

**MONTERERY COUNTY FIRE CHIEFS ASSOCIATION
FIRE OPERATIONS MANUAL
SECTION 16**

Emergency Responder Rehabilitation

1. Introduction

- A. Purpose: This policy is designed to outline specific medical response procedures and responsibilities during any incident where Firefighters and EMS personnel are working under stressful conditions that require rehabilitation. Recognizing a majority of incidents may fall into this category, this policy aims to identify specific trigger points for establishing a medical rehab unit and leader.
- B. Definitions: Emergency responder rehabilitation is an essential element on the incident scene designed to help prevent serious and life-threatening conditions such as heat stroke and heart attacks from occurring. Emergency responder rehabilitation is designed to ensure the physical and mental well-being of members operating at the scene of an emergency do not deteriorate to the point where they affect the safety of any responder. Fire ground rehab is the term used for the care given to emergency workers while performing their duties at an emergency scene. ***It includes personnel monitoring, acclimatization, hydration and nourishment; work/rest cycles where compatible with emergency response, personal protective equipment, and emergency medical response.***
- C. Authority: The prevailing authority for this document lies with National Fire Protection Administration (NFPA) 1584, and is also governed by the United States Fire Administration (USFA). ADM 020 Heat Illness Prevention Plan, as referenced in Cal/OSHA, Title 8, California Code of Regulations, Section 3395.
- D. Scope: This procedure shall apply to all emergency operations and training exercises where strenuous activity or exposure to heat exists.
- E. Responsibilities:
- I. Incident Commander: The Incident Commander shall consider the circumstances of each incident and make adequate provisions early in the incident for the rest and rehabilitation for all personnel operating at the scene. Rehabilitation shall include the provision of Emergency Medical Services (EMS) at the Basic Life Support (BLS) level or higher. An ALS ambulance is preferred.

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F. Supervisors:

- I. Supervisors shall maintain an awareness of the condition of each responder operating within their span of control and ensure that adequate steps are taken to provide for each member's safety and health. **Supervisors will further insure that employees under their supervision understand and follow department policy and procedure.** The command structure shall be utilized to request relief and the reassignment of fatigued crews.
- II. In the Rehab Area, the Rehab Group Leader will oversee medical evaluation, treatment and monitoring; food and fluid replenishment; mental rest; and relief from extreme climatic conditions and the other environmental parameters of the incident.
- III. Personnel: **All employees have the responsibility to be physically fit to perform the variety of tasks and assignments they are given.** During periods of hot weather, members shall be encouraged to drink water and activity beverage (i.e. Gatorade) throughout the work day. During any emergency incident or training evolution, personnel shall advise their supervisor when they believe that their level of fatigue or exposure to heat or cold is approaching a level that could affect themselves, their crew, or the operation in which they are involved. Personnel shall also remain aware of the health and safety of other members of their crew.

G. Establishment of a Rehabilitation Area:

- I. Responsibility: The Incident Commander will establish a Rehabilitation Area or Group when conditions indicate that rest and rehabilitation are needed for personnel operating at an incident scene or training evolution. Note: A heat stress index above 90 degrees F is one example, though the rehab group can be established at a lower heat index depending on the assignment. The Rehab Group Leader will typically report to the Incident Commander or the Logistics Officer in the framework of the incident command system.
- II. Location: The location for the Rehabilitation Area will normally be designated by the Incident Commander. If a specific location has not been designated, the Rehab Group

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Leader shall select an appropriate location based on the site characteristics and designations below.

III. Site Characteristics:

- a. Be in a location that will provide physical rest by allowing the body to recuperate from the demands and hazards of the emergency operation or training evolution.
- b. Be far enough away from the scene that members may safely remove their turnout gear and SCBA and be afforded mental rest from the stress and pressure of the emergency operation or training evolution.
- c. Provide suitable protection from the prevailing environmental conditions. During hot weather, it should be in a cool, shaded area.
- d. Enable personnel to be free of exhaust fumes from apparatus, vehicles, or equipment (including those involved in the Rehabilitation Area operations).
- e. Large enough to accommodate multiple crews, based on the size of the incident.
- f. Easily accessible by EMS units.
- g. Allow prompt reentry back into the emergency operation upon complete recuperation.

IV. Site Designation:

- a. A nearby garage, building lobby, or other structure.
- b. A school bus, municipal bus, or bookmobile.
- c. Fire apparatus, ambulance, or other emergency vehicles at the scene or called to the scene.
- d. An open area in which a rehab Area can be created using tarps, fans, etc. that is in a safe, dry location.

