

The Integrated Rescue System in the Czech Republic has been established as the system of connections that guarantees coordinated activities of all rescue services — medical services, firemen, police as the basic service, and strengthening services, particularly civil defense, armed forces, and specialized technical services. The Medical Services guarantee prehospital and hospital medical care.

The Emergency Medical Service performs prehospital care. In the case of an extraordinary situation, the service immediately is strengthened by both doctors and nurses from the hospital, and by the staff from surrounding hospitals. All possible means of transport are immediately mobilized, including the Air Rescue Service.

Hospital care is guaranteed organizationally by regional trauma centres. The centres send medical teams to the disaster site and prepare free bed capacity both in their own centre and in other regional hospitals, including the supplies of drugs and medical equipment.

Currently, communication using telephone links have been a weakness of the system. This mechanism for communication proved insufficient in actual disaster situations.

The mobile surgical team, TRAUMA TEAM, also is a part of the system that is can strengthen regional centres by providing staff and medical equipment. The Czech Ministry of Health can call this team into action.

**Keywords:** communications; coordination; Czech Republic; pre-hospital care; rescue systems; regionalization; rescue; responses; trauma centers

**Tuesday, 11 May, 9:00–9:45 hours**  
**Video Session**

#### A-12

##### Comparison of the Materials Used in Chest Wall Reconstruction for Flail Chest

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**Introduction:** Flail chest is not uncommon following blunt chest trauma, and often it is complicated by respiratory insufficiency if it is not treated properly. Table 1 shows our strategy for the flail chest patients, which is based on the surgical intervention, according to the severity of the trauma. Our principle of surgical treatment for flail chest is to restore the continuity of fractured portions of the bony thorax, and to reconstruct the flail segment to the physiological chest wall. The comparison of the materials used in the chest wall reconstruction and the details of the operative procedures are shown in this video tape recording (VTR).

**Materials and Discussion:** Three kinds of materials were available: 1) Judet's titanium rib plates; 2) ceramic rib pins; and 3) titanium mini plates. These materials have been used to reconstruct the flail segments. These

materials have been studied as to the easiness of operative procedure, stability, elasticity, and radiopacity. The merits and demerits associated with the use of each of these materials are summarized in Table 2.

**Table 1—Management of flail chest**

Type	Condition	Treatment
I	Mild flail chest with mild intrathoracic injury	Conservative
II	Flail chest with mild intrathoracic injury	Chest wall reconstruction
III	Flail chest with Lung Contusion	IPPV Chest wall reconstruction at right time
IV	Flail chest with intrathoracic injury that required thoracotomy	Chest wall reconstruction IPPV, if necessary

**Table 2—Comparison of materials**

	Judet's Plate	Ceramic Pin	Titanium Plate
Surgical involvement	Large	Moderate	Least
Stability	Excellent	Moderate	Excellent
Elasticity	Moderate	Excellent	Moderate
Radiopacity	Poor	Good	Relatively poor
Application	Shaft	Sternum Shaft	Anywhere Cartilage

As to the operative procedures, Ceramic rib pin and Titanium are easy. On the other hand, about the stability of the reconstructed rib cage, Judet's plate and Titanium mini-plate are excellent with good stabilization.

For elasticity, the Ceramic rib pin seems to be the best of the three. And, it doesn't produce any detrimental effects on roentgenographic examinations.

Judet's plate and the titanium mini-plate have some effects on the x-ray findings, but it is much better than that of stainless materials.

Judet's plate can be applied only to rib shaft. The ceramic pin can be applied to sterno-costal fixation, and also can be applied to the cartilage. The titanium mini-plate can be applied to almost any place.

**Conclusion:** The most appropriate material should be chosen in the chest-wall reconstruction, according to the shape and the location of the fracture as shown in VTR.

**Keywords:** ceramic pin; chest wall reconstruction; flail chest; intrathoracic injury; Judet's plate; pulmonary contusion; titanium mini-plate; trauma

#### V-2

##### "Disaster Management" — The New US Standard

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"Experience has shown again and again, that lives can be saved, damage can be reduced by preparing for a catastrophic situation before it occurs."

