

**Occupational Health and the
Disaster Response Worker**

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Occupational Health and the Disaster Response Worker Outline

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PART 1: PERSONAL HEALTH AND DEPLOYMENT ISSUES

FITNESS FOR DUTY AND HEALTH

Disaster response requires trained individuals who can bring benefit to the situation to which they are responding. The benefit is in the responders' ability to bring their special expertise to the remediation of the circumstances, while not adding to the problems on site. Often disaster response missions activate not only the prepared team, but at times the team member who at that given point may not be in optimal physical or emotional health. It is difficult for the trained responder not to make himself or herself available for deployment. However, it is imperative that the prepared responder takes a realistic look at his/her situation and decline deployment when not in good health. Team management must also be able to recognize individual limitations and evaluate fitness for deployment. It may be necessary for the Team Leaders to assist the member in assessing his/her individual fitness.

This session will explore some of the issues surrounding fitness for duty at the time of and during the course of deployment. We will also review mechanisms of safety, maintenance of health, and recognition of some potential occupational illnesses or injuries. Greater details of some of these specific areas may be found elsewhere in this NDMS training program.

JOB TASKS, ENVIRONMENT AND STRENUOUS DUTY

Disaster response team members come to the team with knowledge in their area of professional expertise. Ideally, these members have the chance to learn more about and practice the application of their disaster response job in drills, team meetings or focused study. Each individual has a unique baseline level of expertise, which is supplemented with specialized

training given to members in team development, hazard information, packaging, deployment requirements, field living, etc. Some members hold professional license; others fulfill support roles, or offer technical expertise as in area such as communications, security and logistics. The knowledge inherent to any position, even including the knowledge added by team training opportunities, does not confirm an individual's fitness for deployment nor his or her ability to maintain that fitness once deployed.

Team members and team management must recognize and acknowledge the disruption that is part of these missions. Sleeping, eating, personal time, and recreation patterns are erratic. Stress factors related to one's own safety and the well-being of team partners is universal. There are added stresses related to the care of disaster victims and the restrictions imposed by the disturbed situation. Response workers may find themselves pressured to not rest, driven by the needs of the victims or by their own self direction. Team management must be aware of the tendency for this to happen and enforce rest, eating and down time. This action is imperative to manage individual and team well-being and the ability to continue the response. Illness or inability to function well by just one team member can impact the response of all. The potential for infection spreads to other members, severe illness from exacerbation of underlying health problems, interpersonal issues and morale problems can intensify. A worker who poses a risk to the public or other team members may need to be placed on restrictions.

Workers have the responsibility to be prepared to do their job and also to assess whether they are well enough to do it. The individual must decide if he/she can function in less than optimal, in fact, stressed circumstances. In general, the emotionally healthy individual should be able to make this self-assessment. A team member has the option to accept or decline deployment but these decisions should be well informed. Personnel who are under medical care

for chronic problems are well advised to discuss their conditions with their health care providers. Responders should be sure that their medical provider is well aware of the stressors associated with deployments. Discussing these situations and the stability of one's health in a non-urgent environment makes it much more likely for the worker to make a rational decision about deployment.

An overriding factor in denial of deployment is one of public health. For example, a team member with a current unexplained rash that may be potentially infectious, vomiting and diarrhea, or influenza may present a risk to others. Post surgical and "not yet released to full duty", uncontrolled medical problems such as hypertension, diabetes, or seizure disorders are representative of situations in which individuals should defer deployment opportunities, until their situations are stabilized.

Opportunities for modified duty during a recovery period, i.e. "Worker may work 4 hours a day" or "may not lift greater than 20 lbs. with the left hand" or "must elevate right leg 30 minutes out of each hour", are examples of modifications offered to recovering workers in industry. While these modification in duties may be rational in stable work environments, they are neither rational nor safe in uncontrolled disaster and austere environments, extreme weather, etc. Deployments are generally short term, but lifestyle restrictions and demands on personnel during those periods may be arduous. Teams have the responsibility of helping, not adding, to the burden of devastated environments.

