**Week 4: Water, Vitamins and Minerals**

Water

The body is made up of about 70% water. Water plays a vital role in nearly every bodily process and is essential for:

* Proper digestion and circulation
* Numerous chemical reactions
* Nutrient absorption and waste elimination
* Flexibility of blood vessels
* Regulation of body temperature
* Also, water benefits the skin by acting as an internal moisturizer.
* As if that’s not enough, water is also an important catalyst in losing weight!

**Water Consumption and Weight Loss**

Water suppresses the appetite naturally and helps the body metabolize stored fat. Studies have shown that a decrease in water intake will cause fat deposits to increase, while an increase in water intake can actually reduce fat deposits.

**Here’s why:**

* The kidneys can't function properly without enough water.
* When the kidneys don't work to capacity, some of their load is dumped onto the liver.
* One of the liver's primary functions is to metabolize stored fat into usable energy for the body.
* If the liver has to do some of the kidney's work, it can't operate efficiently.
* As a result, it metabolizes less fat, so more fat remains stored in the body, and weight loss stops.

**Water helps rid the body of waste:**

* During weight loss, the body has a lot more waste to get rid of - all the metabolized fat must be shed. Again, adequate water helps flush out the waste.
* **Water can help relieve constipation.** When the body gets too little water, it siphons what it needs from internal sources. The colon is one primary source. The result is constipation. But, when a person gets enough water, normal bowel functions returns.

**How much water do you need?**

Depending on gender, body size and activity level the average is about eight glasses per day. However, the overweight person needs one additional glass for every 25 pounds of excess weight. The amount you drink should also be increased if you exercise briskly or if the weather is hot and dry.

**What happens when you don’t get enough water?**

When the body is not getting the amount of water it needs, it perceives this as a threat to survival and begins to hold on to every drop. Water is then stored in extra cellular spaces (outside the cells) and shows up as swollen feet, legs, hands, with the feeling of being ‘bloated’.

**The best way to overcome the problem of water retention is to give the body what it needs. PLENTY OF WATER. Only then will the stored water be released.** If you have a constant problem with water retention, excess salt may be to blame. Your body will tolerate sodium only in a certain concentration. The more salt you eat, the more water your system retains to dilute it. But getting rid of un-needed salt is easy - just drink more water. As it's forced through the kidneys, it takes away excess sodium.

**Tips for increasing your water intake!**

* Have a big glass of water at every transitional point of the day: when you first get up, just before leaving the house, when you sit down to work, etc.
* When you have juice (apple, grape, or orange) fill half the glass with water.
* When you have a junk-food craving, down a glass of water immediately. You feel full quickly and avoid the calories, and it lets time pass until the craving fades.
* Substitute a cup of hot water with a drop of honey for tea or coffee.
* Freeze little bits of peeled lemons, limes, and oranges and use them in place of ice cubes - it's refreshing and helps get in a serving or two of fruit.
* After each trip to the restroom, drink an eight-ounce glass to replenish your system.
* Don't allow yourself a diet soda until you've had two to four glasses of water. You will find that you won't want the soda anymore or that just half a can is enough.
* Drink two full glasses at each meal, one before and one after. Also, drink one glass before each snack so you don't eat as much.
* Carry a small refillable water bottle at all times and drink during downtime.

**Vitamins**

***Refer to Vitamins Handout for Functions, Sources, and Recommended Amounts for each. Go over with participants in session – AND – fill in the blank sheet of minerals. Refer to the Minerals – extra resource – for consultants to complete the table.***

Vitamins can be defined as essential, non-caloric, organic nutrients needed in tiny amounts in the diet. They are vital to life and indispensable to the body. The role of vitamins is to help make possible the processes by which other nutrients are digested, absorbed, and metabolized or built into body structures. Although small in size and quantity, the vitamins accomplish mighty tasks.

# Classes of Vitamins: Fat-Soluble and Water-Soluble

Solubility determines how vitamins are absorbed into and transported around by the bloodstream, where they can be stored in the body, and how easily they are lost from the body.

1. **Fat-soluble vitamins (A, D, E, and K):** are absorbed in the lymph, and travel in the blood in association with protein carriers. They can be stored in the liver or with other lipids in fatty tissues, and some can build up to toxic levels.
2. **Water-soluble vitamins (C and B Vitamins):** are absorbed directly into the bloodstream, where they travel freely and are used when needed. Most are not stored in tissues to any great extent and must be consumed on a daily basis. Excess water soluble vitamins are excreted in the urine making the risk of toxicity not as great as with fat-soluble vitamins.

**Food Sources of Vitamins:** It is no secret that fruits and vegetables are loaded with vitamins. There is no better place to get them. What you may not know, however, is that vitamins can also be found in whole grains, cheese, most animal products and legumes.

*The vitamins are needed in different amounts, please refer to your* ***Vitamin handout*** *for complete details about each vitamin, where you can find them, and the amount that you need.*

*Below is some additional information you can share during the lesson depending on time.*

**The B vitamins consist of:** Thiamin, Niacin, Riboflavin, Folate, B6, B12 and pantothenic acid. These are some of the important B-vitamins that work to make red blood cells, form your genetic blueprint, keep your nervous system healthy and even help your body use energy from food.

