



## EMERGENCY MEDICAL CARE IN THE UNITED STATES: A NEW FRONTIER

by Zita Fearon

The landmark paper, "Accidental Death and Disability: The Neglected Diseases of Modern Society," first documented in 1966 the problem of excessive accident fatalities resulting from the inability of emergency medical services to provide quick and effective medical intervention.

The paper identified the problem as being a gap between knowledge and application. We have an impressive body of knowledge for the effective treatment of trauma, gathered through experience during war time. Excellence of initial first aid, efficiency of transportation, and effective and appropriate treatment proved to be causal factors in decreasing the death rates of battle casualties reaching military medical facilities alive, from 8% in World War I, to 2.5% in Korea and to less than 2% in Vietnam.<sup>1</sup>

The critical factor for surviving battle injury has been the reduction in the time lag from receipt of injury to the initiation of medical care. Expert consultants returning from Korea and Vietnam have asserted that they would have a far better chance of survival if seriously injured in the combat zone than on the average street in America.<sup>1</sup>

Emergency medical care deals with the seriously ill and injured person. Serious illness and injury is a major problem in the United States, not only in terms of personal tragedy, but also because of the financial cost and the large portion of the medical care system that must be devoted to emergency medical problems, which are in part, preventable.

### SERIOUSLY INJURED

Taking accidents as an example, according to the National Center for Health Statistics, accidents were the seventh leading cause of death in 1900. By 1970, accidents had become the fourth leading cause of

death, and accidents are now the leading cause of death for persons between the ages of 1 and 38.

In 1965, 52 million accidental injuries killed 107,000 people, temporarily disabled over 10 million people, and permanently impaired 400,000 people at a cost of approximately \$18 billion. Of the 107,000 people killed, 49,000 or 46%, were killed in motor vehicle accidents.<sup>1</sup>

Currently there are over 65 million accidental injuries a year, of which, in 1977, 104,000 were fatal, giving us a death rate from injuries of 48.1 per 100,000 persons.<sup>2</sup>

It is estimated that there are over 11 million people in the United States who are physically impaired by injuries, including nearly 200,000 people who have lost a limb and 500,000 people with varying degrees of impaired vision.<sup>1</sup>

In 1965 the accident cost was \$18 billion, of which \$5.3 billion was for wage loss, medical expense of \$1.8 billion, administrative and claims settlements of \$3.6 billion, property loss in fires of \$1.4 billion, property damage in motor vehicle accidents of \$3.1 billion and indirect cost of work accidents of \$2.8 billion.<sup>1</sup>

In 1977 the accident cost was \$62 billion for wage loss, medical expense, insurance, administrative costs and property damage from moving motor vehicular accidents. Motor vehicular accidents alone cost the nation \$30.5 billion.<sup>2</sup>

Approximately one out of four Americans suffers an accident of some degree each year. Of the 52 million persons accidentally injured in 1965, 2 million were hospitalized. They occupied 65,000 hospital beds for 22 million patient days and received the services of 88,000 hospital personnel. Approximately one out of eight hospital beds in general hospitals in the United States is occupied by an accident victim.<sup>1</sup>

See vernacular of "Basic Emergency Medical Service Systems" for clarification of terms in this article.

Poisonings occur five million times annually, of which 90% are poisoning of children, and 50,000 people die each year from poisoning, according to the Emergency Medical Services Division (EMS) of the Department of Health and Human Services (DHHS).<sup>7</sup>

Burns injure two million people each year; 70,000 require hospitalization and 10,000 die from burns, also according to the EMS Division of DHHS.<sup>7</sup>

It has been estimated that 15% to 20% of the people who die as a result of accidental injury could be saved with improved emergency care services and that the occurrence and severity of disability could also be greatly reduced.<sup>3</sup>

## SERIOUS ILLNESS

Heart attack is the leading cause of death in the United States. Of the 700,000 people who die annually from heart attack, over half die before they reach the hospital. The American Heart Association has estimated that half the pre-hospital coronary deaths could be prevented with improved pre-hospital emergency medical services.<sup>3</sup>

According to the National Center for Health Statistics, heart disease accounts for 18 million days of hospitalization annually, and for over 90 million days of bed disability over and above hospitalization.

