

the hospital is deployed fully or by separate modules. In two surgical modules, medical aid was rendered to about 500 wounded persons in the region of the Chechenskaya Republic.

The established structure and organization of the Russian disaster medicine service creates favorable conditions to achieve a new, higher scientific and practical level of rendering medical aid during the recovery from emergency situations.

089.

Advisory Computer System for the Medical Evacuation Support after Chemical Accidents

K.B. Guigov, MD, PhD, Asst. Prof. A. Galabova
Military Medical Academy, Sofia, Bulgaria

When large industrial accidents with chemical toxicological agents happen, many medical problems appear as follows: 1) mass one-moment losses; 2) different types and degrees of damage; 3) difficult geographic territories; 4) nonidentified at the beginning chemical agents; and 5) fast changes in the chemical situation. All these factors make the needed medical evacuation support very difficult.

To optimize the functions of the medical personnel and means activities, we had the task to develop an advisory computer system. The system consists of three combined subsystems: 1) data base; 2) advisory subsystem; and 3) graphic imaging of the concrete situation. The data base has some obligatory information necessary for decision-making: 1) dislocation of the industrial facilities all over the country; 2) the type, quantity, and characteristics of the industrial toxicological agents; 3) some meteorological data; 4) the density of the population; 5) the nearby health facilities; 6) some normative for the medical evacuation support; 7) the mechanisms and roads used for transportation and evacuation, etc. The system is open and permits corrections of the saved information to be done with the new input. As forecasting for the chemical situation changes, for the needed medical personnel and means (according to the number of the damaged), for the choice of the roads for evacuation toward suitable health facilities, for the additional personnel and means is done. Even if only one of the input data items changes, the system reacts immediately. The graphic images of the real situation provide help for the right decision-making, and for its documentation. Our positive experience makes us recommend some advisory computer systems to be used obligatory in the events of chemical accidents to better the needed medical support.

090.

On the Usage of Specialized Military Medical Personnel and Means

K.B. Guigov, MD, PhD
Military Medical Academy, Sofia, Bulgaria

A problems associated with the provision of medical care to the persons damaged in natural and human-made disasters is that

the circumstances are too close to those that the Military Medical Service (MMS) meets in war-time situations. Furthermore, the mass one-moment losses, the severe pathology, and the lack of medical personnel and means call for the MMS to be included in the responses, as already occurs in many countries. The MMS has organized a definitive medical strategies, has established an organizational structure, has prepared for emergency response, and has trained highly qualified personnel. This is why we think MMS ought to be included as a constant not only at "certain stages," but during the entire national system of activities in the event of extreme situations.

With this in mind, we have estimated the capabilities of the military medical personnel and means all over the country, their territorial distribution, capacity and training, and particularly of those located near facilities at risk. A special Military Medical Detachment for Emergency Response (MMDER) was established on the functional-module principle. The organization, manner of acting, personnel, and supplies were developed as a result of scientific research and examination of simulated situations. The personnel pass a special, full-volume training program. The possibilities of the detachment extend with each of the stages, starting at the 15th minute from the beginning of the disaster. As the detachment is constructed on the module principle, the needed emergency medical units are developed, together with it.

The results obtained make us recommend the action of including of the military medical personnel and means in the liquidation of the consequences in natural and human-made disasters, and in this way the military medical assets help the civil ones in the event of disasters.

008.

Industrial Disputes as Disasters: Experiences at Woden Valley Hospital

Dr. J.V. Hodge
Woden Valley Hospital, Woden, Australia

At midnight on 20 November 1993, services provided by VMOs at Woden Valley Hospital in the ACT, were withdrawn as a result of an industrial dispute. From that point in time, services in surgery, anesthetics, pediatrics, and obstetrics were withdrawn, with the exception of some major life-saving surgery which the VMOs still agreed to perform. Over the next five weeks, some 210 patients were transferred to interstate hospitals for care.

This represented a major disaster for the ACT, and although the hospital or ACT Medplans were not activated, components of these plans were utilized, and valuable lessons learned in revising the existing Medplan.

On Friday, 18 November 1993, the annual Canberra Airport Disaster exercise was held, with 26 seriously injured casualties being evacuated to Woden Valley Hospital, the main trauma receiving hospital in the ACT and South Eastern NSW. The hospital's external disaster plan was activated, and these casualties were triaged and managed expeditiously. At midnight on Saturday, 20 November 1993, all VMO services were withdrawn from both Woden Valley and Calvary hospitals, with only lim-

ited services being available for life-saving surgery. Although the hospital's external disaster plan was not activated for this disaster, many components of it were, and contributed to both an effective disaster exercise, and contributed to both an effective response, and some valuable lessons in disaster planning.

