

OPERATIONS MANUAL

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STANDARD INSTRUCTION 10 INJURY AND ILLNESS PREVENTION PROGRAM

SECTION 14-B COLD EXPOSURE

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<b>TITLE</b> O P E R A T I O N S M A N U A L	<b>STANDARD</b> <b>INSTRUCTION</b> 10		<b>DEPARTMENT</b> F I R E
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**I. PURPOSE**

This policy is intended to keep San Diego Fire-Rescue personnel rested and hydrated before, during, and after physically demanding incidents or training sessions involving decreased temperatures.

**II. SCOPE**

This policy shall apply to all San Diego Fire-Rescue Department (SDFD) personnel.

**III. AUTHORITY**

The fire chief authorizes the information within this policy.

**IV. POLICY**

Employees operating in water operations or in a cold environment require additional rehabilitation considerations.

**A. Pre-Exposure Guidelines**

1. Personnel assigned to water operations should consider a program of continuous fitness that increases the body's acclimation to operating in cold water. This could include working out with appropriate PPE and controlled exposure to the cold-water environment. Personnel should also ensure proper hydration and nutrition to help the body compensate for the increased cold stress.
2. Employees should have a personal drying device and appropriate clothing for post-incident warming.
3. Personnel assigned to long term operations in and around the water should have PPE, nutrition and hydration appropriate for the environment.

**B. Cold Exposure Guidelines**

1. Company officers, division/ group supervisors and incident commanders shall monitor personnel frequently for symptoms related to cold stress.
2. Personnel displaying abnormal symptoms should be immediately removed for medical evaluation.
3. Link for further information:  
[http://www.seagrant.umn.edu/coastal\\_communities/hypothermia](http://www.seagrant.umn.edu/coastal_communities/hypothermia)

**C. Symptom Recognition**

All department personnel should be aware of the signs and symptoms of cold stress.

1. Hypothermia
  - a. Hypothermia is a serious medical condition resulting from the body's inability to cope with lower temperatures and no longer produces heat. Hypothermia occurs when the normal body temperature is 98.6F drops to 95F or less.

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b. Hypothermia is a progressive condition and displays a variety of symptoms.

1) Early symptoms:

- a) Shivering
- b) Fatigue
- c) Loss of coordination

2) Advanced Symptoms

- a) No shivering
- b) Confusion and disorientation
- c) Slurred speech
- d) Blue skin
- e) Dilated pupils
- f) Slowed pulse/breathing/heart rate
- g) Loss of consciousness

c. Actions

- 1) Personnel can avoid hypothermia by wearing appropriate water rescue PPE whenever possible.
- 2) Affected personnel should be removed from the water.
- 3) Dry off upon exiting the water and administer body heat thermometer to effected employee.
- 4) Personnel should get into a warm environment and change into dry clothing in order to preserve body heat.
  - a) If available, employee should be placed into warm shower.
- 5) The center of the body (chest, head, and neck) should be warmed FIRST using layers of dry blankets or clothing. Do not cover the face. Give warm sweetened drinks if employee is alert.

2. Cold Urticaria

a. Cold urticaria (ur-tih-KAR-e-uh) is a skin reaction to cold that appears within minutes after cold exposure.

1) Symptoms

- a) Affected skin develops reddish, itchy welts (hives).
- b) A worsening reaction as the skin warms.
- c) Swelling of cold affected limb
- d) Anaphylaxis

2) Actions

- a) Personnel who display a skin reaction upon entering cold water should immediately exit and report it to a supervisor.
- b) Dry and warm the person to avoid hypothermia.

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- c) Monitor vitals and consider transport for medical assessment.
  
- 3. Frostbite
 

A body injury caused by the freezing of specific body part, particularly smaller areas like fingers, ears, and toes.

  - a. Symptoms
    - 1) Numbness
    - 2) Skin discoloration – blue, white, or grayish patches
    - 3) Skin feels cold, firm/hard and may blister
  - b. Actions
    - 1) Follow the directions for hypothermia
    - 2) DO NOT rub the frostbitten area
    - 3) Can be soaked in warm water until the area feels warm to the touch
    - 4) Warm slowly and not be exposed to direct heat sources like heating pads, etc.
    - 5) Loosely cover and protect the area from contact
  
- 4. Trench Foot (also known as Immersion Foot)
 

A non-freezing injury brought about by prolonged exposure of the feet to damp, cold, sometimes unsanitary environment.

  - a. Symptoms
    - 1) Itching or tingling sensations
    - 2) Cold, blotchy or flaky skin
    - 3) Blisters and sores
    - 4) Redness, swelling, and numbness
  - b. Actions
    - 1) First clean, dry and elevate the feet in a warm area
    - 2) Avoid walking
    - 3) Submerge affected feet in warm water for a few minutes until warm
    - 4) Wear clean, dry socks
  
- 5. Chilblains (also known as Pernio)
 

Small sores that typically occur on hands or feet after exposure to cold temperatures.

  - a. Symptoms
    - 1) Itching or burning sensations
    - 2) Bumps or blistering
    - 3) Discoloration – red or purple patches
  - b. Actions

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- 1) Keep affected areas warm and unrestricted
- 2) Apply topical creams to relieve pain, itch, or burning sensation

D. Water Temperature and Survival Time Table

Water Temperature		Expected Time Before Exhaustion or Unconsciousness	Expected Time of Survival
(°F)	(°C)		
32.5°	0.3°	< 15 minutes	45 minutes
32.5-40°	0.3-4.4°	15 - 30 minutes	30 - 90 minutes
40-50°	3.3-10°	30 - 60 minutes	1 - 3 hours
50-60°	10-15.6°	1 - 2 hours	1 - 6 hours
60-70°	15.6-21.1°	2 - 7 hours	2 - 40 hours
70-80°	21.1-26.7°	3 - 12 hours	3 hours - indefinite
> 80°	> 26.7°	Indefinite	Indefinite