

**Results:** A total of 2,339 were transferred by air-ambulance: 1,343 by the Greek Navy: 991 from mainland, and 321 from islands.

In those cases in which the patient was transfer by Navy, are gone to flight for more than 160,000 kms (>4 times Ecuador).

**Conclusions:** The steady improvement and expansion of the HNEMS, has been marked by the continuing rise of the number of the medevac operations, as well as the continuing improvement of the primary medical and nursing care. Air transportation of the patient is not always the best option globally speaking. The right patient, to the right medical-infrastructure, the right way, and the right time: safer, faster, proper way.

**Keywords:** air-medical; evacuations; Greek Ambulance Service; helicopter

*Prehosp Disast Med* 2007;22(2):s30

### Evolving Physician-Staffed Helicopter Emergency Medical Services System (Doctor-Heli) in Japan

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Although thousands of people were killed or injured in the Great Hanshin-Awaji Earthquake that occurred in 1995, only 17 patients were transported by helicopter within 72 hours from the onset. However, a huge number of helicopters flew over the disaster site. The catchphrase, "There is no effective disaster medical relief without daily Helicopter Emergency Medical Service System (HEMS)" was widely accepted and systems started 20–30 years ago in European countries. Therefore, present status and future perspectives of HEMS in Japan was evaluated by comparing the impact with that of the pioneering countries. Physician-staffed HEMS (Doctor-Heli) was started in Japan in 2001. By 2006, 11 base hospitals have committed resources to this program. In the fiscal year 2005, the total number of patients who were treated and transported by Doctor-Heli was 4,098. Chiba Doctor-Heli is the most active—2,791 patients were treated from Oct. 2001 till Sep. 2006. Trauma (49%), Cerebrovascular accidents (15%), and Cardiovascular disease (12%) occupied one fourth of total number of missions and 88% (2,458) of the patients were direct transports from the scene to the hospital compared with 11%(301) was inter-hospital transport. Of the patients 59% (16,459) were transported to base hospital and 38% (1,052) to the other hospitals.

The Emergency Medical Network of Helicopter and Hospital (HEM-Net) stressed that in order to diminish "preventable deaths", it is critical to expand the Doctor-Heli service nationwide as early as possible. Finally, it is concluded that the flight cost of Doctor-Heli should be covered by medical insurance in order to distribute the cost burden and that the law concerning Doctor-Heli System should be established quickly.

**Keywords:** costs; demography; doctors; helicopter EMS systems; Japan

*Prehosp Disast Med* 2007;22(2):s31

### Comparison between Helicopter Emergency Medical Services and Ambulance Transportation to Rescue People Injured by Traffic Crashes in Japan

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**Background:** The use of helicopters for the provision of emergency medical services (EMS) has become common especially in Western developed countries; however, this system has not been widely implemented in Japan. The main reason for this is financial difficulty. There have been only a few studies that have assessed which measure the cost and cost-effectiveness of helicopter EMS.

**Purpose:** Transportation by EMS helicopters was compared to ambulance transportation when rescuing people injured in traffic crashes in Japan.

**Subject:** Data from the Japan Trauma Data Bank (JTDB) were used. Seventy people, of whom 26 were transported by helicopter and 44 by ambulance to the Nippon Medical School Chiba-Hokusho Hospital, were analyzed.

**Method:** Because the distributions of background factors and important prognostic factors were different between the two transportation groups, an inverse-probability-of-treatment-weighted method was used to adjust confounding factors. The endpoints were physiological severity (RTS), predicted probability of survival (TRISS), number of days in the hospital, and the cost of hospitalization.

**Results:** Male patients comprised 69% in the helicopter group and 75% in the ambulance group; the mean ages were 43 and 41 years for the helicopter and ambulance groups, respectively. The mean ISS scores were 20 for the helicopter group and 22 for the ambulance group. With the adjustment of several confounding factors, the average number of days in the hospital was 17 days shorter in the helicopter group ( $p = 0.032$ ), and the cost of the hospitalization was lower in the helicopter group by about 1,100,000 yen on average ( $p = 0.027$ ).

**Conclusion:** The usefulness of the helicopter EMS system is suggested.

**Keywords:** ambulance; cost-effectiveness; emergency medical services; helicopter; traffic crashes; transportation

*Prehosp Disast Med* 2007;22(2):s31

### Using Medical Helicopters to Evacuate Children with Severe Trauma

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Timely transportation (during the so called "golden hour") to specialized hospitals is an actual problem of rendering emergency medical care to children who have been injured

in different emergencies (including car accidents). The dense traffic situations pose a considerable obstacle in modern societies.

