Nota: Este documento no tiene disponible la página #178.

Información al Público y a La Prensa

- La misión de portavoz recaerá solo en los directivos del Hospital;
- Se habilitará un centro de información para los familiares de las víctimas y el público y otro para los medios de información (prensa, TV, etc.);
- El Comité emitirá un boletín periódico que proporcione información de interés público;
- El área de información quedará alejada de las áreas de tratamiento;
- El acceso de la prensa a las áreas de atención será rigurosamente controlado.

EMERGENCIA

Ingreso al Hospital

- Se realizará un Triage al ingreso al Hospital;
- El área de Triage será el único punto de acceso de las víctimas;
- El Triage será realizado por el Jefe de Urgencias;
- Las áreas de recepción y tratamiento de los pacientes categorizados estarán claramente identificadas con franjas de colores que facilitarán la circulación desde la entrada.

Identificación, Registro y Categorización de Pacientes

- Se registrarán a todos los pacientes que ingresen;
- Se llenarán todos los datos de las tarjetas de identificación;
- Las Tarjetas de Triage se elaborarán de acuerdo a los códigos propuestos por la OPS;
- Los criterios de prioridad en el tratamiento serán:
  1. Pacientes que requieren atención médico-quirúrgica de inmediato (código rojo);
  2. Pacientes graves cuyas lesiones no ponen en inminente peligro la vida y por tanto pueden esperar (código amarillo);
  3. Pacientes moribundos con lesiones graves o irreversibles o pacientes ambulatorios con tratamiento menor (código verde);
  4. Fallecidos (código negro).

Derivación de Pacientes

- Se tendrá en cuenta la posibilidad de transladar pacientes a otros centros hospitalarios cuando se considere necesario (cuidados mas especializados, cuando la demanda supere la capacidad, desastre interno, etc.);
- Se preveerán medios de transporte en coordinación con el Sistema de Protección Civil (autobuses urbanos, ambulancias, etc.).

Depósito e Identificación de Cadaveres

- El encargado del manejo de los muertos será el Departamento de Patología;
- Los cadáveres se transladarán al anfiteatro de ese Servicio;
- En caso necesario se utilizarán otras áreas como depósito;
- El patólogo será el responsable de la descripción de las víctimas auxiliado por los técnicos;
- Todos los datos de identificación se vaciaran en los formatos diseñados para este fin;
- Después de la descripción, los cuerpos se colocarán en bolsas plásticas junto con sus pertenencias;
- En caso necesario se embalsamarán los cadáveres;
- El tiempo de permanencia de los cuerpos en el Hospital dependerá de las autoridades gubernamentales;
- El reconocimiento del cuerpo lo hará de preferencia el familiar más cercano, de no existir, lo podrá realizar un amigo o compañero;
- El certificado de defunción lo expedirá la Agencia del Ministerio Público;
- Solo en casos especiales se realizarán autopsias, a petición del Ministerio Público y/o con la autorización del familiar responsable.

RESTABLECIMIENTO

- El Comité de Desastres informará a los departamentos y servicios del Hospital y al Cuerpo de Gobierno de la terminación del Plan;
- Las actividades del Hospital deberán retornar a su rutina;
- Cada Jefe de Servicio entregará un informe detallado de las actividades desarrolladas y una evaluación de las mismas;
- El Comité de Desastres convocará a una reunión de evaluación de la respuesta del Hospital;
- Se harán las mejoras al Plan de acuerdo a las propuestas sugeridas.

PROCEDIMIENTOS DE EVACUACION

- El Jefe Operativo decidirá si la evacuación es parcial o total;
- Cualquier persona ante un desastre de gran magnitud podrá accionar la señal de evacuación;
- Cuando se realice una evacuación parcial se evitará que el resto de los pacientes hospitalizados se percaten del operativo;
- Todo el personal del Hospital será enterado de una evacuación parcial;
- El personal entrenado dirigirá la salida en las puertas de emergencia;

- Los pacientes que puedan caminar serán acompañados por médicos y enfermeras a las zonas de seguridad;
- Se tratará que cada paciente lleve consigo su expediente clínico;
- Los enfermos incapacitados para caminar permanecerán en sus camas asistidos por un médico o enfermera, en tanto llegan las brigadas de rescate;
- Un médico con experiencia, debidamente protegido, realizará el Triage de los enfermos no ambulatorios, colocando trajetas con las prioridades de evacuación;
- En primera instancia el personal de las brigadas de rescate y voluntarios no médicos transladarán a los pacientes a las zonas de seguridad;
- El personal de quirófano abandonará el área y un médico o enfermera permanecerá asistiendo al paciente anestesiado;
- Las incisiones quirúrgicas de los pacientes se cubrirán con apósitos esteriles, fijándolos adecuadamente, antes de abandonar el quirófano;
- El personal y los pacientes se concentrarán en la zona de seguridad;
- Se colocará una ambulancia con radio en la zona de seguridad para establecer el puesto de comando;
- Los médicos y las enfermeras del Servicio de Urgencias delimitarán la zona de atención de víctimas, a esta zona solo tendrán acceso los integrantes de los equipos de atención;
- El Jefe Operativo será el encargado de comunicar las condiciones del Hospital al Sistema de Protección Civil;
- El Servicio de Trabajo Social levantará un censo de los pacientes;
- Seguridad delimitará la zona y evitará el ingreso de personas ajenas;
- El Departamento de Anatomia Patológica manejará e identificará a los cadáveres;
- Las brigadas de rescate, a criterio del puesto de comando, sacarán el material y equipo valioso señalado, después de evacuado el personal, los pacientes y las víctimas;
- El traslado de pacientes y víctimas a otros hospitales se efectuará en coordinación con el Sistema de Protección Civil;
- Los trabajadores que no están involucrados en el Plan de Desastres se retirarán de la zona de seguridad.

Aplicación y Evaluación del Plan

A partir de 1985 el Hospital Juarez de México fue rehabilitado en cuatro pequeños hospitales; en su sitio original (Hospital Central) se rehabilitaron los edificios que no fueron destruidos por los sismos y actualmente funcionan la Clínica de Cirugía de Estancia Breve con 20 camas y 4 quirófanos, el Servicio de Urgencias con 2 quirófanos más, Laboratorios, Radiología y Anatomía Patológica.

El Plan Hospitalario para Casos de Desastre fue elaborado por el Comité de Desastres que está integrado por el Director General, los Directores Médico y Administrativo, un Jefe Operativo cirujano general y dos subalternos, uno de Cirugía y otro de Urgencias. También participan la Jefa de Enfermeras, el Jefe de Trabajo Social y representantes de las Brigadas de Seguridad Hospitalaria; se han integrado, además, trabajadores que tienen un interés especial en las actividades de planeación. El Plan quedó terminado a mediados de 1987 pero ha sido modificado posteriormente para hacerlo más operativo.

