because infested by landmines. This results in a vicious circle of poverty.

Much effort is being done in demining areas, increasing awareness, banning further use of landmines, etc. Despite these efforts, landmines still are being scattered in areas of conflict and will be killing innocent victims for many years.

**Why prehospital care?**

Mine victims, as well as all trauma victims, start to die at the site where they are injured. Many of the victims will die before reaching health care services because of: 1) the distance between the site where the injury occurred and the health care institution; 2) the lack of available rapid communication and/or transportation; 3) the lack of qualified first-aid responders; 4) the lack of adequate health-care infrastructure (destroyed by the war or not existing). Once such victims do arrive at the health-care setting, adequate life-saving measures not always are provided because of lack of qualified staff. Therefore, technical assistance to improve prehospital care training in affected areas is needed.

**Who must be trained?**

Villagers usually are the first to contact the mine victim and should be able to provide basic first aid in order to keep the victim alive until advanced care is available. The challenge factor is time!

Trainees should be selected according to their various experience and current occupation. Preferably, they should be working actively in the health services at village or district level in areas with mine problems. Medical personnel from a local or a referral hospital (doctors, nurses) with extensive clinical experience with the treatment of mine victims also should be selected to participate in this training.

**Place of training**

Preferably, the training should be conducted at a location close to minefields and district hospital facilities that regularly provide first aid and surgical treatment to mine victims. Local district clinics or district hospitals are ideal training sites.

**The training program**

Three phases are required at country level:

1) *Training of trainers*—Trainers in collaboration with their respective health departments should be involved in organising training programs at district levels, and should work on the integration of training programmes into the national heath policy. Financial and technical expertise assistance will be required in the implementation phase;
2) *Training at district level*—Trainers in collaboration with their MoH, will train medics at the district level to improve their capacity for assisting landmine victims with emphasis on the time that is the critical factor in lifesaving of all trauma victims;
3) *Training at village level*—Medics trained should be in charge of mine victims in different areas affected by landmines. At the same time, they will train villagers as first aid responders. This training should be as simple as possible, but efficient enough to maintain the victim's life until s/he has access to advanced care. This presupposes that a survival chain is built in addition to the training; and
4) *Training seminars at hospitals*—Seminars are needed in hospitals dealing with the management of landmine victims with a view to improving knowledge and inform medical personnel on new technologies for the approach to trauma surgery. Collaboration with agencies experienced in trauma management (ICRC, EMERGENCY, and TCF) will be important.

**Lifesaving kits**

Life-saving materials to enhance the local equipment and the capacity to provide care are required. Most of District Hospitals are in need of basic surgical kits and fundamental supplies to perform the necessary primary surgery. Otherwise, trained medics need materials to be able to provide first aid to trauma victims.

**Follow-up and evaluation**

A regular evaluation and follow-up should be done in a view of improving the program and making modifications where needed according to local realities.

In addition to the above activities, training guidelines on prehospital care must be initiated. Scientific meeting, workshops, and seminars for a better understanding of the assistance required by mine victims are being envisaged.

**NB**: The lecture will be illustrated by slides on prehospital care training from Afghanistan, Angola, Burma, Cambodia, and North Iraq where the programmes have been implemented during the last five years by the Trauma Care Foundation (TCF) of Norway.

**Keywords**: equipment; evaluation; first-aid; landmines; lay public; life support; prehospital; supplies; surgery; training; trauma

## PN1-2
## Medical Support for Humanitarian Landmine Clearance

*Mr. Eddie Chaloner, BA, FRCS Ed, DMCC*
Senior Registrar in General and Vascular Surgery and Honorary Lecturer, Leonard Cheshire Department of Conflict Recovery, University College, London University, London,

The continuing incidence of injuries from anti-personnel landmines in many countries around the world has been publicised widely. Several organisations currently are involved with active landmine clearance operations by training local people in affected countries to clear mines. These hazardous operations are carried out in countries recovering from war, where the local infrastructure has been severely disrupted. The terrain and weather often are inhospitable. Active fighting still may be in progress. Supply and evacuation chains are uncertain and local medical support may be poor.

Planning medical support for these operations requires careful consideration of these factors, appropriate training of indigenous paramedics, and detailed assessment of the available local hospitals for definitive care for victims with landmine injuries. This paper examines the key issues involved, the potential pitfalls and offers practical advice on how to approach the problems.

