

Impact of Hospital Emergency Incident Command System (HEICS) Training on Disaster Preparedness of Emergency Response Hospitals

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Abstract

To understand whether HEICS training can improve the implementation of the system in hospitals, we reviewed the updated version of disaster response plans from emergency response hospitals in Taipei this year and compared their performance with those done last year. Of the 51 plans (eight from tertiary medical center), there were about 50 (98%) that had predictable chain of management, and the average score was 85 ± 5 points ($P < 0.05$ v 79 ± 6 points last year). There were more plans that met with the criteria ($n=40$; 80% v 58%, $P < 0.05$), as the average score was (80 ± 5 v 68 ± 5 , $P < 0.01$) as to accountability of position function. The improvement has also been found in the numbers of hospitals that had flexible organizational chart ($n=40$; 80% v 58%, $P < 0.05$) that allows flexible response to specific emergencies (average scores 81 ± 7 v 68 ± 13 , $P < 0.05$), documentation of facility (78 ± 9 v 64 ± 10 , $P < 0.05$) and also common language to facilitate outside assistance (75 ± 9 v 60 ± 6 , $P < 0.05$). Thirty-six hospitals (70.2%) have provided prioritized response checklists, cost effective emergency planning within health care corporations, and complete governmental requirements ($P < 0.01$ v 45.3% last year). The scores were thus 72 ± 10 , 70 ± 11 and 68 ± 10 respectively. The tertiary-care medical centers had better performance than another 43 secondary hospitals did (average score 94 ± 11 vs. 78 ± 12 , $P < 0.01$). In conclusion, education and training plays an essential role in successful implementation of HEIC in response hospitals. (*Ann Disaster Med.* 2005;4:7-11)

Key words: Disaster Response; HEICS; Education; Tabletop Drills

Introduction

The Hospital Emergency Incident Command System (HEICS) has been developed to assist the operation of a medical facility in a time of crisis in many countries.¹ The HEICS represents a concerted effort on behalf of any medi-

cal institutes and health system to be prepared in the event of a disaster.¹ Its general organizational chart shows a chain of command that incorporates four sections under the overall leadership of an Emergency Incident Commander.¹

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The four sections such as logistics, planning, finance and operations, have their individual leaders assigned by the incident commander. The leaders in turn designate directors and unit leaders to subfunctions, with supervisors and officers filling other crucial roles. This structure limits the span of control of each manager in the attempt to distribute the work. It also provides for a system of documenting and reporting all emergency response activities. It is hoped that this will lessen liability and promote the recovery of financial expenditures.

Taipei City government has begun to ask the emergency response hospitals to implement HEICS (hospital emergency incident command system) in their disaster response planning for 2 years. We have ever evaluated the adequacies of these plans last year.²⁻⁴ Although the evaluation of disaster response plans after the close supervision of Taipei Department of Health is much better the original, the improvement seemed to be still limited.²⁻⁴ We wondered if the lack of detailed education or training of HEICS may be an important contributing factor. The goal of HEICS training was to increase awareness of the impact that disasters have on a hospital's facility and personnel, and to introduce HEICS in regional training sessions as a model for building and using an incident command structure for an effective response. Our past study also revealed that tabletop drills are recommended before large-scale field exercises are undergone in disaster preparedness.² In other words, the role of tabletop drills or other training has been well established in the implementation of HEICS in each hospital. To understand the impact of HEICS training and drills on the implementation of HEICS in disaster response plans for hospitals, we therein re-evaluated these

plans from emergency response hospitals in Taipei.

Methods

Study hospitals

There were 51 emergency response hospitals accounting for 19,810 beds in Taipei City in 2005. Of these hospitals, eight were the tertiary care medical centers and the remaining 43 secondary referral hospitals. We evaluated the disaster preparation and response plans from these hospitals prospectively and compared the results with those evaluated in 2004.

Of these hospitals, eight were the tertiary care medical centers and the remaining 43 secondary referral hospitals. We then evaluated the SARS response plans from these hospitals retrospectively. As mentioned before,²⁻⁴ we reviewed all the plans under the guidelines of HEICS that concentrated upon: predictable chain of management; accountability of position function; flexible organizational chart; documentation of facility; communication to facilitate outside assistance; prioritized response checklists; cost-effective emergency planning within health care institutes; governmental requirements as was the case with public hospitals. For these 8 categories, there were about items, ranging from 5 to 7, to evaluate the adequacies of the plans. Four individual experts evaluated the plans to determine the scoring. The final scores were summed up and averaged 4 individual scores. The scoring was then compared according to the different levels (or rankings) of these hospitals. The final results of evaluation were compared with the performance last year.

