# PART 2: OCCUPATIONAL ISSUES

## WORKER ILLNESS AND INJURY

It is imperative that activated disaster response members immediately report incidents resulting in injuries and illnesses they think are related to their work. An acceleration or aggravation of a pre-existing condition that occurs as a result of deployment is also defined by Labor code as an injury. Given the sensitivity and demanding environment associated with disaster response, any injury or illness, regardless of the relationship to work, is best reported.

### HOW TO REPORT AND TO WHOM

Federalized NDMS members are covered by the Federal Employees' Compensation Act (FECA). Despite the difference in application of Workers' Compensation laws across the United States, the principles are relatively the same. The principles include no fault compensation, fair compensation, collective liability, mandatory coverage, protection from lawsuits, and the right of appeal.

No fault compensation means that an injured worker is eligible for care regardless of whether the cause of that injury or illness was the fault of employer or employee. Protection from lawsuits means that neither the employer nor the worker can be sued for the event. The principles of the system recognize the effect of injury on salary and that this impact will vary depending on the degree of injury. Coverage is mandated, thus all employers are liable to fund the system. All involved have the right to appeal the decision of the insurer.

The defining point for whether an injury or illness is covered is whether that event is

"arising out of employment and in the course of employment (AOE-COE)". There are a few exclusions, such as self-inflicted injuries, injury in an off-duty activity that is not part of duty, and injury from altercation where the worker was the initial aggressor.

Important to the utilization and benefits of the Workers' Compensation system is the need to report injury and illness promptly to secure care and maintain eligibility for coverage. Since deployments generally last less than two weeks, injured workers will be referred by the Workers' Compensation carrier to a physician for follow-up. Response workers are urged to participate actively in their recovery and are encouraged to ask questions of NDMS or their carrier to clarify any information they need.

Detailed direction for the reporting mechanism, information about benefits, and commonly asked questions are available from the Office of Workers' Compensation Programs (OWCP). Details are available in the NDMS Team Handbook Section 2.14 and on the Department of Labor web site at:
www.dol.gov/dol/esa/public/regs/compliance/owcp/fecacon.htm.

## PREVENTING INJURY AND ILLNESS

### SAFETY: ENGINEERING AND ADMINISTRATIVE CONTROLS

Most work related injuries are orthopedic in nature. This raises the question of safety and the modification of job tasks that put stress and strain on the human body. The safest way to go about the management of tasks is to incorporate safety controls into the tools and methods that we use to perform a task. Proper ergonomics built into a tool or system decreases the risk of adverse events when using that equipment. That is, we engineer safely features into items that we use to get tasks done. This concept in its simplest terms is known as engineering controls.

Examples of engineering controls familiar to the disaster team worker are the safety cage over the fork lift, mechanical lifts, large wheels attached to portable generators, or safety guards and grounding plugs on electrical hand tools. Other engineering controls are ramps, pulleys, lifts, or virtually anything that makes the task easier, is built into the device, or is a adjunct to getting the task done with less mechanical effort and in a safe manner. Engineering controls are multiple and incorporated into many supplies available to disaster teams. For the purpose of this section, we have chosen to address safety and associated events that affect musculo-skeletal effort.

The second control item that should be applied to tasks is termed Administrative Controls. These controls are generally applied by management to make a job safer or less demanding, by the application of reasonable schedules, alternative scheduling of tasks, signage, instruction and training. Examples of these controls in mission readiness and deployments would be instruction in how to safely set up and use electrical power, heaters and generators. Other examples are: formal and informal supervised instruction in pallet building or tent construction that is conducted before deployment or during; maintaining a list of trained individuals and trainers, or application of appropriate rotation in shift assignments. Team members can apply reasonable administrative controls themselves. Examples are simple steps such as carrying and moving items in smaller quantity, asking for assistance when moving things, participating in training and communicating human need. Reporting fatigue factors or safety concerns to the team leader, safety officer, or designee is part of necessary feedback. It enables team management to address, innovate, and incorporate engineered and administrative controls.

## BACK SAFETY

Back pain is a common occupational hazard but is certainly not tied to work alone. Most low back pain is transient or intermittent. In fact, 70% – 90% of all people have experienced back pain at some time in their lifetime. Culture, insurance availability, gender, age, psycho-social factors, structural abnormalities, lifting mechanism, and multiple other factors have been implicated as risk for back pain, especially lower back pain (LBP). The true risk for any single factor effecting back pain is unknown. "Although a few studies have reported benefits of certain techniques based on biomechanical and physiologic data, there is still no consensus on the safest lifting technique with respect to the prevention of LPB." (6)

For the purpose of this section, the we list some of the generally accepted mechanisms individuals can use to reduce their risk of back injury and that are applicable to disaster response tasks:

1. Minimize the distance, the weight of the load, and the frequency of movement when possible.
2. Keep the object you are carrying as close to your center of gravity as possible.
3. Lift in a planned, smooth, controlled manner.
4. Avoid twisting with movement, pivot with the feet.
5. Break down a bulky load to smaller, manageable amounts to move it.
6. Use mechanical aids when possible to reduce stress, load, and frequency of movement.
7. Minimize the vertical distance an object is lifted.
8. Avoid lifts from floor level or from overhead.
9. Avoid high lifting for an excessive period of time.
10. Avoid excessive force in pull or push activities.