The increasing magnitude of the national problem of serious illness and injury obviously requires national policies and resources to be directed to prevention of what is preventable, and to effective treatment of that which is not preventable, so that large numbers of people will not die unnecessarily. The history of our response to this national problem reveals a mixture of uneven and tentative but important efforts toward solution.

## ABOUT AMBULANCES

**Background and History:** The sick and wounded have been transported since earliest historical times; the wounded away from the battle or accident to their tent or cave, and later, the sick away from healthy society to the leprosarium or hospital. The first transport was provided by people. Two friends would carry their sick or wounded comrade between them. If only one person was available for transport, he carried the patient on his back.

The first ambulances were powered by horses, and sometimes by other animals, such as camels. The greatest advances in the development of the ambulance have been made in times of war because of the need to remove large numbers of wounded soldiers from the battlefield.

Dr. Jonathan Letterman was appointed medical director of the Army of the Potomac during the Civil War. He completely reorganized the field medical service so that it became an effective system of mobile hospitals for the evacuation and treatment of the wounded. His method of organization was later adopted for the entire Union Army, and was used in all our subsequent wars. The U.S. Congress passed an act

in 1864 based on his methods, called "An Act to Establish a Uniform System of Ambulances in the Armies of the United States." An important feature of this act was that it separated the Ambulance Transport from the other transport services of the army, placing all personnel, vehicles and administration under the head of the medical department of the army.

During this same period, the first civilian ambulance service in the United States was the hospital ambulance service established in 1865 by the Commercial Hospital (now the Cincinnati General) in Cincinnati, Ohio. The next city-wide ambulance service in the United States was provided by Bellevue Hospital in New York City in 1869.

Very few changes were made in the ambulance from this time until the motor ambulance came into use. The first "automobile ambulance" was purchased by five prominent Chicago businessmen for the Michael Reese Hospital in 1899. St. Vincent's Hospital in New York City purchased the second one a year later.

**The State of the Art:** In spite of the early promising beginnings of ambulance services, in 1966 50% of the country's ambulance services were provided by 12,000 morticians, and first class ambulance services existed in few cities.<sup>1</sup> In contrast to the early beginnings of ambulance services when an intern (doctor) accompanied every ambulance, the practice by 1966 was quite the opposite, with almost total reliance on ambulance personnel to deliver emergency care. There were no generally accepted standards for training of ambulance personnel or determining their competence. Only three or four states provided training courses specifically designed for ambulance personnel.

Certification or licensure of ambulance personnel was a rarity. As for the ambulance, no manufacturer produced a vehicle from the assembly line that could be called an ambulance. Most ambulances in the country were totally unsuitable, carried inadequate supplies and incomplete fixed equipment, and were staffed by untrained attendants.<sup>1</sup>

In 1970, the National Research Council's Committee on Ambulances reported that "more than 1/3 of the accident fatalities in the United States occur at the scene, in the ambulance, or within minutes after arrival in the emergency room. Yet for decades, the general public and the medical profession have passively accepted ambulances sufficient only for transporting the injured on a litter, with little or no equipment for emergency care, manned by inadequately trained drivers or attendants."

In the same year, the Ambulance Association of America estimated that annually 25,000 people were permanently disabled or injured through mistakes by untrained attendants and rescue workers.

In 1970, ambulance services were organized and provided in the following manner:

*Morticians* had for years operated about 50% of the ambulance services in the country. They usually serviced rural or small town and village communities. They provided this as a free public service because they had the only suitable vehicles for transport. The communities which they serviced did not have the

## BASIC VERNACULAR OF EMERGENCY MEDICAL SERVICE SYSTEMS

Emergency medical care is that care given by a qualified health professional, usually at the scene of an accident, in the ambulance, emergency department or special care unit of a hospital, to persons in a state of medical emergency.

