

for the design and deployment of field hospitals, including the military and clinical requirements. It will firstly consider the operational context. Design options for the key clinical areas and the use of tents and container systems will be examined. The paper will conclude by describing an incremental concept of deployment of field hospitals from a 25 bed Hospital Troop up to a 200-bed Field Hospital.

**Keywords:** British Army; field hospital; military; tents  
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## 2.9. Emergency Hospital Operations

### Emergency Department Preparations for Disasters

**Dr. Francis Lee Chun Yue, MBBS (S'pore), FRCSEd (A&E)**

Head and Consultant, Department of Emergency Medicine, Alexandra Hospital, Singapore

In many countries, emergency departments (EDs) serve not only as the main provider for acute and emergency care, but as a central portal of activity in disaster management. The EDs often are expected to be an early, if not first, responder to a disaster, and in many instances, they also are responsible for coordinating the disaster response of the hospital.

Successful disaster preparation requires assigning a high enough priority to the project; good support from the hospital administration; and active participation of staff at all levels. These factors apply, regardless of whether a hospital or an ED disaster plan is being developed.

A major difficulty in disaster planning is translating a written plan into a meaningful response in a real crisis. All disaster plans will fail if they remain "classified", locked away for security reasons, and known only to a few individuals. The importance of developing a disaster training programme for ED staff and encouraging active participation in the planning process cannot be overemphasized.

**Keywords:** disaster management; emergency departments; plan; preparation; training

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### Hospital Command Systems for Disasters

**Prof. (Dr.) V. Anantharaman, MBBS, FRCP (Edin), FRCS Ed (A&E), FAMS**

Senior Consultant/Head, Dept of Emergency Medicine, Singapore General Hospital, Singapore

Though hospitals frequently are situated remotely from disaster-sites, a disaster often goes to hospitals in the form of casualties. When large numbers of casualties occur, hospitals need to modify their operations in order to cope with the influx of patients. There are two aspects of hospital readiness and control in disasters. One involves the in-hospital organisation for managing disaster patients brought to the hospital. The other involves the coordination of hospitals in a community.

A hospital requires a linear and clear system of organisation, command and control, and reporting. The hospital

senior management will need to be in close contact with the key line units; in disasters, these will include the Emergency Department, Operating Theatre, Intensive Care Unit, and Disaster Wards. This direct management has to be supported actively by a dedicated Operations Department, Personnel, Logistics and Communications Departments. These relationships must be defined clearly in a concise hospital disaster management plan drawn up and regularly exercised, reviewed, and coordinated by a Hospital Disaster and Emergency Planning Committee.

Within a community, coordination of hospitals during a disaster is crucial to ensure that casualties from the site are evacuated to well-prepared and appropriate hospitals. Such coordination may be carried out either by a designated hospital or by a central local health authority. The coordinating responsibility also comes with the responsibility of standardising desired responses and reports. Few communities have gone far in laying down coordination ground rules. Such coordination will be crucial for developing economies to minimise the adverse impact of disasters on their communities.

Various systems for command, control, and organisation of a hospital and for co-ordination of medical resources within a community will be discussed.

**Keywords:** casualties; coordination; disaster; disaster management plan; hospitals

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### Disaster IT Support System

**Mr. Kwan Fook Weng**

Manager, Emergency Planning, Changi General Hospital, Singapore

In the event of a disaster, the Hospital Field Medical Teams, under the command of the Ministry of Health Disaster Site Medical Command (DSMC) will treat, and thereafter, evacuate the casualties from the incident site to selected government-restructured hospitals for further medical evaluation and definitive treatment.

All hospitals receiving casualties need to collate and maintain relevant information on the casualties, and send periodic reports and updates on casualties received and their status to Ministry of Health Co-ordinating Centre (MOHCC). The MOHCC reporting procedure is established to keep the medical elements posted on the situation, and to assist them in the process of decision making. The most critical information, besides rescue operations, should focus upon the survivors and casualties. Relatives and friends of the affected parties, including the media, will demand casualty information from the Ministry of Health. Reports must be accurate, comprehensive, and timely.

All of the hospitals in Singapore have their own computerised patient information system. However, for cost and practical reasons, these systems are not designed to handle information and reports required for disaster related casualties.

How information technology has been used in Changi General Hospital to enhance its efficiency in the management of casualty information and to generate the essential

reports for submission to MOHCC is discussed.

