## Water Handout: Why Good Hydration is not optional

The absolutely first essential step in producing good health is maintaining your hydration. Hydration is the balance of water and electrolyte in the body. Why is this important? Your body consists primarily of water. Every reaction in your body takes place in a fluid environment: every cell is a small bag of water, each cell is surrounded by fluid called the extracellular fluid, blood is mostly water as is lymph. You do not function well on a cellular and molecular level without appropriate water and electrolyte because every process in the body is related to the presence and efficient flow of water.

*Inadequate water consumption is implicated in many "disease states". Conditions that will often respond to appropriate water intake include:*

- *Constipation*
- *Lower back pain*
- *Chronic fatigue syndrome*
- *Diabetes*
- *Headaches*
- *Asthma*
- *Allergies*
- *Colitis*
- *Rheumatoid arthritis*
- *Depression*
- *High blood pressure*
- *High blood*

In my experience, most patients are dehydrated to some extent. I have had patients who have literally suffered for years from intense pain, digestive problems and the like where no diagnostic method has ever found a "reason". After learning to drink water again, these patients found their symptoms miraculously resolved. The evidence for the importance of water is irrefutable. To drink water is so basic that most don't believe it could have an effect on their condition. The problem is that sometimes a lack of water IS the condition!

**Basic Functions of Water**

1. DISSOLVING: It is the primary solvent of the body.
2. HYDROLYSIS: Water has an established and essential hydrolytic role in all aspects of body metabolism – water dependent chemical reactions (=hydrolysis).
3. ENERGY PRODUCTION: At the cell membrane, the osmotic flow of water (movement from high concentration to low concentration) can generate electric energy that is used to produce the major energy molecules of the body.
4. STRUCTURE: Water has an unusual structure that allows it to be employed as an adhesive material, sticking solid structures together.
5. TRANSPORT: Nerves use a flow of water to transport materials from their production centers in the nucleus to neural endings.
6. METABOLISM: Proteins and the enzymes of the body function more efficiently in hydrated areas.

**The Movement of Water**

In the body, water is moved by the intentional deposition of electrolytes. The electrolyte in your body is a mixture of ions that we know as "salt". Sodium, chloride, potassium, and a host of other ions make up our body salt; they are often known as plasma electrolytes. Your body salt is important because moving this salt around allows the body to move water from place to place, since water can only move passively in the direction of the highest salt concentration by osmosis.

You get body salt through your diet. That means that a salt-free diet is not conducive to maintaining hydration. It is essential that a good quality and biological salt source be used.

**If I'm dehydrated, why am I not thirsty?**
The classic signal of thirst – the dry mouth – is not the only sign of water deficiency. Many symptoms that we do not relate to water consumption may be present, but since we do not interpret them as thirst signals, we do not consider ourselves dehydrated.

**If I drink extra water, I just end up urinating more . . .**
Water balance in the body is tightly controlled. It has to be since so many processes are dependent on it. What that means is that the body has to establish a homeostatic point for water intake. It usually does so at the lowest level of water that is available. A homeostatic mechanism is one that keeps conditions the same. So if you drink one glass of water per day, homeostasis would be managing the body's water mechanisms on that one glass going in and out. Any extra water, needed or not, will likely be quickly eradicated so that the balance between salt and water is not disturbed. That's why every time you drink a little "extra", you seem to run to the bathroom. To re-establish a new level of hydration takes time and replacement of both water and salt.

**Isn't salt "bad" for my health?**
Salt is, as we noted above, the electrolyte in the body. About a quarter of the salt content of the body is actually stored in the bones as part of the bone structure, being released to maintain blood levels if intake drops.
Salt without appropriate water intake CAN exacerbate certain symptoms. But it may not be as clear as you think! One of the primary salt myths is that salt creates hypertension (high blood pressure). Take a look at this:

> "Another bit of medical dogma is being challenged by scientists, this time by a Canadian researcher from Toronto's Mt. Sinai Hospital. He analyzed 56 studies and concluded that sodium intake has no significant effect on a person's blood pressure. In fact, he found a number of adverse consequences of restricting salt intake, including cholesterol problems and disturbed calcium metabolism. Many doctors have long assumed, incorrectly according to this study, that restricting sodium intake would decrease blood pressure or that higher amounts of dietary salt would lead to hypertension later in life. "
> *Dr. Alexander Logan, presentation at the annual scientific meeting of the American Society of Hypertension, San Francisco, CA, May 30, 1997; Dynamic Chiropractic, Vol.15, No. 16, July 28, 1997*

**What should my water intake be?**
Your water intake ideally should be one third to one half of your body weight in pounds in fluid ounces of water. That means if you are 150 lbs., you should drink 50-75 ounces of water per day baseline. If you exercise, this amount will increase so that you replace what you lose sweating and exhaling water vapor.

