Revised 5/05 – Laurel Frishman

HYDRATION! HYDRATION! HYDRATION!

(Note: I have used the word "run" to mean any vigorous exercise session, be it running, walking, hiking, biking, etc.)

Fun Facts about Water

• 75% of Americans are chronically dehydrated.
• In 37% of Americans, the thirst mechanism is so weak that it is often mistaken for hunger.
• Even MILD dehydration will slow down one's metabolism as much as 3%.
• One glass of water will shut down midnight hunger pangs for almost 100% of the dieters studied in a University of Washington study.
• Lack of water is the #1 trigger of daytime fatigue.
• Preliminary research indicates that 8-10 glasses of water a day could significantly ease back and joint pain for up to 80% of sufferers.
• A mere 2% drop in body water can trigger fuzzy short-term memory, trouble with basic math, and difficulty focusing on the computer screen or on a printed page.
• Drinking 5 glasses of water daily decreases the risk of colon cancer by 45%, plus it can slash the risk of breast cancer by 79%, and one is 50% less likely to develop bladder cancer.

Overview of Hydration

Since the body is approximately 80% water, water plays a vital role in every bodily function and in every cell. If the body is not fully hydrated, even by a small percentage, optimal function will not be achieved.

What Is Water Good for in the Body?

- Disburses nutrients around the body
- Expels toxins
- Regulates body temperature
- Aids in concentration
- Enhances physical performance
- Enhances mental performance
- Prevents headaches
- Prevents premature fatigue allowing one to exercise longer, more comfortably
- Controls weight by spurring metabolism (aiding liver function)
- Plays a roll in controlling hypertension (high blood pressure)
- Plays a vital role in overall well being and fitness

Bottom line...if you are feeling irritable, cranky, short-tempered, tired, sluggish, hungry, or generally out of sorts, you may just be dehydrated. Try swigging 16 ounces of water and see if it doesn't make you feel better.

What Happens When I Exercise?

As you burn calories, heat is generated and sweating occurs to cool off. Fluid is also lost through respiration. During a one hour run (workout), the body can lose 2 quarts of sweat depending on weather and intensity. Body efficiency is lessened when sweating and blood thickens, the heart pumps harder, slowing oxygen and nutrients to the muscles.

Proper hydration is critical especially in hot and humid weather, as the water cools the body, reducing the chance of heat stroke and heat exhaustion. Symptoms of heat stroke and exhaustion can by dizziness, fatigue, nausea and muscle cramps. Don't rely on thirst alone! If it's warm outside and you plan to exercise, plan to drink to replenish.

How Much Should I Drink?
On a normal day, the body loses about 2 quarts of water at rest, through respiration and perspiration. When exercising, the body loses about 10 ounces every 20 minutes. It is recommend that we drink 1/2 to 2/3 of an ounce of water daily per pound of body weight. Example, a 150-pound person at rest should drink approximately 75 ounces of water per day. If this same 150-pound person exercises, the intake should be about 100 ounces.

Drink several cups of water 10-15 minutes before exercising. Drinking a lot of water 30 minutes before running will cause you to have to urinate frequently early on. Not fun. During your run and especially if it is hot, drink small quantities every 10-15 minutes. You may opt to drink a half to a full cup of a sports drink every 15-20 minutes to boost your energy for the end of the run. After the run, replenish with cool (not cold) water or a sports drink.

One sip is about equal to 1 ounce of fluid.

Self Test for Hydration Needs
Here is a self-test you can perform to determine how many ounces of water you need during one hour of walking or running.

1 Properly hydrate before your exercise session. Your urine should be near clear.

2 Warm up to the point where perspiration is generated. Urinate if possible or needed.

3 Weigh yourself naked on an accurate scale. (e.g.: 150 lbs) (Um, you probably don't want to do this part out on the trail!)

4 Walk or run for one hour at an intensity similar to your target pace.

5 Keep track of exactly how much fluid you drink during the walk. (e.g.: 10 ounces)

6 Do not urinate during your one-hour session.

7 Weigh yourself naked again, on the same scale. (e.g.: 149.5 lbs)

8 Subtract your first weight from your second. (e.g.: 150 – 149.5 = .5 lbs)

9 Multiply the difference in weight by 16 (16 ounces = 1 lb.). (e.g.: .5 X 16 = 8)

10 To this number, add the fluid ounces that you drank during the session. This is the amount of fluid you should drink per each hour of exercise. (e.g.: 8 + 10 = 18 ounces)

Variables:

A person's ability to drink while exercising and so dissipate heat from the core has variables including:

- sweat rate – larger people sweat more than smaller people, higher intensity, higher temp and humidity cause more sweating
- rate of gastric emptying - fluid absorption is different; if there is food in body, fluids tend to be absorbed more slowly
- type of fluid drink - sports drinks must contain 8% or less of carbs to absorb properly. Caffeine and alcohol are diuretics; carbonated drinks may cause stomach distress
- % of body fat - thermoregulatory system works harder if higher fat as fat is an insulator and holds in core heat
- heat acclimatization – it takes 10 to 21 days of exercise in the heat to fully acclimatize for optimum performance.
- medications - antihistamines and some blood pressure meds

decrease sweating, NSAIDS (Advil, Motrin) and Aleve may be harmful to kidney taken within 24 hrs of strenuous exercise. NSAIDS are thought to increase possibility of hyponatremia while running long distances. Tylenol seems to be safest.