V. Resources: The Rehab Group Leader shall secure all necessary resources required to adequately staff and supply the Rehabilitation Area. The supplies should include the items listed below:

- a. Fluids - water, activity beverage, oral electrolyte solutions, ice.
- b. Food - soup, broth, or stew in hot/cold cups.
- c. Medical - blood pressure cuffs, stethoscopes, oxygen administration devices, cardiac monitors (ALS), intravenous solutions (ALS) and thermometers.

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- d. Other - awnings, fans, tarps, smoke ejectors, heaters, dry clothing, extra equipment, floodlights, blankets and towels, traffic cones and fire line tape (to identify the entrance and exit of the Rehabilitation Area)

2. PROCEDURE

A. Guidelines for Rehabilitation Area

- I. Rehabilitation Group establishment: Rehabilitation should be considered by Chief Officers during the initial stages of an emergency response. However, the climatic or environmental conditions of the emergency scene should not be the sole justification for establishing a Rehabilitation Area. Any activity/incident that is large in size, long duration, and/or labor intensive will rapidly deplete the energy and strength of personnel and therefore merits consideration for rehabilitation.
 - a. The Rehab Area will be supervised by the Rehab Group Leader. The Rehab G/S can be a fire officer, ambulance crew member, or ambulance supervisor.
 - b. Fire Department resources designated for rehab and ambulance provider will maintain inventories of Rehab forms.
- II. Hydration: A critical factor in the prevention of heat injury is the maintenance of water and electrolytes. Water must be replaced during exercise periods and at emergency incidents. **During heat stress, each responder should consume at least one quart of water per hour. The rehydration solution should be a 50/50 mixture of water and a commercially prepared activity beverage.** Rehydration is important even during cold weather operations where, despite the outside temperature, heat stress may occur during firefighting or other strenuous activity when protective equipment is worn. **Alcohol and caffeinated beverages should be avoided** before and during heat stress because both interfere with the body's water conservation mechanisms. Carbonated beverages should also be avoided.
- III. Nourishment: Food will be provided at the scene of an extended incident when units are engaged for three or more hours. A cup of soup, broth, or stew is highly recommended because it is digested much faster than sandwiches and

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fast-food products. In addition, foods such as apples, oranges, and bananas provide supplemental forms of energy replacement. Fatty and/or salty foods should be avoided.

- IV. Rest: **The “two air bottle rule,” or 45 minutes of work time, is recommended as an acceptable level prior to mandatory rehabilitation.** Personnel should re-hydrate, drinking at least eight ounces of fluid while SCBA cylinders are being changed. Firefighters having worked for two full 30-minute rated bottles, or 45 minutes, should be immediately placed in the Rehabilitation Area for rest and evaluation. Rest shall not be less than ten minutes and may exceed an hour as determined by the Rehab Group Leader. Fresh crews, or crews released from the Rehabilitation Group, shall be available in the Staging Area to ensure that fatigued crews are not required to return to duty before they are rested, evaluated, and released by the Rehab Group Leader.
- V. Recovery: Personnel in the Rehabilitation Area should maintain a high level of hydration. Personnel should not be moved from a hot environment directly into an air conditioned area because the body’s cooling system can shut down in response to the external cooling. An air conditioned environment is acceptable after a cool-down period at ambient temperature with sufficient air movement. Note: Certain drugs impair the body’s ability to sweat and extreme caution must be exercised if an employee has taken antihistamines, such as Actifed or Benadryl, or has taken diuretics, beta blockers or stimulants.
- VI. Cooling Activities: Active cooling measures should be taken. Firefighters should “dress down” removing turnout coats, helmets and gloves in order to reduce trapped heat in their safety gear. Consider using the misting fan or additional active cooling such as hand/ forearm emersion and ice vests to reduce core body temperature.

B. Personnel Accountability

- I. Personnel will be released to the Rehab Group by their supervisor.

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- II. After being released from the rehab area by the Rehab Group, personnel will request a new assignment from the Incident Commander.

C. Medical Evaluation

I. Emergency Medical Services (EMS):

EMS should be provided and staffed by the most highly trained and qualified EMS personnel on the scene (at a minimum of BLS level). They shall evaluate vital signs, examine members, and make proper disposition (return to duty, continued rehabilitation, or medical treatment and transport to medical facility). Continued rehabilitation should consist of additional monitoring of vital signs, providing rest, and providing fluids for rehydration. EMS personnel shall be assertive in an effort to find potential medical problems early.