A **medical emergency** is a specific event where a person *suddenly* becomes *seriously* ill or injured, and where that person will *die* or *suffer severe impairment* if medical intervention is not provided in a time frame ranging from *immediately* to *within one hour*.

The specific events of medical emergencies are:

1. **Severe injury (trauma).**
2. **Heart attacks and strokes.**
3. **Blocked airway.**
4. **Burns.**
5. **Poisoning from alcohol, drugs or other poisons (toxins).**
6. **Severe emotional problems which cause psychiatric instability and destructive and self-destructive behavior.**

**Emergency medical services** are that part of the emergency medical care system which is pre-hospital: the ambulances, mobile intensive care units, paramedic units, heartmobiles, medicopters,

etc.; their personnel, such as emergency medical technicians (EMTs), paramedics, drivers, doctors, and nurses, and the communication system, from receipt of the initial call made by a person in need of an ambulance and the ambulance dispatch system, to the sophisticated communication between paramedics and hospital based physicians.

An **Emergency Medical Services System** has the following functional components: pre-hospital care (ambulance) and hospital care. Hospital care is divided into intermediary care (emergency department) and definitive care (inpatient special care unit). Pre-hospital and hospital care *must* be coordinated in order to be a *system* and in order to be effective in reducing unnecessary death.

The purpose of pre-hospital care is to shorten the time interval before the patient receives critical care. It has been found more effective to bring the critical care to the patient at the pre-hospital stage than to use the ambulance simply as a transport vehicle to rush the patient to the nearest hospital. The purpose of the hospital emergency department is to stabilize and improve the condition of the patient while expediting him/her to the appropriate definitive care unit, for example, surgery, intensive care unit, coronary care unit, burn unit, neo-natal intensive care unit, psychiatric unit.<sup>3 4</sup>

financial resources to provide a public system out of tax monies.

Since burials were their main source of income, the free ambulance service was sometimes in direct conflict with their business interests. Often the first ambulance to arrive at the scene of the accident would pick up the dead, not the injured, leaving the injured to be picked up and transported by the second mortician who arrived later. The results of this practice were predictable.

Morticians understandably did not invest very much in equipment, communications or training. With the tightening of government regulations and the development of standards, making such investment necessary, the National Funeral Directors' Association recommended that morticians discontinue their ambulance services. By 1978 the National Academy of Sciences was able to report "Transport services by part-time providers (e.g., funeral homes) is no longer a major concern, owing to a general upgrading of emergency vehicles to conform to specified standards."<sup>10</sup>

**Volunteer** ambulance services accounted for about 25% of the national total. They are not subject to regulation because they do not have paid staff or receive reimbursement. They are needed only in areas where resources are insufficient to provide an adequate public ambulance service. They are usually community oriented, supported through funds raised by the community, staffed by community volunteers and have a clearly defined community "catchment" area.

While the training and capability of the volunteers varies greatly, there is a kind of heroism and "pioneer enthusiasm" which prevents these services from degenerating to the level of former mortician services. However, "burnout" is an occupational hazard because it is difficult for people to sustain the level of activity needed to operate an unpaid service and carry on their family lives and jobs as well. This is particularly true if they are also committed to being trained and to maintain their training and increase their level of competency, on their own time, with their own money.

**Commercial** ambulance services exist mostly in cities, where the number of ambulance runs is sufficient to support them financially. They are used primarily for transport rather than for emergency care, since their use depends greatly on the ability of the person to pay. There has been little effort to regulate them. The charge for their services for a one-way trip varies from about \$25.00 to \$130.00. It is not known if there is any justifiable reason for this wide range in price. They accounted for about 7% of the ambulance services in 1970.

