**MedicallyFIT**

**Exercise-Induced Rhabdomyolysis: Questions & Answers**

By Joe Cannon

Intense, boot camp workouts are very popular, and for some, can be a fun way to beat exercise-boredom and get in shape. That said, I’d like to tell you about a condition that you may not have heard of. It’s called rhabdomyolysis and it’s a potentially very serious disorder that is becoming more prevalent due to the growing options of high intensity workouts available today and because of those who want fast results. Most people have never heard of rhabdo although they likely have heard vague references to it during some TV commercials.

**What is rhabdomyolysis?**

Rhabdomyolysis (rab-doe-my-oh-lie-sis) also called “rhabdo” (rab-doe) is a serious medical condition that literally means “muscle fiber death.” The condition results from any stress that is too much for the body to handle. Rhabdomyolysis can result from a car crash, a snakebite, the flu and even some medications can cause it. When too much exercise causes the condition, it’s called exercise-induced rhabdomyolysis (or exertional rhabdomyolysis).

When the muscle fibers of the body break down, they release their cellular contents into the blood. This can have disastrous consequences, including death in extreme cases.

**Rhabdo signs and side effects**

There are those who downplay the effects of rhabdomyolysis stemming from exercise. However, here is a short list of some things that may occur:

1. **Heart attack.** When muscle cells die, they release a lot of potassium and calcium into the blood. This can alter the balance of electrolytes in the blood and cause the heart to beat irregularly and in extreme cases, may even cause a heart attack.

2. **Kidney failure.** When the muscle cells die, they release a compound called myoglobin. Myoglobin is a crucial component of muscle cells, but it is toxic to the kidneys. So, when the kidneys are flooded with myoglobin, they stop working. This can result in less urination. In some cases, people may need to go on dialysis to try to save the kidneys. Sometimes, people with rhabdomyolysis may need a kidney transplant.

3. **Swollen arms and legs.** This swelling of the arms or legs after intense exercise can be so bad that people might not be able to bend them anymore. The swelling cuts off the blood supply to the muscles, causing more damage. In extreme circumstances, doctors may need to amputate the limbs to save the person’s life.

One person who developed rhabdomyolysis after exercise told me that the swelling was so bad, that, at first, he thought his muscles had grown bigger! Another person told me that she could no longer bend her arms and was not able dress herself or go to work because of the swelling.

4. **Very intense muscle pain.** Everybody who has worked out, has had sore muscles. This muscle pain is called delayed muscle soreness (DOMS) and usually occurs twenty-four to seventy-two hours after exercise. If you’ve ever had DOMS, you may have noticed that no pain is felt when you were not moving.

Rhabdomyolysis feels different. This pain is usually felt quickly, sometimes soon after exercise has stopped. It may also occur up to twenty-four hours after exercise. Also, rhabdomyolysis pain hurts even when you are not moving. So, even though the person is perfectly still, their muscles still ache.

One person, who had rhabdo told me the pain hurt so badly that when she was in the hospital, not even morphine helped.

5. **Dark colored urine.** In about fifty percent of rhabdo cases, people may notice that their urine looks dark, reddish-brown colored. The urine is often reported as looking like ice tea or cola-colored.

**What causes rhabdomyolysis?**

Exercise-induced rhabdo usually occurs when the exercise intensity is increased too quickly for the body to adapt. An example would be a beginner or someone who has not worked out in many months performing four different exercises for the chest muscles.

Since “negatives” (eccentric muscle actions) result in more muscle damage, exercises that involve a lot of negatives may also increase the chances of rhabdo occurring.

It’s difficult to say how much exercise might cause rhabdomyolysis. It’s different for different people. Two people could do the same work out; one might get rhabdo while the other might not.

To give an idea of how little exercise might cause rhabdo, one case report links the development of rhabdomyolysis to someone who performed only thirty sit-ups for a week.

**How long does it take for rhabdo to occur?**

Rhabdomyolysis can occur after one single workout. This is not something that takes weeks to show up. Rhabdo is not the same thing as delayed muscle soreness (DOMS).

**Does rhabdo only happen in beginners?**

No, anybody can get rhabdomyolysis. Beginners can get it and so too can athletes and those who have not worked out for a long time. Rhabdo often occurs when the intensity of exercise is increased too fast.

**Can cardio cause rhabdo?**

Yes, rhabdomyolysis can be induced by either aerobic activities or strength training. For example, there are case reports of rhabdo occurring following spinning classes and swimming. The thing to remember is that any activity that overwhelms the body can cause rhabdomyolysis.