**Keywords:** casualties; disaster; hospital; information; information technology; management

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### Disaster Management of SQ006 Crash in Chang Gung Linkou Medical Center

**Ray-Jade Chen, MD**

Department of Trauma & Emergency Surgery, Chang Gung Memorial Hospital, Chang Gung University, Taiwan

**Background:** Typhoon Xangsane whirled closer to Taiwan on 31 October 2000, prompting officials to set up disaster relief centers, cancel flights, call-off classes, and raise land and sea warnings. At 23:18 hours, a Boeing 747-400 of Singapore Airline crashed and erupted into flames at Chiang Kai-shek (CKS) International Airport. Flight SQ-006, carrying 159 passengers and 20 crew members, was bound for Los Angeles. Seventy-nine were dead at the scene, and 100 people were evacuated; 16 of them were unhurt, and 84 were injured.

**Methods:** A retrospective study was conducted in the Linkou Medical Center of Chang Gung Memorial Hospital, which is the primary hospital responsible for CKS International Airport. The records of disaster and charts of the admitted casualties from SQ-006 crash were reviewed.

**Results:** The disaster plan was declared at 23:50 hours, and ended at 02:00 hours of 01 November 2001. In total, 36 patients were treated at Linkou Medical Center of Chang Gung Memorial Hospital. Thirty-four were transferred from the scene immediately, and the other two were transferred secondarily from other hospitals. Twenty-six were male, and 10 were female; thirty-four were adult, and two were boys. The age ranged from 6 to 66 years.

After prompt evaluation, stabilization and management, 14 patients mainly associated with truncal contusion or minor lacerations of the extremities, were discharged from ED. Twenty-two patients were admitted, and one patient with burns on 100% of their body died shortly after admission. An Injury Severity Score >15 was found in nine patients. Nineteen of the admitted patients suffered variable degrees of flame burn or inhalation injury. Three patients (14%) suffered from blunt abdominal trauma and required emergent celiotomy. Four patients (18%) suffered orthopedic injuries, two with extremity open fractures, and another with lumbar spine bursting fracture, and the other with odontoid fracture and C5-C6 subluxation. Eight patients required emergent or urgent surgical interventions.

The last patient was discharged on 15 February 2001; 19 patients were discharged smoothly and 3 died from sepsis and multiple organ failure. Seven patients were transferred to their home country during hospitalization, four were sent to the States; 2 were sent to Singapore; one was sent to New Zealand. The overall mortality rate was 8% (3/36), and mortality rate of admission patients was 14% (3/22).

**Conclusions:** The prompt disaster response and coordinated

management of this catastrophic crash, which occurred at midnight in terrible weather, was attributed mainly to a comprehensive disaster plan, repeated drills, and the location of a nearby hospital dormitory. This crash upon take-off resulted in more than half of patients with severe burns, and some of them, combined with other major injuries, mandated emergency operations. To ensure timely and optimal care of the multiple injuries after an airplane crash, the primary hospital for all international airports not only need a disaster plan and repeated disaster drills, but also should be a level-one trauma center that includes a burn unit.

**Keywords:** airplane crash; burns; casualties; disaster management; trauma; Typhoon Xangsane

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## 2.10. Resuscitation

### Update in Resuscitation

**Dr. Mohan Tiru, FRCS (A&E) Edin, FAMS (Emergency Medicine)**

Associate Consultant, Accident and Emergency Department, Changi General Hospital, Singapore

There has been a number of significant changes in the teaching of basic cardiac life support guidelines including new recommendations for bystander cardiopulmonary resuscitation (CPR), teaching, instruction for the use of automated external defibrillators (AEDs) to the lay public, and use of smaller tidal volumes with assisted breathing devices.

Likewise advanced cardiac life support guidelines have changed in accordance to the best available clinical evidence. These include downgrading of lidocaine and high dose epinephrine with greater emphasis on the use of drugs like amiodarone, vasopressin, and procainamide.

New airway devices also are advocated under these new resuscitation guidelines. Conventional teaching on Sellick's manoeuvre also has come into question recently, as it may increase occlusion of the airway.

There also is an increasing role for the use of new modalities in resuscitation especially low energy, biphasic defibrillation for malignant arrhythmia with better success rates while minimising myocardial damage.

**Keywords:** amiodarone; automated external defibrillators; cardiopulmonary resuscitation; procainamide; Sellick's manoeuvre; vasopressin

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### Update in Paediatrics Resuscitation

**Dr. Irene Chan**

Consultant, KK Women's and Children's Hospital, Singapore

The changes in the new international guidelines for paediatric resuscitation mainly consist of modification in the