El Plan se sometió a su primera prueba con un simulacro de desastre interno provocado por un sismo, en octubre de 1987. En ese ejercicio participaron trabajadores, estudiantes de medicina y voluntarios. El Jefe del Servicio de Urgencias se convirtió en el Jefe Operativo y accionó la alarma de evacuación general, después que las brigadas hospitalarias le informaron de un derrumbe y un incendio que comprometía a todas las instalaciones hospitalarias. El Puesto de Comando se organizó en una ambulancia, paulatinamente llegaron a ese sitio las autoridades del Hospital y representantes de Protección Civil, de los bomberos y grupos de rescate voluntarios. Se designó como zona de seguridad a una construcción colonial, teniendo en cuenta que ha soportado 400 años de sismos sin dañarse. A este sitio se transladarn los pertrechos de acuación y se instaló una zona de atención de víctimas y de triage. Los trabajadores del comedor transportaron depósitos de 4 litros de agua potable; el personal de farmacia cargó con las cajas de medicamentos y material de curación, el personal de mantenimiento llevó las herramientas y las plantas de luz portátiles. La evacuación de los pacientes internados e imposibilitados para caminarla realizó inicialmente el personal del Hospital con camillas de lona. Las prioridades de la evacuación las determinó un médico con experiencia, colocando tarjetas de acuerdo al código establecido. Las brigadas hospitalarias de rescate y contra incendios trataron de sofocar el fuego y de sacar a tres víctimas atrapadas en los escombros; al llegar los bomberos y el personal de rescate extrahospitalario se integrarón a estas actividades. Los pacientes fueron transladados a otros hospitales en autobuses del sistema de transporte colectivo estatal, los acompañaron las trabajadoras sociales y las enfermeras para recabar los datos de su destino e informarlos posteriormente a los familiares. El simulacro se prolongó 45 minutos.

Evaluación final: 1) el operativo cumplió el objetivo principal que fue probar el Plan Hospitalario; 2) la integración del Hospital al Sistema de Protección Civil fue adecuada; 3) hubo falta de comunicación interna por

no contar con un sistema portátil; 4) las brigadas de rescate y contra incendio son insuficientes; 5) hubo dependencia importante de las brigadas extrahospitalarias para el rescate y traslado de los lesionados; 6) el personal del área administrativa no se involucró adecuadamente al simulacro; y 7) se requiere agilizar el tiempo de evacuación.

En 1988 se simuló en el edificio de Cirugía de Estancia Breve un sismo. Participaron el personal y pacientes reales y simulados. Después de 2 minutos en que las brigadas de seguridad identificarón un derrumbe y un incendio, se activaron las alarmas de evacuación general en el edificio. La salida de los trabajadores fue ordenada, siguiendo los señalamientos hacía el estacionamiento aledano que se designó como zona de seguridad. Personal capacitado y con distintivos visibles dirigió la evacuación en las puertas de salida y las escaleras. Un cirujano general realizó el Triage a los pacientes hospitalizados no deambulatorios. En el quirófano, en el tercer piso, se simuló un derrumbe parcial que impedía la salida a personal y pacientes, que tuvieron que ser evacuados por personal capacitado descendiendo en camillas especiales. Se utilizaron perros adiestrados para localizar a dos atrapados en la zona de derrumbes.

El puesto de comando se instaló en una ambulancia con radio en la zona de seguridad, en donde se levantó un hospital de campaña para atender a las víctimas y controlar a los pacientes evacuados, en tanto eran trasladados a otros hospitales. El Servicio de Urgencias, que no sufrió daño, puso en práctica su Plan:

Aumentó su capacidad operativa utilizando la sala de espera para la atención de víctimas con código verde, se colocaron 10 camillas de lona plegadizas; 1 área de Urgencias de Pediatría se habilitó para recibir a los lesionados con código amarillo en 6 camas, atendidas por 2 grupos de atención; la zona de Urgencias de Adultos se convirtió en el área de atención intensiva para los pacientes con código rojo, con 4 camas y 4 equipos de atención. El Triage lo realizó el Jefe de Urgencias a la entrada al Servicio. El Departamento de Anatomia Patológica se hizo cargo de 2 cadáveres que describió para su identificación. Seguridad cerró las puertas periféricas y restringió la entrada y salida de personas.

Los trabajadores se anotaron en una libreta al salir del Hospital.

Evaluación:

1. Eel Hospital fue autosuficiente en los primeros minutos;
2. Se requiere de un sistema interno para la evacuación de pacientes y personal de las plantas altas;
3. Nuevamente falló la comunicación interna por carecer de aparatos portátiles;
4. Se requiere de radiocomunicación en el Servicio de Urgencias;
5. Mejoró notablemente el ejercicio y los tiempos se gilizaron;
6. La comunicación real con la Unidad de Protección Civil fue inadecuada; y
7. La instalación del hospital de campaña fue rápida y se propone mantener una zona de almacén en el área de seguridad con planta de energía eléctrica portátil y herramientas.

La prueba definitiva de un Plan Hospitalario son las situaciones reales. En el mes de abril de este año un sismo de 45 segundos de duración y de 6 grados en la escala de Richter sacudió a la Ciudad de México. El desprendimiento del material del recubrimiento de la Clínica de Cirugía de Estancia Breve provocó que se accionaran las alarmas de evacuación general. El personal, los pacientes y visitantes siguieron las vias de evacuación y se colocaron en la zona de seguridad. Dos pacientes que se encontraban bajo anestesia general permanecieron en el quirófano asistidos por los anestesiólogos hasta que llegaron las brigadas de rescate y pudieron ser tranladados al Servicio de Urgencias que activó su Plan tal y como se tenía previsto. En muy poco tiempo la Clínica ya se encontraba vacía. En Urgencias se atendió a un paciente que se provocó una fractura expuesta al arrojarse, presa del pánico, del segundo piso de un edificio contiguo al Hospital, el resto de las víctimas fueron atendidas por crisis emotivas. Una vez que el Comité de Desastres informó la terminación del Plan y que se realizó un peritaje especializado del edificio, se continuó con el trabajo normal.
Evaluación: a) no hubo daños estructurales de los edificios, b) el Plan se comprobó en una situación real, c) el personal ha aprendido a manejar el miedo, ya que la mayoria es sobreviviente de los sismos de 1985.

El contar con un Plan para Casos de Desastre es un gran avance en la organización de una institución que perdió muchas vidas en 1985. Ante la perspectiva de un Hospital nuevo, estamos seguros que podremos enfrentar de manera más segura y efectiva las posibles situaciones de emergencia.

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DEVELOPMENT OF EMERGENCY MEDICINE IN JAPAN COUNTRY CASE STUDY

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BASIC COUNTRY STATISTICS

Japan, situated in the northwest Pacific Ocean, consists of four major islands and several hundred smaller islands. Sapporo in Hokkaido is at a 43 degree northern latitude and Naha in Okinawa is at 26 degrees. Mountainous regions make up about 80% of the islands, and the plains which are convenient for human life are only about 20%. More than 76% of the population dwells in urban areas. As Japan is located in the volcanic and earthquake band of the Pacific Ocean, earthquake attacks are frequent, especially in the Kanto-Tokai area. Typhoon and heavy rainfall disasters are also not infrequent, though the number of dead and wounded in these disasters was smaller than 200 annually in the recent ten years. The population of Japan is about 122.8 million and population density is 325 persons per square kilometer. Its population ranks fifth highest in the world and is about nine times the world average. Taking the geographical distribution of the population into account, you may easily imagine how high the population density is in the urban areas of Japan. Life expectancy at birth is the longest in the world; males surviving 75.61 years and females 81.39 years respectively in 1987. Malignant neoplasms, heart diseases and cerebrovascular diseases are the major three causes of death at present. Major causes of death of the new born are congenital diseases, trauma, accidents at birth, and pneumonia. In children 10 years old and younger, the major causes of death are accidents, congenital diseases, and malignant neoplasm. Suicide ranks as the top cause of death in the young working generation, 20 to 29 years old, followed by accidents, malignant neoplasm, and heart diseases.

