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Committee for Healthy Ageing
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Welcome to Issue 24 of our Bulletin, updating you on issues of importance or topical interest relating to nutrition and physical activity of older people. In this issue, Dr Alex Chisholm, an adviser to our Committee for Healthy Ageing, looks at the important issue of hydration, especially as we embark on what promises to be a very hot summer!

Hydration –our need for water

Optimal physical and mental performance depends on us maintaining healthy hydration levels. Healthy hydration means achieving water balance- when our water intake matches our water losses. How we can best do this depends on our age, diet and lifestyle.

Background

About 60% of the human body by weight, consists of water, with the average adult body containing about 35-45L. Water is found throughout all body tissues – body cavities, blood vessels, cells and organs – and three-quarters of the human brain is made up of water. Our bodies need water for vital functions:- the many chemical reactions that take place in our bodies; lubrication of our joints, regulation of body temperature, transport of dissolved molecules and assisting with the removal of potentially poisonous waste products. Water is an essential nutrient because our bodies need it in larger amounts than we can produce from our food.

The typical adult living in a temperate climate loses between 2-3 litres of water per day via expired breath, sweat, urine and in other bodily secretions. We lose water constantly, but drink only intermittently, so the water content of the body is constantly changing. For the average 80 kg male sitting at rest in a comfortable environment, water losses will typically run at about 300 mL per hour. For the average female who weighs about 65 kg, losses will occur at a slightly slower rate of about 250 mL per hour.

If we accept that a dehydration level of about 1% of body weight is tolerable, that could occur after only about 2-3 hours, but a loss of body water equivalent to about 1% of body weight is normally compensated within 24 hours. Thus as long as we drink adequate amounts at meal times, and at the typical tea/coffee breaks that most of us have, we can stay perfectly well-hydrated throughout the day. However there are other factors that also influence this.

Getting 'enough'

The total quantity of water we require will depend on gender, body size, weather, clothing worn, activity levels and a whole range of other factors. Research suggests that under normal conditions and activity levels, men need 3.4 L and women 2.8L of fluid from all sources every day. However most of the body's needs come from the fluids we drink. In view of this we need to remember that although we may slow down with age, our bodies continue to require similar amounts of fluid to remain properly hydrated. In addition from time to time there may be excessive fluid loss because of illness, for example from the gastrointestinal tract with diarrhoea and vomiting, by excessive urination through conditions that may affect urine production as well as certain medications, and through the skin with fever. Fever producing conditions, including sunburn, increase body temperature, requiring more fluid for proper body functioning.

Special concerns for older people

People usually drink in response to thirst, but by the age of 60, if people only drink when they are thirsty, they may not get as much water as they need.

- The kidney's capacity to concentrate generally declines with the age, leading to an increased loss of water via urine.
- Diminished appetite and poor food choices may lead to a reduction of fluid intake from food.
- Some older adults may suffer from poor memory, immobility, or illness which may affect fluid intake. In addition, certain medications can also block the thirst mechanism.
- Dehydration can cause serious problems in older adults. Older people are at greatest risk of dehydration and its potentially life-threatening consequences: People aged between 85-99 years are 6 times more likely to be hospitalised for dehydration than those aged 65-69 years.
- Chronic dehydration constitutes a serious problem and is associated with an increased risk of falls, urinary tract infections, dental disease, broncho-pulmonary disorders, kidney stones, constipation, and impaired cognitive function.
- Strong (distilled) alcoholic beverages may provoke dehydration and are not recommended.
- A hydration programme should include advice on drinking, offering fluids at mealtime and in between meals. Fluids should be readily available and physically accessible both day and night.
- Some older people will limit fluid intake in the belief that it will help control continence or the need to get up to the toilet during the night. Dark, strong smelling urine may suggest that fluid intake is insufficient. Urine should be a pale straw colour.

With age, the body loses its ability to have a thirst response to a fluid deficit, which increases the risk of dehydration. Therefore, in order to stay properly hydrated, older people should anticipate the body's needs and not always wait until they are thirsty to have a drink. Dehydration in the old and very old is usually more serious and potentially life threatening than in younger people. For some older people restricted mobility can limit access to regular drinks, while those with memory issues may find it difficult to remember when they consumed their last drink.

Food and fluids

Interpreting Adequate Intakes

It is a common misconception that the recommended 'Adequate Intake' of water for an adult man (3.4 L/day) or woman (2.8 L/day) refers only to drinking water. However this refers to all fluids, including that derived from food and that produced in the breakdown of food in the body. The daily advice to drink from 8 to 10 cups (2.6 L for men and 2.1 L for women) of fluid includes all beverages (MOH Healthy Eating and Active Living, 2015). The body gets around 20% of its total water intake from solid food (700-800ml) and also produces 250ml from breaking down food within the body. So the official recommendations treat water as a dietary component present in all foods and beverages rather than as a single source, for example tap or bottled water. Beverages remain the most important source of fluid in the diet and while some people can get all they need from drinking water, this is not true for everyone, particularly if plain water is not much liked. Thus, consuming fluid frequently and increasing our intake of 'high water' foods, mainly fruits and vegetables, increases our chances of reaching the optimal water intake.

Variety in beverages and hydration

Variety stimulates greater levels of consumption of both food and beverages. Taste and sensory qualities, as well as preference and familiarity explain why many people choose to drink other beverages in addition to or instead of plain water. A selection of beverages can also contribute towards enhancing micronutrient intake. Many beverages provide important nutrients, including vitamins, antioxidants and electrolytes. Pure fruit juices can contribute to the five portions of fruit and vegetables that we are recommended to consume each day, as can a fruit 'smoothy' or a vegetable juice. Milk contributes several essential nutrients, including calcium, potassium, phosphorus, protein, vitamin A, vitamin B12, riboflavin and niacin. Contrary to popular belief, caffeinated beverages are not dehydrating.

