

will need urgent surgery, and 8% will require non-urgent surgery. The relevant abilities of the Israeli public hospitals were calculated, including the number of emergency department beds, operating rooms, ICU beds, and hospital beds in order to better define the gaps between the needs of the injured patients expected from mega-attacks by terrorists and the abilities of the hospitals in each area of Israel. **Results:** Applying these numbers to an urban area in Israel, three potential bottlenecks are possible: (1) inadequate number of ambulances required for the rapid evacuation of the casualties from the site within the first hour; (2) lack of sufficient numbers of intensive care beds in the nearby (close-circle) hospitals; and (3) the lack of a complete picture of the system will not enable optimal coordination of this complex event.

Discussion: Because of the lack of EMS personnel and vehicles at the scene, there will be a need for advanced, pre-hospital life support and primary triage by experienced paramedics. There should be rapid transport of the moderately and severely injured casualties to the nearby hospitals (close circle), but mild and stress casualties must be delayed at the scene and transported by buses to hospitals outside of the region (second circle). The possible shortage of ICU beds necessitates the early recruitment of both ambulances and helicopters at the hospitals, so they can be ready for secondary evacuation of casualties to second-circle hospitals or to trauma centers. A medical operational center with a good knowledge of the field-level and hospital-level doctrines and a system for data collection and interpretation should assist the coordinator of such an event.

Conclusion: Such an exercise reveals potential bottlenecks in the flow of injured victims from a mega-attack by terrorists and solutions for the problems can be derived from the analysis.

Keywords: ambulances; bottlenecks; casualties; emergency departments; emergency medical services; exercise; helicopters; hospitals; intensive care units; multi-casualty incident; preparedness; surgery; terrorism; treatment

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The Strategic National Stockpile Program: Emergency Response Preparedness for Chemical, Biological, and Radiological Disasters through Present and Future Initiatives

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The United States Strategic National Stockpile (SNS) Program was established in 1999 as a national resource to deliver medical material to the site of a national emergency. The SNS Program ensures the availability of medicines, antidotes, medical supplies, vaccines, and medical equipment necessary for states and communities to counter the effects of biological pathogens, chemical nerve agents, radiological events, and explosive devices. The SNS Program is designed to deliver medical assets to the site of a national emergency within 12 hours of a federal decision to deploy medical assets. The purpose of this paper is to describe present and future initiatives, which have increased the SNS program's emergency response preparedness for disasters. The SNS Program formulary

undergoes continual review and is subject to modifications based on clinical recommendations, improvements in existing pharmaceuticals, or current threat information. A brief overview of formulary modifications will be presented. Recently, the SNS Program also has undertaken a national effort in augmenting state preparedness with forward placement of chemical nerve agent antidotes in cities and states. Through this effort, emergency medical services and hospitals will have access to chemical nerve agent antidotes for immediate use during an event. The SNS Program also continues to address the needs of the pediatric population during disasters. Recent initiatives include modification of 12-hour Push Packages containers, expanding pediatric-specific formulary items, and efforts to reduce medication errors. The SNS Program also has contributed to a review of mechanical ventilation requirements in mass-casualty situations. The basic characteristics of mechanical ventilators for use in mass-casualty situations may help define requirements for programs considering future stockpiling of mechanical ventilators. The SNS program continues to improve its readiness and capabilities to respond to mass-casualty events through current and future initiatives.

Keywords: initiatives; response; Strategic National Stockpile (SNS)

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Predictors of Suicidal Ideation in 1,138 of the 11 September World Trade Center Rescue and Recovery Workers

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A mental health, screening program was initiated together with a medical screening program to assess the physical and mental health of 11,000 workers involved in the World Trade Center rescue and recovery effort in New York City after the terrorist attacks of 11 September 2001. Analyses of predictors of suicidal ideation (SI) are presented on the 1,138 rescue and recovery workers who were evaluated between 16 July–31 December 2002.

Responders completed the following standardized, self-administered questionnaires: (1) the General Health Questionnaire (GHQ-28); (2) the Post-Traumatic Stress Disorder (PTSD) Symptom Checklist (PCL); (3) the Patient Health Questionnaire (PHQ) modules for Panic Disorder; (4) Generalized Anxiety Disorder; (5) Major Depression; and (6) the CAGE alcohol questionnaire. The questionnaires included five questions about the presence of suicidal ideation.

Results: Of the 1,138 respondents, 1,047 (91%) were male, 660 (58%) were white, 125 (11%) were African-American, and 170 (15%) were Latino. A total of 92 (8%) people endorsed at least one question about SI, and 227 (20%) had post-traumatic stress disorder.

