fare. Incidents caused by chemical agents are far more common than are biological and radiological agents. Factories, laboratories, farms, suicidal cases involving chemicals, and vehicles transporting chemicals and terrorism are potential sources of HAZMAT incidents.

Hong Kong Hospital Authority (HA) will provide consultations to the Hong Kong Special Administrative Region (HKSAR) about the medical management of HAZMAT incidents. In addition, to ensure an adequate supply of antidotes, the HA will cooperate with other agencies and all emergency departments in Hong Kong to deal with HAZMAT incidents. Since contaminated victims may arrive at hospital by their own transports, emergency departments should be prepared to decontaminate victims using at least Level C Personal Protective Equipment (PPE). In order to achieve the above objectives, each emergency department should acquire decontamination facilities, PPE, adequate stock of antidotes, and an updated database of hazardous material. Drills for HAZMAT incidents should be conducted at regular intervals.

Chemical incidents are uncommon. If one occurs, it will cause a major threat to the health of staff working in hospital. Medical preparedness is essential for effective treatment of victims and the protection of staff against chemical contamination.

Keywords: agents; chemical; contaminated; decontaminated; hazardous materials, HAZMAT; Hong Kong
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Management of Nerve Gas Casualties

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In the post-World War I era, the chemical warfare of Iraq against Iran is unique in various dimensions. From December 1980 to June 1983, there were experiments and military maneuvers and drills. From July 1983 to January 1984, there occurred localized and limited Iraqi chemical attacks carried out using mustard gas. From February 1984 until the end of war (1988), mustard and nerve agents were used on a large scale.

On 17 March, 1984, the first nerve gas, "tabun", was used against Iranians. Then, Iraq began to use sarin, and finally, a mixture of sarin+GF until the end of war.

Iranian cities on the western provinces and border villages had been the site of continuous chemical attacks by Iraq during March 1988. Both mustard and nerve gases were employed, but the role of nerve gas was more significant. On 17 March 1988, the city of Halabja, in the northeastern part of Iraq, was the site of a huge Iraqi chemical attack. People from this city and satellite villages were bombarded especially by nerve gas. Many Iranian villages, especially in the regions near Marivan city, were heavily bombarded by mustard and nerve gas.

The existence of a chain service system for treatment of chemical casualties drastically decreased the mortality and morbidity rate. Treatment used a practical triage system for nerve agent victims and administration of atropine, oxime, and diazepam.

Critical in the field emergency was administering the highest possible dose of atropine in the shortest period of time.

Keywords: atropine; chain service system; chemical; diazepam; Iran; Iraq; mustard gas; oxime; sarin; tabun; warfare.
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Stress in Emergency Health Care Providers

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Emergency Medical Service (EMS)is a particularly high stress field, working not only with the acutely sick and injured, but also in emotionally charged and, at times, dangerous physical environments. Increasing utilization of the EMS increase the risk of occupational stress and injury to EMS personnel.

Evidence exists suggesting that this particular group of health care workers are experiencing cumulative exposure to line-of-duty trauma, e.g., managing severely injured, dead, and dying victims, which may lead, not only to stress and burnout, but also to other forms of mental health problems. Hence, it is important to understand critical incident stress and the other associated types of psychological distress that may arise in this profession. Various risk factors, currently available interventions, and self-care are discussed.

Keywords: critical incident stress; emergency medical services; EMS; psychological distress; stress
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2.2. Prehospital Care: Air, Land, and Sea Operations

Another Type of Flying Doctor

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The world's commercial airlines have expanded dramatically in the past decade. The opening of new tourist destinations and the increase in tourist numbers have encouraged airlines to look at larger aircraft able to carry greater passenger loads over longer distances. The next generation of aircraft will be able to carry >500 people in a double-deck configuration.

At any one time, there are many hundreds of thousands of people flying. Many travelers today are elderly and a significant proportion have existing medical problems. The airlines dilemma is what to do should a passenger become ill on a flight. There are only two options, continue to the

destination or divert the aircraft.

