

on-scene supervisors are helpful. They serve as mediators between prehospital providers, EMS management, and external clients such as patients, hospitals, and police and fire departments. Aspects of their work include: 1) Customer service; 2) Quality improvement; 3) On-scene coordination; 4) Medical director privileges; 5) Public relations; 6) Continuing education; 7) Risk management; 8) Employee assistance; and 9) Research. Various social skills and special additional training are prerequisites for excellent supervisory work.
Key Words: customer service; on-scene coordination; quality improvement; supervisor

Advanced Training of Medical Personnel in Rescue Operations Initiated By Building the Öresund Bridge

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The building of the Öresund Bridge between Sweden and Denmark will present special problems in the case of a serious accident at sea. The highest section of the bridge will have pylons built in place which are more than 200 meters high. The building period will stretch over several years and part of the work will occur during nights.

In Malmö, on the Swedish side, this initiated the thought of training medical personnel in qualified first-aid and rescue operations in case accidents occur at sea or in hard-to-reach places. The training focused on two parts: 1) to assure that the medical personnel could operate without risking their own life; and 2) to make sure that they could function independently and in unusual situations.

Ten teams, consisting of one anaesthesiologist and one nurse anaesthetist, have undergone education for this purpose. The education had a didactic part in how to survive in sea, rough weather, and at various heights. The practical part included climbing, repelling down walls, getting winched from helicopter, and training in the water with survival equipment. They also did board ships and were working with VHF radios.

The educational program was evolved through a joint venture between the Malmö University Hospital, The National Administration of Shipping and Navigation, and The Malmöhus County Administration for Disaster Medicine.

We have prepared a 15 minute presentation including a movie sequence from the training.

Key Words: adverse conditions; rescue; special training; teams

Organization of the Emergency Medical Services of the German Federal Armed Forces in the Former Yugoslavia During SFOR Mission

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The mission of the German contingent of SFOR (GECONSFOR) takes place in the region of Bosnia and Herzegovina. Besides the operation of a field hospital in Rajlovac near Sarajevo, the German Federal Armed Forces (GFAF) together with the French Armed Forces secured emergency medical services for this region. To do so, the GFAF (by the MEDEVAC-company) operate an emergency services control room, coordinates the ground-base emergency missions, together with the Aeromedical Evacuation Coordination Officer (AECO), with air-based evacuations to Germany.

For ground-based emergency services, the GFAF uses eight armored transport cars (type FUCHS/SAN). Two of them have similar equipment as a civil emergency car (NAW-DIN). The rest are similar to a civil motor ambulance. For unarmored tasks, the GFAF uses 10 cross-country transport cars (type UNIMOG). Five of them are similar to a civil emergency car (NAW-DIN) by equipment; the rest are comparable with a civil motor ambulance. Depending on the task, the crew of each craft consists of a "mobile medical unit/physician" e.g., one physician (expert in emergency medicine) and two EMTs or of a "mobile medical unit/EMT" that is two EMTs only. For emergencies in and around Sarajevo, a cross-country car (type MERCEDES WOLF with body) is used, which by equipment also is comparable to a civil emergency car (NAW-DIN).

For disasters near Sarajevo, a bus allowing transport of up to 10 severely injured persons is used. Primary air-based emergency service is performed by the French Army. They use of a helicopter (type COUGAR), able to fly at night and in bad weather, which has emergency equipment comparable to a civil emergency helicopter. It can carry up to two severely and six lightly injured persons. The medical crew of the emergency helicopter consists of a physician (experienced in emergency medicine) and an ICU nurse. If needed, an additional German physician and/or EMT can support the crew.

In case of a disaster, the staff of the helicopter is completed by a crew consisting of soldiers (physicians/EMTs/nurses) of the German MEDEVAC-company and a field-hospital. Sorting (Triage) and specific medical care is guaranteed by an executive emergency physician and medical specialist (anaesthesiologist and surgeons).

Key Words: air-medical transport; emergency medical services; emergency medical technicians; emergency physicians; EMS; ground transport; helicopter; nurses

Session 1C: Preparedness

Chairpersons:

J.M. Fonrouge (France)

G. Kroesen (Austria)

Incidence and Performance of Invasive Airway Management in the German Air Rescue System

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Introduction: In case of unsuccessful intubation or inability to ventilate, invasive methods like cricothyrotomy, tracheotomy, and retrograde intubation are proposed for prehospital airway management. In physician equipped rescue systems, no data are available on the incidence and performance of these procedures in the field.