Team members should be familiar with their job descriptions and discuss with the team leader any concerns they may have about their physical or emotional fitness to deploy. Consult can be obtained from NDMS via the team leader. Job descriptions can be found in the NDMS Team Handbook distributed to teams at the 1999 NDMS Conference. Section 3 .5 outlines

“Disaster team positions descriptions and qualifications standards”. While most of these descriptions do not identify the major physical functions of the jobs, the documents are descriptive. (The handbook is accessible within this online training program).

Team leadership must act responsibility in advising personnel about the demands of their deployments. As a representative for the employer (NDMS), the team leader or designee is best able to keep the membership informed of mission particulars. We must also recognize that deployments are fluid situations resulting in erratic work circumstances. The worker must be competent and free from coercion in order to make appropriate decisions. There is no single program or assessment tool that can evaluate a workers’ ability to do a job. Ability to perform the job safely must encompass information about current status, strength, sensation, limitation, aggregating factors, etc. Each assessment is done individually and with each and every deployment. It is not only the question of whether a worker can do the given job but also whether it can be done effectively given his or her limitations or restrictions. Personnel who are not deployable for a given mission can be considered for a support role with team readiness activities or as the “at home contact” during the mission.

PERSONAL HEALTH HABITS AND DEPLOYMENTS

ALCOHOL AND DRUGS

Alcohol and /or drug use during off-duty hours can have devastating effects on the individual's health and on the safety of others. This is particularly true when operating in areas with disturbed environments and under stressed circumstances. Irregularity of sleep and disturbed eating patterns can further aggravate the effects of alcohol and drugs. Individuals who sustain injury in these circumstances will not receive the full benefits offered to workers

through the Federal Employees' Compensation Act (FECA). This system allows for Continuation of Pay (COP) while the claim is being processed. This benefit will not be available if "The injury was caused by the employee's willful misconduct; the employee intended to bring about the injury or death of himself/herself or another person; or the employee's intoxication by alcohol or illegal drugs was the proximate cause of the injury."(1)

SMOKING

Smoking and health concerns are well recognized in the medical literature and frequently addressed in the media. Deployments for individuals who have a heavy dependency on smoking can offer a special challenge to the smoker. Transportation restrictions on military aircraft, requirement of teams to remain together, and group housing may limit the individual's access to smoking areas. Generators, proximal fuels, and tents restrict free access to smoking in certain environments. Interference with work performance and irritation with coworkers or disaster victims can occur if the smoker suffers irritability because of the inability to smoke at frequent intervals.

Disturbed environments with smoke, increased dust, and fumes that may be the result of disaster or rescue operations can potentiate bronchospasm. Smoke can further aggravate this situation. "Cigarette smoke is an irritant substance affecting the eyes and the respiratory tract. When measurements are made some minutes after cigarette smoking a minority of individuals, both smokers and non-smokers, show evidence of induced bronchoconstrictions. However, when measurements are made after each puff of smoke from a cigarette, acute temporary changes are seen on each occasion and some subjects maintain these changes for longer."(2)

Cigarette smoke has effects on the individual as well as the bystander. “Passively inhaled cigarette smoke acts as a trigger for exacerbations of asthma.” (2)

EXERCISE

Workers who have a regular exercise program are encouraged to maintain that regime while on deployment. They may need to substitute activities because of the site of the mission, for example, brisk walking if gym equipment is not available. Exercise provides stress reduction by the release of endorphins and offers the individual personal time that is important in working in a stressed environment. Deployments are not the time to start an exercise program. Deployment-related work obligations; change in habits, sleep and eating patterns are not conducive to *beginning* a vigorous exercise program.

SLEEP REQUIREMENTS

Sleep during pre-deployment activities and during the mission may be less than normal, disrupted, affected by time zone changes, unusual surroundings, and uncomfortable sleeping arrangements. Perhaps the best rule of thumb is to rest and get sleep whenever you can, in the scurry of deployment and while on mission. There may be frequent “wait times” in transit and operational set-up. Using these opportunities for rest is to the workers’ best advantage, if not otherwise involved with mission responsibilities.

