

country haunted by earthquakes. It is very difficult to avoid casualties once the earthquake has taken place, and prevention of earthquake still is in the research stage. Earthquake disaster events can be classified as original disaster, direct disaster, secondary disaster, and induced disaster.

1. Characteristics of earthquake casualties: Injuries in earthquakes are related to: (1) time; (2) season; (3) population density; (4) the structure of the buildings; and (5) the geological environment. Earthquake events have the following characteristics:

1.1 Result in massive numbers of casualties

1.2 Block of rescue

1.3 Produce massive secondary disasters

2. Rescue:

2.1 On-the-spot rescue — on-the-spot rescue should be carried out as soon as possible after the earthquake, though it is dangerous and extremely difficult. The principal task of on-the-spot rescue is to extricate trapped persons.

2.2 Medical treatment — disaster medical stations are formed to provide primary treatment and triage of victims for priority transport for further medical care. Medical stations also perform necessarily emergent treatment and surgeries for disaster victims. The medical station can be divided into several professional groups.

2.3 Hospitals — manage incoming disaster victims after triage at the medical station.

**Keywords:** China; disaster; disaster response; earthquake  
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### Maritime Radio-Medical Services: The Singapore General Hospital Experience

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Medical care for the sick and injured at sea involves unique logistical problems, including scarce resources, distance, isolation, communications, and weather. In 1980, the Department of Emergency Medicine at Singapore General Hospital took over the responsibility of radio-medical advice from the Port Health Authority. This paper analyzes 2,409 calls received over a period of 22 years (January 1980 to December 2001). It highlights the common consultations, modes of communications, treatment and management prescribed, and training requirements, as well as the challenges for the future.

**Keywords:** radio-medical advice; sea; Singapore  
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### Red Cross International Medical Relief for Earthquake Victims in Afghanistan (2002)

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On 05 May 2002, a basic healthcare Emergency Response Unit (ERU) was established at Naharin in the Baglan province of Afghanistan. Mission goals included:

1. Establish a temporary clinic
  - a. Follow-up and rehabilitation of patients who suffered earthquake-related injuries

- b. Treatment of new injuries caused by secondary event
- c. Treatment of patients with chronic diseases, i.e., respiratory infections
- d. Examination of female patients by midwives.

2. Reinforcement of the ARCS mobile teams with training

3. Surveillance for contagious diseases

4. Treatment of patients with the post-traumatic stress disorder (PTSD) patients

5. Disaster preparedness

**Results:** From 05 to 26 May, 1,357 patients were treated: 351 surgical, 875 internal medicine, and 131 gynecological and obstetric patients. Of the 351 surgical patients: (1) 187 (54%) were new patients; (2) 145 (42%) were earthquake-related; and (3) 19 (5%) were war-related. Surgical pathology included: (1) Fractures, 19 (6%); (2) Burns, 25 (7%); (3) Acute injuries, 122 (36%); (4) Infected wounds, 153 (45%); and (5) Others, 32 (9%). Surgical interventions included: (1) Incision and drainage of pus, 23 (45%); (2) Suturing, 13 (25%); (3) Atheroma extirpation, 8 (16%); (4) Cast and its removal, 6 (11%); and (5) Above-knee amputations, 1 (2%).

**Summary:** Conventional customs and mass destruction of the infrastructure forced the victims to live with poorer hygiene, which resulted in easy access to infection. Proper medication or simple operations under local anesthesia generally gave them a cure within one week.

**Keywords:** Afghanistan; anaesthesia; clinic; disaster; earthquake; healthcare emergency response team; infection; infrastructure; Japan; post-traumatic distress disorder (PTSD); preparedness; Red Cross

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### Serious Disasters of Seacoast Provinces in China

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Statistics of the China Reduced Disaster Committee showed that the seacoast provinces of China from north to south consist of Heilongjiang, Liaoning, Hebei Shangong, Jiangsu, Zhejiang, Guangdong, Guangxi, and Heinan. The economic development of these seacoast provinces is of great importance to China. In recent years, National Financial Statistics showed that the output value of coastal provinces was about 1,581 hundred millions of dollars (55.9% of total national output value). But, calamities in this area also are very serious. Recent statistics show that the economic loss caused by calamities is about 18,800 dollars per square meter of coastal area. The main events that occur along this coast include:

1. **Earthquakes:** The geography of the coastal area is part of the seismic zone of the Pacific Rim. Statistics indicate that during last 40 years, there were 22 earthquakes. In 1976, the magnitude of the Tang Shan earthquake was 7.8 (Richter scale) and resulted in 242,000 persons killed and an economic loss of about 1,900 millions of dollars.

2. **Floods:** Rain storms have caused serious floods in low-lying parts of coastal area. According to the records of the Yangtze River from the Han Dynasty (206 BC–AD 2200) to recent time, floods occurred more than 2,000 times.