OVERVIEW OF HEALTH CARE SYSTEM

1. Decision makers: The government decision-making structure is actually in the Diet, but preliminary policy planning is usually made by senior personnel of government organizations. Including experts and authorities, concerned ad hoc councils are often called to discuss important social problems and policy is drafted according to their report. However, it cannot be denied that the Japanese Medical Association, which is basically a mouthpiece for general practitioners, still has its power to influence policy making.

2. Health Insurance System: The health insurance system was started in 1922 for a limited number of company employees and government officials, expanding its scale to the employees of smaller companies after World War II. In 1958, a new comprehensive insurance system was started, which covered not only the company and government employees but also the owners of small shops, farmers, and even the unemployed. This system is completely under the control of government and is compulsory to every people living in Japan. In 1973, a medic-aid system for elderly people over 65 years old was implemented.

3. Medical Facilities: There were 9,699 hospitals and 76,369 clinics in Japan in 1986. 71.6% of the hospitals are private, and large scale general hospitals with more than 400 beds are only about 8% of all the hospitals. The number of hospital beds was about 1,534,000 and was about 12.6 per one thousand population.

4. Major Problems in Health Service: The number of physicians and nursing staff is not yet sufficient, but there is difficulty in finding employment for nurses and doctors in some areas. The number of physicians is predicted to double by the year 2025 if medical students are cultivated at the current rate. Japan is now facing a big problem of a large society of senior citizens. The ratio of the elderly over 65 to the whole population was 10.9% in 1906, but will be 23.6% in 2020. Though a definite and satisfactory policy to cope with this problem has not been established yet, it is eagerly studied today in various ways.

OVERVIEW OF EMERGENCY HEALTH CARE (EHC) SYSTEM

As far as emergency patients are concerned, those with mild symptoms who are able to go home after consultation are the most common. However, looking upon the quality of medical care, casualties of road traffic accidents still create a large problem. In recent years, emergency medical care for the elderly people is obviously increasing in importance.

1. Prehospital emergency health care: As toll free ambulance service is provided by the fire department of local municipalities, the prehospital EHC provider is basically ambulance-based paramedical personnel of fire departments. Ambulance service with physicians or nurses on board is rarely seen. Although many hospitals have their own ambulance cars, these ambulances are usually used to transfer inpatients to other medical facilities. In 1987, 3,021 local governments were providing ambulance services and there were 3,890 ambulance teams and 4,443 ambulances. Response time of ambulances (time from 119 alarm to arrival at the site of accident or patient's home) is very short; for example, the average response time in Osaka City is 4.6 minutes. The educational level of the ambulance crew is not as high as that of the EMT or paramedic in the United States. 135 hours of medical curriculum is the only requirement for becoming an ambulance crew member. Therefore, at this moment, they are not allowed to start IV fluid or to intubate an endotracheal tube. They are authorized to do simple first aid such as basic life support, control of external bleeding, and fixation of fractured extremities. Since 1983, September 9th is designated as the special day for emergency health care. First aid training classes and exhibitions are often held in many local communities on that day.

2. In-hospital EHC providers: In-hospital EHC personnel are different from facility to facility. In almost all the night and holiday emergency clinics, general practitioners without any special training are working by turns, and specially trained physicians are working in all life-saving emergency centers. No trained technicians or auxiliary personnel are authorized to work as primary emergency health care providers in Japan. In hospitals with a tertiary emergency center, emergency medical service is provided mainly in the specialized emergency department or the trauma center. In the hospitals ranked as secondary emergency medical facilities, EHC service is provided by their standard medical and surgical department.

3. Emergency communications system: The emergency communications system relies mainly upon the telephone. The emergency telephone number 119 that connects to ambulance dispatch center prevails throughout Japan, and the communication between dispatch center and ambulance is done by wireless phone, while communication between dispatch center and hospital is usually done by telephone. In 31 prefectures, Emergency Medical Information Service Centers are settled, coordinating with ambulance dispatch centers and hospitals, and providing information about the nearest emergency medical facilities, vacant hospital beds, specialists on duty, etc. with the people who need the information. The importance of a poison information service was not given attention for a long time, but the earnest endeavor of emergency physicians moved the Ministry of Health and Welfare, and the Japan Poison Information Center was established in September 1986.

EHC DEVELOPMENT HISTORY

Before 1960, there was no well-organized emergency medical services system in Japan. Due to the rapid development of industry and motorization in the 1960s, casualties of road traffic accidents and industrial accidents increased rapidly. As these casualties were mostly healthy, young people whose future contribution to the society was quite promising, it came to be considered a serious social problem. Taking this into account, several countermeasures were planned and executed.

1. Designated emergency hospitals: One countermeasure was the implementation of a "designated emergency hospital" system and another was to obligate municipalities to create ambulance services within their fire department. The former was defined by an ordinance from the Ministry of Health and Welfare in 1964 and the matter was started in 1963. Required qualification for the designated emergency hospitals was rather simple, such as to equip a general anaesthesia apparatus, operation rooms, and a surgical team ready at any time. The target of this kind of medical service system was obviously surgical emergencies. However, those hospitals which responded to the "designated emergency hospital" ordinance were mostly small private hospitals. The large-scale general hospitals and the hospitals attached to medical colleges were not at all cooperative toward this policy. At that time, there was no association or affiliation of emergency medical facilities, and ambulances were merely carrying patients to the nearest hospital or clinic however serious the patient's vital signs were. On the other hand, the level of modern sophisticated medical care even in

large general hospitals had developed a great deal, and the discrepancy between the level of ordinary medical services in the big general hospitals and emergency medical services became more and more prominent. Another problem we faced was the change of the types or quality of emergency patients. Trauma surgical patients by traffic and industrial accidents began to decrease while the number of acute ill patients showed rapid increase.

2. Establishment of the Japanese Association for Acute Medicine: In 1973, the Japanese Association for Acute Medicine (JAAM) was established. This medical association has not only provided opportunities to discuss scientific studies but has also made many proposals on emergency health care policy. Accepting the advice from this medical association and the report from the ad hoc council on emergency health care system, the Ministry of Health and Welfare allocated a yearly budget for a nationwide systematic reorganization of the emergency medical service system.