II. Environmental Factors

a. Heat Stress Index (see Attachment A)

The heat stress index is a guideline that factors the outside temperature and current relative humidity to establish a heat disorder rating. The disorder rating establishes an index of potential danger and injury threat to emergency scene personnel in assessing for potentially debilitating symptoms.

b. Wind Chill Index (see Attachment B)

Wind chill is the apparent temperature felt on exposed skin, which is a function of the air temperature and wind speed. The wind chill temperature (often popularly called the wind chill factor) is always lower than the air temperature, except at higher temperatures where wind chill is considered less important.

III. Assessment/Evaluation

- a. Assessment/evaluation of emergency scene personnel will be conducted by EMS personnel under the guidance of the Rehabilitation Group Leader.

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- b. When personnel have checked in to the Rehab Unit, they will be evaluated using the following physiologic parameters:
- Presence/Absence of priority symptoms.
 - Heart Rate
 - Respiratory Rate
 - Blood Pressure
 - Temperature
 - Oxygen Saturation (*if available*)
 - Carbon Monoxide Saturation (*if available*)
- IV. Following this evaluation, the responder will be classified as GREEN, YELLOW, or RED. The criteria for each classification are found in the Clinical Algorithm for Rescue Worker Rehab (page 9).
- Meeting GREEN criteria indicates that the responder can be quickly returned for assignment.
 - Meeting YELLOW criteria indicates that the responder's vital signs are mildly/moderately altered, and that the responder requires more rest, rehab interventions, and re-evaluation before being cleared for re-assignment.
 - Meeting RED criteria indicates that the responder has such abnormal vital signs, or the presence of PRIORITY SYMPTOMS (See Clinical Algorithm for Rescue Worker Rehab) that he/she may not return for assignment before being medically cleared by a physician or a physician's designee. Responders classified as RED will be evaluated at the closest, most appropriate emergency department as soon as possible.
- a. If the responder's evaluation meets GREEN parameters, he/she will be rested for a minimum of 10 minutes, and will receive hydration, and food as needed. Following this, the responder will be available for assignment.
- b. If the responder's evaluation meets YELLOW parameters, he/she will be rested for 20 minutes, hydrated, fed, and cooled as needed, and then reevaluated. If this reevaluation now meets GREEN parameters, the responder will be available for reassignment. If not, the 20 minute process will be

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repeated. If the responder remains within YELLOW parameters for a total of 60 minutes without improvement, he/she will be classified as RED, and must be evaluated by a physician/physician's designee prior to reassignment of any kind. Note: After release from rehab, consider modified work assignment i.e. lighter work, for personnel who require extended rehabilitation. i.e. if someone requires 60 minutes of rehab to get 'green' status, consider assigning them to breathing support, scribe, etc.

- c. If the responder's evaluation meets RED parameters on initial evaluation, he/she will be treated and transported to the closest, most appropriate emergency department for evaluation and treatment.
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- V. Documentation-All medical evaluations shall be recorded on standard forms along with the responder's name and complaints. These forms must be signed, dated and timed by the Rehab Officer or his/ her designee. Accountability shall be maintained by the rehab officer using the check-in check-out sheet. Crews shall not leave the Rehabilitation Area until authorized to do so by the Rehab Officer.

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Clinical Algorithm for Rescue Worker Rehab		
Green	Yellow	Red
<p>Vital Signs</p> <p>HR: 60 - 100 bpm</p> <p>RR: 12-20/min</p> <p>BP: 100/50 - 160/100</p> <p>Temp: 97.6° - 100.4° F</p> <p>CO: <6%</p> <p>SP02 95% or greater</p> <p>No Priority Symptoms</p> <p>Treatment</p> <p>10 Mins Rest</p> <p>16 oz of rehydration fluid</p> <p>Food as needed</p> <p>Cleared for Reassignment</p>	<p>Vital Signs</p> <p>HR: 50 - 60 bpm or 100 - 140 bpm</p> <p>RR: 10 - 12/min or 20 - 40/min</p> <p>BP: 90/50 - 100/60 or 160/100 - 180/110</p> <p>Temp: 96.6° - 97.6° F or 100.4° - 102.5° F</p> <p>CO: 6% - 12%</p> <p>SP02 90% - 94%</p> <p>No Priority Symptoms</p> <p>Treatment</p> <p>20 Mins Rest</p> <p>Remove outerwear</p> <p>Cooling measures as needed</p> <p>16 oz of rehydration fluid</p> <p>Food as needed</p> <p>Recheck Vital Signs</p>	<p>Vital Signs</p> <p>HR: <50 bpm or >140 bpm</p> <p>RR: <10/min or >40/min</p> <p>BP: <90/50 or >180/110</p> <p>Temp: <96.6° F or >102.5° F</p> <p>CO: >12%</p> <p>SP02 < 90%</p> <p>* Priority Symptoms *</p> <p>Treatment</p> <p>Medical treatment as needed and transport to nearest ER</p>