**Hospitals** in many cities have their own ambulances, amounting to about 2% of the total. While there has been little effort to regulate them, it has been in their interest to keep the patient alive so that they could get the patient into a hospital bed and thereby be covered for the cost of the ambulance. With the current pressure to close hospitals which are not 100% utilized, hospitals are more anxious than ever to have their own ambulances so they can fill their beds.

On the one hand, some of the hospital ambulance services are outstanding, for example, in their care of cardiac patients, linking them to a strong inpatient cardiac care service. On the other hand, however, ambulances run by voluntary and private hospitals have tended to pick up only patients with cash or coverage, particularly when they could refer non-paying patients to a public system.

Public ambulance services are under the direct control of local government. They may be operated by the police or fire departments, which account for 15% of the services, by municipal or county hospitals, or by local health departments. They are supported by taxes and are free to the user. While the quality of these services varies according to the level of interest and commitment of local government, many of the best services in the country are public services.

The situation as it existed in 1970 caused the National Academy of Sciences to issue a report, which said, in part, "...emergency medical service...is one of the weakest links in the delivery of health care in the nation...Thousands of lives are lost through lack of systematic application of established principles of emergency care...The majority of ambulances in the United States are hearse, limousine or station wagon type which are inadequate in space and equipment and are manned by individuals with inadequate training to provide essential life support."

## THE NATION RESPONDS

In 1973, Congress passed the Emergency Medical Services System Act (PL 93-154) to provide federal funds to localities to develop regional emergency medical services *systems* which would improve communications, transportation, personnel training and capability, medical facilities and medical care standards for the purpose of reducing unnecessary death and disability due to emergency medical situations.

In 1974, the Robert Wood Johnson Foundation provided grants to 44 regions in the United States of up to \$400,000 each to develop regional emergency medical care systems. They have also provided grants for study and development of various aspects and components of emergency medical services, all in all, totaling over \$22 million.

As a result of federal government and RWJ Foundation grants and initiatives, a great deal of state and local government and professional activity was generated since 1973 to make changes and improvements in the Emergency Medical Services Systems nationwide. While evaluation and data collection is still rudimentary in this field, enough is known to give us a sense of the direction in which the system is going.

Between 15,000 and 20,000 physicians are currently working either part-time or full-time delivering emergency care in community hospitals. Nearly one-third of these doctors have received specialized training in trauma care. Thirty-one residency programs in emergency medicine have been started since 1971 and have graduated over 400 physicians. The American College of Emergency Physicians, with a membership

# AMBULANCE SURVEY OF CITIES —

by the Consumer Health Information

City	Type of Service	Response Time
Baltimore Capt. John Johnson	City Agency	10 minutes average to arrival at hospital
Chicago Lt. Morrison	Fire Dept.	4 minutes average of call to arrival at scene
New York City Jim Kerr	Part of HHC, a public benefit corp.	12.6 minutes average Priority I calls from call by EMS to arrival at the scene
Pittsburgh Mr. Kennedy	City Agency, Dept. of Public Safety	5-7 minutes from arrival at the scene
Los Angeles Doug Brown	City Fire Dept.	5.1 minutes average dispatch to arrival at the scene
San Diego Ernie Kramer	Private paramedic company under contract to city	7.1 minutes average dispatch to arrival at scene
St. Louis Chief Jay Fitch, Mgr.	EMS, part of Dept. of Health & Hospitals	About 7 minutes threatening, and 10 minutes for non-threatening, from arrival
Washington, D.C. John Nusser	Fire Dept.	8.3 minutes average triage (pre-dispatch) at the scene

\*This may not be accurate. It does not seem possible, and the interview

## QUICK AND EASY ERRORS TO MAKE IN DOING COMPARATIVE EVALUATIONS OF EMERGENCY MEDICAL SERVICES: TWO CASES, COMPARED.

On May 12, 1980, *New York* magazine published an article which contained a list of 16 major U.S. cities and their "ambulance response time." The point of the list was to "prove" that New York City EMS was the worst in the country, because it had the worst response time. In actuality, the list doesn't prove anything. There is no definition of response time, which varies from place to place. For example, Chicago defines response time from "receipt of (patient) call to arrival at the scene (of the patient)." San Diego, on the other hand, defines response time from "dispatch to arrival at the scene." This difference in definition will create, in itself, a difference in response time of three to four minutes. *New York* magazine also did not think it necessary to indicate what kind of vehicle and personnel might

