

EFFICACY OF A FEDERAL LAW ENFORCEMENT TACTICAL MEDICINE PROGRAM FOLLOWING A CATASTROPHIC NATURAL DISASTER:

THE DHS ICE SRT RESPONSE TO HURRICANE KATRINA

J. David Davis, NREMT-P, Nelson Tang, MD

On August 29, 2005, Hurricane Katrina struck the Gulf Coast of Louisiana with an unprecedented degree of destruction. Both the initial impact and widespread aftermath of this natural disaster were an order of magnitude not previously experienced by this country. While the nation's disaster and emergency management response resources were being activated and mobilized toward the affected regions of the United States, a federal law enforcement tactical response program and its medical element was deployed in support of police and public safety needs in the area. While not intended primarily as a disaster response initiative, this tactical medical asset encountered frequent, sustained medical needs and was able to provide effective active medical support in this capacity.

BACKGROUND

Major elements of the former United States Customs Service (Department of the Treasury) and Immigration and Naturalization Service (Department of Justice) were re-organized in March 2003 under the Department of Homeland Security (DHS) as the U.S. Immigration and Customs Enforcement (ICE). A total of 10 tactical (also commonly known as Special Weapons and Tactics, or S.W.A.T.) Special Response Teams (SRT) support the ICE Office of Investigations law enforcement

mission and are positioned strategically around the country.

The concept of incorporating dedicated emergency medical support into law enforcement tactical and special operations teams has been increasingly described.¹⁻⁵ In 2004, a tactical medical program was established within ICE, from an existing program of the former U.S. Customs Service, to provide rapid, advanced emergency medical support to these teams. In collaboration with a major urban academic medical center that provides medical oversight, medical command and control, protocols and emergency medicine training, the ICE SRT tactical medical program is a specialized operational asset with a narrowly intended mission, specifically designed for support of up to 50 special agents involved in high-risk law enforcement operations. ICE SRT tactical medics are trained utilizing National Standard Curricula for Emergency Medical Services (EMS) providers established by the National Highway Traffic Safety Administration of the United States Department of Transportation.⁶ Additional specialized training with regards to airway management, intravenous access and tactical medical scenarios are provided through internal agency guidelines.⁷

With typically one tactical medical provider per SRT, the program was designed to deliver medical treatment in the "hot zone" during high-risk warrant services and in isolated or remote areas. These tactical medics are Special Agents responsible for conducting criminal investigations concerning terrorism and other issues pertaining to national security. Their role as medics is secondary to their responsibility as a tactical entry team member during high-risk warrants and other law enforcement missions.

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Address correspondence to: Nelson Tang, MD, FACEP, Department of Emergency Medicine, The Johns Hopkins Medical Institutions, 600 North Wolfe Street, Marburg B-185, Baltimore, Maryland 21287, e-mail: (ntang@jhmi.edu).

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Deployment Chronology

Needs assessment in the immediate aftermath of Katrina landfall and medical threat assessment was performed by the New Orleans SRT, first to arrive on scene, and conveyed to the ICE Headquarters in Washington, DC. Initial information led to the belief that several DHS ICE personnel in the region were possibly unaccounted for. The ICE New Orleans Field Office sustained heavy damage and thereby rendered incapable of sustaining a major law enforcement operation. This was compounded by significant failures of the local

levee system leading to severe flooding, making access and movement by police and EMS near impossible.

As local, state and federal agencies and centers attempted to quantify both the immediate and anticipated mass medical needs post-Katrina, the need to augment local police resources became quickly apparent. On September 3, 2005, ICE initiated the deployment of approximately 725 law enforcement and support personnel at the request of local officials, including five Special Response Teams (each with one tactical medic) to the Gulf Coast of the United States.⁸

During operational pre-planning by the ICE Tactical Medical Program, the command decision was made to implement its Operational Medical Support (OMS) guidelines, historically reserved for international missions and specifically for travel to less-developed countries with potentially inadequate medical capabilities. Similarly, a cache of stockpiled medications were activated and deployed to supplement existing inventory and to support the anticipated ICE SRT response (Table 1). Medical therapeutics was to be based upon pre-existing protocols and augmented by on-line medical command if available. As the ICE SRT response was intended primarily as a law enforcement operation, a physician was not deployed with these teams.

