



Our Mission

"To provide outstanding, progressive care in a nurturing environment that prioritizes individual treatment, with accountability to standard of care; where rehabilitation, fitness, performance and an overall healthy lifestyle contributes to best serving our patients and the community."

Reminder:

We offer free 15-minute consultations to any new patient, to discuss specific injuries.

In the Next Issue:

If you are one of many suffering from *jaw pain*, our next issue features an article with information and help.



Performance Physical Therapy/ (970) 493-8727/ www.performance-physicaltherapy.com

New Member Spotlight: Cay Hoburg

Cay Hoburg has lived in Fort Collins all her life. Cay is married with four children and seven grandchildren. In her spare time she enjoys playing with her two year old granddaughter, Taya. If you want to hear some funny stories, ask Cay about

Taya! She enjoys interacting with the wonderful patients at PPT. Cay job shares with Ronda at Performance Physical Therapy as "Receptionist Extraordinaire".

Nutrition Strategies for Training and Competition *Part 2: Fueling during Competition*

By Kris Osterberg, MS, RD, CSSD

Food is to an athlete as gasoline is to a sports car. Every athlete seeking sports nutrition information has heard this analogy. Just as we would not expect a car to sail through the Indy 500 on one tank of gas, we shouldn't expect our bodies to perform well "running on fumes." The analogy is also helpful because we know that the owner of a \$220,000 Lamborghini likely uses a higher-quality fuel than the owner of a 1985 Honda Civic. However, *knowing* that we require fuel and that we should be filling our tanks with high-quality fuel is the easy part. It takes a little more digging to learn the logistics of how, what, and when to fuel. In the first article of this series, we discussed what to do *prior* to competition. In this article, we'll focus on what to do *during* competition. Learning a few key principles will help ensure that your engine is running efficiently.

Exercise Intensity and Fuel Sources:

As we learned last time, our bodies rely on a mixture of carbohydrate and fat for energy at all but the highest exercise intensities. Fat is plentiful but requires more than twice as much oxygen to burn compared to carbohydrate. For this reason, our bodies will use primarily fat during low- to moderate-intensity exercise such as walking or jogging. As exercise intensity increases from jogging to running, so does our reliance on carbohydrate. Carbohydrate is efficient and requires much less oxygen to burn but our reserves are limited. Our bodies store carbohydrate in our muscles and liver in the form of glycogen. When glycogen stores are full (carbohydrate loaded), we have enough to fuel about 90 minutes of high-intensity exercise. However, most athletes don't pay much attention to the amount of carbohydrate in their diets and their glycogen stores may only be partially full.

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“In other words, if you’re cycling for three hours or running a marathon, you may burn 2,500 kcal during that period of time.”



The term “bonking” or “hitting the wall” is used by athletes who run out of glycogen and haven’t taken in enough carbohydrate during exercise. Most endurance athletes are well acquainted with this phenomenon. Team sport athletes tend to experience this less often but will feel fatigued or may have a heavy feeling in their legs. For this reason, both endurance athletes and team-sport athletes need to pay attention to the amount of carbohydrate in their daily diets but also need to learn how to supplement with carbohydrate during exercise. Many athletes shy away from taking in calories during exercise because they fear an upset stomach. Understanding some basics of the gastrointestinal system may help to alleviate these fears.

Fueling During Exercise:

Before any food or fluid can be used by the muscle for energy, it must first empty from the stomach and be absorbed in the small intestine. The rate at which any food or fluid empties from the stomach is dependent upon the amount of energy (i.e. number of calories) the food contains. In other words, a milkshake will remain in the stomach longer than a glass of water. Therefore, the amount and composition of food or fluid is important especially during exercise when blood is diverted to the muscles and the risk of stomach upset increases. Research suggests that a carbohydrate concentration greater than 6% (6 grams of carbohydrate per 100 ml of water) empties from the stomach at a slower rate than those beverages that are 6% or less. In practical terms, most sports drinks are formulated to be 4 - 8%. Check the label and look for ≤ 14 grams of carbohydrate per 8 oz serving. Gels are popular during sporting events and are concentrated forms of carbohydrate (~25 grams). In order to ensure that a

gel will empty from the stomach quickly, drink at least 14 oz of water with each gel or 7 oz of water with $\frac{1}{2}$ gel. This same principle applies to food eaten during exercise. Always drink water with food to dilute the carbohydrate content. Drinking sports drinks with food or gels adds to the energy content and slows gastric emptying.

