

Running and drinking?

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In the recent past, a lot of information and misinformation has been generated on the topic of how much a runner/walker should drink and what they should drink. An industry has grown up to supply various sports drinks and seemingly exotic forms of bottled water for which there are claims that make it sound far superior to the stuff that comes out of a tap.

On a warm day when you are engaging in moderate to vigorous exercise you can expect to lose between 1 and 1.5 litres of fluid per hour as perspiration, depending on conditions. Perspiring is the mechanism the body uses to dissipate the body heat that results from demanding exercise. If you want to check what your rate of fluid loss is, weigh yourself naked on accurate scales (with fine gradations) prior to exercising on a warm day for 45-60 minutes. When you finish, weigh yourself naked again to establish the amount of fluid you have lost. Naked weighing is best because some perspiration will be absorbed in your clothing. The amount of fluid lost and the efficiency with which the body is cooled will depend on several factors, some of which are associated with personal attributes such as age, body mass, fitness level, etc. Environmental factors also have a significant effect, things like the temperature, humidity and air flow over the body. What you wear can also affect heat loss and rate of perspiration.

In normal circumstances, when training or racing for an hour or less, an adult should not be in danger of dehydration. If you consume 500-600ml of fluid in the hour prior to the activity, the net loss of fluid from your body should not present a health risk or detract from performance. After the activity, consuming a similar amount of fluid should restore levels to normal. If you do like to drink during exercise, limit it to a few mouthfuls every 15 minutes.

There is a danger in consuming excessive amounts water prior to, and during physical exercise. Apart from the feeling of being bloated, in the extreme this can lead to a dilution of blood salts as sodium is lost in perspiration. The condition is known as hyponatremia. It can have a rather nasty collection of effects such as headaches, disorientation, nausea, irregular heartbeat, reduced nerve function and respiratory problems, which can prove fatal and hence is best avoided.

What is better, plain water or a drink that contains carbohydrates and perhaps a small amount of sodium in the form of common salt? Research (Running Research News v20:7; Peak Performance #233) indicates that water with around 4-8% carbohydrate provides energy (that can be converted into muscle and liver glycogen) without inhibiting water absorption in the intestines. Too much carbohydrate and the water absorption rate decreases. A combination of sugars in the carbohydrate (glucose, fructose, sucrose) increases absorption of the carbohydrate. If you want to make up your own sports drink, RRNews suggests 40gm of powdered glucose, 20 grams of sucrose and 20 grams of fructose in a litre of water. A dash of flavouring (without sugar) will make the mixture more palatable. A small amount of salt will assist the absorption of glucose and assist

replacement of salt lost through perspiration. PP suggests a mixture of glucose and fructose in equal amounts to make up a 6% solution. Why does a combination of sugars increase absorption? Sugars like glucose do not just passively move through the wall of the gut, they are actively transported by proteins that are specific to particular sugars. The rate of absorption is greater for a mix of sugars because several different types of transporter proteins can be working at the same time. This is only important if you are trying to achieve the maximum rate of intake of carbohydrate.

For relatively short periods of exercise, taking in carbohydrate during the activity is not essential, but it can become important as the duration increases, for example in events like marathons and triathlons, as can taking in salts to replace what is lost in perspiration.

If the above sounds reasonable, other research can complicate the picture. It may be that glycogen depleted muscle adapts to some training stimuli better than muscle that is loaded with glycogen. Demand on muscle tissue has an effect on growth hormone production and hence the response of that tissue to the demand. It may therefore be advantageous to limit carbohydrate supply to the muscle just prior to and during training, but to use a form of sports drink in endurance races. Taking in easily digested carbohydrate immediately after demanding exercise will quickly restore muscle glycogen stores.

Most of the research on hydration and exercise is aimed at maximising the performance of young, elite competitors often engaging in endurance events. If you are not in that group, other factors may have more impact on your performance than the fine detail of fluid intake. Look at the labelling of sports drinks to see what they contain. Something that contains 4-8% glucose and small amounts of sodium and potassium is likely to be as suitable as more complex (and expensive) drinks. Consider buying a commercial sports drink in powder form (rather than paying for the water and container each time) and making up solutions that best suit you or make your own sports drink as suggested above. Whatever you do, it is best to trial it before an important race. Drink enough to be comfortable and avoid dehydration, but not excessive amounts. As in many aspects of life, moderation is usually the best approach to adopt.