The history of Yellow River in last 2,000 years, caused 1,500 bank bursts, and 26 river beds changed from their original positions. During the last 500 years, 360 disastrous floods befell on Thuhiang River (Quangdong Province), and 431,549 hectares of fields were submerged and >100,000 persons were killed. Statistics of China Reduced Disaster NewsPaper indicated that floods caused an economic loss for China of about 22,800 millions of dollars in one year.

3. **Drought:** This year, Hebei Province suffered a serious dry spell, and 2,114,390 hectares of field were damaged. During the same time, Guandong Province also befell a dry spell, and 1,334,000 hectares of fields were damaged, with economic loss of 400 million dollars.

4. **Typhoons:** In the last 40 years, there were 292 typhoons with major wind-force of 100 meters/second and wind velocity 60 meters/second, struck the coastal area of China. Statistics from these years show that 4,167 persons were killed, 2,550,189 houses were damaged, and 14,345 ships were overturned by the typhoons.

**Character of disasters:** Disasters in the coastal area have increased year-by-year. In Guandong Province, harvested fields were damaged (181,424 hectares by floods, typhoons, and a dryspell in the 1950s; in the 1960s, 439,553 hectares; in the 1970s, 336,158 hectares; and in the 1980s, 820,410 hectares. Typhoons in Zhejiang Province caused \$238 million of damage in 1988, \$479 million; in 1989, \$700 million; and in the 1990s, \$800 million. The economic costs of all disasters combined were greater than the value of the National Economic output during the same time.

**Prevention:** It is essential that a policy of how to prevent disasters be established, as well as attempts avoid the suffering caused by disasters. Plans on how to prevent disasters have been developed through reinforcement of the management skills available in the disaster area. Every coastal province must establish a Disaster Committee to build a computer information systems, disaster alarm systems, disaster evaluation systems, etc. Also, it is necessary to strengthen education of the population and the training the population in prevention measures.

**Keywords:** China; costs; disasters; earthquakes; drought; economics; floods; land; management; plans; policy; prevention; typhoons

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### Rural Emergency/Disaster—Who Will Cope?

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Australia is a large continent of brown emptiness with occasional dense patches of habitation to break up the monotony. People are drifting towards the metropolitan areas at a steady rate, yet, events still happen at a distance from a metropolitan trauma system. (Year Book Australia 2002) A disaster can be defined as a situation in which the problem exceeds the local ability to cope with it without calling for external support. As the rural population either continues to fall or does not increase, the ability of that population to support major services becomes more and more tenuous. There are many places where major events may occur that are so remote that the Golden Hour of trauma care has been spent long before any external aid arrives. This paper looks at the questions of whom is going to provide that initial care and

what level of care is it reasonable to expect them to provide.

Approximately 15 years ago, the authors working as primary general practitioners and acting in support of emergency services, reviewed their workload and outcomes. At that time, any intensive care or even advanced life support intervention at the rural roadside was provided by a doctor. More than 200 cases in two locations [remote rural and outer suburbs] were evaluated. The severity of injuries and mortality prior to arrival of emergency services were similar, those injuries occurring on the more open country roads were characteristic of those resulting from somewhat higher impact speeds.

Fifteen years ago, analysis of the case type and interventions delivered, indicated that relatively few absolute life-saving interventions were performed, but there did occur a substantial reduction in morbidity using only simple measures.

The need was for the provision of simple effective basic emergency care in a timely fashion. The lessons learnt from that study included: (1) Simple, effective measures make the most difference; (2) Effective team work is of great importance; and (3) Education in trauma management builds confidence. Although individual cases were instructive and the lessons learnt were shared, the major point was that the skills required to be of use were on the whole, relatively modest and achievable for those not involved in full-time emergency practice. Since then, the provision of emergency care at a disaster scene or trauma event has changed in response to many influences:

1. Early Management of Severe Trauma (EMST)
2. Trauma systems and retrieval systems
3. Development of the ambulance officer
4. Formation of effective local trauma teams.

There still remain some areas for improvement. These opportunities include the rapid activation of a trauma system concurrently as opposed to sequentially. Improvement in the activation of trauma systems has resulted in reduction in this time. A second area that requires attention is the confidence of the general practitioner to become involved in this area of medicine.

A primary response to trauma must be maintained. The patient's needs still are the same, and the value of simple measures addressing airway, breathing, and circulation remains the same. The issue of who actually provides those measures is of less relevance than the ability of a team to react appropriately and expeditiously to the patient's needs. The doctor may be able to save more lives by attention to the team training and integration than by direct intervention.

**Conclusions:** Acute trauma care is changing in Australia, but the patient's needs are still the same. Many of the factors driving that change are planned and integrated within the healthcare system. The further development of multidisciplinary teams that can provide care at the time within the Golden Hour is ongoing. The leaders of emergency and disaster management must maintain an awareness of the directions of growth, and continue to guide and nurture this growth.

**Keywords:** doctors; general practitioners; leadership; management; needs; patients; training; trauma

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