

# Medics in the Israel Defense Forces and their Experience in Trauma Care during Peacetime

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## Abstract

**Background:** In the military environment it is the medics who usually provide the initial care of mass casualties in the field.

**Objectives:** To determine the number of incidents of trauma encountered by medics in the Israel Defense Forces during peacetime, and to ascertain the role of these medics in providing primary trauma care to the victims.

**Methods:** A retrospective questionnaire, reviewing the activities of medics in treating injured trauma victims, was distributed to medics who were in service for at least 2 years after their professional training.

**Results:** Of the 128 responding medics, 87 (68%) had actively participated in the treatment of trauma victims under various circumstances. The average number of trauma events was 1.2 events over a period of 2 years per combat medic, and 0.7 for medics stationed in rear units. Their activities included insertion of numerous intravenous fluid lines (57% of medics), assistance in intubations (37%), tube thoracostomies (23%), insertions of central catheters (14%) or orogastric tubes (28%), and manual ventilations (41%).

**Conclusion:** Since it is difficult to increase the level of practical experience in dealing with trauma within the military framework, new techniques should be applied to improve the trauma training.

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Trauma, inflicted by whatever means, has become the critical malady of our age; and in the military environment, mass casualty events are not infrequent. Since the number of physicians with advanced trauma care capabilities is small, the initial care of such casualties in the field is usually provided by medics.

The Israel Defense Forces Medical Corps is solely responsible for training young soldiers to become combat medics. This training program is provided by the School of Military Medicine, which is supervised by the Surgeon General's headquarters. Most of these soldiers — 18 years old, just out of high school, and lacking any medical background — are trained over a short 14-week period to serve as medics responsible for the initial care of trauma victims. After completion of this training course the

graduates are assigned to various units of the IDF, both combat and noncombat, for the remainder of their 3-year compulsory military service. During their service they function as medics and implement the professional training they acquired in the course.

This survey attempted to determine in what way the medics are exposed to cases of multiple trauma and what role they actually play in the care of the trauma victim. The results of this survey will be used in the planning and design of future trauma care training in the medics' basic curriculum.

## Population and Methods

From a review of the School of Military Medicine's computerized database, a sample of 200 combat medics — created randomly by enlisting every second listed graduate — was chosen from the participants of recent courses. All of them graduated at least 2 years prior to the initiation of the survey, and were still enlisted.

A questionnaire was sent to the medics at their various assigned units. The questionnaire was specially designed to collect data on subjective experiences in trauma care. In addition to demographic details, it included 30 yes/no questions and several open-ended questions regarding the type of injury. Only events of multiple trauma with major blunt and penetrating injuries (Injury Severity Score, 16) were included. All these cases required urgent evacuation and admission to level 1 or level 2 trauma centers. The population of medics was divided into two groups: those serving in various combat units (group A), and those continuously stationed in rear echelon facilities such as army clinics and bases located far from the border (group B). The data were tabulated and the frequencies analyzed by the Chi-square test.

## Results

A total of 128 medics responded to the questionnaire (64%); 72 did not respond and no effort was made to contact them. All were males and their mean age was  $21 \pm 0.5$  years.

There were 74 medics (57.8%) in group A and 54 (42.2%) in group B. Table 1 summarizes the data on exposure of medics to trauma cases and the circumstances under which they participated in providing care to the trauma victims. As can be seen, medics in both groups were exposed to trauma and treated victims in both civilian (mostly motor vehicle accidents) and military settings

**Table 1.** Participation of medics in trauma events

	Group A (n=74)	Group B (n=54)	Total (n=128)	Pvalue
Medics who treated trauma victims	60 (81.1%)	27 (50.0%)	87 (68%)	0.001
Trauma events per medic	1.2	0.7	0.9	0.001
Military-setting trauma events	54 (73.0%)	16 (29.6%)	70 (54.7%)	0.001
Civilian-setting trauma events	34 (45.9%)	22 (40.7%)	56 (43.8%)	0.558
Treatment in event with fatalities	38 (51.4%)	15 (27.8%)	53 (41.4%)	0.007

Group A = medics posted in combat units; Group B = medics posted in rear-echelon facilities.

**Table 2.** Manual skills practiced by medics during trauma events

Action performed	Group A (n=74)	Group B (n=54)	Total (n=128)	Pvalue
Insertion of >10 peripheral iv lines	43 (58.1%)	27 (50.0%)	73 (57.0%)	0.773
Assist in intubations	31 (41.9%)	16 (29.6%)	47 (36.7%)	0.155
Assist in insertion of tube thoracostomy	20 (27.0%)	10 (18.5%)	30 (23.4%)	0.262
Assist in central venous catheter insertion	10 (13.5%)	8 (14.8%)	18 (14.1%)	0.834
Insert orogastric tubes or Foley catheters	26 (35.1%)	10 (18.5%)	36 (28.1%)	0.039
Perform manual ventilation	18 (24.3%)	21 (38.9%)	39 (30.5%)	0.077

Group A = medics posted in combat units; Group B = medics posted in rear-echelon facilities.

(mostly combat injury). However, more medics in group A participated in trauma events than group B medics ( $P = 0.001$ ). In group A, 73% were involved in trauma events in military settings, compared to 29.6% in group B ( $P = 0.001$ ), but there was no statistically significant difference between the two groups in the number of civilian casualty events treated by the medics ( $P = 0.558$ ).

Overall, the average medic participated in the treatment of only 0.9 trauma events during a period exceeding 2 years. Medics in group A were exposed to 1.2 trauma events versus 0.7 events for group B members ( $P > 0.001$ ). During the 2 years after concluding their basic medical training, a total of 8 medics (7 from group A and 1 from group B) participated in the initial care of a mass casualty event that involved more than 10 victims. Fifty-three medics (41.4%) participated in management of trauma events with fatalities. More than half of group A was exposed to events with fatalities, compared to 28% of group B ( $P = 0.007$ ); whereas 14 medics in group A (19%) and 27 in group B (50%) did not provide care to any major trauma victim during this 2-year period.

Table 2 describes how the medics implemented their trauma skills while providing trauma care. More than 50% of medics in each group inserted more than 10 intravenous fluid lines to victims (58% in group A and 50.0% in group B,  $P = 0.773$ ). In addition, clearly a major part of the medics' role was to assist physicians rendering lifesaving procedures. They participated in intubations, tube thoracostomies, and central venous catheter insertions. Other activities included the introduction of nasogastric tubes and Foley catheters. A total of 39 medics (30.5%) reported to have ventilated a patient — either as part of a medical team or by themselves — using face masks and manual ventilation bags.

## Discussion

The findings of this study indicate that medics serving in various units of the IDF may be called upon to treat trauma victims in a context other than a full-scale war. However, their exposure to trauma events is extremely limited in peacetime. In contrast, the civilian Israeli Emergency Medical Services, staffed by paramedics, are engaged on a daily basis in the initial care of multiple traumatized victims, mostly from motor vehicle accidents. As such, the civilian paramedics are far more experienced, and some claim them to be even more adept in providing initial care to the trauma victim in the prehospital set-up than the average Israeli physician.

For these reasons one could argue about the need — if any — for medics in peacetime. Nevertheless, medics constitute an important part in the chain of survival of the injured soldier in times of strife. Indeed, most wounded soldiers in the battlefield receive their first medical care from medics [1]. It has been shown that the initial care given to combat injuries has a significant effect [2] in that the first aid immediately rendered on the battlefield improves the outcome and minimizes disability [2]. Indeed, the experience in El Salvador in 1983 proved that the introduction of medics substantially reduced the mortality of combat victims [3].

Clearly, the primary responsibility of the Medical Corps is to prepare its medical teams for the worst-case scenario — a full-scale war. To this end, continuous efforts are being made to improve the cognitive and manual skills of the combat medic, which will enable him to perform under field conditions when medic assistance and team work are crucial for the successful outcome of trauma victims. Skilled and experienced medics are invaluable to physicians performing lifesaving procedures in the field. Medics should not only know the sequence of steps of every procedure but also be familiar with their indications and complications.

The combat medic course in Israel lasts 14 weeks during which the newly recruited soldier is transformed into a qualified medic. Similar to other armies, the training course includes battlefield survival skills and mastery of weapons. Although the major focus is devoted to trauma care, the curriculum also includes topics such as preventive medicine, pharmacology, basic anatomy, coping with acute stress reaction, and issues of primary medicine.

In the first part of the course, the soldiers are provided with a basic knowledge in anatomy and are familiarized with the human body and its principal systems: respiratory, cardiovascular, and nervous. They are also instructed on the major problems and maladies that may affect these systems. This is followed by training in providing primary care to trauma victims in the field — from the initial ABC's through secondary survey and preparation for evacuation. Many hours are devoted to mock casualty exercises and practicing peripheral intravenous fluid administration, which account for approximately 45% of class time. In addition, refreshment exercises are conducted periodically by special training teams responsible for providing continuing medical education to medics stationed at remote units.

In recent years, the principles of the Advanced Trauma Life Support® [4,5] and the Pre-Hospital Trauma Life

Support® [6] have been incorporated into the training program. Adopting these principles has undoubtedly contributed to a more systematic and standardized approach to the care of each trauma patient.

Nonetheless, several problems exist in the instruction of primary trauma care to military medical personnel, as also noted by others [7,8]. Foremost is the difficulty of imitating real-life trauma events. Since it is extremely complicated to simulate the sense of an actual wounded victim gasping for air, or one in a severe hemorrhagic shock, special efforts are made to present the trauma training in as realistic an environment as possible. Computer-aided instruction and the use of moulage help in demonstrating various scenarios and the consequent casualty care required. Since there are no military hospitals in Israel, medics are sent for one-week periods (time permitting) to various emergency departments in major level I trauma centers to acquire exposure to real trauma cases.

One of the most striking findings in this survey was the extremely small number of trauma events that IDF medics were exposed to: 1.2 events per 2 years on average for combat medics, and 0.7 for medics in other units. Even more intriguing is the fact that a third of the medics never encountered any major trauma.

There is an inherent paradox in the search for the ideal training of medics. The more exposure to trauma victims the medic receives, the better he will perform in full-scale military conflicts. However, given that primary trauma care experience in peacetime is scarce, in the event of a full-scale war we may find ourselves relying on medics with little trauma experience. This is further aggravated by the fact that training on laboratory animals is becoming ethically prohibitive. It is abundantly clear that with trauma care education and training becoming more and more problematic, the training of medics must be modified to address this paradox. One solution may be to introduce virtual reality training with programs employing sophisticated computerized multimedia techniques. Another approach may be the development of extended capabilities of the trauma care providers, such as improved means of mobility and communication in the battlefield.

## Capsule

### Accuracy of data in abstracts of published research articles

The abstract accompanying a research article is often the only part of the article that will be read; therefore it should reflect fully and accurately the work reported. A team of scientists tried to assess whether the data in abstracts accompanying research articles published in six medical journals could be verified in the article itself.

The analysis included a simple random sample of 44 articles and their accompanying abstracts published during 1 year (1 July 1996 – 30 June 1997) in each of 5 major general medical journals (*Annals of Internal Medicine*, *BMJ*, *JAMA*, *Lancet*, and *New England Journal of Medicine*) and a consecutive sample of 44 articles published during 15 months (1 July 1996 – 15 August 1997) in the

Regarding specific skills, our findings show that airway control is frequently assisted by medics who arrive first at the scene. They are not authorized to open the airway, either by intubation or surgically, and are only permitted to use a simple oral airway. We suggest, therefore, that medics be entrusted with more equipment and greater authority regarding airway management, as are paramedics.

Despite recent controversies regarding the value of intravenous fluid resuscitation in the field [5], most medics have implemented it during trauma events. Although data are not available on the success rate of establishing adequate intravenous fluid lines, preliminary observations suggest that the success rates in intravenous line insertions are inversely correlated with the urgency or need. Casualties in severe hypovolemic shock usually require a physician for successful line insertion. Thus some revision in training may be required.

In conclusion, the training of medics in trauma care requires a revision both in approach and methodology. These necessary changes will better prepare them to deliver adequate care in the battlefields of the future.

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*CMAJ*. The abstracts were to be considered deficient if they contained data that were either inconsistent with corresponding data in the article's body (including tables and figures) or not found in the body at all.

Results showed that the proportion of deficient abstracts varied widely (18–68%) and to a statistically significant degree ( $P < 0.001$ ) among the six journals studied. The authors conclude that data in the abstract that are inconsistent with or absent from the article's body are common, even in large-circulation general medical journals.

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