On September 3, 2005, the lead ICE SRT tactical medic responded to New Orleans and established command in what was intended to be the central law enforcement coordinating center, ultimately the ICE Command Center. This base of operations was located in a downtown New Orleans hotel and immediately presented a number of apparent medical threats (Table 2). Temporarily housed in this facility were more than 300 ICE employees, 150 New Orleans Police Department personnel as well as hotel staff and their families. All were relegated

to the building lobby due to lack of power and physical damage to the hotel. It became readily apparent that the local healthcare system was severely disabled and was neither capable of meeting the needs of the community nor initiating recovery operations. Further compounding this issue was the devastating impact of the storm on local police officers and EMS personnel, many of whom themselves had homes completely destroyed and family members dead or missing.

Operating Environment

Although tactical medics are accustomed to operating in austere environments, conditions after Hurricane Katrina were especially challenging. The constant threat of violent incidents, including at least one situation where gunshots were fired at the hotel (law enforcement command center), required armed contract security personnel to be posted around the property and the implementation of an ad hoc on-site identification system to be established. Severe flooding in very close proximity to the hotel and numerous decomposing corpses frequently encountered during daily operations increased the health risk to all rescuers.

Local police, many who had lost all personal property, were often conducting law enforcement operations with a single set of clothing and equipment, such as firearms and handcuffs, corroded by the caustic waters in which they operated. Additionally, dismal living conditions at the hotel where hundreds of officers slept in the hotel lobby, due to limited electrical service, overflowing toilets in the guest rooms and the absence of running water further threatened the health of all involved. ICE tactical medics and volunteer medical staff slept in the hotel gift shop, utilized as a makeshift clinic due to the high volume of medical needs.

Tactical Medical Response

During the initial 9 days of medical support of law enforcement operations, ICE tactical medics and volunteer medical staff documented the evaluation and treatment of 214 patients for a total of 246 complaints. Of these patients, 102 were confirmed law enforcement personnel, including 69 specifically ICE. The balance were an admixture of support personnel, civilians and persons of otherwise unidentified affiliation. Following an initial period of several hours utilized for establishing a base of operations, securing local assets, networking inter-agency contacts and addressing immediate law enforcement and public safety concerns, the patient volumes quickly peaked and remained sustained for the initial response period (Figure 1).

ICE tactical medics operated with SRT equipment and pharmaceuticals deployed specifically for this mission, augmented by existing ICE national stockpiles. Evacuations and transports, when necessary, were performed with local EMS ambulances if available and

TABLE 1. Operational Medical Support Medications Mobilized for ICE Special Response Team Tactical Medics Deployed to Hurricane Katrina Stricken Areas

Acetaminophen (oral)
Albuterol (metered dose inhaler)*
Amoxicillin
Azithromycin (oral)
Cephalexin
Ciprofloxacin (oral)
Ciprofloxacin (ophthalmic)
Clindamycin (oral)
Dextrose (injectable)*
Diphenhydramine (oral)
Hydrocortisone/polymyxin/neomycin (otic)
Ibuprofen
Loratidine
Morphine sulfate (injectable)*
Oxycodone/APAP
Prednisone
Promethazine (oral)
Pseudoephedrine
Ranitidine (oral)
Zolpidem

*Reflect supplemental quantities deployed to support existing pars.

TABLE 2. Immediate Medical Threats Identified by ICE Special Response Team Medics at New Orleans Law Enforcement Command Center and Improvised Solutions

