

## November 2016 Health Notes by Evelyn Ames

### Sports Drinks Part 2: Are They Useful? Citric Acid and Tooth Enamel

Suggestion: drink when you are thirsty and don't waste your money or calories on sports drinks—choose water instead.

The promotion of sports drinks through media and sport/athletic events has developed an estimated twenty-some billion dollar industry. Sports drinks are flavored beverages that contain carbohydrates (usually sugar) and minerals such as sodium and potassium, which are generally referred to as electrolytes. Electrolytes are minerals (e.g., calcium, magnesium, chloride, phosphate, potassium, and sodium) that maintain the body's ionic balance. This balance is essential for nerve, muscle, and brain functioning.

At the time of the 2012 Summer Olympics in London, the British Medical Journal published articles about the usefulness and promotion of sports drinks. The papers addressed two related but distinct questions: "Should people who exercise seek to proactively replace fluids lost, or can they rely on thirst to guide them during and after physical activity? And when they rehydrate, do they need all the salts, sugars, and other ingredients dumped into sports drinks, or is water fine? The correct answers are: best to rely on thirst, and water is fine. All that stuff about replacing electrolytes and so on you've been hearing all these years? Never mind! The evidence doesn't support it." "Humans do not regulate fluid balance on a moment to moment basis."

Two major concerns about sports drinks: high calorie content (due to sugars) and citric acid effects on tooth enamel, especially in children and teens. Some drinks contain the equivalent of 10 teaspoons of sugar. A 32 ounce serving of Gatorade contains about 200 calories.

Citric Acid and tooth enamel. Citric acid in sports drinks is used as a preservative and flavor enhancer. According to dental researchers, sports drinks may, over time, "pose a significant threat to dental health. Normally, tooth decay is caused by bacteria that produce acids in the presence of sugar." Sports drinks can wear away tooth enamel over time. "Because this kind of damage affects the whole tooth and not one particular spot, you might not notice it right away. But eventually, it can weaken your teeth, leaving them more vulnerable to chipping and cracking." "Researchers looked at fluoride levels (called "titratable acidity) of 13 sports drinks and 9 energy drinks. Molars were sliced in a petri dish with the beverages for 15 minutes followed by artificial saliva for two hours (saliva is important in neutralizing the acids)." Researchers repeated this four times a day for five days. Result: exposure to both drinks took off enamel, with energy drinks even more than sports drinks. Important to note that saliva will generally re-mineralize one's teeth and harden the enamel after a certain amount of time has passed. "However, if you brush your teeth before that happens, you can permanently remove the enamel." Jain, a dental researcher, is concerned about health effects beyond cavities, suggesting that consuming a lot of citric acid can lead to loss of bone mass and kidney stones. In relation to children, the American Academy of Pediatrics concludes that "routine ingestion of carbohydrate-containing sports drinks by children and adolescents should be avoided or restricted."

Resources: <http://www.health.harvard.edu/blog/trade-sports-drinks-for-water-201207305079>  
[http://jada.ada.org/article/S0002-8177\(14\)60811-4/abstract#/article/S0002-8177\(14\)60811-4/fulltext?mobileUi=1](http://jada.ada.org/article/S0002-8177(14)60811-4/abstract#/article/S0002-8177(14)60811-4/fulltext?mobileUi=1)  
<http://sciencenetlinks.com/science-news/science-updates/sports-drinks/>  
<http://www.healthline.com/health/food-nutrition/is-gatorade-bad-for-you>  
<https://www.reference.com/food/can-drinking-much-gatorade-harmful-someone-s-health-3489d7cc01460658>  
Sports drinks Washington post July2016