OSC|12
Ohio Safety Congress & Expo

WELL AT HOME. SAFE AT WORK.

215 Firefighter Rehabilitation Operations

Frank Dispenza

Wednesday, March 28, 2:30 to 3:30 p.m.

Ohio | Bureau of Workers' Compensation

Fire Fighter and First Responder Health Issues

-OR-

The Need for Rehab at Your Emergency and Training Events

Frank Dispenza, MEd., NREMTP
With help and guidance from
Mike McEvoy, PhD, NREMTP, RN, CCRN
Fire EMS editor – Fire Engineering Magazine

Rehab - What's in a word?

- **Firefighter Rehabilitation** - Firefighter rehab is designed to ensure that the physical and mental well-being of members operating at the scene of an emergency(or a training exercise) do not deteriorate to the point where it affects the safety of any other members. Firefighting is inherently dangerous in the best of circumstances, and any additional physical or mental stress increases the danger. - *Wikipedia*

Rehab – Some Background …

- Firefighting equipment history:
  - Bucket brigades & men
  - Hand operated pumps & men
  - Machine assisted pumps & men
  - Airway protection (SCBA) & men
  - Better fire turnout gear protection & men
  - Technology
    - CO detectors / Thermal Imagers / PASS devices
    - SCBA interface / Pulse Oximeters / computers

Rehab – Some Background …

- But Always … Men
  - Firefighting was long considered a "males only" profession.
  - **Machismo**, or machoism, is a word of Spanish and Portuguese origin that describes prominently exhibited or excessive masculinity.
    - As an attitude, machismo ranges from a personal sense of virility to a more extreme male chauvinism. Characteristics include domineering, fierceness, bravado, etc., in ways that are showily and histrionically tough.

Rehab – Some Background …

- A stigma was historically attached to firefighters who asked for help
  - Fireground personnel, who after engaging in the strenuous activities associated with firefighting, were not immediately seen to reengage in those activities were somehow regarded as less "macho".
  - The more one risked one's life … the more macho he was.

Rehab – Some Background …

- Yet the bottom line is that firefighters continued to suffer death and injury while engaged in the completion of their duties.
- With all the advances in firefighter protection technology, little was being done to, in essence, protect the firefighter from him(her)self.

Rehab – Some Background …

- Some Influences that have resulted in better focus on emergency responder rehab;

  Integration of EMS into the fire service

  More females in the fire service (females tend to take their personal health seriously)

Rehab – Some Background …

- The presence of more EMT's and medically trained fire personnel meant a better focus on health issues that may have been undiscovered and unassessed in previous years.

Rehab – Some Background …

- **1993** – US Coast Guard conducted a study dealing with the effects of interior firefighting on the human body.
  - The researchers noted that the firefighter's body core temperature often reached 104 degrees Fahrenheit during the firefight, even after short exposures.

FF LODD Statistics (FEMA) …

- **From 2001 to 2009:**

  530 Firefighter deaths due to "stress/overexertion".

FF LODD Statistics (FEMA) …

- **From 2001 to 2009:**

  174 Career Firefighters Died

  336 Volunteer Firefighters Died

FF LODD Statistics (FEMA) …

- **Nature of Death:**

34 Deaths due to Stroke (CVA)

481 Deaths due to Heart Attack

3 Deaths due to Heat Exhaustion

FF LODD Statistics (FEMA) …

- **Duty Type:**

110 Deaths on-scene Fireground

45 Deaths on-scene Non Fireground

79 Responding to or returning from Call

119 Deaths After the Call

75 Deaths during Training

FF LODD Statistics (FEMA) …

- **Activity Type**

#1: In Station Duties … 51

#2: Advancing Hoseline/Fire Attack …46

#3: Fitness Activity … 33

As usual, Emergency Responders Follow the Lead of the Military

- Field Aid Stations / Mobile Hospitals
  - Soldiers who received immediate intervention for battlefield injuries had a higher survival rate than those who had to wait for transport to medical care "behind the lines"
  - The sooner treatment and monitoring occurred, the better.

The Fire Service Response to Rehabilitation Issues

- NFPA 1583 (2003)
  - "Recommended Practices on the Rehabilitation of Members Operating at Incident Scene Operations and Training Exercises"…
    - Rehab should be an organized system
    - Rehab should be an integral part of the Fire Department's safety and health program
    - Rehab should become a part of the NIMS

NFPA 1583

- Revised in 2008
  - Elevated from a "recommended practice" to a "standard"
  - Established minimum criteria for developing and implementing a rehab process.
- NFPA 1583 *DOES* apply to:
  - Fire / Rescue, EMS, HAZMAT, Special Ops
  - Pubic, military, private, and industrial Fire Departments

NFPA 1583

- NFPA 1583 *DOES NOT* apply to:
  - Industrial fire brigades, emergency response teams, fire teams, plant emergency organizations, mine emergency teams.