In the USA, a new standard for "Disaster Management" finally is on its way. The National Fire Protection Association (NFPA) is developing Standard No. 1600 that establishes a common set of criteria for disaster manage-

ment programs. Standard No. 1600 will become effective in the spring of 2000. The committee in charge of developing this standard is comprised of 25 experts, including representatives from the Federal Emergency Management Agency (FEMA), the International Association of the Fire Chiefs (IAFC), the American Insurance Services Group, and the National Coordinating Council on Emergency Management (NCCEM). The committee has composed a comprehensive paper to build "disaster resistant communities". The paper addresses the process of hazard analysis, risk assessment, as well as public and leadership awareness and leads to emergency activities. The disaster activities are described in four related phases: 1) Mitigation; 2) Preparedness; 3) Response; and 4) Recovery. This presentation will outline these phases as well as the planning process for both the public and private sector.

The disaster planning process should include as many entities as possible (public, private, business, first responders, neighborhood groups, churches, charitable and non-profit organizations, and other specialists). In order to be prepared, it is crucial that every person and organization know their respective role(s) and responsibility(ies) in advance. All parties must be trained on a regular basis (drills, table-top scenarios, full-scale exercises) and allowed to make suggestions on how to refine the current plan.

Using the example of the 1994 Northridge Earthquake, this presentation will demonstrate how the Californian Comprehensive Emergency Management (CEM) worked. It will display how Mitigation, Preparedness, Response, and Recovery activities were addressed before, during, and after the impact.

The most common management tool used in the USA for emergency situations is the Incident Command System (ICS). This presentation will explain the principles and structures of the ICS including unified command and span of control. Different agencies (law enforcement, emergency medical services (EMS), fire, hospitals, military, public works) and jurisdictions (Federal, State, Local) were able to communicate, coordinate, and cooperate their resources using the ICS in the earthquake event.

The objective of all disaster efforts is to reduce the occurrence and/or the impact of catastrophic situations on life, environment, and property.

**Keywords:** disaster, management of; earthquakes; exercises; incident command system (ICS); mitigation; National Fire Protection Association (NFPA); Northridge Earthquake; planning; preparation; recovery; response

### V-3

#### Automatic Advisory Defibrillator

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Circulatory arrest due to ventricular fibrillation causes 40 to 50 thousand sudden deaths each year in France: that is, 1 person in every 1,000. Such fibrillation occurs in 85% of non-traumatic, unexpected, circulatory arrest outside of hospitals.

When faced with this type of distress, emergency teams must begin cardiopulmonary resuscitation with

the well-accepted procedures of the chain of survival. When the victim is inanimate and does not react, the first team member on the scene must systematically make an initial assessment and raise the alarm. When the most experienced team member arrives, s/he must check to confirm that the victim is in a coma, that s/he is not ventilating, and that there is no carotid pulse.

Two emergency gestures then are performed simultaneously:

- 1) Cardiopulmonary resuscitation is begun by controlling the free passage of the upper airways, setting up efficient artificial ventilation, and exerting thoracic pressure;
- 2) The other workers prepare the automatic advisory defibrillator. The two electrodes that are pre-connected to the device are applied according to the possible access to the thorax. The pads are applied either to the upper part of the right hemithorax and the lower part of the left hemithorax. If the message is that a shock is required, priming the charge for defibrillation takes 9 to 15 seconds to trigger according to the power level chosen... button is activated. It then becomes possible to press this button to deliver a shock. Once the shock has been administered, the device performs another analysis.

In favourable cases, the victim recovers consciousness with normal spontaneous ventilation and efficient circulation. It then is preferable to continue oxygenation using a high-concentration oxygen by mask and to place the patient in the recovery position. But, be careful, because another episode of ventricular fibrillation may occur at any moment!

This is why the presence of the Mobile Intensive Care Unit is mandatory since the victim can be managed properly on site and on the way to hospital. Therefore, by placing this equipment in emergency vehicles involved in prehospital settings, for example, emergency services, intensive care, and cardiology units. The time taken to diagnose and treat a large number of episodes of ventricular fibrillation should be reduced. In this way, the presence of automatic defibrillators should lead to saving a considerable number of patients with unexpected ventricular fibrillation, and help them to achieve a much improved cerebral and functional outcome.

**Keywords:** automatic advisory defibrillator; cardiopulmonary resuscitation (CPR); training; ventricular fibrillation

*General Session (11)*

**International Repatriation**

Tuesday, 11 May, 9:00-10:00

Chair: *Linda M. Dann, Masahiro Takiguchi*

### G-54

#### Emergency Medical Evacuation Program for Expatriates in Russia

Dr. Tom Löfstedt, MD; Mr. Juhani Missonen

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In the late 1980s, the Emergency Medical Assistance Group, Ltd. (EMA) together with the air ambulance