Check This Out!
If the body is:
• 1% dehydrated, thirst is stimulated, heat regulation during exercise is altered, performance begins to decline
• 2% dehydrated, there is a further decrease in heat regulation, increased thirst, worsening performance
• At 3%, you experience more of the same
• 4%, your exercise performance is cut by 20 to 30%
• At 5%, you experience headache, irritability, a "spaced out" feeling and fatigue
• 6%, weakness, severe loss of thermoregulation
• 7% dehydrated, collapse is likely unless exercise is stopped

Electrolyte Replacement
If you plan to exercise for more than an hour, it is recommended that you drink an electrolyte replacement (ER) sports drink such as Gatorade, Powerade, Accelerade, Ultima Replenisher, or Squenchers. There are many types of ER drinks available with varying levels of minerals (typically sodium, potassium, magnesium, etc.) and carbs (typically 6-7% or 20g per 16oz). People may react differently to these drinks so try different types to find out what works best for you. Check out what will be served at your marathon and get used to it in training, if possible.

Energy Drinks
Some energy drinks such as Red Bull contain high caffeine counts and are not recommended. Caffeine and alcohol are both diuretics and so will deplete the fluids in your system. Although many believe a cup of coffee before a run will improve performance, it is not recommended that caffeine be utilized in excess.

Performance drink
Much research has been done lately on optimizing recovery times after a workout. There are performance drinks (like Endurox R4 and Amino Vital) which are aimed at immediate post-exercise replenishment of lost carbs and protein. These have much higher concentration of carbs (typically 60-80g) with a 4:1 carb/protein ratio. Use within 30-60 minutes of a hard workouts and races (e.g. hills, track, long runs). These are NOT intended to be used in place of water or electrolyte replacements but as a supplement.

Smoothies
Smoothies made at home in the blender can be an excellent pre-run breakfast or a great post-run refueler. Use yogurt as a base, add milk, water, or juice, and fresh or frozen fruit. This offers the body the protein, carbs, vitamins and water it needs.

Tell Me Again. WHEN Do I Drink?
ALL THE TIME!! Hydration is necessary 24x7. Try to have fluids available all the time - keep a drink next to the bed, on your desk at work, in your sports bag, in your car, etc. Sip constantly rather than drinking a lot at once. Ensure you hydrate well the night before a long run - this is even more important than the morning of the run.

Always take a bottle on any run over one hour. The minimum needs are about 20-30 ounces per hour. MINIMUM!!! More when it's hot. Sip the water (or a mixture of water and electrolyte replacement) constantly as you run.

How Do I Know If I'm Hydrated?
You should "pee clearly". Good signs are near clear or pale yellow urine. Bad signs are dark yellow urine. REALLY bad signs are chills, dizziness, nausea and lack of sweating during exercise. These are all signs of dehydration and heat exhaustion - seek shade, lie down and drink copious amounts of sports drink and/or water.

Is There Such as Thing as Too Much Water?
Yes. There is a risk of hyponatremia (salt and fluid imbalance) if you lose a lot of minerals through sweating and don't replace them. This is typically caused by drinking only water during a long run (3 hours or more); another reason to use sports drinks during and after exercise. Symptoms of hyponatremia mock those of dehydration (chills, dizziness, nausea and lack of sweating) but the treatment is NOT to administer more water. A person in this state requires electrolytes and medical attention, as hyponatremia can be fatal.

There has been a lot of attention in the news lately on hyponatremia. The emphasis on drinking while exercising has caused some to over-hydrate, especially in marathons and events lasting more than 4 hours. There have been a number of deaths reported from hyponatremia in marathons, usually of amateur runners. NSAIDS are thought to increase possibility of hyponatremia while running long distances.

Remember, the idea of hydrating is to replace the fluids lost by sweating. The USA Track and Field has published new guidelines for proper hydration which state that, "For athletes in general, and especially for those completing a marathon in more than four hours, USATF recommends consuming 100 percent of the fluids lost due to sweat while racing." Eating during the run or taking salt tablets can help balance the salt levels. Sports drinks alone contain too little salt to compensate for the fluid imbalance.

Useful Tools
There are many types of water packs, belts, and hydrations systems available. Find one that works for you and USE IT! Amphipod water belts are designed to reduce movement and give easy access to the bottle. San Jose Fit members can find these at Athletic Performance for 20% off. Amphipod is a USA Fit sponsor and may offer discounts at their website, <http://www.amphipod.com/>.

The Camelback Flash Flow has a 45 ounce reservoir and waist belt

and is ideal for long runs. The Camelback Mule has a 100-ounce reservoir and backpack and is excellent for long trail runs and hikes where water isn't available.

If you have any questions about hydration, please feel free to email me at laurel@apple.com.
Laurel Frishman - 5/21/05