11. Avoid long periods of a static position.
12. Avoid awkward positioning.
13. Judge stability of the mass to be moved (fluids or bulk) and plan move accordingly.
14. Lock wheels on transport items from which persons or objects are lifted, prior to the lift.
15. Use gravity slides or other firm surfaces such as boxes to support item during staged movement.
16. Get enough help for the job at hand.
17. Be sure footing is stable (dry flat surface verses slippery, wet pavement).
18. Time the move and be willing to move in stages and reposition as you go.
19. Be certain that the plan for moving an item is known to each and every person who is assisting with the move. This includes the individual you are transferring.
20. Self-select yourself out of moving tasks that you do not feel you can manage.

## USE OF PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) is equipment a worker dons in order to decrease the risk of exposure to mechanical injury, biological or chemical exposure. In disaster response, many opportunities for injury and exposure can be modified or eliminated by common sense and the use of PPE. Many PPE items are ones that team members might use in their normal work; others are particular to the unusual setting that disasters bring. The best situation is when PPE is not needed at all. If the situation requires use, these items should fit appropriately, be comfortable, in good repair, and appropriate to the potential exposure situation. The user must know about the PPE, understand its use and limitations and recognize if the equipment is for one time or multiple uses. Information is needed on how to clean and store reusable PPEs. No PPE

is a substitute for the application of common sense and focus on safety. These pieces of equipment are an adjunct to engineering and administrative controls. PPEs provide extra protection to enable the worker to get the job done while minimizing if not eliminating the risk to the worker. PPEs are not 100% effective, and are sometimes subject to misuse and defects. They require proper maintenance.

Common PPEs used in disaster response include:

- Eye protection (goggles, safety glasses, and face shields)
- Hearing protection
- Masks and face shields
- Hard hats
- Work gloves
- Steel toed boots
- Medical use gloves
- Medical use gowns, scrub covers, boots and hair caps
- Respirators (dust mist, canister, and supplied air)
- Plastic aprons or impermeable garb
- Hazardous material gear
- Rubber boots
- Gauntlets

The uses of PPEs are multiple and selection is vast. PPEs are of no use, if the situation warrants their use but the individual does not properly select and don them.

## YOUR SAFETY AND BODY FLUID EXPOSURES

### MANAGEMENT OF SHARPS

Management of medical sharps such as needles and surgical blades is an essential orientation item for any team member deploying with a medical, patient transport, tactical or search and rescue team. Used implements that are contaminated with blood or body fluid, especially sharps, can be a mechanism for exposure to infectious disease. The most common exposures of concern are human immunodeficiency virus (HIV), and the viruses that cause hepatitis B and C. These are not the only diseases implicated, but for the purpose of this learning session, the most applicable. These diseases, and the course of action to be followed if exposure occurs, can be found under the heading “Bloodborne Pathogens” included in this session.

The following actions in the management of medical sharps will decrease the potential of an inadvertent exposure to a potentially significant infectious disease.

1. Do not recap used needles, dispose of immediately in a needle disposal box.
2. If you must recap a needle (because of the transfer distance to a needle box), cap with a one handed technique. This is done by laying the cap down and threading the needle into the cap with one hand. The needle can then be carefully secured to the hub.
3. If manufactured needle boxes are not available, you can make one using a hard wall canister such as a coffee can, cutting a hole in the plastic top and dropping the needle and syringe or implement through the hole. Be sure these canisters are labeled and disposed of properly. Consult the team safety officer for proper design and use.
4. It is the user’s responsibility to dispose of the used sharp. Leaving "one time use” sharps for other team members to clean up is fraught with danger. The sharp may not be recognized,

gets mixed up with other equipment, and may be forgotten. The bottom line is, you use it - you dispose of it.

5. Medical sharps that are reusable and must be prepared for sterilization should be carefully communicated to those working in the vicinity; storage of that used implement must be safe and well marked.
6. Sharp containers should be conveniently located.
7. Placement of sharp containers must be out of reach of children who might stick their hand in out of curiosity. This is especially true in the setting of alternate medical sites, such as tents, hangers, and field arrangements where adaptation of sites and equipment are part of the mission.
8. As a rule of thumb, needle boxes need to be changed when three-quarters full. This eliminates users from jamming in equipment, over flow, and resultant injury to others who are using the disposal box.