**How likely is rhabdo?**

Most people will never get exercise-induced rhabdomyolysis even if they engaged in high intensity exercise. Having said that, it is difficult to estimate how many people get exercise-induced rhabdo per year because not everyone who gets it will have it badly enough to seek medical attention. According to the Center for Disease Control and Prevention statistics, in 1988 there are approximately 25,000 cases of rhabdo each year in the US and at least fifty percent of those cases were due to exercise. Granted, that is an older statistic, but the nineteen eighties pre-dates most of the popular, intense exercise regimens we have all heard of. Are the rates higher now? I don’t know. For those who have experienced rhabdomyolysis after exercise, it can be a life-changing and frightening event.

**Who is risk of Rhabdomyolysis?**

Technically, anybody can get rhabdo if they exercise hard enough or if the intensity of exercise is increased too quickly. The trick is knowing how much is too much. The amount of exercise is likely to be differ-
Caffeine, as well as other stimulants, might also increase the risk of rhabdomyolysis. There are also case reports of rhabdomyolysis following use of large amounts of caffeine. That contains amphetamines might also increase rhabdomyolysis risk. There are also case reports of rhabdo following these as well.

1. Cholesterol lowering medications. You may have heard TV commercials for cholesterol-lowering drugs give the vague warning, “If you experience any muscle pain or weakness, see your doctor as this could be a sign of a rare but serious disorder…”

The “rare but serious disorder” TV commercials refer to is rhabdomyolysis. Since cholesterol medications slightly raise the risk of rhabdomyolysis, it’s logical that the risk is increased when combined with high intensity exercise programs.

For those who take supplements such as red yeast rice or guggul to help cholesterol levels, isolated case reports of rhabdo have also been reported following these as well.

2. Amphetamines/stimulants. Some prescription medications that contain amphetamines might also increase rhabdomyolysis risk. There are also case reports of rhabdo following use of large amounts of caffeine as well as Hydroxycut.

3. Lots of negatives. Eccentric muscle actions (“negatives”) do more damage to the muscle and are more highly associated with rhabdomyolysis. Yes, eccentric movements do have exercise benefits, but programs that incorporate a lot of negatives, especially in those not used to them, may increase the risk of getting rhabdomyolysis in some individuals.

4. McArdle disease. This is a condition where people do not store glycogen (carbohydrates) in their bodies very well. Excessive exercise in people with McArdle disorder has been noted to result in more rhabdo.

5. The sickle cell anemia trait. People with the sickle cell anemia trait don’t have sickle cell anemia, but they have a gene for it. There is some evidence that the risk of rhabdo is greater in those who have the sickle cell trait. In one case report, a nineteen-year-old healthy college football player who had the sickle cell trait died from rhabdo complications after running sixteen successive hundred-yard dashes.

Dehydration and rhabdo

In some circles, there is the belief that that drinking water during exercise prevents rhabdo from occurring. While being severely dehydrated can cause rhabdo and even make rhabdo worse, the most often cause of rhabdo in the gym is overwhelming the muscles with too much exercise, causing the muscle fibers to die. Drinking water during exercise will not prevent muscle fiber death.

Creatine and rhabdomyolysis?

Creatine, is a popular muscle-building supplement. If you do an Internet search for “creatine and rhabdo” you will see case reports of people who developed rhabdomyolysis — some of which died — while taking creatine supplements. “Having looked at the creatine and rhabdo research, the one thing everybody had in common was that they were all doing a lot of exercise. So was it the creatine or exercise that caused rhabdo – or a combination of both? I feel more research is needed on this issue.”

Can you get Rhabdo more than once?

It does appear that if a person developed rhabdomyolysis once, that he/she is more likely to get it again. There are case reports of people getting rhabdo several times following exercise.

For personal trainers

In some gyms, personal training sessions are only thirty minutes long. Some trainers try to squeeze as much as possible into those workouts to challenge people to help them achieve their fitness goals. While it’s good to be efficient, and challenge people, the desire to help others achieve their fitness goals might accidentally induce rhabdo if too much exercise is prescribed, especially if the client is a beginner or someone who is returning to the gym after taking a few months off.

When in doubt, circuit strength training, using light resistances, is the most efficient and safest training program for beginners and those returning to exercise after a long absence.

There are strong feelings on both side of the issue and my intention when writing this article was not to scare anyone or disparage any specific intense/boot camp style exercise program. Rather, my goal was to educate the public about a rare exercise-related phenomenon, and in doing so, reduce the likelihood of it occurring.

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