dehydration and hyponatremia is high up on that priority list. My personal recommendation is to drink before thirst sets in, and to eat snacks continually to replace vital electrolytes. Amounts will vary. Everyone is different.

Endurance events, be they marathons (of which I have run many) or multiple-day events, are a somewhat different kettle of fish. The differential diagnosis of a hyponatremic, collapsed athlete is, as the article clearly states, often difficult to make in the field, and the treatment obstacles are well described. As a 40-year emergency medical technician (and former special operations medic) I found the modalities noted, especially as they pertain to endurance athletes, very informative.

In closing, I believe that prevention of heat-associated injuries is a key issue in wilderness medicine, especially for wilderness travelers, for whom sophisticated medical help is often far away. Endurance athletes who have heat issues present, in most cases, with a rather different profile from that of the sojourner—generally, they are more dramatic, and appropriate medical help is more frequently closer at hand. For the wilderness traveler, prevention of heat-associated injuries is much easier to control because of the slower nature of the activity than it is for the athlete going for her or his best time in a long event.

Nevertheless, in either case, I question whether “waiting until you are thirsty to drink” is the best medicine.

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References


Reply to: Is drinking to thirst a prudent guideline to avoid hyponatremia?

To the Editor:

We appreciate the opportunity to respond to the Letter to the Editor by Aughton,1 which highlights continued misconceptions regarding hydration and the role of thirst sensation. Efforts to dispel myths about proper hydration are especially timely given the recent deaths of 2 American high school football players from overhydration resulting in hyponatremic encephalopathy.2–5

Hew-Butler et al5 provides an excellent overview describing how sensation of thirst is regulated, and why drinking to thirst is used as a risk mitigation strategy to avoid the consequences of both under drinking and over drinking. Even though it is well documented that prevention of symptomatic dehydration and exercise-associated hyponatremia (EAH) occurs when drinking to thirst,5–7 Mr Aughton states that this recommendation is questionable, and suggests that it might even be a dangerous practice. We regard his clinical experience, but note that he did not provide supporting evidence for his assertions.

Our recommendation of drinking to thirst in the EAH practice guideline was specifically intended for the prevention of overhydration, which is clearly the key risk factor for EAH morbidity and mortality.7 But drinking to thirst is also an appropriate strategy for avoiding dehydration. Common misconceptions are that drinking to thirst will result in decreased exercise performance owing to significant dehydration at the time of initial thirst sensation, and an increased core body temperature, which may increase the risk of heat-related illness. None of these ideas is correct. Noakes et al6 outline how these misperceptions came into existence. Furthermore, there is no published scientific evidence to show that drinking to stay ahead of thirst, as a popular mantra, during competitive or noncompetitive exercise produces a more beneficial outcome than using thirst to drive fluid intake. Importantly, excessive fluid ingestion does not prevent serious heat illness. In fact, exertional heatstroke is most likely to occur in short duration, high intensity activities, and can occur without dehydration. Additionally, a sustained high rate (1200 to 1800 mL/h) of fluid ingestion, either at rest or during exercise, is neither sustainable nor safe as it can produce initial symptoms of intestinal distress, nausea, and vomiting, and can progress to death from exercise-associated hyponatremic encephalopathy. Of critical importance is that there are no published reports of an exercise-related death or serious illness in marathons, long-distance triathlons, or ultramarathons due solely to dehydration.6

Adolph et al8 conducted classic research by examining thirst mechanisms and fluid homeostasis in a fluid-restricted group and a group with free access to water (ad libitum) during daylong marching (walking) in summer desert heat. The fluid-restricted group had moderate (7% to 10%) dehydration with symptoms of fatigue, weariness, sleepiness, anorexia, dizziness,
orthostatic hypotension, and decreased walking ability followed by dyspnea, tingling, and tetany that required periods of rest or early termination of marching. Conversely, the group who freely consumed water (ad libitum) did not have these symptoms—even without matching total body water loss.

In other supporting studies, Noakes\textsuperscript{6} reviewed 18 studies of ad libitum drinking by subjects during a variety of activities (eg, walking, cycling, running, or triathlon) in both controlled laboratory and outdoor field studies. He reported that these studies showed there was no significant advantage of drinking more fluid than self-selected drinking patterns. From a meta-analysis of numerous studies on cyclists in time trials, Goulet\textsuperscript{9} also concluded that relying on thirst to gauge the need for fluid replacement was the best strategy.

More recent evidence for drinking to thirst as a safe and effective recommendation comes from a study by Hoffman and Stuempe\textsuperscript{5} in which drinking strategies were examined among participants in a 161-km ultramarathon with ambient temperatures reaching 39\textdegree C. Key findings were that 1) extent of weight change (–6.8\% to 3.1\%) varied considerably among participants, but did not differ between finishers and nonfinishers; 2) in general, runners had lost more than 2\% body weight by 48 km and thereafter maintained a similar weight; 3) some top performers lost more than 2\% body weight relatively early in the race and continued to lose additional weight through the remainder of the race; and 4) drinking strategies and sodium supplementation had no statistical effect on weight change during the race. On the final point, participants who drank to thirst and did not use sodium supplements were able to maintain an appropriate hydration level for as long as 30 hours of continued exercise, with portions of the time under very hot conditions.

The science supports the premise that proper hydration can be maintained during exercise when thirst is used to guide fluid intake. Perpetuation of the myth that one needs to drink beyond the dictates of thirst can be deadly, as was the case for the 2 football players who were unnecessarily lost to overhydration.

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References