## BLOODBORNE PATHOGENS

Avoiding exposure to blood and body fluids while providing medical aid and care in austere and adverse environments may be an added challenge. Workers must adjust rapidly to foreign environments, alternative procedures, and awkward circumstances. The focus on protection for oneself and colleagues from blood and body fluid exposures is an important part of team training and safety procedure. It is imperative that healthcare workers (HCWs) understand the risk imposed by inadvertent exposures and what to do if an exposure occurs.

A break in the skin and exposure to HIV positive blood can transmit HIV. The risk is modified by the depth of the stick, quantity of blood involved, stage of illness of the source

person, use of gloves, and other factors. "Prospective studies of HCWs have estimated that the average risk for HIV transmission after a percutaneous exposure to HIV-infected blood is approximately 0.3% (95% confidence interval (C) =0.2%-0.5%) and after a mucous membrane exposure is 0.09% (95% CL+0.006%-0.5%)." (7) The risk of exposure from an infected HIV source is not high but infection, if it does occur, is serious. Prevention is of paramount importance. The use of antiretroviral prophylactic treatment post-exposure may be indicated in some exposures.

The action to be taken by any worker exposed to blood or body fluid is:

1. Immediately wash the exposed site with soap and water.
2. Note the gauge of the needle, presence of visible blood, and condition of glove if the injury involved a needlstick or laceration from a sharp through a glove.
3. Mucous membrane exposures, such as blood splash to the eyes, should be irrigated for 15 minutes.
4. Seek immediate medical attention. Do not delay medical attention for prolonged reporting mechanisms. Time is of the essence if the use of antiretroviral treatment is indicated.
5. The exposed worker is discouraged from self-assessing these injuries. Anxiety levels may be high and interfere with an objective view of the data. Additionally, the medical provider can assist in procuring source information that will assist in the worker's decision as to whether or not to take prophylaxis.
6. The HCW should expect that the health care provider will assess risk for HIV, hepatitis B and hepatitis C.

7. The HCW should expect to obtain follow-up for these potential bloodborne exposures for six months to a year, with appropriate counsel about risks.

## ANTIRETROVIRAL THERAPY

The use of antiretroviral therapies following an exposure to HIV is aimed at interfering with viral replication before the virus gets into the cell. A study by the U.S. Centers for Disease Control and Prevention (CDC) and in cooperation with public health agencies in Western Europe and the United States, conducted a retrospective case-control study about risk factors for HIV transmission. That study, though limited, suggested that HCWs given Zidovudine (Retrovir®, ZDV, AZT) promptly after injury had a 79% lower risk of getting HIV. Some of the workers who were exposed to HIV became infected despite taking the medication.

In June of 1996, the CDC and the U.S. Public Health Service published provisional guidelines for the management of healthcare workers exposed to HIV. These guidelines supported using AZT with the addition of Lamivudine (3TC). This drug, like AZT, is a nucleoside reverse transcriptase inhibitor. These drugs can be given as a single medication called Combivir. Additionally, a third medication called Indinavir (Crixivan®, IDV) or an alternative protease inhibitor can be added, based on the stratified risk. Additional recommendations since 1996 have supported the use of antiviral medications post exposure.

The use of antiretroviral therapies post exposure is complex. The rationale is that infection can be ameliorated or prevented by the use of these medicines. "Information about primary HIV infection indicates that systemic infection does not occur immediately, leaving a brief "window of opportunity" during which post exposure antiretroviral intervention may modify viral replication."(7)

The decision to use antiretrovirals is stressful because it occurs during a point of anxiety. The risks versus benefits of prophylaxis in each case must be handled with careful exploration of the events surrounding the exposure. Assessments must be made quickly so decisions about prophylaxis can be made without delay.

With the adjunct of protease inhibitors and other medications that have been helpful in HIV treatment, there has developed an increasing number of HIV positive individuals who are resistant to some of the antiviral medications. Resistance to some of these medications by the source patient may mean that the recipient of an exposure will require alternative medication. These medications have not been studied in well individuals. The use of alternative drugs in a post exposure circumstance is often a "best guess approach" in choosing the antiretroviral therapy that will be of benefit to the HCW.

The bottom line for the exposed worker, is to be aware that post exposure prophylaxis is available, and that the timing of prophylaxis should be as immediate as possible. The exposed worker will need to take an active role in seeking advice about the exposure and in the decision to take prophylaxis and secure follow-up.

In summary, disaster response team members should be aware that prophylactic strategies are available for use after real or potential exposures to bloodborne pathogens. If an exposure does occur, treatment should begin as immediately as possible.