

siveness when faced with multiple choices because of the dilemma posed by this choice. These persons need a developed theoretical grounding in order to justify their choice.

An evaluation programme of the teaching of emergency practices has been developed in order to exploit the answers to a questionnaire offered to more than 7,000 first-aiders trained each year. This programme was designed for a MacIntosh computer. It analyses four types of information: 1) personal details (profession, age) which remain confidential; 2) information concerning the training of the individual; 3) training course, quality, organization, teaching methods used, etc.; 4) answers to 10 questions concerning their knowledge of the CPR programme; the assessment of a victim, recovery position, mouth-to-mouth ventilation, chest compressions; and 5) steps to take when faced with: a) haemorrhage; b) heart attack; c) suffocation; d) electrocution; etc. The questions relating to the assessment of the level of knowledge can be modified without disrupting the comparative analysis from year to year.

Thus, with the help of the programme, it is possible to devise a validation or non-validation of the choice of teaching practices.

Key Words: academic level; CPR; evaluation; first-aid; training

Training in Disaster Medicine: How to Simulate Pathologies and Treatments and How to Evaluate Efficiency of Medical Care

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Introduction: Teaching Disaster Medicine requires a minimum of theoretical lectures and practical exercises. The Emergency Department of the Catholic University of Louvain organized a course on Disaster Medicine for physicians working in Emergency Departments and in prehospital medical teams. During the last course, a simulation demonstrated two difficulties: 1) How to efficiently simulate the evolution of pathologies, i.e., vital signs and clinical findings according to the applied treatments; and 2) How to efficiently evaluate triage, medical cares, and the regulation of evacuations.

Methods: To improve the communication between victims and medical staff, we separated 50 attending physicians into two groups: 15 "medical personal" and 35 "victims" (10 T1; 12 T2; 13 T3, and one dead). Each victim received a data-sheet containing information including history, vital signs, and clinical findings at sequential times and the effectiveness of the applied treatments or actions. Efficiency of triage, medical care, and regulation of evacuation can be evaluated "a posteriori" following these two parameters: 1) the avoidable mortality: number of deceased patients who did not benefit of a "just in time" treatment; and 2) the excess of treatment: based on medical actions without influence on the clinical evolution. At the end of the exercise, each victim completed a debrief-

ing-sheet concerning the adequacy of "his" management. **Rules**—We defined three categories of rules: 1) General and Security rules; 2) Diagnostic rules (measuring vital signs, clinical examination); and 3) Therapeutic rules (intravenous lines, endotracheal intubation, oxygen, ventilation).

Results: Amongst the 35 victims, 6 died (17.1%) due to late treatment, 2; excess of medication, 1; or lack of ventilation, 3.

Conclusion: Using physicians as victims in a disaster simulation improves the reliability of the evaluation of clinical evolutions. A retrospective analysis comparing the victim's data-sheets and the METTAG of each patient allows the evaluation of the efficiency of the provided cares in disaster simulations.

Key Words: disaster; efficiency; evaluation; mortality; physician; simulation

Experience and Problems of Disaster Drills and Education for Medical Teams Using a Disaster Manual

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The roles of the Clinical Research Institute of the National Hospital Tokyo Disaster Medical Center include education and promotion of disaster drills, as well as development of disaster handling manuals and studies of treatment of casualties resulting from a disaster.

Disaster simulation drills were repeated twice before a disaster handling manual was developed in March 1996. The disaster manual was designed to be as simple and practicable as is possible. After that time, the disaster manual and the education course were used on two occasions. These exercises and education apparently attracted a great deal of attention for disasters and deepened the knowledge of Disaster Medicine of medical teams from the main hospitals that were dispatched from almost all prefectures in Japan.

Many problems remain in our disaster handling manual, such as the lack of a section describing avoidance of a secondary exposure to toxic substances and treatment of patients of chronic diseases. However, a more practical disaster manual is thought to be essential for use in the training and education of appropriate personnel for Disaster Medicine as an adjunct to repeated disaster drills.

Key Words: disaster drill; disaster education; disaster manual

Systems and Problems of Disaster Drills in the National Hospitals of Japan

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In case of a disaster, the National Hospital Tokyo Disaster Medical Center acts as headquarters of all of the National Hospitals in Japan. All National Hospitals are divided into 9 blocks, and set-up main base hospitals

in each area. In case of a disaster, the main base hospitals act as the center of the area.