The problems of illness on board aircraft and the current state of in-flight medical assistance and where it appears to be heading is reviewed.

Keywords: airlines; elderly; flying; illness; medical assistance; tourists
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Radio-Maritime Medical Services: The Singapore General Hospital Experience

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Medical care for the sick and injured on a variety of seafaring vessels throughout the world represents a challenging area of medical care, viz. maritime medicine. The scope of this field is extremely broad, and is unique in terms of the problems encountered at sea, logistical difficulties in assessment and treatment of patients, as well as in the provision of definitive medical care. Sparse resource availability, great distances, isolation, communications difficulties, accessibility, and weather are all very challenging problems.

In Singapore, radio-medical advice was first coordinated by the Port Health Authority until 1980, when the Accident and Emergency Department at Singapore General Hospital took over the responsibility of giving advice to ships on the high seas. About 100 calls for radio-medical advice are received annually.

The commonly-encountered problems, diagnoses, and frequently prescribed treatment will be discussed. The different modes of communication, provision of basic and continuing education, and skills upgrading for seamen, how to maintain standards of care on-board, as well as the latest in state-of-the-art techniques of telemedicine and video-conferencing will be highlighted.

Keywords: accessibility; communication; medical; radio-medical; sea; ships
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Research in Disaster Medicine

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Disaster Medicine is a new science and the development of a science requires information. As a science, we modify what we do in a given circumstance based on the validity and reliability of what we have learned through research integrated with our own experience. Such actions are tempered by the resources available or potentially available. Furthermore, it is not possible to obtain additional resources or generate change without supporting data.

Disasters are increasing in frequency, intensity, and scale. The damage resulting from an event can be assessed in terms of human, economic, and intangible costs. Obtaining accurate and reproducible information from each of these catastrophes is essential in order to mitigate these costs. Activities to mitigate the damage from future events may be directed toward elimination or modification of the hazards, decreasing the risks for actualization of the hazards (pre-event status), and/or in responses to the event from the initial responses through recovery and rehabilitation and constitute the objectives of disaster research and evaluation.

Disaster research, in addition to traditional medical research, e.g., randomized, controlled, experimental studies, requires qualitative research techniques that include structured interviews, surveys, and case-controlled studies. Similarly, the use of severity scores will become important. Thus, to accomplish good research in this field, we must learn new techniques and sampling strategies: ones that have high external validity, good internal validity, and high reliability. The results from their use have modified our approaches to subsequent events. The design of such studies is discussed in detail as the Third Template in the *Guidelines for Evaluation and Research in the Utstein Style.*

The sooner that a study is conducted after the event (if sudden-onset), the better will be the information obtained, as the information is perishable. Ideally, such studies should be done concurrently; but this raises some ethical issues, particularly in acute-onset events. Concurrent studies have great utility in the later stages of sudden-onset disasters and in delayed-onset or chronic types of disasters. Examples of successful projects will be discussed.

The time of anecdotal reports is past: the information obtained without a structure for data collection and analysis only serves to repeat what we already know and generally contributes little to furthering our science.

Keywords: costs; data collection; disaster medicine; guidelines; research; science; structure; techniques; timing; training
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The Future Direction of EMS in Singapore

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The current Emergency Ambulance Service (EAS) in Singapore is an amalgamation of the ambulance services of the Fire Service and Ministry of Health in the 1977. Its conversion to an emergency medical services (EMS) system utilising paramedics specialising in prehospital care, started in June 1998 and was completed a year later.

There are four challenges facing the EAS. First, it must be determined whether there is a need to further train paramedics from an EMT-Intermediate level to EMT-Paramedic level in view of factors such as the short transport time to the nearest hospitals and the longer period of training required. The current training system is based on a single-tier response and on that of the Justice Institute, British Columbia.

Secondly, the degree of medical direction required for the EAS as more procedures are made available for paramedics