Water content in common foods and beverages

Beverages	
Water, tea, coffee, sports drinks, soft drinks, vegetable juice	90-100%
Milk, fruit juice, juice beverages, soy drinks	85-90%
Alcoholic beverages (Do not count in your tally of daily fluid intake!)	
Beer & wine	85-95%
Distilled	60-70%
Soup	
Consommé, onion, meat and vegetable, vegetables, tomato, mushroom cream, Noodle with chicken, concentrated soups (made up), vegetable cream (made with milk)	90-95%
Fruits & vegetables	
Strawberry, melon, grapefruit, grape, peach, pear, orange, apple, boysenberry, kiwifruit Cucumber, lettuce, celery, tomato, pumpkin, broccoli, onion, carrot, green beans, Brussels sprouts, cabbage, green peas	80-95%
Banana, potato, corn, kumara, broad beans	70-80%
Dairy products	
Fresh milk	87-90%
Yoghurt	75-85%
Ice creams	60-65%

Cheese	40-60%
Cereals	
Rice (boiled)	65-70%
Pasta (spaghetti, macaroni, noodles)	75-85%
Bread, biscuits	30-40%
Breakfast cereals (ready to eat)	2-5%
Meat, Fish, Eggs	
Fish & seafood	65-80%
Eggs (scrambled, fried, poached) omelet	65-75%
Beef, chicken, mutton, pork	40-65%
Cured meat, bacon	15-40%

At work or at home

Many factors such as increased workload, stress, long journeys to or from work, dry air due to air-conditioning or heated environments can affect the normal functioning of the body and increase water loss even when we are not noticeably sweating. For those who work in an office or live in surroundings with air conditioning, the atmosphere often has a low water content resulting in increased losses of water from the lungs and through the skin. On the other hand high humidity can play a greater role in dehydration than heat, because the sweat drips from the body rather than evaporating, and thus does not cause a loss of heat from the body. When performing physical work, sweat output often exceeds water intake, producing a body water deficit or dehydration. In these situations, dehydration can adversely affect productivity, safety and morale because mental performance can be reduced as well as physical performance. Hydration is therefore just as important for the office worker and people living in an air-conditioned environment as it is for the very physically active. Water losses need to be replaced through a rich and varied diet including foods and drinks with a high level of water content. Not being well hydrated during the day can cause headaches, tiredness and loss of concentration. Regardless of location environmental temperatures should be moderate, for each degree centigrade over over 37ºC it is recommended that the intake of liquids should be increased by 250ml.

Physical activity

Dehydration during exercise may be reduced or prevented by drinking sufficient amounts of water before, during and after most sports activities when water loss is expected to occur. Sports drinks provide fluids, electrolytes and carbohydrates.

During exercise, drinking should occur regularly, but the frequency of drinking and the amount consumed will depend on many factors, including the intensity and duration of exercise and the weather conditions, as well as on the physical characteristics of the individual, including body weight and individual sweating characteristics. In very hot and humid climates, outdoor sports should be performed in the early morning or late afternoon, and it is best to avoid unnecessary physical exertion during the hottest times of the day.

When exercising for short periods or at low intensities, it may not be necessary to drink anything: water is perfectly adequate in these situations if something is needed. When the exercise lasts longer than 60-90 minutes, especially at a higher intensity, sports drinks may be better than water. One key benefit is that they can reduce the sensation of effort. This makes exercise seem easier and this means that the exercise programme or sport will be more likely to be enjoyable. However, high rates of sweating can also occur during sports or other vigorous physical activity in cool and dry conditions, contributing to the risk of dehydration. Heavy clothing limits sweat evaporation meaning that body heat is not dissipated causing the body to lose even more water as it attempts to lose more heat.

Travel: Flying and Road safety

The body tends to dehydrate while travelling by plane because air in the cabin is dryer (10-20% humidity) than in a comfortable indoor environment (30-60% humidity).

Thus skin dehydration symptoms can be observed (parched lips, dry eyes, etc.) and increased amounts of water are lost through the breath. Mild dehydration occurring during long flights is one of the causes of an increased blood viscosity, which in turn may increase the risk of deep vein thrombosis when sitting relatively still for a prolonged period of time.

In order to maintain hydration levels you need to drink an additional 250 mL of water per hour more than you would need when sitting resting at home.

Driving in a hot car can lead to sweating with large losses of water and electrolytes. Even in an air-conditioned car, water losses can be high on a long drive or deficits can develop if journey progress is preferred over stops for drinking. Mild dehydration can cause symptoms such as thirst, headache, weakness, dizziness and fatigue and generally makes people feel tired and lethargic. Given that sports drinks can provide electrolytes and carbohydrates as well as fluids they may be useful in this situation. However they are no substitute for frequent stops for refreshments, and some gentle exercise as well as a short rest.

Maintaining adequate hydration while driving is of great importance, because mild hypo-hydration has been shown in recent research to cause an increase in driver errors. The increase in risk of errors over the duration of a long drive was shown to be at a greater rate when the driver had restricted their fluid intake than when drinking had taken place to maintain hydration status. These dehydrated drivers also reported higher subjective feelings of thirst, and impaired concentration and alertness. The magnitude of decrement was similar to that observed following the ingestion of an alcoholic beverage resulting in a blood alcohol content of approximately 0.08%, or driving whilst sleep deprived. Frequent drinks of non-alcoholic beverages may help to reduce driving errors on a long monotonous road trip.

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www.nutritionfoundation.org.nz/about-us/Healthy-Ageing
http://agewelleatwell.com/