**Apology:** The editor regrets the omission of credit that should have been accorded to the authors of the articles written in recent editions of the *Consumer Health Perspectives*. The National Science Foundation grant (NSF 78-10000) summarized in the August and September, 1981 (Vol. VIII, #1 and #2) editions of *Consumer Health Perspectives* (9/81), was researched and written under the same grant. However, the recommendations and conclusions are the views or policies of the National Science Foundation or its Science for Citizens Program. The editor sincerely apologizes. *Editor*

# OF SELECTED MAJOR U.S. JUNE 1981

Information and Resource Center

Kind Definition	Number and Type of Vehicles	Annual Runs	Population
Age from dispatch at hospital*	16, of which 13 are paramedic, 3 are EMT	85,000	1.5 million
Age, from receipt at scene	30—all are mobile ICUs	200,000 plus	3.5 million
Age for from receipt arrival	100, of which 16 are paramedic	600,000	8 million
Age from dispatch to at scene	10 mobile ICUs 2 rescue trucks all paramedic	53,000	475,000 base 1 million + daytime
Age from at hospital	47 ambulances, of which 39 are paramedic. 2 para- medic engine co. not included in response time	170,526	3 million
Age from at the scene	14.5 paramedic ambulances	18,576	867,000
Age for life- about 11 life dispatch to	22 paramedic ambulances plus 2 paramedic supervisory cars 24 hours	67,000	500,000
Age, from (dispatch) to arrival	14, of which 3 are paramedic	89,967	700,000 base 2 million daytime

Interviewee may have misunderstood the question.

arrive to care for the victim, nor did they indicate the source of their information for their readers.

The Consumer Health Information and Resource Center did its own study of eight of the 16 cities, in June, 1981, by telephone interview. Our study, while inadequate for purposes of comparative evaluation, was useful in showing the range of organization, resources and problems even with a very limited selection of variables. A more adequate study would include at least the following additional variables: dispatch system, square miles covered, down time of ambulances, budget, triage system and education and training of first responders and citizens.

The accompanying table shows our limited findings, and identifies the source of our information, usually the first or second person in command. We hope it will provoke thought in our readers, rather than a judgemental and inaccurate ranking. There are several things we learned in reaching and talking with these EMS people which do not appear in the table:

*Continued on page 6*

ed the Science for Citizens program, National Science Foundation for its support of NSF sponsored seminars were made possible by NSF grant #05579-23391 and were of *Consumer Health Perspectives*. The lead article, "Women's Health" (Vol. VIII, #2, foundations contained therein, pp. 3 and 4, are those of the authors and do not reflect citizens program. For any inconvenience caused by omissions of these references, we

exceeding 9,000, developed a certification examination in 1977 and has received specialty status in the American Board of Medical Specialties.<sup>11</sup>

The Emergency Medical Technician (EMT), a job category which did not even exist before the mid-1960s, numbered 200,000 in 1978. (EMTs receive 81 hours of instruction.) 65% of these EMTs have been certified by the National Registry of Emergency Medical Technicians, and the number of registrants is growing by about 2,000 per month.

Paramedics, who receive at least an additional 400 hours of instruction beyond the EMT level, number about 15,000, with their ranks growing rapidly.<sup>10 11</sup>

In 1966, only four states had established an administrative unit responsible for state-wide emergency medical services planning, development and operations. Today every state has such a unit, which, as one of its major responsibilities, assures that EMT courses meeting national standards are provided across the state.

There are national specifications for ambulances, their equipment and supplies. While these specifications are meant to apply to ambulances purchased with federal funds, they have tended to become the standard elsewhere as well, because they are more or less a result of consensus from experts in the field.