SLEEP, SHIFTWORK, AND SCHEDULING

Shift changes may be part of deployment activities. Prolonged work hours are generally applicable. We are used to a 24-hour rhythm of light and darkness that affects body function and biochemistry. These time periods are called circadian rhythms and the complexity of these

rhythms affects wakefulness, attention and fatigue factors as well as many other functions. For the purpose of this learning module we will briefly review some of the issues involving the circadian timing system (CTS), jet lag, and shift change and suggest compensatory methods to apply to deployment scheduling.

CTS is basically a biological clock maintaining behavioral and body timing in the sleep/wake cycle, rhythms of sleep, body temperature, and hormones. When all is stable and in a steady state, normal energy levels and state of health are optimized. Transcontinental or international travel, and a change in shift work schedule are frequently a part of deployments. A different rhythm of sunlight time-altered activities and schedule, can often result in several days of fatigue, decreased mental alertness, and performance, difficulty sleeping, or sleepiness and gastrointestinal disturbances. These events are commonly recognized as “jet lag”. All of these events occur in a period of time that require optimal performances from teams arriving at a disaster site, implementing a medical care response, or making quick and accurate site assessments. “Rapidly crossing time zones affects both physiological and performance rhythms. The latter are of major occupational significance when people are required to carry out complex psychomotor or intellectual tasks soon after arrival. In general, psychomotor performance after a 6-hour transmeridian flight suffers a reduction of 8-10% of preflight levels during the first day of travel. This is a disquieting because such impairment is comparable to that observed when blood alcohol concentration is 0.05%.”(3)

When possible, workers and team management can decrease the effects of “jet lag” by scheduling personnel who generally work nights, into night positions during activation. When rotation shifts are required, scheduling officers should consider rotating shifts in a forward

pattern. That is rotate forward from days to evening to nights. Teams should be encouraged to quickly adapt to the meal times, sleep schedules, and social activities of the mission site.

According to authors Comperatore and Krueger, the consumption of carbohydrate rich meals may help induce sleep for the eastward traveler (3). This is generally less risky than sleep aids that may affect cognitive or vasomotor function. Teams that are traveling westward can more easily adjust their time to the destination by delaying sleep with caffeine intake and protein intake. Protein rich meals may prolong wakefulness and help delay sleep time; thus the westward bound team will adjust more easily to the mission destination.

NUTRITION AND FOOD MANAGEMENT

WHAT TO EAT

The biggest concern about food and water intake on deployment is usually not the type of foods you are eating but rather safety of the sources of food and water. Additionally, the avoidance of dehydration resultant from heat; added physical workload, air travel, and active physical exertion may distract one from drinking adequate amounts of fluid. Hypohydration can lead to a temporary cycle of decreased appetite, or disinterest in food and water intake. This cycle will further result in decreased fluid and food consumption.

Hand washing before food preparation and prior to eating is paramount. Self-contamination can easily occur when hand washing is not performed. Hygiene is a must. Deployed individuals can expect to eat somewhat erratically and protein sources such as protein bars, or nuts and dried fruit may sustain one until the team site is established and meals are more routine. Meals Ready to Eat (MREs) are frequently available in deployment stashes. These offer a variety of ready to eat foods, some which can be heated with a hot chemical pack.

“The contents of one MRE meal bag provides an average caloric intake of 1300 kilocalories (13% protein, 36% fat and 51% carbohydrates). It also provides 1/3 of the military recommended daily allowance of vitamins and minerals determined essential by the Surgeon General of the United States.”(4) There are MREs that consist of vegetarian menus for those who cannot eat meat. Religious, Kosher or Halal MREs are available for individuals who maintain strict religious diets. The dietary needs of individuals should be considered before deployment, as alternative MRE choices may not otherwise be readily available.

