Muscle Cramp in Swimmers

Having a muscle cramp while swimming presents some unique challenges to the sufferer. If you experience cramp while swimming you normally have to stop and climb out due to the pain and inability to continue. You are lucky then if you are not performing an open water swim where you can't stand or hang on to the lane rope. The best course of action is to get out of the water as quickly as you can without causing the muscle to re-cramp.

At some point almost everyone has suffered from cramp. Incidents can last from as little as a few seconds or up to 15 minutes, sometimes longer and can reoccur multiple times until the problem is finally resolved.

WHAT IS HAPPENING?

Cramp is one of those issues that still has sports scientists scratching their heads. One long-standing theory cites electrolyte loss/imbalance as the most likely culprit, but another more modern theory is that neuromuscular fatigue could play a central role when muscles involuntarily contract.

What that fancy 'sciencey' stuff means is that as you tire, the nerves supplying your muscles start firing and sending inappropriate signals without your permission, triggering a muscle to contract. Studies have shown this to be true, however scientists still don't fully know why the nerves talking to your muscles go AWOL as you tire.

The reaction may be that when you are working your muscles very hard for an extended period of time, the nerves fatigue and 'miscommunicate' messages from your brain, simply telling the muscle to contract. Another thought is that if you are exercising and a specific muscle is in a shortened (semi-contracted) position for a lengthy period, and has not had the opportunity to be relaxed or stretched out, it builds up a signal to the nerves saying it is 'contracting' and then the nerves trigger a full contraction without your permission.

This theory holds for swimmers as it explains two of the most common examples of cramp that swimmers experience:

1. **Cramp in the calf and sole of the foot:** Plantar flexing (pointing the toes and ankles down like a ballerina) occurs when all the muscles of the leg form a rigid line from your calf all the way to the toes. This position is sustained throughout freestyle, backstroke and butterfly kicking. It's an ideal position for the foot as it allows for maximum contact with the water and therefore greater force generation and more speed. The problem is, holding this pointed posture with the calf muscle and muscles of the foot in a shortened (semi-contracted) position, results in fatigue of the neuromuscular unit (the nerve muscle 'call centre') and subsequent cramp.
2. **Cramp in the hamstring muscles at the back of the thigh:** This is the same problem as above. During freestyle, backstroke and butterfly the knees are always slightly bent whilst kicking, never fully straightening. This places the hamstring muscle in a shorted position for long periods, ultimately risking the development of cramp.

If neuromuscular fatigue is the main issue then training more specifically (ie. with longer and harder efforts at race pace, under race-type conditions) should help as it will condition the muscles to cope. It may also be worth getting some proper sports massage on the affected muscles and topping that up with foam rolling and regular stretching to keep the muscles as supple and relaxed as possible.

WHAT DO YOU FEEL?

Agony! It's normally the sudden unexpected shock of the cramp that catches us off guard. Cramp involves a visible hardening of the area, tenderness to the touch and debilitating pain. Often your toes curl up and you can't straighten them.

The symptoms therefore include:

- Sudden stiff and tight muscles
- Pain in the affected area
- Restricted or difficult movement in affected area
- A feeling of bruising in the muscle following a bad cramp.

TREATMENT FOR CRAMP

1. Once out of the water, primary treatment involves stretching. Or attempting to stretch whilst treading water. If possible have a friend or coach help you stretch, they can provide the correct amount of tension without you straining yourself.
2. A massage following the cramp can be beneficial in relaxing the muscle and minimising the chance of that bruised feeling the following day.
3. A hot pack may also provide some relief, and the increased blood flow to the muscle can aid in relaxation.
4. Always try to incorporate an adequate warm-up and cool-down phase as part of your training session.