*** Priority Symptoms*:** Chest Pain, Shortness of Breath, Severe Headache, Altered LOC, Orthostatic Symptoms, Arrhythmias, Nausea/Vomiting, Significant Weakness, Poor Skin Signs, Any injury which will reasonably preclude a rescuer from safely returning to duty.

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Rescue Worker Rehab Flowchart



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ATTACHMENT A**

HEAT STRESS INDEX

RELATIVE HUMIDITY

TEMPERATURE °F		10%	20%	30%	40%	50%	60%	70%	80%	90%
	104	98	104	110	120	132				
	102	97	101	108	117	125				
	100	95	99	105	110	120	132			
	98	93	97	101	106	110	125			
	96	91	95	98	104	108	120	128		
	94	89	93	95	100	105	111	122		
	92	87	90	92	96	100	106	115	122	
	90	85	88	90	92	96	100	106	114	122
	88	82	86	87	89	93	95	100	106	115
	86	80	84	85	87	90	92	96	100	109
	84	78	81	83	85	86	89	91	95	99
	82	77	79	80	81	84	86	89	91	95
	80	75	77	78	79	81	83	85	86	89
	78	72	75	77	78	79	80	81	83	85
	76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77	

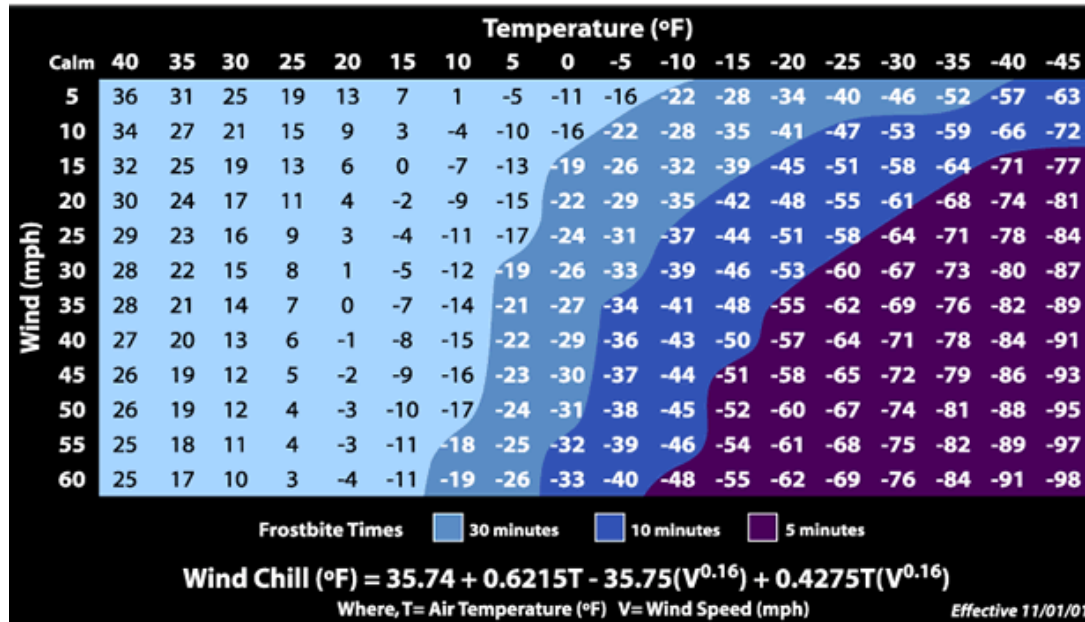
NOTE: Add 10°F when protective clothing is worn and add 10°F when in direct sunlight.