Methods: In a retrospective study, all 50 physician-equipped, German air rescue bases were asked to complete a questionnaire about invasive airway management from 1991 to 1995.

Results: Twenty-eight bases (56%) answered. They reported a total of 128,202 emergency missions. The overall incidence of invasive airway management was 0.019% (n = 24), of cricothyrotomy 0.016% (n = 20), of tracheotomy 0.0024% (n = 3), retrograde intubation 0.0008% (n = 1), and of tracheal puncture 0% (n = 0), each after failed intubation attempts due to maxillofacial trauma 33% (n = 8), laryngeal trauma 29.1% (n = 7), soft tissue swelling 20% (n = 5), and obstruction by foreign material 16.6% (n = 4). One cricothyrotomy failed due to hemorrhage. Procedures were performed mainly by anesthesiologists (45.6%, n = 11) or surgeons (41.6%, n = 10). Survival rate was 37.5% (n = 9). 25% (n = 6) of the patients died on scene, on transportation 8.3% (n = 2), or in hospital 20.8% (n = 5).

Conclusion: Invasive airway management has a low incidence in a physician equipped rescue system. Preferred technique is cricothyrotomy. Corresponding severe injuries must be expected for poor outcome although a patent airway was established.

Key Words: air-rescue; cricothyrotomy; invasive airway management

Casualty Management Planning for Mass Crowd Events

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Incidents of mass casualties occurring at crowded events over recent years, have highlighted the need for effective planning to address the health implications associated with the staging of preplanned events, and to have in place, an effective response medical organization to cope with an impact disaster in crowded situations. Health Emergency planning for special major events, must be integrated comprehensively with community emergency service response plans. Planning committees must include representatives from the event-approving authority who can impose specifications on entrepreneurs as a prerequisite to granting approval to stage the events. Such plans would include Public Health requirements for safe food and water, and adequate toilet accommodations, to prevent and reduce illness and dis-

ease, and the requirement for a structured First-Aid system to be in place during the event.

This presentation will highlight the various considerations needed to prevent or reduce the effects of the public health aspects causing illness. It will address the on-scene requirements for a medical/first-aid organization to cope with minor casualties which can be expanded to provide rapidly prehospital medical control for the management of the more serious casualties.

Key Words: crowds; management; mass casualty

Life-Saving Potential In Tsunami Victims

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Introduction: There have been few reports concerning the health and medical effects of an earthquake-tsunami disaster. On 12 July, 1993 at 22:17 hours local time, an earthquake (7.8 on Richter Scale) hit Okushiri Island, Hokkaido, Japan. The earthquake generated several tsunamis which hit the shore of the island within 3 to 5 minutes after the impact. Total deaths on Okushiri Island (pop. 4,000) were 203 with 29 missing and 236 injured.

Methods: A joint Japan and USA research team performed a structured-interview study in Aonae and Matsue districts of Okushiri Island, 3 months after the event. The team performed 91 interviews and encountered 11 survivors directly hit by the tsunami. The team also analyzed medical records of victims and official reports concerning the medical response.

Results: In Aonae and Matsue, 113 deaths were identified as having been caused by the tsunami. Of these, 89 cases were due to drowning and 22 were caused by life-threatening injuries (head, 16; spine, 3; chest, 2; hemorrhage, 1). The causes of two deaths were unknown. Among the drowning victims, the diagnosis was made by the existence of water in the airway and/or respiratory system, by chest x-ray, or autopsies. Nine survivors were rescued by fishermen's boats or patrol ships of the Maritime Safety Agency within four hours after the impact. Two survivors came back to shore by themselves. Some of the survivors testified anecdotally that they had heard the voices of other victims in the dark sea when they were drifting (the water temperature was 24° C). Data analysis among victims indicated that age, gender, and prior physical injury are risk factors for drowning in a tsunami. This study also indicates that some victims can survive even after being directly hit by a tsunami.

Conclusions: Therefore, sea and land rescue are warranted immediately after the impact of an earthquake-tsunami.

Key Words: earthquake; search and rescue; tsunami