Problem	Solution
Complete lack of potable water supplies	<ul style="list-style-type: none"> • Requested emergency re-supply of bottled drinking water • Supplemented water with bottled performance drinks
Extreme heat and humidity as ambient environment	<ul style="list-style-type: none"> • Established work rotation schedule • Limited some activities to cooler hours.
Overflowing and inadequate number of portable toilets (6 for 500 personnel)	<ul style="list-style-type: none"> • Requested emergency delivery of additional portable toilets • Stationed cleaning supplies and hand sanitizer in each portable toilet • Worked with hotel engineering staff to use non-potable water supply for toilet flushing
Lack of hand sanitization measures	<ul style="list-style-type: none"> • Established hand sanitation station at main hotel doorway and at food serving line • Issued pocket-sized hand sanitizer
Lack of applied food handling and preparation procedures	<ul style="list-style-type: none"> • Lead medic conducted food inspection at volunteer food locations • Limited food consumption to only inspected locations or packaged foods • Verified ice and food origin
Overcrowded housing conditions	<ul style="list-style-type: none"> • Requested contracting for large "tent city" with portable showers and air conditioning
Unsanitary living conditions (trash, uneaten food, stagnant water)	<ul style="list-style-type: none"> • Instituted a daily clean-up routine "police call" to include all personnel • Advised hotel to drain stagnant water fountain • Install trash receptacles with lids around lobby • Removed trash from living areas twice daily • Medical personnel immediately took control of stockpile and restricted access • Pharmaceuticals were placed under control of a volunteer licensed pharmacist • Excess pharmaceuticals were turned over to a regional hospital for disposal • State Pharmacy Board notified of appropriated medications
Free access to seized pharmaceuticals	

otherwise by law enforcement vehicles such as sport-utility vehicles and pickup trucks.

ICE SRT medics encountered a wide range of medical and traumatic complaints (Figure 2). The most common were cutaneous injuries and lacerations (25%), ENT complaints (14%), musculoskeletal injuries (13%), gastrointestinal illnesses (8%) and rashes (8%). Analgesics were provided for 16% of patients treated and intravenous rehydration was required for at least 3% of those treated. Because indoor air quality was often extremely poor and floodwaters were found to be particularly caustic, environmental exposure was noted to be an independent complaint by providers if specifically elicited during medical history taking.

Of particular note, 14% of all complaints encountered involved symptoms related to underlying and preexisting medical conditions or the seeking of replacement prescription medications for the treatment of those conditions. This presents a strong argument for the adequate training and preparation of tactical medics in the evaluation and management of a broad base of medical conditions, including what may generally be considered routine or non-emergent in nature. Greater proficiency through directed training with regards to baseline medical conditions may prove invaluable to a tactical medic engaged in sustained or extended medical support operations.

With regards to these data, what appears to be a lack of patient encounters during the first 72 hours of operations is actually reflective of extremely high acuity and numbers of patients. In fact, the sheer number of medical emergencies to present during this very early stage of response was such that there were insufficient personnel and resources to accommodate accurate record keeping. Anecdotal reporting by ICE SRT medics in retrospect would suggest the patient acuity (for example, as evidenced by the number of transports required to hospital facilities) and volume during the first three days of deployment to be as high, or higher, than those seen in subsequent days.

Special Scenarios

In addition to the large numbers of medical and traumatic conditions encountered by ICE SRT tactical medics on a frequent basis, a number of scenarios arose that required either special consideration, additional medical control or unique management. These are reported for their potential utility as the collective debriefing following Hurricane Katrina occurs and agencies strategize for future responses.

Open Pharmacy Situation

Upon arrival at the law enforcement command center in New Orleans, ICE SRT tactical medics immediately

