remote control. The transmission of live images using wireless networks already is possible. The growth of network speeds and the development of image processing technologies will enable transmission of higher and higher quality images. The transmission of all kinds of information from the disaster site could be implemented using several separate, compact, functional devices, and each one of them should be connected to the control centre.

The telecommunication connections available on the spot, if any, also should be utilized. From urban centres and along the main roads, we usually can use faster connections than are available in uninhabited areas. This is due to the fact that it is easier to transfer better quality live images from cities rather than remote areas.

Key words: acquisition of information; chemical disasters; communications; control centres; information; technical devices; telecommunications

Evaluation of Health Disaster Management

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This initiative from the Norwegian Association of Disaster Medicine, to develop a globally accepted protocol for evaluation of Health Disaster Management, was formally adopted by the Nordic Society of Disaster Medicine in 1993. At the International Resuscitation Research Conference in Pittsburgh in 1994, the World Association for Disaster and Emergency Medicine (WADEM) decided to collaborate in the project. At the World Congress in Mainz, 1997, the WADEM General Assembly formally endorsed the process.

The Task Force on Quality Control of Disaster Management (TFQCDM) has had seven meetings and workshops. An important break-through in the process was the development of The Research Template in the Utstein Style at the Utstein Abbey outside Stavanger in 1994. On 01 March 1997, 50 experts from all over the world met at the Nordic School of Public Health in Gothenburg under the patronage of HRH Princess Christina of Sweden to discuss key problems of the Template. The 2nd version of the Template was presented at the Kobe Summit in Kobe, Japan, May 1997. The version presented at this Nordic Conference is the last of three. 13 Basic Elements for Disaster Management and their variables have been identified and listed. The principles behind a Vulnerability/Preparedness Index (VPI) have been established and also a Disaster Severity Score and a score for Health Disaster Impact are being developed. The group is working on the scientific approach, comprised of both quantitative and qualitative methods, and on a uniform disaster terminology. The generic part of this protocol aims at finding the lowest common denominators, regardless of type of disaster or where it takes place (geographically, culturally, and climatologically). This will enable us to compare and learn from seemingly very different scenarios.

To conclude, this TFQCDM protocol should help all actors in disaster management, and, to a large extent, actors on development of cooperation, to objectively analyse the effect of their activities, and adjust and improve them accordingly.

References: TFQCDM: Disaster Medical Response Research: A Template in the Utstein Style. *PDM* 1996:11;16–24.

Key words: basic elements; disaster medicine; disaster responses; evaluation; preparedness; qualitative methods; quantitative methods; research; severity scores; template; terminology; vulnerability; vulnerability preparedness index

What Are the Expectations for Preparedness of Medical Doctors and Nurses?

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Disaster preparedness concerning personnel at the hospitals in Preparedness Region II-DK, was investigated. The aim of this investigation was to describe the disaster preparedness among the hospital staff members and to describe the outcome of the Disaster Medicine courses given in the region—in theory as well as practice.

In the region, a questionnaire was sent to the chief doctor and chief nurse for each of the involved departments. A personal questionnaire was sent to all the doctors and nurses in the region who had participated in one or more courses in Disaster Medicine during the period from 1990–1995. Of the total numbers of doctors at the involved departments, 7% of the residents, 29% of the senior residents, and 56% of the consultants had taken a course, and as few as 2% had participated in a follow-up course to the primary one given in the region. Forty-one percent had used their acquired knowledge either in theory or practice: 55% for educational purposes, 11% for disaster planning, and 12% for buying equipment for the hospital. In general, easier access to follow-up courses is desired, and there seems to be a need to give more consideration to courses in Disaster Medicine.

Key words: disaster medicine; nurses; physicians; preparedness; training

Toxicity of Organophosphates and Experimental Therapy

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Organophosphates (OPs) are used widely as pesticides and therapeutic drugs. Unfortunately, OP compounds such as sarin were used by terrorists against civilian populations in Japan in 1994 and 1995.