**Folate**, also called folic acid or folacin, is especially needed **before** a womanbecomes pregnant as well as during pregnancy. This B-vitamin helps to reduce the baby’s risk of developing a type of birth defect that affects the brain and spinal cord. Many foods contain only small amounts of folate, so it’s difficult to get enough from food alone. If you are of childbearing age or planning to become pregnant, eat plenty of folate-rich foods and take a daily multivitamin and mineral supplement that contains 0.4 milligrams (or 400 micrograms) of folic acid. Make sure the supplement contains no more than 1 milligram (or 1000 micrograms) of folic acid.

**Vitamin B12** is only found naturally in animal foods such as meat, poultry, fish, eggs, milk, cheese and milk products. If fortified, soy and rice beverages as well as soy-based meat substitutes will provide vitamin B12. Strict vegetarians or vegans who do not eat these fortified foods may need a vitamin B12 supplement. Together with folic acid, vitamin B12 helps to make red blood cells and DNA, our body’s genetic blueprint.

Milk and yogurt are the highest sources of **riboflavin**, followed by eggs, meat and cheese. Riboflavin, also called vitamin B2, helps to keep our skin, eyes and nerves healthy. It also works with other B-vitamins to use energy from the food we eat. A deficiency of riboflavin is usually

associated with other nutrient deficiencies and may cause mouth, throat, skin and blood problems. Other foods that contain riboflavin include: nuts, green peas, dark green leafy vegetables, legumes and enriched breads, cereals and pasta.

**Vitamin D** is a nutrient that helps the body use calcium and phosphorous to build and maintain strong bones and teeth. Too little vitamin D can cause calcium and phosphorus levels in the blood to decrease, leading to calcium being pulled out of the bones. This can cause rickets in children and osteomalacia (softening of the bones) or osteoporosis (fragile bones) in adults. However, too much vitamin D can cause too much calcium to be deposited in the body, which can lead to calcification of the kidney and other soft tissues including the heart, lungs and blood vessels.

**Vitamin E**

Vitamin E is the term used for a group of fat-soluble antioxidants, which act in the body to protect against cell damage. Vitamin E exists in eight different forms. Each form has its own biological activity, which is the measure of potency in the body. Alpha-tocopherol is the name of the most active form of vitamin E in humans. It is also a powerful biological antioxidant. Vitamin E is also thought to play a role in maintaining the body's immune system and other bodily processes.

**Vitamin E is found naturally in such foods as:**

* vegetable oils such as sunflower, safflower, canola, and olive;
* seeds and nuts such as sunflower seeds, almonds, hazelnuts, and peanuts;
* wheat germ; and some green leafy vegetables, although it is present in small amounts.

**Minerals**

***Go over “Minerals Handout” with participants during the lesson.***

***Refer to Minerals Handout for Functions, Sources, and Recommended Amounts for each. Go over with participants in session – AND – fill in the blank sheet of minerals. Refer to the Minerals – extra resource – for consultants to complete the table.***

Minerals are inorganic substances required by the body in very small amounts. They perform a variety of functions in the body that include:

* Maintaining water and acid-base balance
* Assisting in blood clotting
* Nerve transmission
* Oxygen transport
* Absorption of nutrients

**Minerals are categorized into two groups depending on the quantities required by the body:**

1. **Macro-minerals include:** Calcium, Phosphorus, Sulfur, Sodium, Potassium, Cholorine, and Magnesium. The body requires 100mg or more of these minerals.
2. **Micro-minerals include**: Iron, Copper, Zinc, Flourine, Iodine, Chromium, Selenium, and Manganese. The body requires these in extremely small amounts hence the name “micro” mineral.

***MORE RESOURCES FOR CONSULTANT – NOT NECESSARILY HAVE TO BE COVERED IN THE PRESENTATION***

**Body Fluids and Minerals:**

Most of the body’s water weight is contained inside the cells, and some water bathes the outsides of cells. The catch is that cells cannot regulate the amount of water directly by pumping it in and out because water slips across membranes freely. In order to prevent the cells from collapsing from water leaving, or swelling up when too much gets in, it needs minerals to control the inflow and outflow of water. Cells have the ability to pump minerals across their membranes and this is why they are so crucial in our diets.

**Electrolyte Balance**

The macro- minerals form salts that dissolve in the body’s fluids; the cells direct where the salts go; and this determines where the fluids flow because water follows salt. In other words, to control the flow of water, the body must spend energy moving its electrolytes from one compartment to another. If the fluid balance is disturbed, severe illness can develop quickly because fluid can shift rapidly from one compartment to another. For example, when you have been sick from the flu (vomiting or diarrhea) the loss of water from the digestive tract pulls fluid from between the cells in every part of the body. Fluid then leaves the cell interiors to restore balance. Meanwhile the kidneys detect the water loss and attempt to retrieve water from the pool designed for excretion. To do this, they raise the sodium concentration outside the cells, and this pulls still more water out of them. The result is fluid and electrolyte imbalance, a medical emergency. This loss can disrupt the heartbeat and threatens life. It is often a cause of death among those with serious eating disorders.