**Does it have to be plain water?**
Generally, yes. Think of it this way: you wouldn't try to clean the floor with soda pop. If you did, it would be all sticky. Water that is just plain water is different than water with sugar and flavors and colors in it.

**What should my salt intake be?**

I recommend that people use Celtic salt, which is unrefined sea salt. It is slightly tan-gray and damp. Sea salt is almost identical in composition to blood electrolytes: it is about 86% sodium chloride and 14% potassium, calcium, and other trace ions. This is in contrast to "table salt" which is almost 100% sodium chloride and has dessicants added (so that it doesn't clump or is "free-flowing") as well as other additives depending on the brand. Celtic salt is very nice tasting and does not have the tinny taste of the refined salt. It may be used as a substitute in cooking. Celtic salt actually tastes saltier than table salt and usually you'll find you use less to produce the same amount of saltiness.

I tell patients that they should salt "to taste", but try for about a quarter teaspoon per day.

If you sweat or otherwise exert yourself, you should drink slightly salted water as fluid replacement: a quarter to a half a teaspoon per liter of water (I usually put a splash of lemon juice or some such thing in to take the edge off of the salt).

**What about water quality?**

Water is an unusual molecule: it is an ideal carrier of organic and inorganic substances, which is ideal for bodily processes.

The downside of water being both widespread and an excellent solution for dissolving is that it is easily contaminated on its way from the groundwater through our water systems and to our taps. The best drinking water is contaminated with at least 350 parts per million of toxic contaminants. The worst is estimated to be 1000 parts per million. And for each part per million of toxin the body must filter the entire body's amount of water. Remember that approximately 3 pounds per person per year of agricultural chemicals are dumped into the groundwater in the US, and the amount is likely to be similar for Canada. Industry also deposits its share into the groundwater. As many as 500 new toxic chemicals are found in tap water in addition to the 12 000 new toxins introduced in the past 20 years.

Current water supply systems do not allow for the removal of these substances, and they usually add chlorine, which is adds to the chemical load. (Chlorine contamination is an issue in itself, since it has been linked with coronary disease and strokes via cholesterol interaction.) It is pretty much impossible to fully understand the implications of such contamination on health, since data is most certainly incomplete and the data that does exist is often characterized by uncertainty.

What is certain is that even substances that are helpful in a low concentration, such as calcium, magnesium and the other trace minerals, are usually not beneficial in a large amount. It should be said, however, that the U.S. National Academy of Sciences have shown that there is an inverse relationship between water hardness and mortality from cardiovascular disease, meaning that persons drinking soft water, which is deficient in magnesium and calcium generally appear more susceptible to disease. Soft water has also been linked to elevated rates of Sudden Infant Death Syndrome, cerebrovascular disease and cancer. In Calgary, we have good trace mineral content due to our main water supply's origin in the mountains.

*Many people are taking medications when they are really just dehydrated. They have no idea that they are dehydrated, as the symptoms are not obvious.*

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*Many diseases of the elderly are often caused by the consequences of a settled-in dehydration. These may be prevented with proper water drinking.*

**What should you do about your drinking water?**

City water, in my opinion, should be appropriately filtered to remove the bulk of toxic substances if possible. The best way to do this is with carbon block filtration, where the water is forced through a dense block of carbon. Reverse osmosis systems are excellent but usually very expensive. The cheaper but less effective method is to use a gravity filter jug like that on the market today or a tap filter. If you draw water from a well, get it analyzed for contaminants, particularly if you are near agricultural activities. Note that such tests will be special requests, as groundwater is not routinely tested for chemical contamination.

Purchased mineral water is not evaluated for these contaminants, as a caution, and I do not know enough about contamination in these waters to recommend against their use, but I would not make them my primary water source unless I knew that information.

What must also be kept in mind is that as noted above, water is often the source of minerals that have a directly positive effect on the health of the population that consumes them. There have been a few studies, however, that show that you absorb organic minerals from your food more efficiently when the water you drink is purified. So you will have to decide for yourself based on the information that you receive from the supplier of the water.

**A Note About Water and Your Weight**

Water can be an important part of maintaining an appropriate weight. Many people find themselves snacking throughout the day; in fact, I have seen patients for whom this is the primary weight control issue. The problem is that often such individuals are mistaking thirst with the need for a snack. Once they got used to drinking some water, waiting twenty minutes and THEN seeing if they were still hungry, they find that the urge to snack is gone! When you think about it, it takes a lot of snack food to satisfy your thirst - snack foods are often dry and filled with poor quality salt, which just makes us more thirsty as water is drawn away by the body's dealings with the salt being ingested.

**BOTTOMS UP!**