mild to moderate levels of dehydration—a loss of 1.5-2% of body mass—will negatively impact your performance in these areas. Cognitive effects of mild dehydration include decreased reaction time, lessened short- and long-term memory capabilities, shortened attention span, poorer arithmetic ability, and weaker perceived discrimination. In addition, you will experience enhanced fatigue and moodiness. In sport, moderate dehydration decreases overall performance, including consequences like reduced endurance and strength. Researchers have shown as much as a 45% reduction in high-intensity exercise capacity with a 2.5% loss of body weight from dehydration.

To prevent these ramifications of dehydration you need to remember to drink hydrating fluids even when you do not feel thirsty. Our natural thirst response does not initiate until we are already 1-2% dehydrated, so to prevent the possibility of even slight intellectual and physical decline, drink up!

**Natural Response to Dehydration**

Dehydration can be serious; our bodies have innate physiological mechanisms to correct dehydration. Our kidneys—the chief organ in charge of fluid status—senses dehydration mainly through plasma sodium levels and, to a lesser extent, through blood volume. When sodium is too low, a state called *hyponatremia*, our brains secrete Antidiuretic hormone and stimulate an increased thirst response. These events collectively cause our kidneys to retain water and make us thirsty to consequently drink more fluid. Both these mechanisms safeguard the body from becoming severely dehydrated.
**How much liquid should I be drinking?**

According to the recommendations made by the Institute of Medicine (IOM), men should be drinking **13 cups (~3 liters)** and women, **9 cups (~2.2 liters)** of beverages per day. These IOM recommendations are not individualized, but they are a good place to start. On certain days or at certain times, like on a very humid or cold day, or when you have sweat a lot, you will need to drink more fluids than the IOM suggests to achieve adequate hydration.

An alternative, and perhaps easier way to conceptualize how much fluid you need to drink each day is to use the following formula: **Drink ½ of your body weight in ounces.**

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\text{Bodyweight (lbs.)} \times 0.50 = \# \text{ of ounces you should drink per day}
\]

(Example: 140lbs x 0.50 = 70lbs. This 140lb individual should drink 70 ounces per day to stay hydrated)

**Caution:** While adequate hydration is crucial to health, it is possible to over-hydrate. Over-hydration occurs when the body takes in or retains more water than it excretes, leading to electrolyte imbalances (i.e. sodium levels are diluted), which prevent body cells from functioning properly. Over-hydration is most common in individuals with kidney malfunction, however you should still be careful not to overdo it even if your kidneys are healthy. Always keep your personalized recommendation in mind.

**Tips for staying hydrated at MIT**

1. **Utilize reusable water bottles** – Having one with you every day ensures access to water wherever you are and FREE refills.

2. **Drink a glass of water at every meal** – This will get you in the habit of drinking even when you’re not feeling thirsty, which will ultimately prevent dehydration.

3. **Add natural flavoring** - Lemon or other fruit slices, and herbs, like basil and mint, can add a refreshing boost to your drink!

4. **Eat food with high water content** - Examples of fruits with a lot of water are watermelon, cantaloupe, grapefruit, peaches, and strawberries. High water content vegetables include broccoli, cabbage, cucumber, zucchini, celery, tomatoes, and peppers.

5. **Track the amount of fluids you drink each day** - Write down when, what, and how much you drink in a day, to make sure you are drinking the recommended **13 cups** (men) or **9 cups** (females) of beverages per day.

Resources: