

### Laryngeal Mask: Experience from Prehospital Use at EKAB in Heraklion, Crete

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**Purpose:** To investigate the use of laryngeal mask (LM) in Prehospital Emergency Medicine, to document the experiences with the device, and to develop a staff-training program.

**Materials:** From 01 January 2000 through 31 December 2002, doctors and paramedics placed the LM in victims of respiratory or cardio-respiratory arrests or victims of multiple traumatic injuries. Paramedics were trained in LM placement for a total of 12 hours (video, manikin).

**Methods:** The following information was recorded for each patient: (1) Vital signs (systolic and diastolic arterial blood pressures (SAP, DAP), heart rate (HR); ventilatory rate (RR), pulse oximetry readings (SpO<sub>2</sub>); Glasgow Coma Scale score, (GCS)), Rapid Acute Physiology Score (RAPS) on-site and at the Emergency Department, Hector Emergency Scale (HES), and therapeutic interventions.

**Results:** The LM was placed in 221 cases (140 cardio-respiratory, 70 respiratory arrests, 9 multi-trauma patients, and 2 burn episodes). In 147 episodes, it was placed by paramedics without a doctor present, and in 77 cases with a doctor present. In 94% of the cases, the LM was placed in the first attempt.

For the 140 victims of cardio-respiratory arrests, 47 patients had return of spontaneous circulation (ROSC, heart rhythm and arterial pressure). In these cases, the mean SpO<sub>2</sub> and GCS on-site and at hospital arrival were: SpO<sub>2</sub> = 31.8% → 87%; and GCS = 3 → 13 respectively. In those patients with respiratory arrests: SpO<sub>2</sub> = 61% → 96.5% and GCS = 7 → 14. In victims of multi-trauma, the intubation was impossible in four patients. For another four patients, the LM was a temporary airway, and in three cases, the patient was intubated via the LM with handle after general Anesthesia (SpO<sub>2</sub> = 65% → 97% and GCS = 6 → 12). No aspiration was observed in patients who recovered from respiratory and cardio-respiratory arrests as well as in multi-trauma patients.

**Conclusions:** This 3-year experience shows that crew training is easy and practice using the device indicates that only rarely are there side effects. The LM is a valuable tool during the recovery process and for establishing a temporary airway in the prehospital setting.

**Keywords:** aspiration; arrest, cardiorespiratory, ventilatory; laryngeal mask; prehospital; training, trauma  
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### Use of Visual Analogue Scale for Measurement of Pain in the Prehospital Setting

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**Objectives:** The aim of the study was to use a visual analogue scale (VAS) to measure pain severity in the prehos-

pital setting, and to compare changes in pain score with a clinically significant benchmark reduction of 20 mm.

**Methods:** This prospective, observational study used a VAS to record pain severity for patients requiring ambulance transport. Patients used a VAS to score pain severity during the initial patient assessment process (T<sub>0</sub>), and again at the hospital of destination (T<sub>end</sub>). This study reports mean changes in score, and the percentage of cases in which the difference between T<sub>0</sub> and T<sub>end</sub> in the study population achieves or exceeds the 20 mm benchmark. A survey also was administered to ambulance officers participating in this study to identify attitudes, values, and beliefs that may influence their use of the VAS.

**Results:** A total of 262 patients were enrolled in this study. The mean reduction in VAS (T<sub>0</sub> - T<sub>end</sub>) was 18.2 ± 23.9 mm [±SD] (median = 14.0 mm, 95% CI = 15.3–21.1 mm). Eighty-six patients (32.8%) did not receive analgesia. The mean initial (T<sub>0</sub>) pain score for the no-analgesia group was 53.5 ± 25.6 mm, with the mean change in VAS (T<sub>0</sub>-T<sub>end</sub>) = 3.1 mm (median = 0; 95% CI = -2.3–8.5). Forty-six patients (17.6%) recorded some deterioration in their pain score at T<sub>end</sub> (T<sub>0</sub>-T<sub>end</sub> < 0 mm). Survey results identified significant attitudes that may affect pain management decisions and the use of pain scales.

**Conclusions:** The results suggest that oligoanalgesia is an issue in this setting. Effective analgesia requires formal protocols or guidelines supported by effective analgesic therapies, along with regular audits as part of a clinical quality assurance program. However, such programs rely on data derived from patient self-assessment using a recognised pain measurement tool.

**Keywords:** ambulances; pain measurement; prehospital care; visual analogue scale  
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## Free Papers: Global Sharing: Medical Response to Terrorism

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### Mass Casualty Terrorist Bombings: Comparison of Outcomes by Bombing Type

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**Study objective:** The epidemiologic outcomes of terrorist bombings that produced 30 or more casualties and resulted

in immediate structural collapse, occurred within a confined space, or occurred in open air were reviewed.

