Performance Services

Fact Sheet: Cramping

Canadian Sport Centre Pacific/Pacifique — Centre canadien multisport

Cramps – what are they and why do they occur?

Cramps are uncontrollable muscle contractions which are typically quite strong and can range from slightly to excruciatingly painful. When cramping occurs it becomes difficult to continue with intense exercise. Cramps are most common in the leg muscles.

Cramping is likely due to one or more of the following:

- Fluid loss resulting in dehydration.
- Loss of sodium - important in neural transmission and electrolyte balance
- Changes in other electrolytes (potassium, magnesium, calcium) but the evidence for this is limited
- Muscle fatigue

Avoiding muscle cramps

- Allow adequate recovery from training. Fatigue can play a role in cramping and a well rested muscle is less likely to cramp during exercise.
- Minimize quick changes in intensity late in the exercise session (ie – going from rest to hard efforts). An example of this would be coasting on a downhill section in a bike race and then having to quickly hammer up a hill.
- Increase fitness level as stronger muscles are less prone to cramping
- Stay well hydrated during exercise. This will require drinking the appropriate amount of fluids during exercise as well as starting the session well hydrated. The exact amount of fluid required will fluctuate with environmental temperature changes so be sure to take this into account.
- Make sure to adequately replace electrolytes by using a sport drink you've tested in training. Higher sodium intakes may be required when temperatures are unusually high, when sweat losses are large, during heat adaptation, or when exercising for greater than 3 hours. (see sodium table below)
- Make sure to have the right amount of carbohydrates during exercise, to optimize fluid absorption. Most sport drinks have about 60g of carbohydrate per litre, so you may need to have some food if you are drinking a lower Calorie drink.
- Be aware of changes in your sweat rate and sweat sodium concentration over the course of a season. It is important that fluid and salt consumption is adjusted accordingly as your physiology changes with improved fitness and adaptation to different environments.

Practical strategies for determining individual causes of cramping:

1. **Keep a training/competition log** – record the following:
   - time of day and temperature during training or competition
   - amount and type of food and fluids consumed the day before, 2 hours before, and during training or competition (best to record in milliliters)
   - training loads and recovery the 72 hours prior to competition

2. **Determine your sweat rate** – each person has slightly different fluid, electrolyte, and fuel requirements during competition and this will fluctuate with changes in temperature.

The following is a simple way to measure sweat rate:

- weigh yourself immediately before and following a hard training session. The difference between these two is your fluid loss during exercise.
- Weigh naked or in dry clothes as a large amount of your sweat will be trapped in your training gear.
- add to your pre-exercise weight the weight of any fluids and food you consumed during the training session so that you can calculate total sweat loss rather than just change in body weight. One litre of fluid weighs approximately 1kg.
- To increase accuracy try to avoid going to the bathroom between the pre and post training weight measures.

Calculations for Determining Sweat Loss

Pre-training weight:	75.0 kg
Post-training weight:	73.7 kg
Volume consumed:	1.5L (approx. 1.5 kg)
Duration of exercise:	120 min (2.0 hr)
Fluid deficit:	**75.0-73.7 = 1.3 kg**
Total weight loss:	**1.3+1.5 = 2.8 kg(~2.8 L of Sweat)**
Sweat rate:	**2.8L/2.0 = 1.40 L/hr**

3. **Evaluate your sports drink** – sports drinks are meant to help replace fluid, carbohydrates, and electrolytes (sodium, potassium, etc.) lost during training/ competition. As you'd expect, not all sport drinks are made the same and it will take some playing around to find one the works best for you.

   Note: Pay attention to how different sports drinks make you feel and then consult a sports Registered Dietician and Physiologist

4. **Analyze your sweat** – if you cramp regularly and/or notice white streaks on your workout gear sweat analysis will help you determine if you are a salty sweater. Working with a dietitian and physiologist, you can use this information to make adjustments to your diet and/or drink mixes and fine tune your salt needs. Some Canadian Sport Centres have this capability.

High Sodium Foods:

- **Sport Fluids** – Infinit Chill, E load
- **Dairy -** Buttermilk cheese or cottage cheese
- **Meat/fish/poultry** – cured, smoked, dried, salted, canned or pickled meats or fish; lunch meats
- **Nuts/seeds** – salted nut butters, salted nuts and seeds
- **Condiments** – ketchup, mustard, pickles, sauerkraut, olives, salad dressings, most seasonings, sauces and marinades
- **Soups** – all commercial soups and bouillons
- **Bread products and snacks** – commercial pancake, muffin, biscuit and cornbread. Crackers, potato chips, corn chips, pretzels, salted popcorn, cocoa.