3. Critical Emergency Transfer System: The new EHC system, which is called the "Critical Emergency Transfer System" started in 1977. In this new EHC system, emergency medical facilities are divided into three categories; primary, secondary, and tertiary. Coordination of different level medical facilities and transfer of patients among these facilities is strongly recommended. Primary emergency centers are prepared for patients with minor injuries or mild diseases who do not need hospitalization. Municipalities with a population larger than 50,000 are obliged to operate these primary emergency centers at night and holidays. Members of the local doctor's associations usually cooperate in this project. At the end of fiscal year 1987, 481 night and holiday emergency centers were operating, and in 721 areas general practitioners opened their clinics by turns for 24 hours for primary emergency medical care. Secondary emergency medical centers are mostly medium-sized hospitals like city hospitals or county hospitals and are responsible to those who need in-hospital care. By the end of March 1987, 367 cities registered their hospitals as secondary emergency centers. Tertiary emergency medical centers are called life-saving emergency centers, which are synonymous with shock-trauma centers. They are equipped with the most sophisticated medical equipment and have a large number of well-trained personnel to save the lives of very serious patients. Ambulance crews or physicians working in the primary or secondary emergency centers select the patients and send them to the tertiary centers. It was planned to build one center for every million people, and there are now 101 tertiary centers in Japan. Roughly speaking, out of 100 emergency patients, ten need hospitalization (secondary centers), and one needs life saving care.

ANALYTICAL OVERVIEW

There is no doubt that emergency health care services should be checked and improved in their quantity and quality. In that sense, the idea of dividing emergency patients into three groups according to their severity and to classify medical facilities into three categories by their capabilities was apparently successful. After the introduction of this new system, general practitioners who had not been cooperative in emergency medical services before came to be involved in working at night and holiday clinics by turns only several times a year. Thus the problem of quantity of EHC services was solved. The burden of EHC service on the mid-sized hospitals is also much relieved since the number of emergency cases has been reduced due to the operation of primary centers. In addition, they are able to transfer the most difficult patients to the tertiary emergency centers. Many of the big general hospitals which had not been cooperative in emergency medical services in the past opened tertiary emergency centers, resulting in higher level and more up-to-date emergency medical services. In this new system, there are still several problems. First, as tertiary emergency centers are distributed in the big cities, it takes too much time to transfer a severe patient from a rural area. Helicopter transportation should be effectively used, but it is not yet popular. Second, people do not always understand these new emergency medical services well and may visit tertiary centers directly with only minor complaints, or they sometimes go to primary centers with a serious condition. Third, emergency medical services in specialized medical fields such as ophthalmology, ENT etc., are not well-organized. Fourth, technical achievement of ambulance crews is not sufficient, and as ambulance service is free, people are apt to use ambulances too easily even if their condition is not emergent and serious. Finally, the beds at tertiary emergency centers are apt to be occupied with elderly patients who have little hope for returning to society as active members.

The costs and benefit of emergency facilities are difficult to evaluate, but undoubtedly tertiary emergency centers need large amounts of money. It is highly desirable to revise the Physician's Practical Act and let the ambulance crews do higher level first aid and to change the curriculum in the medical college making the emergency health care program compulsory. To strengthen the departments of emergency medicine at medical colleges is also a very important matter. The emergency health care services system in Japan are a little behind those of other developed countries, but it is apparent that it was pushed forward by the efforts of

active members of JAAM. In this regard, the cultivation of specialists in emergency medicine was, is and will remain very important.

EMERGENCY MEDICAL ASSISTANCE IN THE METROPOLITAN AREA OF PORTO ALEGRE: PRESENT AND FUTURE[10] [11]

Cláudio Henrique Wolff[12] [13], Fábio Segal[14]

THE CITY

Porto Alegre is the Capital City of Rio Grande do Sol, the most southern state of Brazil, bordering on Argentina and Uruguay.

Greater Porto Alegre comprises the city plus 16 neighboring towns where 2.5 million inhabitants live.

In this area there are thirty hospitals, which hardly ever have proper conditions for emergency health care. Twenty four hospitals have Intensive Care Units (ICU). The HPS of Porto Alegre City Council, is the only one specialized in and prepared to offer this kind of service 24 hours a day.

There is a lack of linkage among the various hospitals in order to coordinate their forces to reach an emergency medical system.

The downtown area of the city of Porto Alegre lies mainly in a peninsula by the Guaiba River. Its urban development has not been planned.

There are many narrow streets, and consequently many traffic jams, which bring a lot of harm to people who need fast transportation to any hospital, even HPS.

THE HOSPITAL DE PRONTO SOCORRO (HPS)

The HPS is a building with over 8.000 km2 with 135 beds, a staff of 1,200 people, including 300 doctors, 30 of whom are on permanent 24-hours duty. This public institution has been working for 45 years, assisting now up to 600 patients daily in the various emergency medical specialties. Five percent of these patients arrive politraumatized, as a result of either traffic casualties, home and work-related accidents, or aggressive criminal assaults. There is a special room called "Poli-PAR" aimed at assisting either polytraumatized and/or high-risk patients simultaneously as soon as they arrive at the hospital. It is like an ICU related to the reception area of HPS.

Computerized Tomography equipment is being bought and the new 400 km2 area for burn patients is being finished. The ICU has 12 beds. The surgery center offers five surgery rooms: There are clinic, cardiology, traumatology, neurology services, and everything else that such a hospital basically needs. There is no assistance only for gynecological and obstetric urgencies. Children in general and patients who need extra-corporeal circulation for surgery are referred to another hospital nearby.

The HPS receives as trainees, students of Medicine, practitioners, residents, nurses, social service officers, policemen, fire fighters, scouts, etc. HPS has just been asked to become the curricular hospital for students of Emergency Medicine.

THE COMMUNICATION SYSTEM, FIRST AID AND TRANSPORTATION

The communication system in the metropolitan area of Porto Alegre in emergency situations is based on telephone, and four ambulances with radio systems, simultaneously linked to the HPS and to the firefighters' Central Station. The police help to inform the hospital, specially when a bigger accident happens. Periodically the State Civil Defense Committee makes rescue exercises for simulated accidents in which the HPS participates together with other private and public institutions.

Although some efforts have been made, no specially prepared personnel does the first aid on the site of the accident: so, everyone does his/her best and tries to forward the victims as fast as possible to the hospital, mostly by taxis, private cars or police cars. On arrival at the HPS, the patients are selected for the clinic or for the dressing or for the "Poli-PAR" room. Almost five percent of the ambulatory patients become in-patients, who have a turn-over of about three days; then they either are referred to a general hospital or are discharged.

THE HOSPITAL DE PRONTO SOCORRO - 140,000 PATIENTS IN 1988

In 1988, 140.000 patients arrived at HPS and 190.000 procedures were delivered - a daily average of 525 procedures and about 200 hospitalizations, with greater occupation of ICU and surgery, traumatology, and neurology infirmaries. The main causes of emergency assistance were bad falls (15%), injuries (8%), aggressions (7%) and traffic accidents (6%). The general mortality rate is 8.22%, including the 18 high-risk or trauma patients who arrived daily at the "Poli-PAR" room. The highest mortality occurs among trampled people and the gunshot victims.

