



FIRE PROTECTION TRAINING

Procedures Handbook 4300

FIREFIGHTER SAFETY

TOPIC: HYDRATION

TIME FRAME: :20

LEVEL OF INSTRUCTION: Level I

BEHAVIORAL OBJECTIVE:

Condition: A written quiz

Behavior: The student will confirm a knowledge of Hydration and Hydration practices

Standard: With a minimum 80% accuracy according to the information contained in the CAL FIRE Handbook 1700; NWCG Six Minutes for Safety; Heat Stress booklet , PMS 303-1, USFS (1999)

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate video equipment and screen
- Slides/overhead transparencies for this lesson plan
- Video: Fatigue and the Firefighter NFES 2072

REFERENCES:

- CAL FIRE 1700 Health and Safety Manual, Section 1855.5.3
- NWCG Six Minutes for Safety, First Aid/Health Category
- Heat Stress Booklet, PMS 303-1, USFS (1999)

PREPARATION:

Water replacement (Hydration) is essential during prolonged strenuous work in the heat. Lack of adequate hydration (dehydration) is a pre-condition of heat illnesses such as Heat Exhaustion. Heat Exhaustion can potentially lead to Heat Stroke, a heat injury that can have fatal consequences if cooling and hydration intervention is not aggressively applied. Your ability to safely perform firefighting duties in high heat environments is greatly affected if you do not stay hydrated. Failing to maintain hydration not only affects your work production, but can result in fatal consequences.



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HYDRATION

PRESENTATION	APPLICATION
<p>I. HYDRATION</p> <ol style="list-style-type: none">1. Hydration is the process of replacing water in your body lost to perspiration during heavy exertion, this need to hydrate is exacerbated in high heat environments. B. Studies conducted on wildland firefighters indicate that fire suppression activities generate about 7.5 kilocalories of heat each minute worked.<ol style="list-style-type: none">1. Approx. 400 kilocalories/hour C. Additional heat (approx. 180 kilocalories) comes from the environment and fire. D. Total heat load amounts to 580 kilocalories/hr. E. Complete evaporation of 1 liter of sweat removes 580 kilocalories of heat. F. In order to maintain a healthy body temperature, firefighters need to evaporate about 1 liter of sweat during each hour of work G. In order to prevent dehydration firefighters then, need to hydrate at a rate of at least 1 liter/hr.<ol style="list-style-type: none">1. This is a minimum replacement rate. <p>II. WATER</p> <ol style="list-style-type: none">A. Water is the fluid of choice when hydrating. B. When high heat environments and heavy exertion is anticipated pre-hydration should occur<ol style="list-style-type: none">1. Begin drinking one to two cups of water before encountering high temperatures and exertion C. Once exertion begins water should be consumed during the work.	



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PRESENTATION	APPLICATION
<p>1. When strenuous work is being performed in hot conditions a guideline for water intake is one cup per 15 minutes, or one quart per hour</p> <p>D. Rest breaks should be encouraged and hydration made a part of the break</p> <p>E. Once work is completed hydration should continue. Thirst always under estimates fluid needs, so you should drink more than you think you need.</p> <p>F. Fluid replacement with carbohydrates and or electrolytes (Sports drinks, juice, etc) can assist in retaining fluids and energy levels, as well as replacing electrolytes.</p> <p>III. DEHYDRATION</p> <p>A. Fluids containing caffeine or alcohol increase dehydration and fluid loss due to increased urine production.</p> <p>1. Caffeinated and alcoholic beverages should be avoided as they are diuretics (cause your body to release fluids)</p> <p>B. Signs of dehydration can include rapid weight loss and urine discoloration (darkening of color due to concentrated electrolytes)</p> <p>a) If you are not urinating every two hours and/or your urine is dark in color, you are not drinking enough water!</p> <p>C. Signs of dehydration leading to heat exhaustion are consistent with hypovolemic and metabolic shock signs and symptoms.</p> <p>1. Rapid pulse</p> <p>2. Low Blood Pressure</p> <p>3. Pale, moist, cool skin</p>	



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<p>4. Weakness, fatigue, dizziness</p> <p>IV. MANAGING HYDRATION</p> <p>A. The key to managing hydration is drinking water.</p> <p>1. Dehydration leads to fatigue and an unsafe condition to be in.</p> <p>B. It is department policy (Handbook 1700, Health and Safety Manual, Section 1855.5.3) for managers to provide sufficient quantities of potable water prior to, during, and after work in a heated environment.</p> <p>C. The policy also states that it is the employee's responsibility to remain hydrated.</p> <p>D. Hydration is a critical step in the department's overall Heat Illness Prevention policy</p> <p>1. Handbook 1700 Health and Safety Manual, Section 1855</p>	



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SUMMARY:

The importance of hydration during incident assignments cannot be understated or underestimated. Your performance and that of your fellow crew members depends on the ability of you to stay healthy and productive in the work environment. Dehydration is one of the most common causes of illness during incident performance and if not corrected can lead to heat illnesses that can have fatal consequences

EVALUATION:

The student will complete a written quiz at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read the department policy on "Preventing Heat Illness" in Handbook 1700, Section 1855 in order to prepare yourself for the upcoming quiz. Study for the next session.