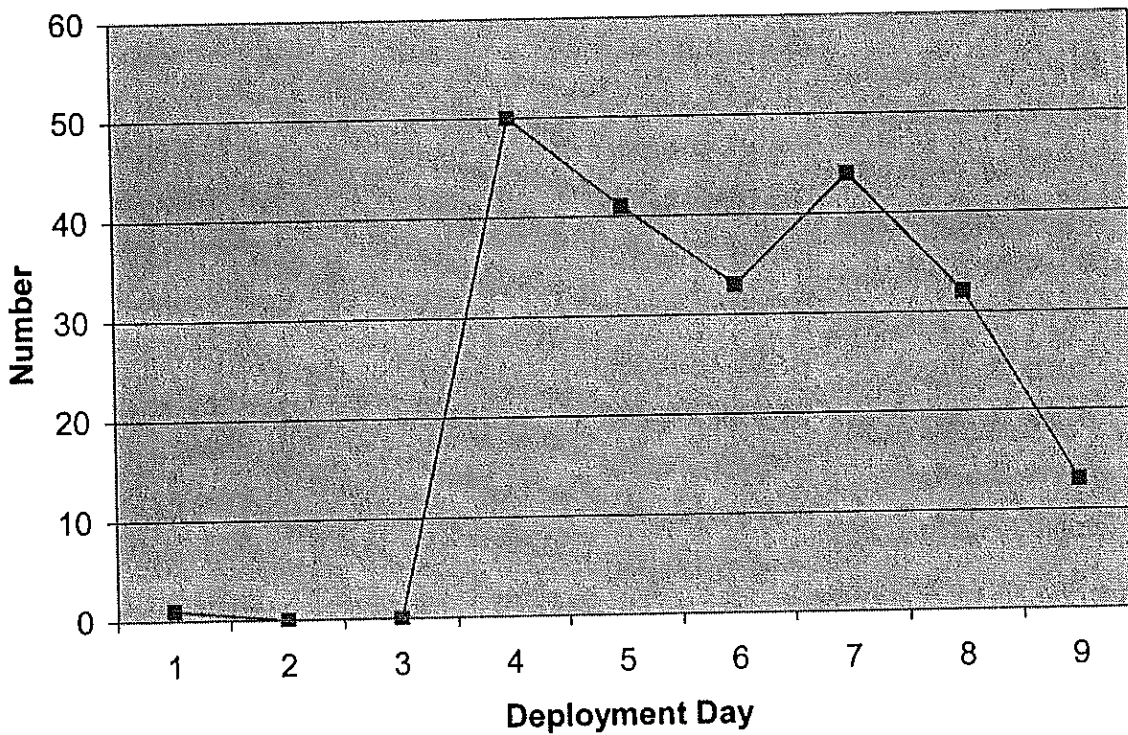


FIGURE 1. Volume of patients encountered by ICE special response team tactical medics during initial phase of deployment.

discovered an extensive stockpile of pharmaceuticals, apparently secured by local law enforcement and a volunteer physician, from the inventory of a local pharmacy. Concern was further elevated after both law enforcement personnel and members of the public

were observed to have unrestricted access to these medications. In conjunction with medical control it was determined that these prescription medications (including vasoactive agents, anticoagulants and narcotics) required close monitoring and ICE SRT medical

