



On-site Occupational Health Services at the World Trade Center Recovery Project

The heroic rescue efforts that began immediately following the World Trade Center attack quickly expanded to include substantial on-site occupational and environmental medicine. These on-site workplace health services proved to be extremely valuable in both treating and preventing injuries at the site.

From the time the recovery effort began until it officially ended June 30th of this year, rescuers and recovery personnel worked over 3.4 million man hours with no deaths and surprisingly few serious injuries in an extremely dangerous work environment. At peak times the workforce numbered nearly 5,000 individuals from dozens of agencies and companies. Total incurred workers' compensation costs for the recovery project were estimated at 7.5 million dollars, but amounted to only 1.67 million dollars, representing far better health and safety outcomes than had been expected.

Initial responses from local agencies included medical personnel ranging from first responders and EMT's to physicians from the New York Fire Department (including NYC's Emergency Medical Services), Police Department and the Port Authority. Local hospitals and individual providers also responded immediately. They were soon supported by other state, federal and non-governmental agencies. The New York City Office of Emergency Management (OEM), City Health Department, New York State Department of Health, OSHA, FEMA and NIOSH and others all played leading roles.

As the project transitioned from a *rescue* effort to a *recovery* effort, the project's on-site needs changed. In addition to search and rescue personnel, the work force included thousands of heavy equipment operators, welders, plumbers, electricians, and other skilled laborers. In many respects, the recovery effort resembled a large construction project. But unlike other construction sites, ground zero was a 16-acre

unstable mass of tangled debris that could shift or collapse beneath people and equipment. In addition, hazardous exposures required respiratory clearances and fit testing for the workers. The city and the project's insurers both recognized the need for specialized occupational health services on-site at ground zero.



The enormous scale of the project is shown by the size of personnel on the debris to the left of the heavy equipment.

The New York Office of Emergency Management brought in a private firm, experienced in managing on-site medicine for large construction sites and special projects. In October, 2001, Medcor, Inc. began assuming responsibility from the Disaster Management Assistance Teams (DMAT) which were preparing to leave.

Dr. John Goutos, Medcor's New York Regional Medical Director, was well prepared for the task. He was supported by a strong operational team, many of whom had worked together for nearly a decade on other projects (albeit none as large or complex). Dr. Goutos is also Medical Director for the Port Authority Police and for the John F. Kennedy Airport Medical Center.

Within days of being called, Medcor was providing 24-hour coverage on site, operating from two mobile clinics, complete with potable water, waste systems, electrical, phone and internet connections. Each clinic contained treatment rooms, a restroom, private office and a multi-purpose central area which was used for staff meetings, safety orientations, and as a place for workers to complete health questionnaires associated with their respiratory and other surveillance exams. Each clinic was equipped like an ambulance to provide emergency ACLS care.

New York native, Michael Golub, was Medcor's regional operations manager responsible for the start-up logistics, including getting the clinics moved in and set up. "Having mobile clinics was important capability," he explained. "As the work progressed, we were able to move our clinics so that we were always physically close to the perimeter and the majority of the workers, ensuring rapid response times and convenience for the workers."



Decontamination sinks and showers were set up at the site in addition to Medcor's two mobile clinics.

Each clinic was staffed with a physician assistant and two paramedics at all times. The staffing model was given careful consideration. With so many excellent hospitals nearby, the team determined it was not necessary to duplicate expensive x-ray, laboratory and other equipment that would only be used occasionally. Rather, they focused on rapid response and assessment.

Veteran paramedics with decades of experience, much of it in construction sites, provided the majority of this

capability. The physician assistants ensured most injuries were able to be treated on-site. The PA's also were able to address the numerous health questions from workers who were concerned about their exposures. The team also provided a full-time grief counselor and maintained a physician on call 24-hours a day, both for consultation and on-site response if needed.

Without knowing exactly what services would be needed in such a challenging and changing environment, Dr. Goutos was prepared to change the staffing model immediately, if necessary, and he tracked injury data from the onset to ensure the staffing levels were appropriate. The initial model proved effective and was kept in place until the end of the project.

The staff all followed Medcor's established clinical guidelines, designed to optimize on-site treatment. Dr. Goutos reviewed all medical charts and met with on-site staff on all shifts regularly to assess their performance and provide hands-on support.

Medcor's on-site staff assessed and treated 1,077 injuries. Of those, 94% were resolved on-site; only 64 were referred off-site for additional diagnoses or treatment (none of whom were admitted overnight). Approximately 150 other injuries were transported by ambulance directly from the site without being seen in the on-site clinics due to the potential urgency of their injury (such as electrical shock, or falls requiring c-spine clearance by x-ray). Taking those injuries into account, approximately 82% of all injures at the site were resolved on-site. The most common complaints resulted from were respiratory symptoms, soft-tissue wounds and strains and sprains resulting from trips and falls associated with collapsing and shifting debris.

Injury prevention was a critical aspect of Medcor's services. Medcor's on-site manager, Joe Donadio, sat on the site's safety committee. Using proprietary software, the on-site medical team tracked nearly 100 standardized data elements for each injury in a relational database, including the type of injury, potential causes, and contributing factors. The team conducted regular trend analyses and were able to give effective support to the site's safety managers. For example, eye injuries were practically eliminated when

the team identified foreign body injuries which were occurring in small numbers across all shifts, involving multiple contractors. No single agency or work group had many eye injuries by themselves, but the medical team was able to use the aggregate numbers justify changes in site-wide safety glass requirements and enforcement.