Advances in emergency medical technology have made equipment available which is important for communication, diagnosis and treatment. These advances include the Medical Anti-Shock Trousers (MAST); telemetry, which provides radio communication of biological data from EMT to hospital physician; and defibrillators, which send an electrical shock to the heart so that normal, coordinated heart contractions are re-established. These are only a few of the advances in emergency medical technology.

## THE SYSTEM IS THE KEY TO SURVIVAL

However, there are varying degrees of system development in the regional programs. Those regions which have been able to develop coordinated programs which function well at all levels, *from pre-hospital through hospital*, have shown, through evaluative studies, that the *system* is effective in reducing unnecessary death. Better pre-hospital organization and care, including improvements in access to the EMS system, training of EMTs and paramedics, central dispatch, and radio communication between EMT and hospital physician, are now bringing more injured patients alive to the hospital than was the case 10-15 years ago. However, during the same 10-15 years, the hospital phase of the care of the acutely injured patient has not improved commensurately. Recent reports indicate that many potentially salvageable patients who arrive alive at the hospital are still dying unnecessarily. Recent studies have shown that errors in evaluation and management are common. The planning, mobilization and organization of hospital staff and facilities necessary for the care of the injured are often inadequate.

A study by Frey et al in 1969 of resuscitation and sur-

*Continued on page 6*

# THE EDITOR SPEAKS. . . .

"If people are informed about the potential consequences of their risky habits, such as driving without seat belts..., but nonetheless choose to continue them, is it anyone's business but their own?"<sup>1</sup> Katharine Bauer chose to ask and answer this question by noting that society does have a responsibility to intervene under three circumstances:

- where innocent bystanders are harmed by those with risky habits.
- where such risky behavior is promoted by others such as advertisements for smoking, drinking, or buying fast cars, and
- where the individual wants to change his/her behavior but finds it difficult to do.

The Surgeon General's Report, "Healthy People," speaks to this question by noting that bike riders in those states which repealed their motorcycle helmet law, because it represented an infringement on the driver's personal liberties, had twice as many moderate to severe head injuries and three to nine times more fatal head injuries than in those states with such laws.<sup>2</sup> More important, injured bike riders paid a high cost for their personal liberties by placing a heavy burden on their families and by their demands on scarce medical care resources provided by society. One would have to conclude that society does have a legitimate responsibility for protecting the individual, even against his own interests.

Fearon's article highlights one of the important ways society through governmental intervention has provided assistance to consumers, namely in developing emergency medical services. While sporadic efforts were undertaken in the 1960s and early 1970s, it was not until the passage of the Emergency Medical Services System Act in 1973 that Congress assumed a serious responsibility for financing and encouraging the development of an EMS system throughout the United States. Fearon's article clearly shows the real progress that has been made in saving lives and reducing the severity of injuries treated in a well-developed EMS system.

It would seem that Congress and the executive branch is being short-sighted in relieving itself of its responsibility for emergency medical services. The states, already under financial distress, are unable to make up for the 25% reductions in federally-financed public health programs included in block grants. This may well mean the dismantling of major parts of the as yet uncompleted EMS system in many parts of the nation. Most communities and states simply do not have enough of a tax base to support this important service. This is particularly true of the sparsely settled rural areas, where so many of these accidents occur.

It is also ironic that at the same time the federal government in the name of non-interference with a citizen's personal liberty is putting thousands of inno-

cent persons at risk by refusing to honor its commitment to require automobile manufacturers to install passive restraints such as airbags or automatic belts. This, of course, will lead to thousands of unnecessary serious injuries and fatalities, almost 40% of whom will be teenagers and young adults. These are the youth whom we look upon as the productive and future workers and leaders of our country. It seems that our national leaders have their priorities backwards when they are willing to put a balanced budget against the lives and future of our young people whose lives in many cases may be too ruined to enjoy the benefits of economic savings.