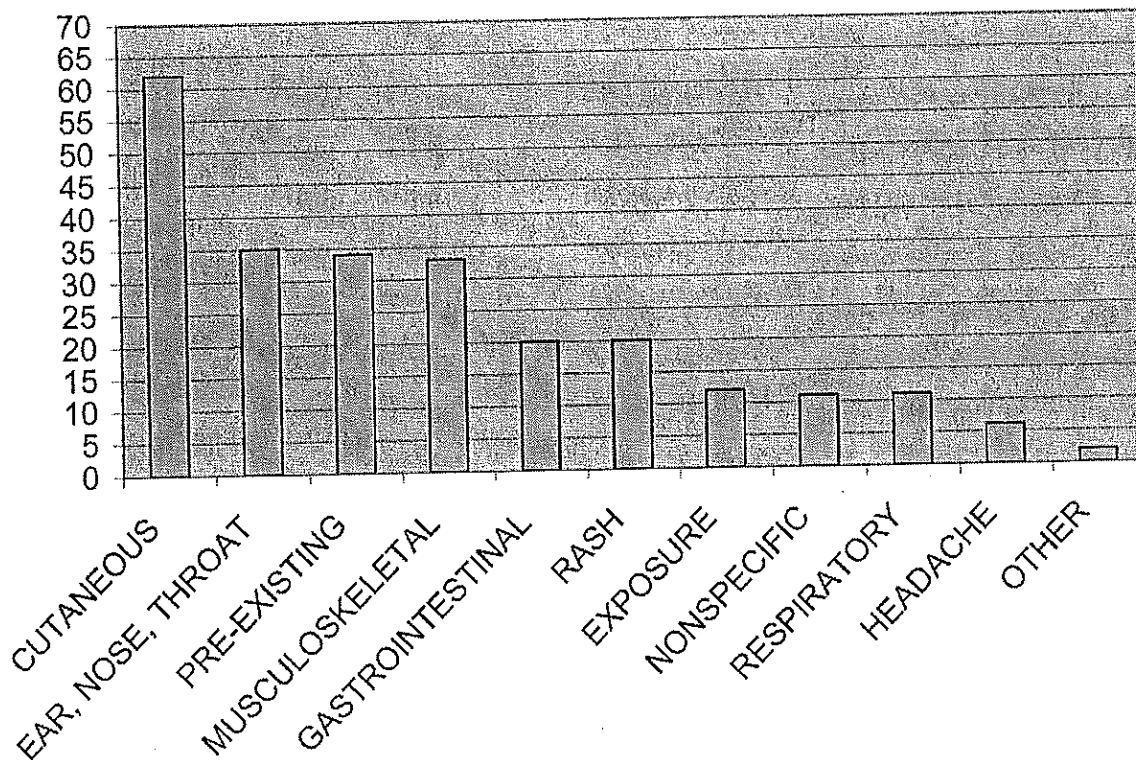


FIGURE 2. Types and numbers of medical complaints encountered by ICE special response team tactical medics.

personnel immediately secured the medications, relocating them from a public area. The prevention of unauthorized use was especially important in this disaster scenario where risk of abuse and even suicide may be increased.

Animal Bite Management

The effects of a natural catastrophe upon a large geographic area encompassing residential communities are likely to be similarly devastating to domesticated animals. ICE SRT medics encountered several cases of dog bites to law enforcement personnel. In one instance involving significant tissue penetration, pet history and immunization tags were not immediately available and raised significant questions concerning management for possible rabies exposure. Conventional medical management would indicate quarantine of the animal but due to the widespread destruction and lack of resources, this was not an option. Termination of the animal for autopsy examination was considered through medical control but the availability of veterinary pathology services was similarly not certain. Ultimately neither of these options was required as agents were able to secure the animal's rabies vaccination tag. Even in this austere setting and despite the generally unsanitary conditions the agent recovered fully without infection or other complications through aggressive initial wound care, immediate initiation of antibiotic therapy and subsequent daily monitoring.

Field Sanitation

A working knowledge of field sanitation, an area not covered during conventional EMS or tactical medical training, is essential for sustaining organizational health. This becomes especially relevant in situations without running water. ICE SRT monitoring and direct contact with volunteer mobile kitchens, often the sole sources of nutrition, was an extremely significant measure that resulted in an extremely low incidence of food borne illness. Additionally, close inspection of food storage measures to prevent vermin infestation in the urban environment and proper food handling techniques contributed significantly to this success. In one instance, routine inspection led to the discovery of an ice source intended for meat and beverage storage that was likely to be highly contaminated, possibly preventing widespread contamination. In another it led to the identification of a volunteer who developed a diarrheal illness yet continued to prepare food. This patient was removed from his duties and returned to home immediately upon identification and notification to his supervisor.

Examples of Leveraged Local Assets

Communication and direct contact with outside organizations such as local hospitals, EMS, CDC, DMAT and military counterparts is critical during a disaster response to obtain and report accurate information concerning local health threats and the availability of resources. This becomes even more crucial when the local resources have been partially or completely destroyed. ICE SRT medical personnel were able to establish contacts with local hospitals and DMAT teams for the procurement of large quantities of tetanus and Hepatitis A vaccines. Sharing of ICE SRT medications with local EMS jurisdictions helped to ensure accessibility of transport support and medical supplies. ICE SRT medical surveillance led to the discovery that the Charity Hospital/Louisiana State University emergency medicine residency program lost facilities in which to continue its training. These resident physicians graciously volunteered to support ICE SRT medical operations for several days while their program leadership established a local field hospital. The identification of a licensed clinical physician and pharmacist helped to support the ongoing medical needs within the law enforcement command center and also to manage the pharmaceutical stockpile that had been previously secured.

Communications for Medical Control

Communication with medical control for prehospital medical personnel has traditionally been a cornerstone of EMS operations. Following Katrina, near complete destruction of radio repeaters and cell phone towers made communication by standard means extremely difficult at best and impossible at times. It is therefore necessary in disaster situations to have in place clear preexisting standing orders covering a variety of unconventional as well as nonemergent scenarios as communication may be limited or nonexistent. ICE SRT medics operated through standing protocols and were fortunately able to access its existing remote cellular communications infrastructure for on-line physician medical control in nearly all critical instances. Nevertheless, response organizations should continue to explore the use of nontraditional communications such as text messaging, satellite email, satellite phone, cellular "direct connect" and Blackberry technologies.