Sometimes, team members are distracted by mission job tasks and may not eat. The Committee on Nutritional Research examined the reasons surrounding under-consumption of rations by troops. While the military stresses may be greater than the majority of disaster response deployments, there are some shared factors that could be applied. There are a number of factors that influence consumption in field circumstances such as adverse environments, temperature extremes, and proximity to danger. The opportunity for social interaction, sharing of information, and appropriateness of the meal to the time of day it is eaten will encourage consumption. General food attractiveness, taste, temperature, smell and color affect intake in the same manner as our acceptance of food and beverage in our home environment. Recognizing this, workers should seek out the opportunity to eat with others, pay attention to the need to eat and drink, and choose eating areas away from activity and out of the view of victims. Team leadership, with the help of logistics, must provide for these environmental needs. Teams should be prepared to provide food and water for themselves for at least the first 72 hours of deployment, paying attention to early arrangements for re-supply.

UNDERSTANDING FOODBORNE ILLNESS

“Food poisoning, foodborne intoxication, and foodborne infections are generic terms applied to illnesses acquired through consumption of contaminated food or water.”(4) Food poisons likely to present in deployments are illnesses that occur a short time after consumption and are usually recognized when a number of people become sick after having eaten the same foods. Individuals or groups of people may present with severe abdominal cramps, nausea, vomiting, and diarrhea. Symptoms may be abrupt and last 1-2 days or be so severe as to cause prostration and dehydration. People can become sick within a half-hour to 8 hours after eating. Foodborne infections are considered “a potential hazard in situations involving mass feeding and lack of refrigeration facilities” and have disaster implications.(4) Deploying teams should expect a general lack of refrigeration and plan accordingly.

KEEPING FOOD HEALTHY

“Ultimately, prevention of foodborne illness depends on the education of foodhandlers in proper practices in cooking and storage of food, and personal hygiene. Toward this end WHO has developed “Ten Golden Rules for Safe Food Preparation.” These are as follows:

1. Choose food processed for safety.
2. Cook food thoroughly.
3. Eat cooked food immediately.
4. Store cooked food carefully.
5. Reheat cooked foods thoroughly.
6. Avoid contact between raw foods and cooked foods.
7. Wash hands repeatedly.

8. Keep all kitchen surfaces meticulously clean.
9. Protect foods from insects, rodents, and other animals.
10. Use safe water.”(4)

We have not discussed chemical poisoning of food or water, botulism or other deliberate poisoning that may be the mechanism of terrorist acts. The reader is referred to the terrorism session in this NDMS training program.

IMMUNITY, MEDICATIONS AND SCREENING

IMMUNIZATIONS: PRE-DEPLOYMENT WISDOM

Protection against vaccine preventable illness begins well before team activation. Immunity requirement is part of clearance for work in many healthcare industries in the United States today. Childhood vaccination and previous completion of vaccine requirements for school, college, or military duty may well have provided the worker with a solid immunity base from which to build.

Responders should review Table 1, outlining the vaccination and immunity requirements for NDMS Teams. Currently, it is the responsibility of the individual to procure immunity and document receipt. Teams have different mechanisms for the management of vaccination records. There is no current maintenance of vaccine information on a national level for NDMS teams.

The immunity requirements established by NDMS do not address the requirements for members of International Medical-Surgical Response Teams (IMSuRT). These responders will need the baseline set of vaccinations as described for DMAT and additional protection against vaccine preventable illnesses not common to the continental United States. They may also require malarial prophylaxis dependent on the countries and situations to which they respond.

