

Exertional Rhabdomyolysis Information Sheet

WHAT IS EXERTIONAL RHABDOMYOLYSIS?

Exertional Rhabdomyolysis is the breakdown of skeletal muscle as a result of excessive physical training, work, or exercise. Injury causes the release of cellular contents into the bloodstream. Some of these muscle fiber contents, most notably myoglobin, are toxic to the kidney and can potentially result in severe kidney damage. In addition, excessive muscle damage can produce swelling of muscle and surrounding tissues resulting in poor circulation and excessive pressure causing further trauma.



RISK FACTORS AND PROTECTIVE FACTORS ASSOCIATED WITH RHABDOMYOLYSIS

RISK FACTORS FOR EXERTIONAL RHABDOMYOLYSIS	PROTECTIVE FACTORS AGAINST EXERTIONAL RHYBDOMYOLYSIS
<ul style="list-style-type: none"> • Elevated heat and humidity • Poor physical conditioning • High-intensity, load-bearing exercise • Dehydration • Sickle cell trait • Recent weight loss • Prior history of heat injury • Altitude greater than 3000 feet • Stimulant use (ephedrine, Ephedra, caffeine) • Supplement, drug, or alcohol use that disrupts temperature regulation or hydration • Viral and/or bacterial infection • Illicit drug use 	<ul style="list-style-type: none"> • Heat stress acclimatization • Good physical fitness • Avoiding rapid increases in exercise volume and intensity • Exercise familiarity • Good hydration status • Absence of sickle cell trait • Stable and healthy body weight • Altitude less than 3000 feet and/or acclimatization • Illicit drug and alcohol free behavior • Well-balanced diet • Proper recovery and sleep habits

NOTIFY YOUR INSTRUCTOR IF YOU HAVE THE FOLLOWING SYMPTOMS

<ul style="list-style-type: none"> • Excessive muscle discomfort • Weakness • Severe fatigue • Discoloration of the urine (dark brown color) 	<ul style="list-style-type: none"> • Fever • Elevated resting heart rate above 100 bpm • Nausea • Vomiting
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SIGNS AND SYMPTOMS OF EXERTIONAL RHABDOMYOLYSIS

Muscle pain, malaise, weakness, tenderness, and contractures (knots). Most frequently, the involved muscle groups are the legs and lower back. However, the pain may be generalized to the muscle group most worked during training, and a significant proportion of cases may show no signs of muscle injury at all. Sometimes, bruising of the overlying skin may be seen. Typically, the muscle disorder is self-limiting and resolves within days to weeks.



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PREVENTATIVE RECOMMENDATIONS

SERIAL POSTURES OF EXERTIONAL COLLAPSE



- Athletes in active recovery to early fatigue: continue rehydration, rest intervals, cooling and controlled breathing.
- Athletes who are showing signs of physical distress should be allowed to set their own pace while conditioning. Instruct athletes to rest while experiencing symptoms as they may soon feel better and be ready to continue. If symptoms reoccur or progress, the athlete should stop exercise and be assessed by a health care provider.
- Athletes unable to stand on their own from a kneeling position or having trouble walking normally during recovery should raise suspicion of distress, and additional medical intervention should be considered.

High intensity activities that lead to exertional collapse can cause rhabdomyolysis

- Maintain good physical condition.
- Adhere to proper hydration practices to include:
 - Consume ½ to 1 liter (17-34 ounces) of fluids (water, milk, juice) two hours prior to exercise or physically demanding training.
 - During activity, drink frequently (1 cup every 15 minutes)
 - After activity, replenish fluids at a rate at or exceeding ½ liter (use about 2 cups) for every pound of body weight lost during the shift. Regain weight before next shift.
- Monitor urine output. Trainees should be urinating at least four times per day, and it should be very light yellow in color.
- Avoid any substance and/or nutritional supplements that may disrupt normal hydration status and/or metabolism, which may include but is not limited to:
 - Energy drinks or supplements (caffeine, ephedrine, Ephedra)
 - Alcohol
 - Protein supplements beyond what is needed (protein requirements during training are equal to 0.68 to 0.90 grams per pound of healthy body weight)
 - Illicit drugs
 - Antihistamines/decongestants (increases likelihood of dehydration)
 - Laxative and diuretics (water pills)
- Trainees who are overweight and are trying to lose weight should consume a well-balance diet with plenty of fruits, vegetables, grains, lean meats and water. Modify calorie intake to illicit a slow consistent weight loss rate of 1-2 pounds per week.
- Trainees with medical history of having seizures, asthma, the sickle cell trait, taking lipid (cholesterol) lowering medication, prior heat-related injuries, recent weight loss > 10 pounds, poor physical fitness, and/or general illness should let their instructors know as they are at a higher risk of developing exertional rhabdomyolysis.