**Methods:** Eligible reports were identified via a MEDLINE search of articles on terrorist bombings published between 1966 and August 2002 and a manual search of published references. Pooled mortality, immediately injured survival, emergency department (ED) utilization, hospitalization rates, and pooled injury frequencies in injured survivors were determined for each bombing type. Results: There were 33 eligible reports concerning 30 terrorist bombings that collectively produced 8,542 casualties, including 903 immediate deaths and 7,639 immediately surviving injured. Pooled immediate mortality rates were: structural collapse 12% (95% CI = 11–13%); confined space 8% (95% CI = 7–10%); and open air 4% (95% CI = 3–5%). Bimodal distributions of mortality were identified in all bombing types. Pooled hospitalization rates were: structural collapse 15% (95% CI = 14–16%); confined space 40% (95% CI = 36–45%); and open air 17% (95% CI = 15–20%). Unique patterns of injury frequency were identified in all bombing types.

**Conclusion:** Understanding the epidemiologic patterns of mass casualty, terrorist bombings may assist ED and hospital disaster response to such events.

**Keywords:** bombing; collapse, structural; distribution; epidemiology; mass casualties; mortality; terrorism

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### Bioterrorism-Related Beliefs, Attitudes and Behaviors of Community-Based Clinicians

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**Introduction:** In order to properly assess the readiness of the healthcare workforce to respond appropriately to the threats posed by bioterrorism, we assessed the beliefs, attitudes, and behaviors of community-based clinicians, including nurses, nurse practitioners, physicians, and physician assistants.

**Methods:** Anonymous responses to a two-page questionnaire were obtained from 310 clinicians (85% response rate) that surveyed respondents about the following: (1) Beliefs about the risks of bioterrorism; (2) Attitudes about their ability and willingness to treat victims of bioterrorism agents; (3) Fear of contagion; and (4) Intentions regarding infection control practices and their efficacy.

**Results:** Of the clinicians surveyed, 86% felt that their patients were concerned about bioterrorism diseases, and 61% were concerned personally as well. A majority (77%) of clinicians believed that the U.S. likely would be subject to future attacks, while only 14% felt that the nation was well-prepared for such attacks. While few were concerned about contracting cutaneous anthrax from patients, many were unaware of the correct infection control procedures that should be followed. Nearly half of the clinicians (49%) stated that they would recommend the smallpox vaccine to their patients.

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**Keywords:** attitudes; behaviors; beliefs; bioterrorism; contagion; fear; infection control; preparedness; professionals; readiness; response; smallpox; threats; vaccination; workers, healthcare

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### Prehospital Management of 1,392 Victims of Blast Injuries Caused by Terrorist Explosions in Israel (August 2001 to January 2003)

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Maged David Adom (MDA), the Israeli emergency medical services (EMS) system teams provided prehospital management to 1,392 victims of 22 multi-casualty incidents (average 63 injured per incident) caused by explosions of suicide bombers. Of these, 175 (13%) were killed at the scene, and 281 casualties (21%) were categorized as "urgent".

**Mechanism of injury:** The explosion of powerful charges (in 3 incidents more than one charge) resulted in: (1) inside six buses with an 18% mortality rate; (2) in seven confined places with a 14.3% mortality rate; (3) and nine in open spaces with a 7.9% mortality rate. In most instances, metal objects were inserted inside the explosive charges (nails, screws, screw nuts): these devices increased the damage associated with the explosions significantly.

**MDA Forces amassed (average per incident):** 42 emergency vehicles (22% ALS); 116 team members (12% ALS). **Timetable:** From time of the explosion (average per incident) to arrival of the first ambulance = 4.6 minutes. Evacuation of first urgently injured = 11.5 minutes. Evacuation of last urgent injured = 28.3 minutes.

**Triage:** At the ALS level, 281 (61.5%) were triaged as urgent casualties of whom 32 were DOA (11.4%); 176 (62.5%) had sustained severe injuries (ISS >16), and 73 (26.1%) sustained less severe injuries (medium).

**Life Saving Procedures:** 68 life saving procedures were performed in the field (32.7% of severely injured): 48 were intubated; seven had chest drainage performed; and arterial hemorrhage was controlled in 13: 45 of the casualties on whom these procedures were performed (62.2%) survived.

**Evacuation to Hospitals:** 116 urgent cases were evacuated at the ALS level (42%); six incidents occurred in areas without trauma centers, 49 severely injured were evacuated to nearby hospitals (63% were referral secondarily to trauma centers), and 16 incidents occurred where trauma centers were available. A total of 127 severely injured were evacuated. 90 (71%) were diverted directly to the trauma centers. 37 were conveyed to nearby hospitals and of these, 40% underwent secondary referral by MDA-ALS vehicles to trauma centers.

**Conclusion:** An active national EMS system treating 50,000 trauma cases per year according to PHTLS guidelines operates equally well in emergency situations. The deployment of 450 ambulances (100 ALS level) staffed with 1,200 employees and 7,500 volunteers dispersed throughout the country enabled MDA to provide professional prehospital response to 22 multicaseualty incidents (MCI) and to save the lives of many of the victims.

**Keywords:** blast; evacuations; explosions; injuries; prehospital; management;