ALCOHOLISM AND MORTALITY

A prospective study (Fleck, M - HPS, 1988) showed a 17.2% Mortality among alcoholized traffic accident victims, in comparison to 6.9% of non-alcoholized patients (p/0, 05) and 9.4% of the general mortality of this kind of incident.

TRAFFIC ACCIDENTS

In 1988 traffic accidents brought over 10,500 patients to HPS (an average of nearly 30 patients daily) making 6% of all patient encounters and 30% of all hospitalized.

About 40% are victims of tramples, 25% are motorcycle riders (mean age 24 yrs. old) and 21% are vehicle crashes.

HOSPITALIZATIONS

The review of the 600 hospitalizations in May 1986 shows 12% of them because of aggressions and assaults, almost 50% by hand weapon and 25% by gun. After traffic accidents and criminal assault victims come the home-related accidents, as bad falls and injuries, about 15% of the 600 patients. The yard and the kitchen were almost frequent places where the domestic accidents occurred.

THE WORK-RELATED ACCIDENTS

Now, let us see some data about the work-related accidents which were about 3,500 out of 70,000 patients assisted in the HPS during the first semester of 1989. The average was 5.21% of the ambulatory patients and 2.42% of the hospitalized ones. Brazil is the world champion of work-related accidents. For instance, one and a half million accidents happen per year, 300,000 fingers are amputated yearly and one worker dies every two hours during the work shift. Such terrible numbers motivated the foundation of a Committee for the Humanization and the Safety of Work, composed of engineers, doctors, psychologists and social attendants who do not have any linkage to parties, government or labor unions. Businessmen and workers have no real conscience about the damage they suffer, investing very little in the safety and prevention of the work-related accidents.

There is a workers' cultural deficiency and the government is not efficient at forcing the obeyance of laws. In other words there is an overall lack of education concerning safety and work. The employer counts on one of the cheapest labor markets in the world; reason for a bigger profit and chance to foreign export; therefore they are not interested in the safety of their workers.

THE WORK IN THE "POLI-PAR" ROOM

Taking a look only at the work in "Poli-PAR" room, we can see it grew from 3% in 1985 to 6% in 1989 of the entire assistance delivered by the HPS. The main causes among 463 "Poli-PAR" patients, were traffic accidents (45%), aggressions (22%), domestic accidents (18%) and clinic or cardiology diagnosis (11%). Almost 50% of these trauma patients needed at least one of these medical specialists: neurologists, surgeons or traumatologists. Forty percent were referred to the ICU, 8% to the clinic and cardiologic infirmary and 2% underwent burn or plastic surgery hospitalization.

THE PLAN FOR THE FUTURE

The last point we would like to make is in regards to emergency medical care in the metropolitan area of Porto Alegre, in the near future.

Only 58 out of 401 hospitals that assist the social welfare patients in the State of Rio Grande do Sul maintain an ICU. Twenty out of 24 ICUs in the metropolitan area are located in the hospitals of Porto Alegre. So, 2/3 of the ICU beds of the state are in our Metropolitan Area, mostly in PA itself. These conditions should obviously be addressed in any plan. Ten public health ambulatories located in the most inhabited areas and near to the farther suburbs will give primary emergency health care, forming a ring around the city. Thirty-five ambulances will transport the patients from the site of the accident to the nearest first aid institution.

Some ambulance crews will be firefighters prepared as paramedics and will be designated to assist particularly serious emergency situations. Some patients will need an emergency room in the metropolitan hospital chain. Other selected patients, because of their life threatening conditions, will be taken to the HPS, which hopes to become a trauma center.

The Public Health Ambulatories will be expected to be able to assist medical emergencies mostly for about 18 to 24 hours a day, making primary investigations as blood cell count, simple urinalysis, chest and bone extremities x-ray, as well as vein puncture, little sutures, first bone immobilization and primary reanimation management. The secondary emergency health care will be offered by the hospital chain and it is planned to divide them in specialties like clinic, surgery, traumatology, neurology and so on. For trauma patients there will be the HPS (and, may be another reasonably large hospital - the Cristo Redentor) as a tertiary health care hospital. Other patients that need special tests in difficult diagnosis cases, will be referred to one of the three university hospitals of Porto Alegre, which serve as the final referral centers.

ROLE OF A VOLUNTARY AGENCY IN THE DEVELOPMENT OF ACCIDENT AND EMERGENCY SERVICES IN A DEVELOPING COUNTRY:

A CHALLENGE AND LESSONS TO LEARN

Dr. Gautam Sen, MS FRCS
Founder Secretary General and Vice President
Association for Trauma Care of India

"Trauma is the most severe, most complicated disease of the modern mankind. It arrives on your door step when you least expect it and when you don't want it.

If you are not prepared to meet the challenge at that particular moment - you are simply killing them !! "

Dr. R Adams Cowley
Shock-Trauma

" But Dr. Cowley, the sophisticated Emergency Medical System is alright in a developed rich country like yours. Don't you think a poor country with resource constraints - can little afford the cost of developing such system - we just don't have the money!! "

" You have the money alright. You just don't know how and where to use it!! "

TV Interview with Dr. Cowley
March, 1987, Bombay, India

India, after 42 years of independence, is poised on the threshold of emerging as one of the developed nations of the world. As an aspiring developing nation it wanted to get into the fast track to catch up with the modern world. That it has succeeded to a great extent is reflected in its GNP per capita which today stands at Rs 2749 as compared to GNP per capita of Rs 255 at the time of Independence. The task of building a nation when the odds were so much against it was formidable indeed. One of the most populous countries in the world, next only to China, supporting 15.4% of the world population in 2.4% of the world's land area, it chose the path of democracy, mixed economy and industrialization, so that the majority of citizens who were in poverty could improve their standard of living and hope to aspire to a decent living comparable with the standard of living of their counterparts in other developed nations.

In the field of health care it has had considerable achievement. Mortality rates dropped from 27.4 to 12.2 per thousand population, life expectancy increased from 32 to 56 years, and the infant mortality rate dropped from an appalling 140 to 66 per thousand. Smallpox has been eradicated, and malaria brought under control to a considerable extent. The health infrastructure is fairly well spread and well developed through successive 5 year plans, the latest being the 8th 5 year plan, largely following recommendations of WHO: having basic units of primary health centers for 30,000 population, having subcenters at village levels for 5000 population, one community rural hospital of 30 beds for every 5 primary health center, and a district hospital as referral hospital for community hospitals in the locality. Medical colleges and apex institutes serve as training grounds for medical and nursing students. India has 125 recognized medical colleges training doctors in allopathic medicine, the curriculum and nature of training being the traditional British system of early training in basic sciences followed by clinical training in all the fields of medicine and internship before graduation.

In successive Health Policy Plans developed as an integral part of five year plans, the emphasis has always been on control of infectious diseases, control of communicable diseases, maternal and child health care, family planning and family welfare, national blindness control program, cancer control program and lately, thanks to the publicity, the AIDS control program.