Dr. Goutos also shared data with other agencies on-site. OSHA personnel on-site to keep the 200 and 300 logs, relied on information from the medical team and cross referenced their logs with Medcor's. Medcor also provided data to the fire department to augment its tracking of injuries that occurred off the work-site.

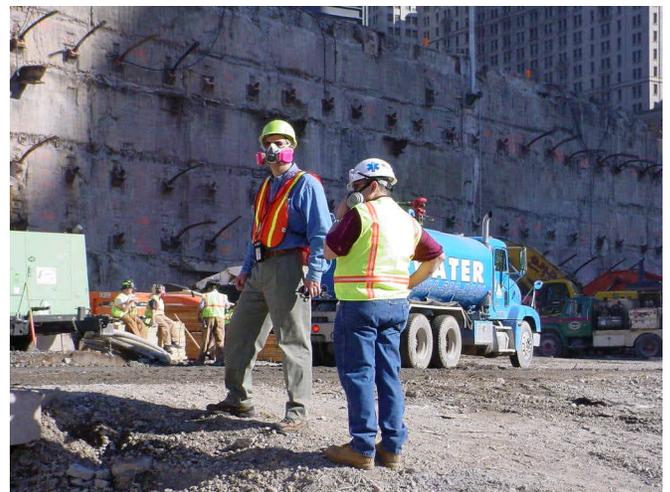
The on-site medical team conducted 1,100 respiratory exams for recovery workers, in addition to over 9,000 exams the fire department provided for its own members. In the first week after the attack, fewer than 10 percent of firefighters used respiratory protection beyond dust masks, which were inadequate for the airborne contaminants. By the second week, many more rescuers were wearing appropriate equipment – and sufficient supplies were available as businesses such as 3M delivered literally, truck loads of respirators. By the time the recovery effort began, strict site-wide respiratory protection rules were in place.

Environmental sampling to identify and quantify hazards began almost immediately, and was soon being conducted on a large-scale. For example, over 1,000 workers at ground zero wore air-sampling devices between September 18th and October 4th. Sampling data was analyzed by researchers the EPA, CDC, NIOSH and New York City's Health Department, as well as by private firms which were also contracted to perform testing. Toxic substances found at the site include asbestos, hydrogen sulfide, mercury, benzene, dioxin, and PCB's. Most toxic substances were found at levels below those deemed safe under existing standards. However, uncertainty and concern continues to exist about the long-term effects of exposures at the site – particularly from the dust cloud during the collapse and from the combination of substances and combustion products.

The on-site medical team was not involved in environmental sampling, but did make its respiratory

and other surveillance examination data available to the sampling agencies for study. Dr. Goutos also made certain the on-site team was familiar with the potential toxins so they could watch for applicable signs of exposure, and, more often, answer workers' questions about them. The only injuries seen by the on-site team which were immediately attributable to exposures were of a more routine, such as carbon monoxide exposure from equipment operating in areas without sufficient ventilation.

Numerous workers presented with a persistent cough or asthma-like complaints, now commonly being called, "World Trade Center Cough." Although little is understood about this condition, the fire department's deputy chief medical officer, David Prezant, reported to NIOSH that as many as 25% of all fire fighters involved in the initial response are showing early signs of asthma.



Medcor CEO Philip Seeger & Site Manager, Joe Dinadio survey part of the ground zero work site near the end of the project.

The occupational health team recognized from the onset that emotional care was going to be required and ensured that qualified staff was available. Like the recovery workers they were supporting, the on-site medical staff was effected by the magnitude and horror of the tragedy. The recovery work was being conducted in what was, essentially, a mass grave. Body parts and personnel effects of victims provided constant reminders of the loss of life involved. Medcor's on-site counselor saw between 12 and 20 workers each day, many informally outside the clinic

in work areas – allowing private and spontaneous responses. Dr. Goutos worked closely with all the on-site staff to assess and support their morale, which remained high throughout the project. “Everyone felt honored to be able to contribute to this effort,” explained operations manager Michael Goloub. “The team had a strong sense of purpose, even when the day to day tasks were routine.”

Those tasks included maintaining medical records for workers on-site. This responsibility included protecting patient confidentiality while ensuring the various employers had the information they needed both to operate safely and to meet their individual reporting obligations. Having a well-developed charting and filing system that could be dropped into place was key to staying organized and operating efficiently. The team’s detailed records, many of which are electronic, will likely serve as a valuable base line information for on-going monitoring of the project’s workers.

Medcor’s Vice President, Kyle Johnson, was the team’s primary liaison with the city, project managers, and insurers – the medical team’s customers on the project. His role was vital to the project’s success, explains Medcor CEO Philip Seeger, “understanding the business context in which we were working and accommodating all the agencies involved was key to allowing our medical staff to focus on our primary mission of providing great occupational health on site.”

At the closing ceremonies marking the official end of the recovery project, the Medcor team’s flag flew along the American flag on the ramp leading out of the site while Dr. Goutos and his on-site team looked on, their mission accomplished.

– Susan Sullivan, RN, BSN