Acetylcholinesterase (AchE) hydrolyzes acetylcholine (Ach) at the neuromuscular junction and at the

synaptic cleft between nerves. OP compounds phosphorylate and irreversibly inactivate the active site of AchE after which the synapses can not hydrolyze Ach. This inhibition of AchE is believed to be the cause for the respiratory failure characteristic of OP poisoning. World-wide, there are approximately 100,000 cases of OP poisonings per year.

The antidotal effects of OP hydrolase (PTE) in acute OP intoxications were studied in mice. PTE was given intravenously prior or following the intraperitoneal or intragastric administration of OPs such as paraoxon (PO), DFP, sarin, and soman. Against the potent OPs such as DFP or sarin, the reversible inhibitors of AchEs such pyridostigmine, physostigmine, and heptylphysostigmine were administered intravenously 10 minutes prior to the administration of the OPs. The animals received atropine subcutaneously immediately after the administration of the OPs.

The PTE dose of 120 U/g body weight increased the OP hydrolyzing activity in mouse plasma up to 70-fold when measured 1 hour after its administration. The half-life of PTE in circulation was approximately five hours. The protective effect of PTE decreased progressively in the order: 1) PO, 2) DFP, 3) sarin, and 4) soman. Both pre- and post-PTE treatments were effective in PO intoxication. PTE also hastened the recovery of the PO-inhibited AchE activities. PTE-pretreated animals survived even at a 50-fold dose level when compared to the control mice without showing any major signs of intoxication. PTE also protected the brain and lung AchEs against inactivation by DFP, sarin, and soman. Heptylphysostigmine alone increased the brain AchE activities that had been inhibited by DFP. However, physostigmine was the most effective carbamate in sarin poisoning. The LD_{50} value for sarin was increased by 3.4- and 1.6-fold in mice receiving PTE and physostigmine, respectively.

In conclusion, PTE and physostigmine appears to provide at least experimentally effective therapy for OP intoxications.

Key words: acetylcholine; anticholinesterase; DPF; heptylphysostigmine; intoxication; organophosphate; paroxone; physostigmine; poisoning; pyrostigmine; sarin; soman; terrorist

Alarm, Response, and Command

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Historically, in many countries, we have thought we can bring the hospital functions out from the hospital without changing them very much from their original setting. In many countries, specialized functions for command, alarm, and response have not been well-developed until in the latest years. In some areas, this has not occurred. In many European countries and especially in the Nordic countries, experience with mass casualty situations has been limited for the last several decades. But with our sparse population, a limited number of hospitals and long distance coordination between areas and organizations far away may be necessary, even with a rather limited number of victims.

The command function must be provided by people with appropriate education and training. They should be well-prepared to use modern manual and technological systems for collecting information, calculation, decision-making, information/communication, documentation, and follow-up. The Alarm Centers must be trained, equipped, and prepared to function even under extreme workloads and stress, and must be the natural coordinators of several important tasks. The field personnel not only must be well-trained to perform their own tasks, but they need to be much more aware of the different levels of command under different circumstances than they are used in normal times. They must get the information they need appropriately and rapidly.

Within the United States of Europe, it might be more logical and efficient to transfer victims to neighboring countries rather than to transport them long distances within our own country.

Key words: alarm centers; alarms, command; cooperation; direction, hospitals, information; training; transport

ABSTRACTS OF INVITED AND SCIENTIFIC PAPERS

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Joint First Responder Unit of Officials and Volunteers—The Pyhäjoki Model

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Pyhäjoki is a rural coastal commune of 3,800 inhabitants. The Health Station employs two full-time doctors. A 24-hour/day emergency service has its base in the Raahe Health Centre. A paramedic ambulance service operates from Raahe. During the years 1995–1996, the average time for the ambulance to reach the location of an emergency patient in Pyhäjoki was 23 minutes (range: 10–35 minutes). The average distance from the patient was 32 kilometres (range: 24–46 km). During this period, the Pyhäjoki Health Station was not informed about the situations by the emergency services dispatch centre even if the emergencies occurred in the immediate vicinity of the Health Station. It was not customary for the Health Station to provide treatment to patients outside of the station.