Particular problems faced by the ACT included the absence of any large hospitals closer than Sydney, and the very limited resource of ACT Ambulance vehicles and crews which would be depleted quickly in the evacuation of patients to other hospitals. Access to interstate resources would be a vital part of the response.

014. Role of the Department of Military Toxicology in Environmental Protection, Chemical Emergencies, and Disaster Management

O. Krs, J. Bajgar, J. Fusek

Purkyne Military Medical Academy, Hradec Králové, Czech Republic

The Department of Military Toxicology was established in 1952 as an unique, experimental, military medical institution dealing with chemical warfare agents (CWA). Our scientific work and teaching activities have been focused mainly on the mechanisms of CWA action and development of antidotes and decontamination kits for defensive use. Industrial and environmental hazards only were of marginal importance from the military point of view during the past years. We have realized some problems and demands during our involvement in a few actions concerned with civilian toxicological topics, especially in the last five years, i.e., analysis and risk assessment of unidentified substances contained in more than 200 "roving barrels," chemicals of unknown origin stored in bunkers in east Bohemia or left in some former Soviet Army's garrisons.

We provided our own expeditious and universal method of inhalation toxicity estimation in a chemical storage bins fire. For the future, we can offer closer cooperation with civilian authorities based on detailed knowledge of chemical risks in the region, organizational and educational preparedness for toxic outbreaks and spills including chemical analysis, and special therapeutic advisement provided by our Antichemical Detachment, made up of Analytical and Therapeutic Teams, in support of civilian medical response.

In conclusion, the recommended approach should be reflected in material and organizational support in the frame of planned medical rapid reaction force of the Purkyne Military Medical Academy.

003. The Experience in the Treatment of Patients with Trauma and Shock by the Prehospital Trauma Teams

*Olga Y. Kuznetsova, MD, Efim Y. Danilevich, MD,
Yuri M. Michailov, MD*

St. Petersburg Medical Academy of Postgraduate Studies, St. Petersburg, Russia

Prehospital Trauma Teams (PTT) was organized in St. Petersburg in 1957. They provide qualified medical aid to about 6,000–7,000 patients annually, with 70%–80% complicated by shock. The comparative study reviewing the efficacy of hyperosmolar saline solution (first group of patients) and ketamine anesthesia (second group of patients) were compared to the routine treatment also provided by PTT (controls). Haemodynamic changes were measured by mean of noninvasive reoplethismography method to help define the delay of the irreversibility of traumatic shock in the first two groups of patients (according to cardiac output and pulmonary vascular resistance).

The mortality rate during the first two days of follow-up similar treatment was 48.8% and 65.7% for group 1 and group 2, respectively, compared to that of the controls ($p < 0.05$).

Therefore, we consider that:

- 1) Prehospital trauma teams provide the effective specialized medical aid in comparison to regular teams, and they have to play the holding role during mass casualties;
- 2) Prehospital treatment must require the adequate amount of hyperosmolar saline solution and ketamine anesthesia to delay the irreversibility of heavy trauma complicated by shock.

025. Does the Number of Beds Reflects Hospital's Surgical Capability in Wartime and Disaster? The Use of Simulation Techniques at the National Level

L. Levi, D. Bregman, H. Geva, M. Revach

Trauma Research Unit, Rambam Medical Center, Haifa, Israel, Israel Defence Force-Medical Corps, and College of Management, School of Business Administration, Tel Aviv, Israel

Combining previous experience with modern simulation techniques is a better method to assess the nationwide surgical capability. It was estimated that the raw number of hospital trauma beds and occupancy is a rough method to assess the current surgical capability. To determine what load of casualties it will absorb efficiently, one needs a better criterion. We used simulation software under various disasters and wartime scenarios. There was a test for each hospital parameter under different loading of "standard casualties." Length and mode of load were up to a daily load of a 10% of the hospital trauma beds for 10 days (successive or intermittent). With increasing load, there was a constant decay in the standards of care measured by the average waiting time for injured patients to enter the operation room. There were different ways unique to each hospital of optimizing these waiting periods, e.g., reducing the load by diverting lightly injured patients from the major trauma centers (either before or after triage) and/or alternate days' shifts. Combining similar techniques with real time data, is a powerful method of optimizing nationwide health care under wartime and disaster.