— Herbert H. Hyman

1. Katharine G. Bauer, "Averting the Self-Inflicted Nemeses (SINs) from Dangerous Driving, Smoking and Drinking," in Mushkin (ed.) *Consumer Incentives for Health Care*, New York: Prodist, 1974, p. 4.

2. The Surgeon General, *Healthy People*, DHHS, Public Health Service, Publication No. 79-55071, 1979.

## QUICK AND EASY ERRORS

*Continued from page 5*

1) The telephone information operators in these major cities do not know what EMS is, who runs it or how to find the phone number of the administrative offices of the agency responsible for the public ambulance service. In some cases, we were advised to dial "911."

2) The people running EMS in these cities are knowledgeable and dedicated, working very hard with very limited resources. These are the people, together with their crews, who are on the front line in the war against death and disability from medical emergencies. They also love their work — and really love to talk about it!

3) It is presumptuous to make comparisons between EMS in different cities for the purpose of ranking them. The problems are very different in each city. The EMS components are not identical, and there is still a lot of experimenting with components and procedures.

The best things citizens can do to improve EMS in their geographic area is to fight for more resources for EMS and to become knowledgeable and well-trained first responders.

## EMERGENCY MEDICAL CARE

*Continued from page 5*

vival of motor vehicle accident victims showed that, based on autopsy studies and what was known at that early time about treatment of accident victims, 18% of those who died should have been saved, by even the most conservative estimate.<sup>12</sup>

Ham cites a study by Waters and Wells in 1973 showing a 24% reduction in trauma deaths because of improved and integrated emergency care from pre-hospital through hospital care.<sup>4</sup> The study done by Ham et al in south central Pennsylvania in 1977 shows a 24% less probability of death in those patients who received both pre-hospital and intermediary care before receiving definitive care than those who receive definitive care only.<sup>4</sup>

David Boyd, director of the Division of Emergency Medical Service for Health and Human Services reported a decrease in deaths from highway accidents of 15.4% in Central Illinois as a result of developing a regional network of trauma centers to which severely injured patients are taken instead of to the nearest hospital.<sup>9</sup>

The famous study by Trunkey and West in 1979 comparing two systems of hospital care of motor vehicle accident victims who died after arrival at the hospital showed that of 92 consecutive deaths in San Francisco County, only one was judged to be potentially preventable. Accident victims in San Francisco County are taken to a trauma center. In Orange County, where accident victims are taken to the nearest available hospital, 73% of the non-CNS-related deaths and 28% of the CNS-related deaths could have been prevented with vigorous resuscitation and aggressive surgical intervention.<sup>13</sup>

A major cause of inadequate hospital care, particularly in urban and suburban areas, is the delivery of patients to the nearest hospital rather than to a more qualified pre-designated hospital capable of caring for the patients' injuries. This problem continues in most areas of the country even though it is known that patient survival ultimately depends on hospitals being categorized and designated to receive critical care patients based on their ability to provide appropriate intermediate and definitive care. Hospitals are reluctant to be limited to receiving only those patients they are capable of caring for. Unfortunately, their concern that they must appear capable of caring for every medical event in order to keep their beds full exceeds their concern for their legal liability. A hospital is legally liable if a patient dies because the hospital holds itself out publicly as being able to care for patients it in fact has no capability to care for. Since all critical care patients do not exceed 5% of all emergent and urgent cases, a hospital loses nothing from a limited designation, but the patients have everything to gain, i.e., their lives, from hospital categorization.

## PROBLEMS AND RECOMMENDATIONS

1. The federal government must continue to make resources available to complete the development of the pre-hospital part of the system nationwide, especially for dispatch, communications, and training. Most communities simply do not have a large enough local tax base to support this activity. Since 80% of highway related deaths and two-thirds of all vehicular related deaths occur in the vast sparsely populated rural areas of our country, federal support should be provided for helicopter ambulances so that these patients can be quickly reached, resuscitated, stabilized and taken to a regional trauma center.