PERSONAL MEDICATION ON DEPLOYMENT

Individuals need to carry an adequate supply of personal prescription medication on deployment. It may be inconvenient to fill prescriptions written in another state. Supply systems and availability may be limited. Mission completion can be delayed or missions extended, so having extra medication is important. Individuals are encouraged to carry their personal medications with them during transit. These medications should be in their original containers. A back-up supply of prescription medication, included in the routine luggage will provide a safety net if the hand piece is lost. Limiting medication to storage in the routine luggage is a jeopardy, since it is not unusual for luggage to sit on a pallet, unavailable for days. Personal medications that require refrigeration can be carried in hand pieces with blue ice packs or a cold pack thermos. However, refreshing this cold source may be difficult. Individuals are encouraged to speak with their personal health provider and discuss the use of alternative medications that do not require refrigeration during deployments.

Use of over-the-counter preparations, while providing comfort to the disaster worker, can cause side effects. The user should be aware that fatigue, drowsiness, palpitations, and dry mouth are not uncommon with some of these preparations. These same complaints can be associated with fatigue, dehydration, caffeine ingestion, and anxiety directly related to deployments. The worker needs to be vigilant and aware, recognizing that both the circumstances of deployment and the use of over-the-counter medications can intensify effects. NDMS responders are advised to carefully read the information about the medication that they are using. It would seem prudent not to use new medications on deployment but if needed, to take ones that the individual has had experience with using in the past. Interference with job function, safety, and general wellbeing

must be considered. Self-medicating may also mask other more serious symptoms. Team members are encouraged to report even minor ailments to the team leader or their designee.

WHY DO DISASTER WORKERS NEED TUBERCULOSIS TESTING?

DMAT and DMORT teams may be asked to respond to medical facilities. Many facilities have the responsibility to screen and to be aware of the TB Skin Test status of workers. This is often a regulation issue and health and safety concern for both patients and staff. It is prudent for team members to be aware of their Mantoux test results. This test uses standard purified protein derivative (PPD) and is injected on the forearm. The site is evaluated 48 – 72 hours later in millimeters of induration. A positive test does not distinguish between current disease or past infection but is a step in the evaluation of a treatable condition. Chest radiographs will be obtained if a PPD is positive.

Team members who are currently working in healthcare facilities most likely have PPD testing or some screening for tuberculosis done on an annual basis. Workers who currently do not have this screening done routinely, are recommended to obtain it for baseline information.

WHAT DO I NEED TO KNOW ABOUT TUBERCULOSIS?

Tuberculosis (TB) is a bacterial disease usually affecting the lung. Infection can occur when aerosolized droplets containing living organisms are inhaled. When the organisms reach the lung they can either die or multiply. Organisms can become dormant but remain viable and reactivated if the individual's defense mechanisms are lowered.

CDC tell us that: "Infection is most likely to result from exposure to persons who have unsuspected pulmonary TB and are not receiving anti-TB therapy or from persons who have

diagnosed TB and are not receiving adequate therapy”(5). There is increased exposure risk in populations that may present with atypical symptoms. These include the elderly, especially those in group housing, such a nursing facility, and patients with human immunodeficiency virus (HIV). These individuals may also present with tuberculosis infecting body areas outside of the lung.

Tuberculosis is generally treatable when recognized early. Unfortunately, there is an increasing number of strains of *Mycobacterium tuberculosis* (M. tuberculosis) that are resistant to the more common antituberculosis medications. “Risk for factors for drug resistance include immigration from parts of the world with a high prevalence of drug-resistant tuberculosis, close and prolonged contact with individuals with drug-resistant tuberculosis, unsuccessful previous therapy, and patient compliance. Resistance to one for more antituberculosis drugs has been found in 15% of tuberculosis patients in the United States. New York City accounts for 61.45% of these cases.”(5). There have been occupational exposures to multidrug-resistance cases in both Florida and New York that have resulted in severe illness and death rates of greater than 70%.

Any potential exposure to tuberculosis on deployment should be reported immediately and a follow-up PPD testing done in 6 – 10 weeks post exposure. Conversion to a positive test result will require further medical evaluation. “In general, persons who become infected with M. tuberculosis have approximately a 10% risk for developing active TB during their lifetimes.” (5). There is available treatment for those who become infected with TB and for those who develop active tuberculosis.

Please go now to Part 2 of this session, Occupational Issues.