The care of the injured or development of accidents and emergency services has not even been mentioned in various working groups established among prominent medical personalities as a topic for consideration in developing India's policy. It is truly a neglected disease, as it was in USA in 1966 when that brilliant document was published, "Accidental Death & Disability: The Neglected Disease of Modern Society," prepared by the National Academy of Sciences.

The situation today in India is as grim as, if not worse than the US in 1966. The tragedy is that this is in spite of a good health care infrastructure which is well spread through various levels of health care facilities for a designated population.

THE PROBLEM

The fast track development of a country with a basic agricultural economy and population brought along with its progress and prosperity the "new disease" of modern society. With rapid industrialization came rapid infrastructure for its development - the roads and vehicles - both on highways as well as railroads. In India since independence, there has been a three fold increase in road surface, with a ten fold increase in vehicle population. The vehicle population has increased from 4.5 million in 1980 to over 12 million. Every year 1.7 million vehicles take to our roads. (IRF 1988) Granted, the vehicle population is 1/3 that of comparably developed nations, but considering that available road surface is low and population density is high, this increase in vehicle population becomes a significant factor.

The sudden influx of modern machinery brought three evils, primarily responsible for an alarming rate of accidents - bad drivers, bad roads, and badly maintained vehicles. In India, 80% of all accidents occur due to bad drivers. The licensing is lax and traffic rules scarcely observed. Enforcement authorities to monitor and punish traffic offenders lack authority and clout. Ninety percent of all accidents occurring on highways are due to heavy duty vehicles which are badly driven as well as badly maintained. Until this year, the outdated motor vehicle transport act permitted anyone who had studied through class IV in his junior school and was above age 18 to apply for a license to drive heavy duty vehicles, the majority of truck drivers being illiterate. As regards road worthiness of vehicles, there is to date no legislation to

check or regulate vehicles. All these lacunae are being corrected in a move to amend the motor vehicle transport act in the current session of the Assembly, but it is encountering problems due to opposition by groups in the transport industry unions.

The statistics of road accidents in India is alarming to say the least. Every 2.4 minutes an accident occurs on Indian roads. There are 45 deaths per ten thousand vehicles in India as compared to 2.5 deaths in the US, 5 deaths in the UK, 3.2 deaths in Australia, 8 deaths in Singapore, 10 deaths in Thailand and 167 deaths in Indonesia. 1984 studies done by WHO show that road accidents account for 2.5% of total deaths recorded in developing countries like India. In the age group of 5-44 it is as high as 10% and is among the six leading causes of death. International traffic experts estimate the loss of production and hospital expenses caused by accidents amount to 1% of GNP. In India it amounts to Rs 2000 crores per year (20,000 million Rupees).

In India, 40,000 people die on roads every year and 1,250,000 get seriously injured. That is equivalent to 123 kanishka crashes every year. And yet these appalling statistics do not reveal the human tragedy; a life ended, a family shattered. A nation with so many resource constraints cannot afford to lose a potentially productive citizen. Natural disasters due to floods and droughts are a common occurrence, coming at regular intervals. Added to this now are chemical disasters - the man-made disasters brought on by the rapid industrialization of a country attempting to catch up with the rest of the world. The Bhopal gas tragedy in 1984 drew the attention of the world to the challenge an aspiring developing nation faces in coping with modern technology, heralding the potential of mass tragedy due to lack of disaster preparedness and neglect of risk evaluation to the community in which the technology boom is thrust in the name of progress and prosperity.

ASSOCIATION FOR TRAUMA CARE OF INDIA

Against this grim background, the Association for Trauma Care of India was established in March 1981 as a national association. The founding fathers of this association realized that the care of the injured or prevention of injury or its aftermath and rehabilitation is beyond the scope of mere medical attention. It is a unique body where membership is open to all who feel attracted towards its aims and objectives and feel like contributing towards the cause - the prevention of accidents, better management of accident victims, and rehabilitation programs for the injured.

ATCI members are from all strata of life, medical professionals, leaders of industries, professionals, societal leaders, government bureaucrats, traffic police - truly a multidisciplinary effort to improve, contribute, activate, and at times play the role of catalyst in the development of accident and emergency services in the country Having influential members of the society in all fields, helped in catapulting the association's objectives in several fields, simultaneously and rapidly.

GOLDEN HOUR PROJECT (NOVEMBER 1985)

ATCI, in its early years, came out with several studies addressing the cause of the high mortality rate once an accident occurs.

The salient causes of high mortality and morbidity rate were:

1. Inadequate communication and delay in notification;
2. Inadequate rapid transport system;
3. Non-existent or primitive prehospital care;
4. Poorly equipped casualty and emergency rooms;
5. Non-existence of trauma center; and
6. No significant rehabilitation program.

It was felt that the association should contribute and initiate some remedial measures on its own initiative without waiting for the government to develop the Golden Hour concept inspired by the early pioneering work done by Dr. R Adams Cowley in the state of Maryland. The city chosen was Bombay - India's commercial capital where 2 deaths occur on the roads every day, and the state of Maharashtra, in which 12 die on the highways every day.

It as decided to start India's first radio controlled ambulance service in the city of Bombay with a central coordinating center. Initially, the Western India Automobile Association provided the space (later to be replaced at a better location) on top of a multi-story building in the heart of the city. The ambulances and equipment were donated by various industries and the government, with various facilities in expediting the project. A toll free number was provided and radio frequency granted for the project. However, in spite of all this initial ground work, it was limping through and was not getting the impetus it needed. It got the necessary boost when one of the dynamic members of Parliament from the city, Mr. Murli Deora, who also happened to be an ATCI member, came forward to launch the project as a joint venture with ATCI which was to be projected as a gift from his party to the citizens of Bombay as part of its centenary celebration of his party. ATCI was quick to grasp the opportunity as long as its purpose was served, and the project was formally launched by the Prime Minister Mr. Rajiv Gandhi in November 1985. Since then, it has responded to more than 7500 calls of all kinds of emergencies. Seven radio controlled, well equipped ambulances are placed at vantage points and the central control room is situated in the center of city with radio operators and a supervisor. ATCI medical members are on call if they are needed.

The Golden Hour Project is thus a symbol for the nation that if there is will and commitment significant

contribution can be made from the society itself in the form of self help and thus attract various agencies interested in developing prehospital services.

The state government is now seriously considering extending its radio receiving stations to various major hospitals in the city of Bombay and also to develop pre hospital services in the state in general and along the region of Pune Kolhalpur highway in particular as a pilot project. Already various states in the country are asking for the blueprint and the modus operandi to start such projects in their respective states.

ATCI has thus started the ball rolling in this very important area of accident and emergency services development - namely the prehospital services which includes network communications, well equipped ambulances manned by emergency medical technicians and bridging the communication gap between various agencies.

NATIONAL DISASTER MANAGEMENT PLANS: NDMS USA, ATCI GOVERNMENT OF INDIA, (AUGUST 1987 NEW DELHI)

The concept of developing a National Disaster Medical System came from the pioneering work done by NDMS, USA. The Bhopal gas tragedy being fresh in mind, the need for a National Disaster Management Plan was acutely felt. NDMS USA, the Public Health Department, USA provided the background materials and necessary impetus.