If the federal government withdraws support from its EMS Division, hospital categorization will virtually disappear, and with it the upgrading of hospital capability to care for emergent patients. The excellent work of trauma centers like the one in San Francisco County, will become the exception instead of the norm.

2. A computer system for traffic lights, using emergency vehicle traffic lanes should be developed for use in major cities to divert traffic, since much of the excessive response time is due to traffic congestion.

3. Telephone companies must be persuaded through whatever means available to provide the three digit 911 emergency phone number throughout the United States. More than half the country still has to look up a seven digit emergency phone number for their specific locale.

4. Community boards of hospitals caring for emergency patients should insist that the hospital participate in categorization, and that it not seek in any way to receive patients it cannot care for. The community boards should also monitor to assure that hospitals maintain their basic and designated emergency care capability.

5. Facility and staffing standards for intermediate and definitive care developed by the EMS community should be adopted by the federal government and incorporated into the "Medicare Conditions of Participation." To increase efficiency and lower costs, survey and approval by the local EMS System of these areas of the hospital should establish hospital qualifications to participate rather than accreditation by the Joint Commission on the Accreditation of Hospitals (JCAH).

6. Medicare and Medicaid should provide simple and fast reimbursement covering 100% of costs to EMS for services in urgent and emergent cases without a pre-authorization requirement, and a reasonable fee to transportation services for transport of patients for medical care.

7. Federal initiative to "contain costs" through reductions in beds and reimbursement has created serious difficulties for emergency care. Bed and staffing shortages have created a crisis in many areas for pre-hospital services which have no place available for their multiply-injured or cardiac patients.

8. While the *need* for a federal commitment of resources to EMS remains, federal means to meet such commitments are being dismantled and/or delegated to states and localities. This is an impractical approach to EMS, where very large one time investments in highly technical equipment have to be made and where maintenance of skills and equipment is essential. One should perhaps keep in mind that vehicular accidents occur mainly on public property, if not on federal property. It is hard to see how government can legally evade its responsibility in this area.

The other approach to problems (the first being government evasion of responsibility), particularly in the health field, is that of prevention. This is certainly a worthwhile and long overdue approach. It does, however, pose certain contradictions and difficult decisions for the administration:

1) Highway accidents and consequent fatalities are caused by, among other things, unsafe vehicles, alcohol consumption, failure to use safety equipment such as seatbelts and helmets (for motorcyclists), inadequate safety equipment, poor driving practices including excessive speed, and poorly trained drivers.

2) A government commitment to prevention would require vigorous regulation and enforcement of the

auto industry to assure that vehicles are safe, which they have not been (why should non-racing vehicles have the capacity to so greatly exceed the speed limit?), that the best possible safety equipment be installed, designed so that the passengers must use them, or so that they activate automatically in the event of an accident. Helmet safety laws should be required in each state that has or will receive highway construction funds.

3) Alcohol consumption is a major health problem in the U.S., a contributing cause not only to accidents, but also to cirrhosis of the liver, certain cancers, homicides, birth defects and poisoning, alone or in combination with other drugs. Insidious advertising techniques which project highly desirable images of drinkers, and thus induce an artificial desire for alcohol to "satisfy" the "need" to be attractive, successful, desirable, etc. should be prohibited in cases where excessive consumption is harmful. A far more vigorous program against drinking and driving should be pursued by the federal government.

Therefore, an effective prevention program requires much stronger regulation of industry, advertising, the media, and state laws. (All of this is in contradiction to the philosophy and activities of the current administration.) Thus, it would seem that the government will have to continue to fund the mopping up of the results of irresponsible industry, advertising and media activity, and the failure of states to act. We ourselves would

recommend government funding of EMS at the level necessary to reduce unnecessary death and disability due to medical emergencies, and at the same time that government should vigorously pursue the prevention measures outlined above to prevent the medical emergencies from happening in the first place.

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68