HEICS training

HEICS training and drills have been undergo-

ing since January 2005. The course consisted of 4-hour special lecture and 2.5-hour tabletop drill. The 4-hour course consists of the lectures such as the introduction of HEICS, types of hospital emergency response planning (evacuation, relocation, isolation, acceptance), the roles of HEICS staffs, and hospital response to individual disasters. The 2.5-hour tabletop drill was conducted by an invited disaster specialist.

Statistic analysis

All the data were processed and analyzed with Microsoft Excel 2000 for Windows. The techniques applied to data analysis included descriptive statistics generating and independent samples by *t*-test and chi-square test.

Results

Performances of SARS response plans judged by HEICS

Of the 51 plans, there were about 50 (98%) that had predictable chain of management, and the average score was 85 ± 5 points ($P < 0.05$ v 79 ± 6 points last year). As to accountability of position function, there were more plans that met with the criteria ($n=40$; 80% v 58%, $P < 0.05$), as the average score was (80 ± 5 v 68 ± 5 , $P < 0.01$). There were also more hospitals ($n=40$; 80% v 58%, $P < 0.05$) that had flexible organizational chart that allows flexible response to specific emergencies (average scores 81 ± 7 v 68 ± 13 , $P < 0.05$), improved documentation of facility (78 ± 9 v 64 ± 10 , $P < 0.05$) and also common language to facilitate outside assistance (75 ± 9 v 60 ± 6 , $P < 0.05$). Thirty-six hospitals (70.2%) have provided prioritized response checklists, cost effective emergency planning within health care corporations, and complete

governmental requirements ($P < 0.01$ v 45.3% last year). The scores were thus 72 ± 10 , 70 ± 11 and 68 ± 10 respectively.

Comparisons among different rankings of hospitals

We compared the performances of 8 tertiary-care medical centers with another 43 secondary hospitals. The average score was still significantly higher in tertiary centers than in other hospitals (94 ± 11 vs. 78 ± 12 , $P < 0.01$).

Discussion

This study documented that training, education and drills play an important role in implementation of HEICS in emergency response hospitals. In other words, the first step to establish a good HEICS is to teach "know-how". The past three year follow-up in the completeness rate of HEICS has been proven to rise progressively after the administrative supervision and related education/training.

There has been a trend that a hospital's emergency preparedness plan is undergone under the guidance of HEICS.⁵ The HEICS plan for hospitals has the following benefits^{5,6}---such as predictable chain of management; flexible organizational chart allowing flexible response to specific emergencies; responsibility of position function; improved documentation of facility; good inter-agency communication and cooperation; prioritized response checklists; cost effective emergency planning within health care corporations; and governmental requirements in public hospitals; emergency response plans share many organizational characteristics with other ICS based plans under the structure of the ICS. The common language provides a great advantage to bind hospitals and non-hos-

pitals together in times of disasters.

HEICS is a standard by which the medical community has found success and common ground in the area of disaster management.^{7,8} A survey of California hospitals in the spring of 1997 indicated that this disaster management plan was the choice of many hospitals; the medical community had established HEICS as a facility standard in emergency response. HEICS is an emergency management system made up of positions on an organizational chart. Each position has a specific mission to address an emergency situation. Each position represented above has an individual checklist designed to direct the assigned individual in disaster recovery tasks. The HEICS plan includes details to enhance this overall system and promote accountability. The HEICS plan is flexible, and only those positions or functions, which are needed, should be activated. The HEICS plan allows for the addition of needed positions, as well as the deactivating of positions at any time⁹. This equates to promoting efficiency and cost effectiveness. The above chart may be fully activated for a large, extended disaster such as an earthquake. However, full activation may take hours or even days. The majority of disasters or emergencies will require the activation of far fewer positions. More than one position may be assigned to an individual. Situations of a critical nature may require an individual to perform multiple tasks until additional support can be obtained^{10,11} ed.^{10,11}

Our past two surveys revealed that most of the hospitals in Taipei still did not make full use of the HEICS.^{2,3} The possible reasons for the hesitancy for a conversion may include time, cost and lack of internal desire. Sometimes the real reason is lack of understanding of HEICS

and the overwhelming idea of changing out an entire disaster plan. All of these concerns are valid. However, all facilities need to examine the real attributes and benefits of an Incident Command System-based plan. There are distinctive advantages to the entire disaster medical response community when all participants operate in a similar, predictable fashion. Follow-up studies have found the implementation of administrative policy and regulations have the effects of increasing rates of participation.^{2,3} Detailed HEICS training and drills provided further improvement in establishing HEICS in emergency response hospitals, as this study demonstrated.

In conclusion, education and training plays a critical role in successful implementation of HEIC in response hospitals.

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