A National Conference was organized in New Delhi in August 1987 and for the first time in the history of the nation, various agencies both inside and outside the government, private sector industries, public sector, airport authorities, railways, oil and national gas authorities, and most importantly the armed medical services representing army, navy, and air force came together on one platform to discuss various issues concerning disasters and disaster preparedness. ATCI was thus a catalyst to bring the various agencies together for the first time and stress the importance of working together in a coordinated way at times of disaster. This itself was quite an achievement.

The recommendations formulated at the conference are now under active consideration of the government. This conference set the ball rolling and was followed by several other regional workshops at various state levels, notable among them being in Nagpur organized by WHO in October the same year and in Bangalore in 1988.

PUNE-KOLHAPUR, NATIONAL HIGHWAY 4: PILOT PROJECT TO DEVELOP ACCIDENT AND EMERGENCY SERVICES AS A SYSTEM APPROACH

In the middle of 1988 ATCI approached the state of Maharashtra with specific proposals for a systems approach to develop EMS in the state. It specifically drew the attention of the state towards the following remedial steps.

1. Development of disaster management plans for the state and the city;
2. Development of a trauma center: Level I,II,III, and IV hospitals;
3. Upgradation of district hospitals in equipment and manpower to manage major trauma;
4. Training of emergency medical technicians and development of an EMT cadre;
5. Standardization of ambulances, equipment and manpower - prehospital services;
6. Network of communication and transport; and
7. Development of various protocols.

The Chief Secretary of the state, who also happens to be honorary ATCI member, called for a meeting in October 1988 of all department Heads, including police, fire, and civil defense organization chiefs.

A working group was established to suggest to the state how best the above steps could be implemented in the government.

ATCI, along with Department of Public Health and Family Welfare of the state of Maharashtra, decided to take up a designated defined area where all the above aspects of a systems approach could be implemented and set an example to the rest of the state to follow.

Danbury hospital in Connecticut provided technical knowhow to develop India's first emergency medical technician's course, which was inaugurated on July 4, 1989. It was a 9 day course organized in the Civil Defence Staff College and GT Hospital, Bombay, Pune is the second largest city in the state and Kolhapur is the third largest, covering between them a 260 sq. km. area. National Highway No. 4 connects the two cities, including 3 Districts, and the accident rate on this particular highway is one of the highest in the state. The stretch between the two cities includes a good mixture of Level I, II, and III hospitals and the most important factor was the enthusiasm of the various health personnel along the stretch to participate in this pilot project and develop a systems approach encompassing the above elements.

The project case study is published separately in details. All the basic elements of EMS and systems approach are incorporated in this project which was scheduled to begin functioning in December, 1989.

ATCI is actively working to develop trauma centers with the Apex Institute in GT Hospital, Bombay.

JOINT COLLABORATION IN VARIOUS FIELDS OF TRAUMA CARE WITH DANBURY HOSPITAL CONNECTICUT, USA

Early in 1989, ATCI joined hands with Danbury Hospital for the exchange of scientific information in the field of trauma and emergency medicine. Danbury has

offered a fellowship to ATCI sponsored candidates for exposure to EMS in the state of Connecticut. The Joint Director of Health Services of the state was the first visitor in September, 1989. A course for Advanced Cardiac Life Support and Advanced Trauma Life Support will be conducted by representatives of Danbury hospital in August 1990 in India as invitee of the association.

LESSONS TO LEARN

The role of the voluntary agency in the development of health care is widely acclaimed and acknowledged. The care of the injured can only be developed by a multidisciplinary approach. The voluntary agency can play a pivotal role in initiating the movement, so that various disciplines can come together and together develop a systems approach towards development of trauma care. In the Golden Hour project, government agencies provide various infrastructure facilities, ATCI provides technical know how and is the prime mover, and the regional political party provides political commitment and influence setting an example of multidisciplinary effort in developing the prehospital service.

The Pune Kolhapur project shows how an enlightened and committed bureaucracy can develop a systems approach in a given area, if given the right advice and technical knowhow.

In developing the National Disaster Management Plan, various agencies of the government and private sector, including the armed medical services, came together, acknowledging for the first time the need to develop a body to meet the national disaster situation.

The involvement of NDMS USA in supplying the initial knowhow and of the Danbury Hospital Fellowship to ATCI-sponsored candidates, demonstrates the international cooperation in development of a disaster medical system and emergency services in a developing country like India.

The systems approach to trauma care and the development of emergency medical services do not require heavy capital investment. What is required is the will to develop such a system and the cooperation and commitment of various agencies to set up such an organization in their particular region.

CONCLUSIONS

1. Trauma transcends the artificial barrier of race, creed or nationality. A disaster situation anywhere in the world creates emotions of compassion among the international community. The spontaneity and generosity of help comes as a natural goodness of humanity, which cannot and should not be restrained.

2. The cause for the injured, whether affecting individuals or a mass of populations, has universal appeal. This universal and natural appeal should be harnessed at a local, state, national and international level.

3. As expressed by the American College of Surgeons in its document on Trauma Care - the two most significant elements which are needed to establish trauma and emergency services are commitment and continuity.

4. A voluntary agency consisting of a group of influential, committed people can start a movement in trauma care, howsoever small, which later snowballs into a significant improvement in accident and emergency services.

A time for decisions has now come not only for the developed nations as extolled in an editorial in the British Journal of Surgery in its October issue in 1988 by Dr. DD Trunkey of USA, but also more acutely for a developing nation like India to develop a system approach for trauma care. As Dr. R Adams Cowley said a decade ago, if we are not prepared to meet the challenge of the most vicious disease of modern mankind, we will then be guilty of perpetuating the grim state of affairs.

The challenge of the care of the injured is the challenge to all mankind.

EMERGENCY MEDICAL SERVICES IN TAIWAN: THE PRESENT AND PERSPECTIVE

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INTRODUCTION

It is said that the emergency medical services (EMS) system in the United States and its ambulance technician specialists who serve on the vehicles as paramedics, or assistant emergency medical therapists, rank as leaders in the world. The reasons for America's particular focus on this problem area are based on the facts released from the scientific statistic report (Table 1-3). (1,2)

In other words, coronary artery disease, vehicular accidents, and trauma provoke sudden and unexpected death for many people. Theoretically, these people could all be medically rescued, provided there existed a good emergency rescue system and professional ambulance personnel. The expert performance of cardiopulmonary resuscitation and Advanced Cardiac Life Support (ACLS) in the field can save the lives of a minimum of 40-60% of

people generally will not call this service because of its very expensive service charges.

Aside from the above methods to access "EMS", each hospital has its own ambulance which functions mainly as an interhospital transportation. They do not routinely accept calls from the street or patients' homes. In case a severely ill patient is on board for a transfer, the authority would send a doctor or nurse to care for the patient during the transportation. Otherwise no special personnel except the driver serve on the vehicle on routine daily runs. These ambulances are rather small and look like a Volkswagen vehicle and are equipped with only a limited first aid kit, oxygen, suction device, and necessary drugs. Just one year ago, the radio system was opened to medical service only in the local area of Taipei, the biggest city of Taiwan. Now we have radio communication between ambulances and some designated hospitals. It is especially good for the notification of mass casualty incidents and the big cases so as to let the hospital be well prepared.