Conclusion: Suicidal ideation was higher in people who met threshold criteria on standardized questionnaires for diagnosis with anxiety disorders. However, surprisingly, hours of exposure to the disaster site, race, alcohol problems, and marital status variables were not associated with increased incidences of SI.

Risk Factors	Rate of suicidal ideation (%)	Odds ratio (95% Confidence Interval)
Female gender	14	2.3 (1.23–4.2)
Age >50	11	1.7 (1.04–2.7)
Post-traumatic stress disorder	26	9.6 (6.0–15.4)
Panic disorder	31	6.6 (3.6–12.0)
Generalized anxiety disorder	49	17.7 (10.1–31.0)
Problems with spouse	21	4.9 (3.0–7.9)
Problems at work	18	11.7 (16–22.0)

Table 1—Predictors of suicidal ideation by the Chi square analysis significant at 0.05

Keywords: 11 September 2001; mental health; post-traumatic stress disorder; predictors; screening; suicidal ideation (SI)

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Free Papers Theme 14: CBRN -1

Aftermath of the World's Worst Chemical Disaster

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Current practice in preventive environmental health action includes chemical analysis of land, water, and air for known (controlled), toxic chemicals and comparisons against standards for identification of breaches of regulatory limits. This methodology also is followed after an event or disaster to ensure air, water, and food safety. Some problems, not easily addressed by this methodology include: (1) unidentified toxic chemicals; (2) non-conventional uses of toxic materials; (3) unexpected synergetic effects of toxic mixtures; and (4) human health consequences of exposure to toxic materials with unusual and unidentified pathways of exposures. In Bhopal, the citizens were faced with a mixture of approximately 27 toxic substances, a variety of exposures related to activities of the persons, for example, remaining in their homes or running in the toxic cloud, and a variety of perceived injuries, of which not all would have been predicted simply by analyzing the chemicals involved.

The benefits of combining different approaches, such as examining the health, social, and cultural environments, and the economic situation of the victims in Bhopal, and the effects of each on health is presented. This more broad analysis provides a clearer, overall picture of the problems in the aftermath of exposure, and also provides clues to effective treatment and alleviation of future problems. Two effective strategies for connecting health problems ten years after the exposure to the original event, and understanding the biochemical reactions in the body when invaded by a mixture of toxic substances, as well as how such an understanding will, in turn, affect public policy planning, emergency preparedness, and emergency medicine will be presented.

Keywords: analysis; Bhopal; chemical; disaster; health effects

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Tasks of Disaster Medicine Services to Counteract the Risk of Accidents at Operating Nuclear Power Plants in Russia

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Taking into account the experience of the Chernobyl nuclear power plant (NPP) response operations, a suggested protocol is being developed for coping with the risk of potential accidents at operating NPPs in Russia for the Subjects of the Russian Federation (SRF). This concept reveals those territories in Russia with NPPs who have the potential for accidents, and, therefore, should be familiar with the zones of radiation hazard. The zone of a high radiation hazard (territories of 11 Subjects of the Russian Federation where NPPs are located), and the zone of an elevated radiation hazard (12 Subjects of the Russian Federation whose territories border the zone of the high radiation hazard) already are determined. Eleven Subjects of the Russian Federation belong to the radiation-safe zone.

The rest of the territories in the radiation hazard zone (55 SRF) are referred to as potential radiation hazard zones. In light of this concept, the tasks of disaster medicine services on medical support of a population in case of a large-scale event at a nuclear power plant are considered.

For the SRF categorized as being in the high radiation hazard zone, the entire SRF must be provided with a radiation accident protective measures in full volume when planning medical support.

For the SRF falling in the elevated radiation hazard zone, the same measures in full volume must be provided for the population residing within the area of 100 km from the NPP. It is sufficient to provide protection from penetration of Iodine-131 and other radionuclides into a human organism for the population of the other territories of SRF and those living in the SRF referred to as the zone of potential radiation hazard.

Keywords: hazard; nuclear power plant (NPP); radiation; Subjects of the Republican Federation (SRF); zones

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High Security Bio-Safety Isolation under Operational Circumstances

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The increase of multi-national peace missions in nearly every area of the world stresses the need for planning to address the risk of highly communicable diseases in operational circumstances.

The deployment of South African forces into central Africa required planning to address outbreaks of African Viral Hemorrhagic Fevers in operational circumstances. The reluctance of air transport authorities to transport these patients, the different health regulations for re-entry of communicable diseases of contributing countries, as well as evacuation distances required training to establish high-level isolation facilities under operational circumstances.