Title: SAFETY ARTICLE: Summer 2012

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It's beginning to look a lot like summer

This is our third installment dealing with the heat of summer.

"Don't be surprised - be aware and prepared".

Our ability to cool down is dependent upon acclimation, physical condition, environment, high heat and humidity, proper hydration, and asset management.

Acclimation – Acclimation allows our bodies to adjust to the high heat and humidity of Florida's summers. The acclimation process;

- Start gradually by going for a walk in full PPE and build to full capability.
- Results in 7 to 14 consecutive days of two hours / day.
- Results vary depending upon physical condition but can include improved heat comfort, performance, organ protection, reduced core temperature, body heat production, heart rate and salt losses.

Acclimation, while easily gained, is just as easily lost. For Example - A two week vacation in cooler climates causes a loss of about 75% of acclimation benefits.

Physical Condition – The value of acclimation is limited or erased if we are not physically prepared to "do the job". 16 minutes of firefighter operations in 168°F - 197°F results in body temperatures of 104°F.

- Rested – Sufficient rest is a key component to condition. If your engine runs most of the night, do not be surprised if it overheats during the day.
- Recovered – While acclimation prepares you, your body still needs time to recover from high heat exposures. Prior to shift, a full day in the fun and sun may not allow sufficient time for your body to recover.
- Illness free – Starting out with a cold, fever or other malady places you at great disadvantage for not only heat issues but more illnesses. In addition, many medications increase the body's sensitivity to heat. Check out: http://www.consumer-health.com/services/CautionSomeDrugsMightMakeYouMoreSensitivetoHeat.php

Environment - Our cooling system is hampered by normal clothing. In the firefighter's environment, cooling is further limited by protective equipment, operating in direct sunlight on 120°F roads and functioning in the heat of structure fires.

High Heat and humidity limits the evaporation of sweat. How high is too high? While there are other methods, the one most widely used is the Heat Index. The heat index recommends:

- Caution when the Heat Index is over 80.
- Extreme Caution when the Heat Index is over 90
- Danger when the Heat Index is over 105
- Extreme Danger when the Heat Index is over 125.

In addition to the posted or calculated Heat Index, adjustments for firefighters must be added:

- Add 10 to the heat index if bunker gear is being worn
- Add 15 to the heat index if in direct sunlight – (Index assumes shade).
- Add a few more if there is no wind – (Index assumes a 6.7 MPH wind).

Consider – Training is being conducted in bunker gear, in direct sunlight and on a windless day with a current Heat Index of 80. The adjusted Heat Index would be 105 – 110.

Asset management – We do not want equipment damaged and the most expensive equipment out there is human. Let's consider prevention, recognition of potential damage, and treatment.

Prevention

- Control those prone to "Exertional Heatstroke". Young or new firefighters are trying to prove themselves and go beyond their abilities. They will complete the mission or die unless intercepted.
- Company officers monitor and encourage frequent drinking, (1.5 liters per hour or 12 liters per day max. Energy drinks, coffee and soda don't count!
- Limit physical activity to mission critical operations during periods of high heat. Reschedule other tasks for early morning or night.
- Employ automatic rehab after consuming two SCBA bottles. Consider fans, misting and nearby air conditioned facilities. Immersion of forearms and hands in 50°F to 68°F water effectively reduces core temperatures. Sip from cups of ice water and inhale across the top of the cup. Cool air is inhaled and the lungs join rehab.
- Avoid working excessive hours as the effects of increased body heat are cumulative.
- Rest periods should be extended to help dissipate built up body heat.
- Call for additional companies, especially for overhaul operations.

Recognition of potential damage - Dehydration

When the troops are thirsty, they are already on the fast track to dehydration. As dehydration progresses:

- A fluid loss of 2% results in impaired cognitive and physical performance.
- Between 5 and 7% dyspnea, headaches, dizziness, and apathy show

Recognition of potential damage - Over-hydration or hyponatremia

Drinking too much water can be a bad thing as blood sodium levels dilute to the point that cell function becomes impaired. It can cause coma or death.

Recognition of potential damage – Sensitivity to heat post heat exhaustion.

While not quite understood and controversial, some individuals who experience either hyperthermia or hypothermia develop sensitivity to heat or cold respectively. Whether psychosomatic or metabolic, the body responds to a cold or heat threat earlier and the ability of the individual to function in the environment is either limited or non-existent.

Treatment - Drink fluids while replacing carbohydrates and electrolytes. Water is the staple but sports drinks have being added. Sports medicine is using full body immersion, as well, to counter early signs of heat exhaustion. Check with your medical director, local sports medicine folks or manufacturer for issues regarding sport drink dilution and treatment for heat exhaustion and heat stroke.

As always, your feedback / comments are appreciated. We have an SOP that is used at the Fire College. If you would like to share yours or want an example to build upon, contact me at 352-369-2836 or Charlie.brush@myfloridacfo.com .