A total of 104 children (age from 2 months to 15 years) injured in Moscow and Moscow region were evacuated by medical helicopters to specialized hospitals of Moscow within the period (01 January 2001–31 January 2006). Evacuation was held from the place of accident in Moscow (64) and Moscow region (23), as well as from medical preventive institutions of Moscow region (17). Two patients were evacuated simultaneously in 11 cases.

The main causes of the injuries were car and road crashes (95); in 9 cases every day and street traumas were responsible. The majority of evacuated children had concomitant (49), multiple (7), or combined (6) traumas. The state of 49% of children was considered as “severe” and “extremely severe” and required infusion support in up to 28% of the children. Evacuation distance of varied from 3 to 135 km, evacuation duration lasted from 2 to 49 minutes. No patients died during air evacuation.

Using of medical helicopters in modern, big cities improves the quality of medical assistance by the rapid delivery of injured children to specialized hospitals. That fact is the leading role of survival.

**Keywords:** children, etiology; helicopters; trauma

*Prehosp Disast Med* 2007;22(2):s31–s32

#### **Session 4: System Developments: New Horizons and Evaluation**

*Chairs: Darren Walter; D. Wulterkens*

#### **Fire Service Medical and Prehospital Care Training in the United Kingdom**

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**Introduction:** Fire and Rescue Services (FRSs) in the United Kingdom (UK) generally do not provide Emergency Medical Services (EMS). However, required response times for FRS often are shorter than are those for EMS, and firefighters frequently are in a position of needing to provide unsupported, immediate, medical assistance to casualties at the incidents to which they have responded to. The current level and nature of prehospital medical training delivered to UK firefighters was assessed in this study.

**Methods:** Questionnaires were mailed to individuals that have received firefighter, medical training at each of the 62 FRSs in the UK. Telephone follow-up was conducted 1–2 weeks after the questionnaires were sent. Investigator analysis of course syllabi were conducted.

**Results:** A total of 49 (79%) questionnaires were returned. Of these, 61% (30) FRSs train all firefighters in advanced prehospital care beyond statutory requirements (three FRSs to a nationally agreed standard: “First Person on Scene”); 13 train to statutory first aid requirements; and six train to different levels depending on employment status.

Thirty-five FRSs train firefighters in the administration of supplemental oxygen and six provide training in the use of automated external defibrillators. Standard training lasts a mean of 4.5 days (range 2–8). No FRS could guarantee that each appliance attending an incident would have a member of the crew trained in prehospital medical care.

**Conclusions:** The medical training and, therefore, the medical competencies of firefighters vary considerably across the UK. An adequate and appropriate level of medical training must be designated for all UK FRSs. In partnership with the Chief Fire Officer’s Association, a national standard should be established so that UK firefighters acquire standard medical competencies.

**Keywords:** emergency medical services (EMS); Fire and Rescue Services (FRSs); prehospital; standards; training

*Prehosp Disast Med* 2007;22(2):s32

#### **Difficult Intubation on the Street or in Operation Rooms: Does it make a Difference for Experienced Anesthesiologists?**

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**Introduction:** This study investigates the management of a difficult airway in a group of six experienced anesthesiologists in the operation room setting (ORS) and in the out-of-hospital setting as part of the Helicopter Mobile Medical Team (OHS-HMMT).

**Methods:** From 15 April to 31 July 2006, the anesthesiologists recorded on a validated registration form (RF) the number of intubation attempts, Cormack and Lehane score (C&L), subjective view of the difficulty of each intubation, aids and techniques used to facilitate intubation and the application of the Dutch difficult airway algorithm (DDAA). A difficult intubation was defined as a C&L score >3 score.

**Results:** Data from intubations of 67 (ORS) and 15 (OHS) patients were collected. In the ORS, 98.5% of intubations (n = 66) were successful, 91% at the first attempt. Six patients (9%) had a C&L score >3; two intubations (3%) were subjectively assessed as difficult. In the OHS, 100% of intubations were successful, of which 73% (n = 11) at the first attempt. Five patients (33%) had a C&L score >3; two (13%) were subjectively difficult. When the first intubation attempt was not successful, the anesthesiologist used cricoid pressure in 23% (n = 7), improved sniffing position in 20% (n = 6), increased elevator force in 16% (n = 5), or a gum elastic boogie in 13% (n = 4) of the cases. These techniques decreased the C&L scores for three patients. In all difficult airway situations, the DDAA was followed.

**Conclusion:** Experienced anesthesiologists perform similarly during intubations performed inside and outside the OR. The percentage of DDAA application in the OHS is greater than in the ORS.

**Keywords:** anesthesiologists; intubation; operation room; out-of-hospital setting

*Prehosp Disast Med* 2007;22(2):s32