NFPA 1583

- Definition of firefighter rehabilitation…
  - *An intervention designed to mitigate against the physical, physiological, and emotional stress of fire fighting in order to sustain a member's energy, improve performance, and decrease the likelihood of on-scene injury or death.*

Rehab

- Elements of the Rehabilitation Process:
  - Initiate Rehab
  - Define Responsibilities
  - Accountability
  - Assure Safety
  - Return personnel to service ONLY when it is determined to be safe to do so.

Rehab

- When should it begin?
  - At any emergency or training operation that poses a risk of exceeding a safe level of mental or physical endurance for rescue personnel.
  - At the request of the Incident Commander
  - Through established department SOP's.

Rehab

- Who is in charge?
  - SOP's should address the Officer or personnel who are to staff and run the rehab center.
  - Often, non-fire department personnel may be needed to staff and monitor the center. This usually refers to non-fire EMS and medical personnel.
    - Well-established guidelines prevent confusion among these rescuers.

Rehab

- Accountability?
  - Incident scene personnel who use the rehab center must be tracked.
  - Incident scene personnel in rehab should not leave unless they have been cleared by medical staff.
  - Personnel should only be released when they are:
    - Adequately rested
    - Adequately hydrated
    - Responded favorably to treatment measures

Rehab

- Safety:
  - Primary mission of rehab staff is to insure safety of all those who use the rehab center
  - Protection is needed from:
    - The Incident itself
    - The ambient environment
    - The media
    - Societal threats
    - Curious rubber-neckers

Rehab

- Release:
  - Those who use the rehab center should only be returned to service when:
    - They are fully rested
    - They are fully re-hydrated
    - They have responded to any care measures taken for them in an appropriate manner

Rehab

- Release:
  - The ultimate decision to return personnel to work should be made by the Rehabilitation Officer through the authority of the Incident Commander.

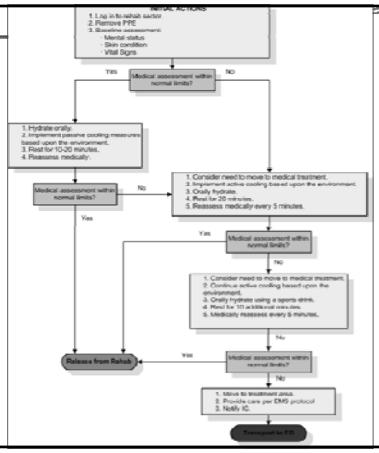
Some Best Practices for Rehab

- Smaller departments should seek to develop a "regional" rehabilitation plan that shares equipment purchase and use throughout the region.
- Nutrition should also be a rehabilitation concern. Especially when fighting wildland fires and major incidents, count on each rescuer to consume nearly 4000 calories a day.
- Each service should develop specific EMS protocols that guide both fire service and non-fire service personnel in rehabilitation operations.

SOP/SOG Guidelines

- Guidelines should address
  - Relief from excess heat or cold
  - Rest
  - Rehydration
  - Caloric and electrolyte replacement
  - Medical monitoring
  - EMS assessment, treatment and transport
  - Accountability of treated personnel
  - Qualifications for release

- Those who need immediate transport
- Those who need closer observation
- Those who can leave



Fitness

- An important aspect of rescuer safety and longevity on the job.
- All Fire and EMS agencies should support and facilitate ongoing fitness programs
- NFPA 1583 details standards of fitness and conditioning.
- Both fire and EMS work require a great amount of physical activity and can result in permanent injury to rescuers. Prevention is still the best cure.

Preplanning for Rehab

- All rescue personnel should understand:
  - Thermoregulation in the human body
  - S/S heat stress
  - S/S cold stress
  - How to maintain hydration
  - How to maintain adequate nutrition
  - Medications and substances that can result in fluid loss

Substances Causing Fluid Loss
Diuretics
Blood pressure medications
Phenytoin (Dilantin)
Lithium (Lithobid)
Alcohol
Caffeine
Laxatives
Theophylline
Green tea

Prehydration

- To fight the inevitable effects of dehydration, rescue personnel should PREHYDRATE.
- 500 ml (16 oz) of fluids 2 hours prior to event.
- Use water initially
- Sports drinks can be considered when moderate to high intensity work is anticipated to combat electrolyte and carbohydrate loss.
- Small, frequent drinks of fluid are best.

The Rehabilitation Area

- Establish and locate an area for rehab.
- Notify the IC of the location
- Obtain final approval of site from IC
- Consider the following for location
  - Wind speed and direction
  - Precipitation
  - Angle of sun according to time of day

The Rehabilitation Area

- Establishing a rehab area too close to the incident will hinder mental and physical rest effort of rescue workers
- Rehab should be accessible for all personnel
- Access to the public and the media should be restricted

Other Favorable Site Characteristics

- Space for removal of personal protective equipment
- Protection from the weather and environment
- Large enough to handle the number of rescuers expected to be involved.
- Space for medical monitoring and EMS
- Control of entrance and exit to ensure accountability.