The same principles apply to intestinal absorption. Lower concentrations of carbohydrate are absorbed more quickly than high carbohydrate foods or beverages. In addition, products containing multiple types of carbohydrate are absorbed faster than those with only one. A product that contains multiple types of sugar (sucrose, glucose, fructose) utilizes multiple transporters in the small intestine. As sugar is absorbed, fluid follows allowing for better hydration, as well. Products containing only one sugar will saturate the transporters and slow carbohydrate and fluid absorption.

Putting it all together:

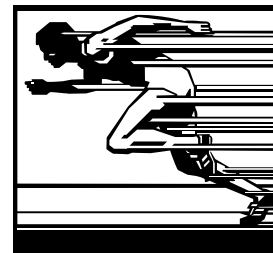
It’s important to understand that carbohydrate is the only form of energy that will be used by the body when consumed during exercise. Fat and protein will not be oxidized to any meaningful extent, if at all. Therefore, consuming calories that will not be used by the muscle will only serve to slow down gastric emptying and intestinal absorption.

Finally, your body has an upper limit to what it can absorb and use. It is not the goal during exercise to try to stay in energy balance. In other words, if you’re cycling for three hours or running a marathon, you may burn 2,500 kcal during that period of time. Carbohydrate is quickly absorbed and used by the muscle; however the upper limit is between 60-80 grams per hour (240-320 kcal).

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Consuming more than this amount will only increase the risk of gastrointestinal discomfort. It is possible that larger people are able to absorb and oxidize more carbohydrate than smaller people. However, the range of carbohydrate oxidation is relatively narrow and consuming more than 100 grams per hour for even the largest person is not

advised. Proper fueling for training and competition helps you get the most out of your body. There are so many factors in sports that you cannot control; it's good to know that nutrition does not have to be one of them. Practice in training what you intend to do during a game or a race and you'll be a fine-tuned machine.



Tips for Training and Competition:

- Your body needs carbohydrate, fluid, and electrolytes during exercise.
- Weigh yourself before and after exercise and drink enough to avoid more than 2 pounds of weight loss.
- Muscle cramping is often due to dehydration and/or excessive sodium losses. If you are experiencing muscle cramps during exercise, make sure you're drinking enough and taking in extra salt.
- Consume between 60-80 grams of carbohydrate per hour to keep muscles fueled.

Tips for Fall Prevention

- Keep all rooms free from clutter, especially on the floors
- Keep floor surfaces smooth but not slippery. Learn to look for differences in floor levels and thresholds.
- Wear supportive, low-heeled shoes, even at home, and avoid walking around in socks, stockings or scuffs.
- Make sure all carpets or area rugs have skid proof backing or can be tacked down to the floor, including carpeting on stairs.
- Be sure all stairwells are well lit and that stairs have handrails on both sides. Consider placing fluorescent tape on the edges of top and bottom steps.
- Install grab bars on bathroom walls beside tubs, showers and toilets. If you are unstable on your feet, use a plastic chair with a back and nonskid leg tips in the shower.
- Use a rubber bath mat in the shower or tub.
- Keep a flashlight with fresh batteries beside the bed.
- Add ceiling fixtures to rooms lit by lamps only or hook up a lamp so it is activated by a switch near a room's entry point. Another option is to install voice or sound activated lamps.
- Use at least 100-watt bulbs in the home.
- Consider purchasing a portable phone you can take with you from room to room. This way you can answer the phone without rushing for it and you can call for help if an accident occurs.
- Have daily contact with a family member or friend. Be sure at least one person always knows where you are.

**Performance
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Get Results!!

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**Suggested Websites/
Bibliography**

www.theprrt.com

www.vestibular.org

www.muscleactivation.com

View video of MAT and PRRT
techniques on our website!

We're on the Web!

See us at:

www.performance-physicaltherapy.com

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