

RHABDOMYOLYSIS AWARENESS & PREVENTION BEST PRACTICES

Rhabdomyolysis is a serious condition caused by the breakdown of skeletal muscle tissue. When muscle is damaged, substances such as myoglobin and creatine kinase (CK) enter the bloodstream and can lead to kidney injury, dangerous electrolyte imbalances, compartment syndrome, and other medical complications. This bulletin provides awareness of rhabdomyolysis, its warning signs, and practical steps to reduce risk during training and emergency response activities.

Fire and EMS work can combine multiple risk factors at the same time:

- Extreme physical exertion often with heavy PPE and SCBA load
- Prolonged incidents with limited recovery time
- High-repetition, strenuous drills
- Return to duty after illness, injury, or deconditioning

Fire and EMS agencies have experienced rhabdomyolysis in several high-risk situations, including:

- Recruit academy training and high-intensity physical training
- Live burn, stair climbs, hose advancement, and forcible entry training
- Wildland or high-heat and long-duration operations
- Mass Casualty Incidents; repeated patient lifting, moving, or extrication

Best Practices to Prevent or Mitigate Rhabdomyolysis

During Training

- Increase physical demands gradually
- Avoid sudden spikes in intensity or volume
- Avoid excessive repetitions to failure
- Build in work/rest cycles
- Modify drills for recruits, deconditioned members, and personnel returning from leave or injury
- Avoid stacking intense PT with high-heat training evolutions

During Emergency Response

- Use formal rehab
- Rotate crews during prolonged or high-heat operations
- Provide hydration and cooling
- Remove PPE in rehab when safe to do so
- Monitor members for pain, weakness, fatigue, and heat stress symptoms. Monitor responders who experience these symptoms until they return to baseline.
- Do not allow personnel to “push through” severe symptoms

General Risk Reduction

- Encourage hydration before, during, and after strenuous work
- Promote acclimatization to heat and workload
- Encourage reporting of recent illness, medication changes, or prior rhabdomyolysis to the appropriate medical authority. Use medically guided return-to-duty processes after a confirmed case.
- Educate personnel on early recognition and reporting of warning signs.

Warning Signs and Symptoms

- Severe muscle pain beyond normal soreness
- Muscle swelling or tightness, or cramping
- Unusual fatigue, weakness or difficulty continuing activity
- Nausea or vomiting
- Dark, tea-colored, or cola-colored urine or reduced urine output

It is important to note that not all cases present with dark urine early. Severe pain, swelling, or weakness after heavy exertion should never be ignored.

Rhabdomyolysis Is Suspected

- Stop activity immediately
- Move the member to rehab or a cooler area
- Assess for heat illness and other urgent conditions, such as altered mental status or signs of heat stroke
- Arrange prompt medical evaluation
- Do not return the member to training or operations until medically cleared

In Fire and EMS settings, rhabdomyolysis most commonly occurs when extreme exertion, heat stress, and dehydration combine, especially in personnel who are not acclimatized, deconditioned, fatigued, or pushing through symptoms. The best protection is a combination of heat and workload management, a formal rehab-hydration-rest policy, and education.