Some Site Complications

- If your incident is big enough, you may need several rehab sites.
  - Keep them organized by giving each one a unique designation (usually location).
- "Informal" rehab can also take place at the company level as well.
  - Each apparatus should be prepared to deliver:
    - Fluids
    - Shelter
    - Seating
    - A place to remove PPE.

Traditional Items of the Rehab Center…

- Collapsible Tent
  - This structure can be set up quickly and provide shelter from heat, cold, sun, wind and precipitation.
  - Open and closed structures are available.

Traditional Items of the Rehab Center…

- Chairs
  - Folding chairs provide personnel with a place to sit and recover.
  - Cots and even bunks are available from manufacturers, many of them collapsible for easy storage

Rehab Item Packaging

What starts out as this ↑, quickly sets up into this ➔

Rehab Items for Comfort

This can be a real comfort!

Even a fan to cool you!

Rehab Sizes

- Rehab can go anywhere from the back of an ambulance to one of the large bus/RV vehicles that comes equipped with everything!

Medical Supplies Needed for Rehab

- Oxygen
- Airway supplies
- Carbon monoxide (CO) monitor
- Automated external defibrillator (AED)
- EKG monitor
- Blankets
- Pulse oximeter (or CO-Oximeter)
- Orthopedic supplies
- Bleeding supplies
- Cardiac medications
- Cyanide antidotes
- Stretchers
- Hand-washing and equipment decontamination supplies.
- Other medical supplies

EMS Concerns

- **MEDICAL MONITORING vs. TREATMENT**
- Medical monitoring and medical treatment are different. Not all EMS providers are experienced at medical monitoring in the rehab operation. There must be specific protocols for medical monitoring that differ from standard EMS treatment protocols. To avoid confusion, the medical monitoring area and the medical treatment area must be separate.

EMS Concerns

- Non-fire-based EMS providers in the rehab area may be needed.
- The culture of the FD can sometimes be problematic (?)
- Personnel must know that EMS providers have authority in the rehab sector through the IC.

Other Resources

- Establishing rehab resources:
  - The IC should assure that the rehab area has adequate resources.
  - The NIMS recommends one EMS provider for every 5 members in rehab.
  - Outside agencies (e.g., Red Cross, Salvation Army, FD auxiliary) can be utilized for support.
  - Outside agencies must adhere to the tenets of rehab (i.e., no doughnuts).

General Criteria

- Rehab criteria:
  - Initial rehab efforts may have to be delayed early in fire suppression operations because of limited resources.

General Criteria

- At a minimum, members should undergo rehab when:
  - 45-minute or 60-minute SCBA bottle has been used.
  - Following 40 minutes of intense work without an SCBA.
- Rest and recovery:
  - Personnel entering rehab for the first time should rest for at least 10 minutes—longer when practical.
  - A member should not return to active operations if they do not feel they are adequately rested.

General Criteria

- Personnel should rest for a minimum of 20 minutes following use:
  - Second 30-minute SCBA bottle.
  - Single 45-minute or 60-minute SCBA bottle.
  - 40 minutes of intense work without SCBA.
- Fire departments that have a comprehensive work health program will often have a complete work prediction profile for each firefighter. This information can be made available to the rehab sector personnel to allow them to make more informed decisions about work-to-rest ratios. It takes some of the guessing out of the equation.

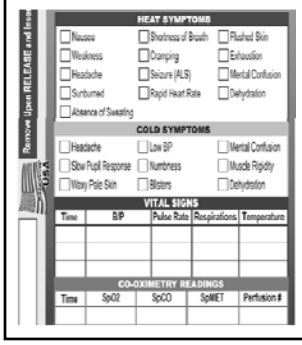
Accountability/Tracking

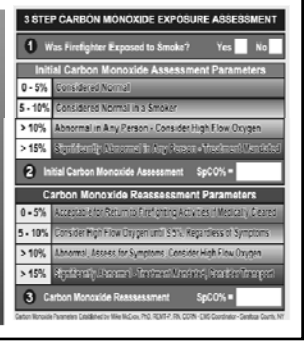
- Accountability and tracking is an essential component of firefighter rehab.
- The accountability system should be a part of the overall NIMS scheme used in the region.

Accountability/Tracking

- Commercial accountability tags are also available.
- A "rehab kit" should be as much a part of your EMS vehicle as much as a "MCI Kit" is.

Tracking Forms





Forms

Some Commercial Providers

- **www.firerehab.com**
- **Masimo**
- **Cool Draft Products**
- **Coyote Camp Fireline Products**
- **Disaster Management Systems**
- **DQE**
- **Crew Boss Rehab**
- **Zephyr Technology**

Summary

- Some overall important points of rehabilitation:
  - Now a NFPA Standard.
  - Should be included in the ICS.
  - Preplanning and community sharing of resources by neighboring departments can cut down on expense and duplication of effort.
  - The clearly defined role of EMS must be a part of your plan. EMS should have the final say in rehabilitation.
  - Many rehab items can be found through specialized providers or on your own.
  - Have a set rehabilitation plan in your SOP's.

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