Sports drinks such as Gatorade are useful when you have had a serious bout of diarrhea or vomiting or after extreme physical activity where a lot of sweat is lost to restore fluid electrolyte balance.

***Sodium***

Sodium is needed in the body to regulate fluids and blood pressure, and to keep muscles and nerves functioning smoothly. The amount of sodium considered adequate to promote good health in adults is 1,500 mg per day. The United States Institute of Medicine (IOM) is commissioned jointly by the USA and Canada to establish the nutrient reference values that are used to set policies and standards. One of these reference values is the Tolerable Upper Intake Level (UL), which is the highest intake level that is likely to pose no risk of adverse health effects. Based on the IOM's UL, Health Canada recommends that adults **do not exceed 2,300 mg of sodium per day.**

***High blood pressure is one of the most important risk factors for cardiovascular disease and stroke, which are the number one cause of hospitalization and death for Canadians. Research has shown that blood pressure rises with increased sodium intake in the general population and that reduced sodium intake decreases blood pressure.***

**Salt and sodium**
1 teaspoonful contains about 6 grams of salt
6 grams of salt contains about 2400 mg of sodium

Sodium (Na) is one of the chemical elements found in table salt, also known as sodium chloride. Most of the sodium consumed by Canadians comes from pre-packaged, ready-to-eat foods, rather than from salt added at the table or in home cooking. Restaurant foods, especially those from fast food outlets, generally contain high amounts of sodium. As well, since sodium is often used by the food industry to enhance flavour or as a preservative, many common foods contain sodium. Some of the foods that can be high in sodium include: sandwiches and burgers; soups; pizza; frozen and ready-to-eat meals; cheese; gravies and sauces; processed luncheon meats; and snack foods, such as crackers, nachos, potato chips and pretzels.

**Ways to Reduce Salt Intake**

* Read nutrition labels to make informed food choices. Almost all pre-packaged foods have a Nutrition Facts table, making it easier to see how much sodium is in any given food. The label will give you the amount of sodium in the specific amount of food listed.
* Check the percentage of the Daily Value (%DV) for sodium. The %DV tells you at a glance if there is a lot or a little of a nutrient in that specific amount of food. Use the %DV to compare food products.
* Since most people get more sodium than is healthy from pre-packaged foods and meals purchased outside of the home, reduce your sodium consumption by choosing these foods less often.
* Choose fresh, unprocessed foods to eat or prepare at home in place of pre-packaged, convenience foods and choose plenty of fruits and vegetables. Fruits and vegetables are also higher in potassium which is a factor in reducing the risk of high blood pressure.
* Look for foods with claims such as "salt-free" (less than 5 mg of sodium per serving), "low in sodium" (140 mg of sodium or less per serving), or "reduced in sodium" (at least 25 percent less than the regular product).
* When dining out, order dressings and sauces on the side and use sparingly. Before you eat at a fast food restaurant, ask for nutrition information to see how much sodium is in the food on their menu. Many chains now make nutrition information available online or posted in their outlets.

**Salt and “Water Weight”**

If your blood sodium rises, as it will after you eat salted foods, thirst will ensure that you drink water until the sodium-to-water ratio is restored. Then the kidneys excrete the extra water along with the extra sodium.

Dieters sometimes think that eating too much salt or drinking too much water will make them gain weight, but they do not gain fat, of course. They gain water, but a healthy body excretes this excess water immediately. ***Excess salt is excreted as soon as enough water is drunk to carry the salt out of the body***. ***From this perspective, then, the way to keep body salt (and “water weight”) under control is to control salt intake and drink more, not less, water!*** When you drink adequate amounts of water, you should not feel “bloated” anymore.

***When looking at how much of a nutrient you need it is important to know what the terms mean and how they apply to you.***

**What are DRI's?**

Dietary Reference Intakes (DRIs) refer to four different values for nutrient intake recommendations. They are based on the amount of nutrients we need to prevent deficiencies and lower the risk of chronic disease.

**The DRI Family**

There are 4 different values that make up the DRIs: RDA, AI, EAR, and UL.

* **Recommended Dietary Allowance (RDA)**: The amount of a nutrient expected to meet the needs of nearly all healthy people, while lowering the risk of certain chronic diseases.
	+ Most people should try for this intake.
* **Adequate Intake (AI)**: AI has a similar meaning to RDA. AIs are used for some nutrients because there is not enough scientific evidence to set a firm RDA.
	+ Most people should try for this intake when RDA values are not available.
* **Estimated Average Requirement (EAR)**: The amount of nutrient expected to meet the needs of half the healthy people in a group.
	+ EAR is used by health professionals to measure the nutritional status of a group.
* **Tolerable Upper Intake Level (UL)**: This is the maximum intake that probably will not pose risks for health problems for almost all healthy people.
	+ UL is not equal to the desired level of intake. Intakes should remain below UL unless medically advised.
	+ Most ULs include intake from all sources of food, water, and supplements. A few nutrients have ULs only for the man-made form. These include folate, niacin, vitamin E, and magnesium.