Field Expedient Patient Documentation

In a dynamic and rapidly evolving crisis situation, the need for medical documentation remains critical yet present particular challenges. Extremely high patient-to-provider ratios should be expected which can make the use of standard documentation methods prohibitively cumbersome and time consuming. In the ICE SRT experience, basic patient information

including agency affiliation, chief complaint(s), vital signs, and treatment intervention(s) can be maintained on small index card-sized records. Despite the obviously unconventional practice setting, the maintenance of accurate record keeping is invaluable both for real-time patient tracking as well as retrospective quality assurance reviews. Regardless of the methods utilized, the format must be realistic and sufficiently concise to permit providers to keep pace with the operational tempo.

Media Coverage of Health and Medical Issues

Local and national news coverage is often inaccurate when reporting from areas impacted by natural disasters. During the aftermath of Katrina, news reports at one point created near hysteria leading on-site relief workers to believe that infectious diseases such as cholera were rampant in the flooded areas.⁹ In another instance, local officials suspended rescue operations due to a belief that Malaria and West Nile Virus were major credible health threats.^{10,11} Real-time information from government agencies was not readily available to either support or contradict such media reports. Ultimately, persistent and directed communication with local medical officials was required to determine these reports had in fact been inaccurate.

Psychological Impacts

The severity and depth of the emotional and psychological impact of such complex disasters upon responders of all types cannot be underestimated. The risk may be particularly high when local public safety personnel are involved and who may have themselves suffered severe losses of assets or family members. ICE SRT medics were able to confirm the suicide of at least two local police officers engaged in relief operations although the actual number was rumored to be much higher.¹² Although generally not trained in depth for psychological evaluations, ICE SRT tactical medical personnel maintained vigilance for at-risk individuals and attempted preventative referrals to the extent possible.

DISCUSSION

A tactical medicine program is typically intended to support small groups of law enforcement special operations personnel and do not generally have well-established roles in mass disaster response models. Despite the ever-increasing experience base with regards to disaster mitigation, there often remains what appears a tendency to consider mass medical needs as a largely isolated consequence of natural disasters. As evidenced by the immediate aftermath of Hurricane Katrina upon the United States, the contingencies to be encountered also clearly include enormous, sustained and active

law enforcement intervention for the purposes of public safety, infrastructure protection and search and rescue operations. The response by law enforcement in such instances will include local, state and federal agencies with vastly differing assets and capabilities. Many of these agencies will have simultaneously sustained personnel and resource losses during the disaster as well.

A law enforcement tactical medical element has potentially unique capabilities within highly complex disaster environments. As bona fide police personnel, the access to critical sites may be assured with somewhat lesser concerns for medical provider safety and security. The proximity to tactical medical responders allows for rapid, advanced interventions for those law enforcement personnel otherwise without the option for evacuation and access to either conventional or ad hoc medical treatment facilities. The dual qualifications for medical and police functions may prove critical in post-disaster scenarios in which population behavior en masse becomes increasingly unpredictable. Despite primary responsibilities related to the law enforcement mission, tactical medical teams must anticipate large numbers of complex medical scenarios and the deployment of program physicians should be strongly considered or even standardized in postdisaster scenarios.

In the earliest stages of planning for the ICE SRT response to Hurricane Katrina, dynamic medical threat assessments led to the anticipation of widespread dehydration, gastrointestinal illnesses, respiratory infections and cutaneous and musculoskeletal injuries amongst law enforcement responders. This was only partially affirmed by the actual ICE SRT experiences in New Orleans post-Katrina. Perhaps in part due to the very early response by this program to stricken areas, many such medical conditions had not yet had sufficient time to develop into fulminant complaints. Nevertheless, it is reasonable to believe that, to some degree, the early assessment and rapid intervention by tactical medics of early medical signs and symptoms potentially prevented the development of some more severe conditions. Further, the vigilance by tactical medics toward such preventative health measures as aggressive oral hydration, handwashing, safe food handling and adherence to personal protective equipment would be expected to have significant positive impact upon the health status of law enforcement responders (Figure 3).