Disaster drills and education were performed in each area. Disaster simulation drills were performed twice in 1996. In 1996, each national hospital prepared a disaster handling manual, but those manuals are not sufficient. Many problems are left in our disaster handling manuals, such as cooperation with other private hospitals or local governments.

Practical disaster handling manuals and systems must be consolidated as fast as possible.

Key Words: disaster drill, disaster manual, national hospital

Transcapillary Liquid Exchange in the Lung following Combined Trauma

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Total and lung intestinal liquid volumes (TILV, LILV) have been studied for the case of combined trauma (5% full-thickness, thermal burn with acute blood loss of 30 mg/kg) and polyglykin with blood auto-transfusion (1:1; 30 ml per minute) using the intraosteal method. The study was performed using 15 dogs narcotised with tiopentalum natrium (45 mg/kg).

The combined trauma resulted in decreasing the arterial blood pressure to 45 mmHg and the development of a pre-agonal state. Despite a pronounced reduction of circulating blood volume as a result of increasing capillary permeability, LILV increased 2.7 times.

Infusion-transfusion therapy resulted in a short-lived (1.5 hours) mobilization of liquid into the vascular channel. Within two hours after the injury, the liquid and albumin motion vector reversed the direction to "blood-to-tissue" with increasing vascular permeability (2 times). Liquid volume in the lung increased from 79 to 80.5%.

Within three hours of the injury, TILV increased to 159%, LILV to 625% (3.9 fold). Histological indices showed interstitial pulmonary edema. The liquid and albumin penetration into the interstitial space resulted in an early pulmonary edema with developing acute pulmonary insufficiency and the death of the dogs within the first 8–12 hours after the injury.

Key Words: burns; capillary permeability; hemorrhage; pulmonary edema; pulmonary failure; pulmonary infusing; trauma

Active Surgical Treatment of Heavy Burns

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The restoration of skin surface prior to the development of irreversible changes in 789 heavily burned patients became realizable against the background of infusion therapy and intensive treatment. The period of spontaneous wound purification from necrotic tissues, local wound preparation for operations, as well as donor wound healing due to a better reparative process were shortened thanks to increased organism protection.

Thus, the intervals between operations was reduced to 5–7 days. These reduced intervals were decisive for the patients' convalescence.

The number of repeated transplantations was reduced at the expense of a maximum possible increase in their volumes, thus limiting the auto-immunization that impaired the results of the operations. The danger of shock associated with the operations was prevented by a fraction of the pressure at traumatic moments. Thus, it became possible to cover the wounds with large skin patches that improved the results and limited the needs for allogenic skin and net-shaped transplantations. Many patients who earlier would have been thought incurable enjoyed their convalescence.

Key Words: allogenic skin; burns; infusion therapy

Have Aggressive Supportive Care Measures Altered Indications for Emergency Department Thoracotomy?

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Introduction: The availability of cardiac bypass procedures for use in the treatment of trauma patients has encouraged the use of emergency thoracotomy in the emergency department (EDT) followed by immediate transfer of the patient to the operating room. Has this practice changed the outcome and indications for EDTs?
Setting: A Level-I trauma center with 60,000 Emergency Department visits per year and 4,000 admissions of trauma patients annually.

Design: A retrospective review of all EDTs from July 1988 through June 1996.

Results: A total of 426 EDTs were performed, 261 for penetrating (192 with gunshot wounds, 69 with stab wounds) injuries, 159 for patients who sustained blunt trauma, and six others. Two hundred twenty-nine victims were pronounced dead in the emergency department. Out of 197 patients taken to operating room, 16 survived: five with gunshot wounds (4 not associated with cardiac injury) and 10 with stab wounds. None of the 159 patients that underwent EDT for blunt trauma survived. The only EDT survivor who had not sustained a penetrating injury was a person with hypothermia who survived 60 minutes of CPR. This patient and the 14 other survivors were neurologically intact on discharge. Severe anoxic brain injury occurred in one patient where spontaneous cardiac contractions were not achieved in the emergency department. Survivors from penetrating injuries had documented signs of life within 20 minutes of arrival at the emergency department.

Conclusion: Despite the increased availability of aggressive intra-operative cardiac support, the outcome and indications for EDT for blunt trauma has not changed. EDT is indicated for penetrating trauma with signs of life within 20 minutes of arrival in the ED. Transfer of the patient from the ED to the OR is not indicated unless spontaneous cardiac function has been established in the ED.

Key Words: thoracotomy; trauma