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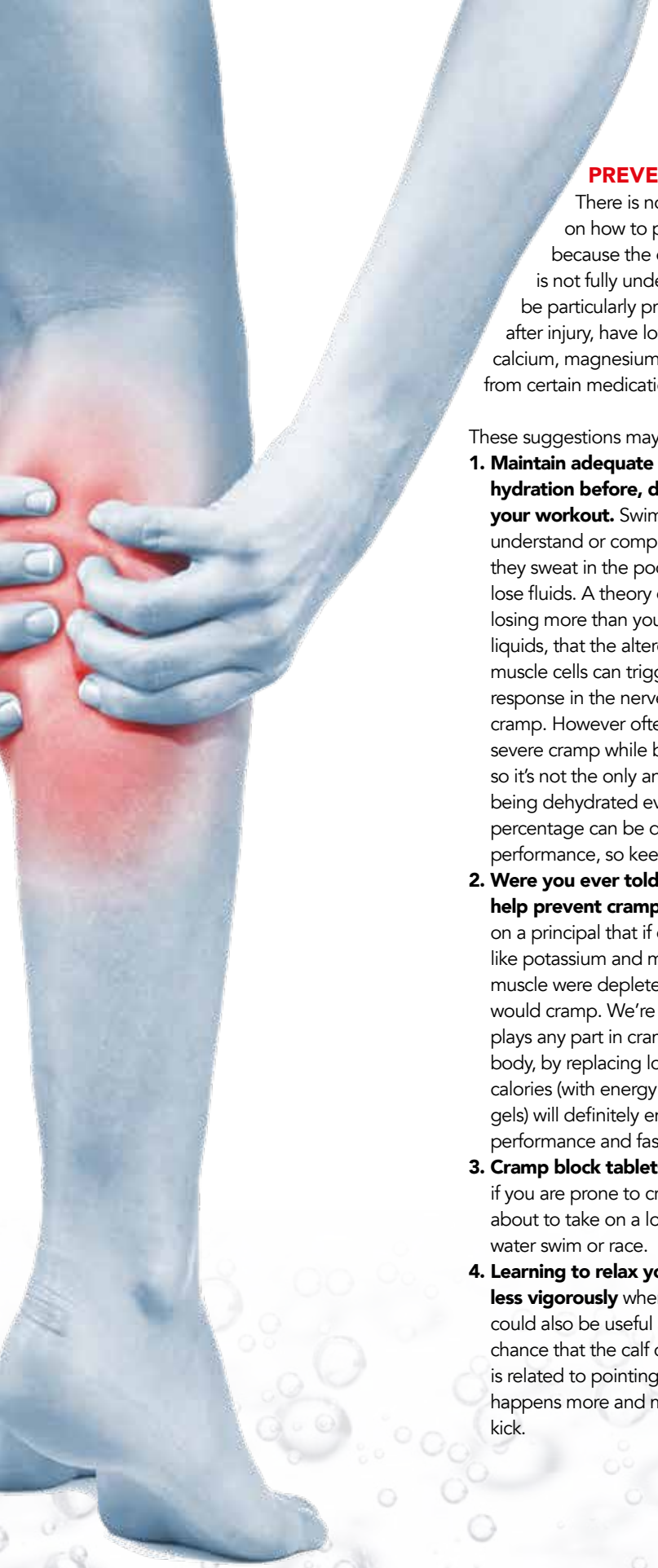

PREVENTING CRAMP

There is no definitive answer on how to prevent cramp because the exact mechanism is not fully understood. You may be particularly prone to cramp after injury, have low blood levels of calcium, magnesium, or potassium or from certain medications.

These suggestions may help:

1. **Maintain adequate levels of hydration before, during and after your workout.** Swimmers don't fully understand or comprehend how much they sweat in the pool and therefore lose fluids. A theory exists that if you are losing more than you are consuming in liquids, that the altered fluid level in your muscle cells can trigger a mechanical response in the nerves and result in cramp. However often athletes suffer severe cramp while being well-hydrated, so it's not the only answer. Either way, being dehydrated even by a small percentage can be detrimental to performance, so keep those fluids up.
2. **Were you ever told to eat bananas to help prevent cramp?** This was based on a principal that if electrolyte levels, like potassium and magnesium, in the muscle were depleted your muscles would cramp. We're still not sure if this plays any part in cramp, but fuelling your body, by replacing lost electrolytes and calories (with energy bars, drinks and gels) will definitely ensure prolonged performance and faster recovery.
3. **Cramp block tablets may be helpful** if you are prone to cramping and are about to take on a long swim, open water swim or race.
4. **Learning to relax your feet and to kick less vigorously** when swimming hard could also be useful as there's a good chance that the calf or foot cramping is related to pointing your toes, which happens more and more the harder you kick.
5. **Avoid a heavy leg session in the gym prior to a pool session.** Swimmers will tell you that if you jump into the pool straight after a hard workout, that their muscles continue to twitch with each kick or push off the wall, with an imminent reaction being cramp in the legs. This follows the theory that fatigue of the nerve-muscle-complex triggers cramp.
6. **Conditioning.** You have probably noticed that you cramp up more at the beginning of the season, after a long layoff, or during particularly trying stretches of intense training when you are either not in great shape or fatigued. General fitness and improved swimming condition over time should help reduce your incidence of cramp. If you are prone to cramp in a specific muscle, then maybe some focused strengthening and stretching are required. A physical therapist can teach you appropriate exercises. The exercises should not be aimed at building bulk or strength – remember cramp is associated with fatigue - so exercise sets should be based on improving endurance and stamina in the muscle, lots of low intensity repetitions.
7. **Variety.** Try mixing up your swimming sessions with different strokes and drills so your muscles are not in sustained contracted positions for lengthy periods.

Cramp tends to happen when you are pushing yourself harder than normal, or when you are going too hard compared to your training experience. This isn't necessarily the worst thing for a competitive swimmer who is constantly trying to probe the reaches of their limits, but not really necessary if you're getting into the pool to get into better shape. There's no guarantee that if you drink lots of water and escalate your training at a reasonable pace that you will never experience a muscle cramp again, but maybe less often and to a lesser extent.

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