

Note: Crew leaders should print this page and carry it with them. In the event of a potential case of rhabdomyolysis, bring this sheet with you to the hospital, clinic, etc.

Exertional Non-traumatic Compartment Syndrome and Rhabdomyolysis in Wildland Firefighters

This wildland firefighter is presenting to your Emergency Department for evaluation of muscle pain along with possibly heat illness. Our wildland firefighters in the last several years have had an increased incidence of exertional non-traumatic compartment syndrome as well as rhabdomyolysis because of the prolonged exertion during fire response duties and training, carrying heavy loads (up to 110 lbs.) and arduous exertion for long periods of time across steep terrain. Several cases have become permanently disabling.

These firefighters tend to be stoic in regards to their injuries and pain, and don't normally complain of much until they can't deal with it. As a result, the pain tends to be an acute onset complaint. These two diagnoses are rare, often initially misdiagnosed, and difficult to identify, but please consider them high in your differential, so that we can keep these firefighters doing a job they love.

Classic signs/symptoms:

- Muscle pain/cramping
- Swelling of affected area of limb
- Weakness/decreased ROM of affected limb
- Dark, tea colored urine in rhabdomyolysis

Consider:

- Check serum CPK
- Value is considered positive if 5X's greater than the upper limit of that assay's reference range or above 1000 IU/L²
- If normal but high suspicion, admit for observance and serial CPK's q6hr x 12-24 hr¹

1. Criddle LM [2003], Rhabdomyolysis: Pathophysiology, Recognition, and Management. Crit Care Nurse 23(6):14-30.
2. Khan FY [2009], Rhabdomyolysis: A Review of the Literature. Netherlands J Med 67(9):272-283.

Note: This clarifying guidance will assist Forest Service Employees—including contracted and AD employees in communicating Forest Service Policy with healthcare providers after a wildland firefighter burn injury. It is important that the right care at the appropriate level is discussed before the wildland firefighter is released from care.

Burn Center Consultation Protocols for Forest Service Wildland Firefighters

A burn injury sustained by a wildland firefighter may need a consultation or a referral for care by a Regional Burn Center. The Forest Service has existing policy, located within the 2021 NWCG Redbook Chapter 7 that specifies conditions for treatment at a regional burn center (see “Specific Conditions”). However, this letter clarifies responsibilities when specific criteria may not be met (see “Borderline Conditions”).

Remember that an injury which needs immediate stabilization may be sent to the nearest hospital first before being transferred to a burn center if appropriate. This is the call of the transporting local authority.

Burn injuries are often difficult to diagnose and may take up to 72-hours post injury to develop to the full extent.

A partial thickness burn larger than the size of the injured person’s palm should be evaluated in an ER and not an urgent care or doctor’s office.

Specific Conditions- Burns that are to be treated at a burn center:

- 1- Any full Thickness Burn (a.k.a. 3rd degree)
- 2- Any partial thickness burn (2nd degree) greater than 10% of total body surface area (TBSA).
- 3- Partial thickness burns (2nd degree) involving the face, hands, foot, genitalia, perineum, or major joints.
- 4- Any patient with burns and concomitant trauma (such as fractures) in which the burn injury poses the greatest risk of morbidity or mortality.
- 5- Electrical burns, lightning injury, chemical burns are present or if inhalation injury is suspected.

Borderline Conditions- When the above criteria are not clearly met, consider the following:

The Agency Administrator, or designee (ex: Hospital or Family Liaison), should work closely with the attending physician when there is a concern about borderline conditions not meeting the above criteria. The Forest Service cannot require an attending physician to make a referral, nor does a Regional Burn Center have to accept a referral. However, Forest Service Employees need to initiate a conversation with the attending physician to either obtain a virtual consult with a Regional Burn Center or refer them for follow-up within 48 hours with an outpatient burn center clinic. Regional Center Locations can be found at the American Burn Association Website linked below. Conditions which may promote additional conversation include, but are not limited to:

- 1- Burn injuries are greater than superficial (1st degree) but less than the above partial thickness criteria (5% or more of TBSA).

- 2- A medical provider has made a direct comment they are not sure of the degree of the burn or size.
- 3- A medical provider has made a comment that they do not know where the burn center is.
- 4- The medical provider has not discussed burn injury consultation options with the injured wildland firefighter or representative.

Resources:

[2021 NWCG Redbook Chapter 7](#)

[American Burn Association, Burn Center Locations](#)



This guidance was put together in the spring of 2021 in response to multiple burn injuries experienced by U.S. Forest Service employees as an effort to bolster support and understanding of care and support when a burn injury occurs.