HUMITURE °F	DANGER CATEGORY	INJURY THREAT
BELOW 60°	NONE	LITTLE OR NO DANGER UNDER NORMAL CIRCUMSTANCES
80° - 90°	CAUTION	FATIGUE POSSIBLE IF EXPOSURE IS PROLONGED AND THERE IS PHYSICAL ACTIVITY
90° - 105°	EXTREME CAUTION	HEAT CRAMPS AND HEAT ESHAUSTION POSSIBLE IF EXPOSURE IS PROLONGED AND THERE IS PHYSICAL ACTIVITY
105° - 130°	DANGER	HEAT CRAMPS OR EXHAUSTION LIKELY, HEAT STROKE POSSIBLE IF EXPOSURE IS PROLONGED AND THERE IS PHYSICAL ACTIVITY
ABOVE 130°	EXTREME DANGER	HEAT STROKE IMMINENT!

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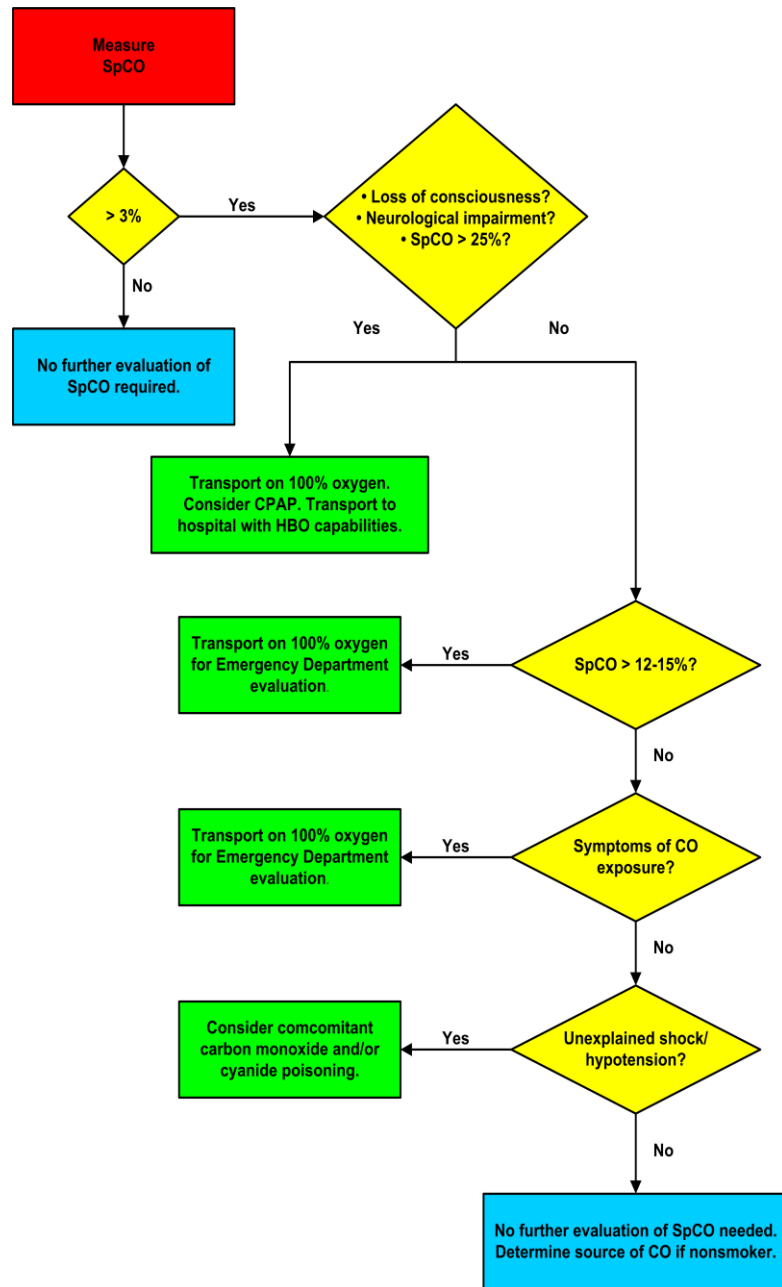
NWS Windchill Chart



Wind speeds above 40 mph have little additional chilling affect

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Carbon Monoxide Monitoring Algorithm



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FORMS:

VITAL SIGNS LOG										
Incident: _____										
Date: _____										
NAME/ UNIT	TIME(S)	TIME/ # Bottles	BP	Pulse	Resp	Temp	Skin	Taken By	Condition	TRANS PORT?