**Keywords**: anti-personnel landmines; hospitals, role of; injuries; landmines, clearing of; planning

### PN1-5
### Modern Technology for the Removal of Landmines

*Hiroshi Tomita*
Secretary General, Japan Alliance for Humanitarian Demining Support (JAHDS)

Outline:
1. Global Problem
2. Current technology
3. Why current technology is not adequate
4. The characteristics of the proper technology
5. JAHDS efforts

The most reliable estimates of the number of landmines currently in the ground in post-war areas in the world today range from 60 to 110 million in 70 different countries. However, this quantity of mines is not the point. A family of four requires 1/2 hectare (1/2 the size of a soccer field) of land to produce a ration of rice that will allow them to survive for one year. If there has been even one mine incident in their 1/2 hectare of land, the local people will be afraid to use it for farming purposes. So, it doesn't matter if the 1/2 hectare of land in question contains one mine or 100 mines. The local people are denied the use of that arable land for their survival.

The most effective demining technique in the world, at the present time, is detection of a metal signal with a World War II vintage metal detector, location of the landmine with a prodder, and destruction of the landmine where it is found with an explosive charge.

The major problem with this technique is twofold. First, the metal detector cannot tell the difference between a shell fragment, a piece of barbed wire, a soda can — common examples of false positives, and a landmine. The current ratio of false positives to actual landmines detected runs from about 150 to 450. You can imagine how this slows the process of landmine clearance to a crawl.

The appropriate hand-held detection technology, which does not yet exist in a field-practical form in the world, must be able to determine the size, shape, material composition, and orientation of an object that causes a signal register in a detector.

For the past seven years, JAHDS has been researching this problem, expending great effort, both in engineering time and money, as well as in dispatching technical advisors to mine-affected countries to understand this problem. We hope to field a prototype within this year that will satisfy the above-mentioned, appropriate criteria.

**Keywords**: anti-personnel mines; demining; detection; false positives; land, arable; landmines; removal

*Plenary Session-I*
## Children, Disasters, and Wars
**Monday, 10 May, 15:50–18:00 hours**
**Chair:** ***Leonid Rochal, Ernesto Pretto***

### PL1-1
### Plenary Session 1-1: Problems of Children in Disasters and Wars

*Prof. Leonid M. Roshal, MD, PhD, DrSC (Russia)*
Chair, International Task Force on Pediatric Disaster Medicine and Wars, World Association for Disaster and Emergency Medicine (WADEM)

Our previous experience in disasters and military and political conflicts indicates that the medical aid provided to children must be specialized and delivered as close to the disaster site as is possible. It has been useful to teach and train rescuers, paramedical personnel, physicians participating in the first responses about the peculiarities of rendering medical aid to children; especially those associated with the prophylaxis and treatment of the crush-syndrome, cardiac and pulmonary insufficiency, infusion therapy, psychological help, and cosmetic repair. The most positive results occur when the afflicted children are concentrated in specialized departments provided with the proper staff and equipment.

Children's doctors usually begin by this work — enthusiasts. Currently, along with the actively functioning International Committee for Children in Disasters, we began organizing regional committees for the countries of the Central and South America, Africa, Middle Asia, and Asia.

We hope that this Congress will show its interest in this problem.

**Keywords**: children; conflict; crush syndrome; disasters; insufficiency, cardiac/respiratory; regional committees; special care; war

### PL1-3
### Treatment of Children with Severe Compression Trauma

*R.A. Keshicshyan, MD, PhD; L.M. Roshal, MD; L.B. Puzhitstky, MD*
International Committee for Children in Disasters, WADEM

During earthquakes in Armenia (1988), Georgia (1989), and Sakhalin Island (1995), the incidence of compression injuries in hospitalized patients was 24%. Fractures of extremities prevailed in 90% of cases, and they were accompanied by ischemic neuritis. Fractures of the lower extremities were 3-4 times higher than were those of upper extremities and fractures of the long tubular bones were found in 15.6% of the injured.

The most common surgical intervention performed was fasciotomy (32.9%). Purulent surgical complications developed in 11.0% of children after fasciotomy.

The best results were achieved using "subcutaneous" technique. The number of amputations in children with compression trauma was 2.1% in Armenia and 10.7% in