Prehospital care, owing to the lack of qualified medical assistants like EMTs or paramedics, is nearly non-existent. After arriving at the emergency department (ED), patient management is quite different depending on the facility of the hospital. For example, the ED in Taipei Veterans General Hospital (TVGH), a teaching hospital and the biggest hospital in southeast Asia, can do everything that many western EDs do. The ED in TVGH is big and well equipped with computerized tomography (CT), sonography, and endoscopy in addition to the regular ED equipment. The most commonly seen disorders in the ED of TVGH are quite different from those seen in the United States. The top three are Upper Gastrointestinal Bleeding, Cerebral Vascular Accident, and Chronic Obstructive Pulmonary Disease, which can explain why the ED at TVGH has its own CT and endoscopy. It is believed that having this equipment, we may treat patients more efficiently.

OPTIONS FOR DEVELOPING COUNTRIES AND PERSPECTIVE OF EMS IN TAIWAN

There is no question that an advanced EMS system is our ultimate goal. However, in the developing countries, in order to arrive at a feasible solution to our emergency needs, and from financial necessity, I believe it is best to begin our implementation of an ambulance service at the EMT-A level. The reasons are as follows:

1. To train a paramedic would be much more expensive and complicated than to train an EMT. Furthermore, associated operatives such as the Mobile intensive Care Nurse, who must be specially trained, and the development of physician's role in this system, would all have to be programmed prior to establishing a paramedic system. In almost all of the developing nations, a Mobile Intensive Care Nurse and a classical ALS class rarely exist.

2. On the other hand, it would be natural and easy to establish an EMT level class. Sophisticated equipment is not needed, and nurses would be capable of teaching such a program.

3. From another perspective, the paramedic has the capability to treat cardiac arrest, but the incidence and prevalence of coronary artery disease in developing countries is much less than in the United States. Therefore, the advanced skills of the paramedic in cardiac resuscitation are less essential. However, the skills for the basic EMT in non-cardiac life support could be obviously quite beneficial.

In San Francisco, according to my riding experience, cases which really require a paramedic's skill account for less than 15% of the total calls. Literature also showed that cases needing paramedics service are only 3-30%.(8) Therefore, it would be infrequent that a paramedic service would be needed in our daily operation. All the other cases can be managed effectively by the EMT. From this point of view, it is not cost effective to create a paramedic level service at this time in the developing countries. There are many other first priority things that must be resolved.

Based on the above concept, we map out our EMS in the future as follows:

1. The firefighter is still the most appropriate personnel as a first responder for a real emergency case. These people have to be trained as EMTs.

2. EMTs will be the main source in the daily practice of EMS. This will be a new position in the government, and will attract many young people.

3. A fully computerized dispatch center will be set up to determine the urgency of the call. This unit will also have a direct line to contact the responsible hospital. In case of a mass casualty incident or a life threatening case which needs advanced life support, the closest responsible hospital will be notified and will be responsible for sending out a crew of one physician and one nurse to the scene.

CONCLUSIONS

In conclusion, I would like to emphasize the following three points in support of my claim that an EMS system with an EMT level of training is essential to the more prosperous developing countries such as Taiwan, Korea, Singapore, and Hong Kong.

1. Upgrading the quality of service. A strong medical service should start at the prehospital stage. The quality of care in the prehospital phase is as important as any drug or new operational procedure.

2. An EMS system is a valuable community resource. In instances of mass casualty events, the EMT personnel will immediately triage, evaluate, initiate life-saving measures, and transport patients to the appropriate hospital rapidly and safely. Their actions will serve to reduce the extent of injury of all.

3. The more prosperous developing nation can afford the expense. The taxpayers also have the right to request the government to provide improved medical care. A good EMS system is the most practical approach. It offers people a sense of security, and offers confidence to the individuals who must function in that society, and a sense of gratitude to the government in knowing that he is well protected. It is important that the entire populace reap the benefits to be gained from a well-trained, well-planned emergency medical services. So it is that this project should become Taiwan's first priority.

Anything that must be accomplished in the future should be accomplished as soon as possible, especially when it improves the well-being of the people. If it is not achieved today, there could be cause for regret tomorrow.

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TABLE 1

Estimated Leading Causes of Death in the United States. 1986

Causes	Number	(%)
Disease of heart	768,350	36.6%
Malignant neoplasms	465,980	22.2%
Cerebral Vascular Disease	147,790	7.0%
Accidents	95,640	4.6%
Chronic Obstructive Pulmonary Disease	75,420	3.6%
Pneumonia and Influenza	70,500	3.4%
Diabetes Mellitus	36,340	1.7%
Suicide	31,470	1.5%
Chronic Liver Disease and Cirrhosis	26,210	1.2%
Atherosclerosis	22,120	1.1%

Source: Monthly vital statistics report, 1987, US public health service

TABLE 2

Estimated Death in the USA Due to Cardiovascular Disease. 1986

CVD	Number	(%)
Disease of heart	768,350	79.39%
Hypertension with or without renal disease	7,580	0.78%
Cerebral vascular disease	147,790	15.27%
Atherosclerosis	22,120	2.28%
Other diseases of arteries, arterioles and capillaries	22,090	2.28%
Total	967,930	100.00%

Source: Monthly Vital Statistics report, 1987, US public health service.

TABLE 3

Estimated Death Due to Heart Disease in the United States, 1986.

Disease of heart	Number	(%)
Ischemia heart disease	524,080	68.2%
Acute myocardial infarction	263,050	34.2%
Other acute and subacute IHD	3,550	0.5%
Angina pectoris	1,070	0.1%
Old MI and chronic IHD	256,410	33.4%
Hypertensive heart disease	19,860	2.6%
Other disease of endocardium	11,140	1.4%
Rheumatic fever and RHD	6,440	0.8%
Hypertensive heart and renal disease	2,610	0.3%
Others	204,220	26.6%
Total	768,350	100.0%

Source: Monthly vital statistics report, 1987, US public health service

TABLE 4

Estimated Leading Causes of Death in the ROC, 1986

Causes	Number	(%)
Malignancy	17,342	18.19%
CVA	14,476	15.18%
Accidents	13,024	13.66%
Heart disease	11,209	11.75%
DM	3,286	3.45%
Chronic liver disease and cirrhosis	3,260	3.42%
Hypertension	3,083	3.23%
COPD	2,506	2.63%
Pneumonia	2,434	2.55%
Nephronic syndrome, nephritis, etc.	2,113	2.22%
Others	22,621	23.72%

Source: National Health Administration. 1986.

TABLE 5

Estimated Death in the ROC Due to Cardiovascular Disease. 1986

CVD	Number	(%)
Ischemic heart disease	4,451	14.94%
Acute MI	3,338	11.21%
Others	1,113	3.74%
Stroke	14,476	48.60%
Hypertension	3,083	10.35%
Rheumatic fever and RHD	413	1.39%
Others	7,360	24.71%
Total	29,783	100.00%

Source: National Health Administration. 1986