Law enforcement tactical teams are rapidly deployable assets with special operations personnel accustomed to functioning in severe and austere conditions. Tactical medical providers trained and proficient in operational medical support may be tremendously effective and invaluable at treating a myriad of medical conditions in the postdisaster environment, particularly at a relatively early stage of development.

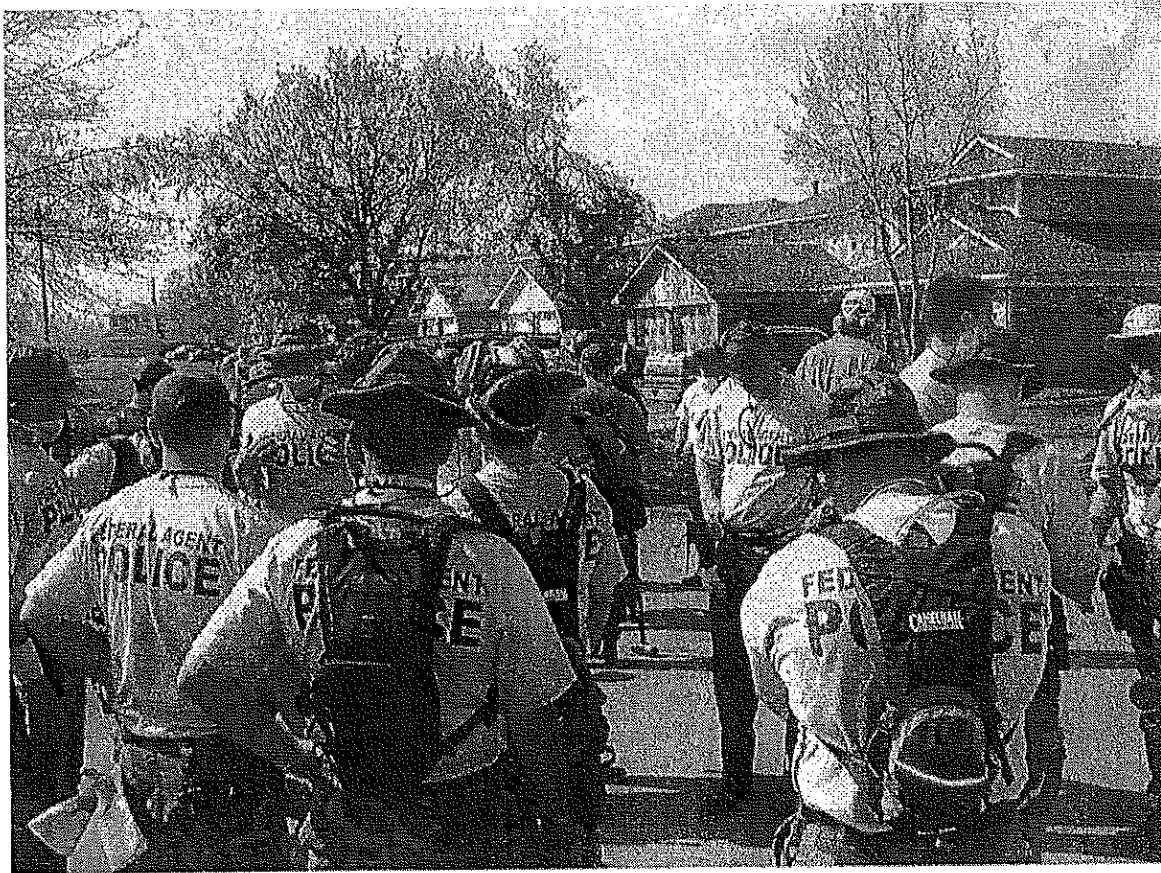


FIGURE 3. Federal agents support local law enforcement operations post-Hurricane Katrina utilizing respiratory precautions, gloves and rehydration measures. Tactical medics were instrumental in advocating adherence to personal protective equipment, although availability was variable and environmental hazards pervasive.

Real-time communications for medical control may greatly enhance the capabilities of such providers, even when geographically remote. Access by tactical medical providers to multi-agency command centers and on-site resources enables the leverage of a wide array of assets to support sustained postdisaster law enforcement operations.

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