

The seven years' war

J.D. FARRINGTON, MD, FACS, *Minocqua, Wis.*

It is indeed a great honor to give this, the 11th Scudder Oration on Trauma. I feel somewhat out of place when I review the names of the great surgeons who have stood here in the past. My only hope is that what I have to say will measure up to those presentations.

Many of my statements will be personal, and not necessarily reflect the opinion of the establishment. To those of you who wonder about the title, "The Seven Years' War", I offer this explanation: we have been at war with sudden death and disability for seven years now, and we must decide if we have won, lost, or are still in the fight. If we are still in the fight, what must we do to assure victory?

From 1922 until 1966, first through its Committee on Fractures and later its Committee on Trauma, the American College of Surgeons wrestled—virtually alone—with problems of the critically ill and the injured. It was the first organization to develop and publish lists of necessary equipment for ambulances; the first to offer a recognized program for the

education of ambulance personnel in emergency care; the first to publish guidelines for emergency departments; and the first to design and offer an in-depth course for physicians in fractures and other trauma.

Two events occurred seven years ago which helped turn this solo shouting match into an all out war, involving eventually many other organizations, both governmental and professional. First was the publication of *Accidental Death and Disability . . . the Neglected Disease of Modern Society* by the National Academy of Sciences/National Research Council.¹ The other was the passage of the National Highway Safety Act. The publication presented the problem and suggested some solutions; the passage offered means for implementation. But the law was enacted without built-in guidelines for the proposed action. States were given only the mandate to implement the 18 different standards of the act, one of which called for improvement of emergency medical services (EMS). With no guidelines to follow, interest and activity by the states varied, and only fragmented action occurred, with wasted money and manpower. It was not until 1969, three years later, that manuals were published with definite plans for implementation.²

Most of this audience is familiar with the multitude of problems concerning sudden death and disability, but it is only by thorough review of where we stood seven years ago that we can come to conclusions as to the possible outcome of this war.

Where did we stand?

Regarding sudden death and disability, the state of the nation in 1966 was appalling. Accidents were the leading cause of death for persons between one and 37 years of age. There were 114,000 accidental deaths that year for a rate of 58 per 100,000 population. Of that 114,000 nearly half, or 53,000, were due to motor vehicles, a rate of 5.67 deaths per 100 million miles traveled. Over 70 percent of the automobile deaths occurred in rural areas or in communities of 2,500 or less. Death due to

Continued

In brief . . .

The seven years' war against death and disability is showing beneficial results and, while we have not won the war, we have won some important battles, Dr. Farrington states.

But there is still a long way to go . . . accidents are still the leading cause of death between ages 1 and 37, funding is lacking, and despite improvement in the pre-hospital care of patients with heart attacks in metropolitan areas, half a million such deaths occurred in 1972, 50 percent of them before the patient reached medical facilities.

Among other battles still to be fought, and won, Dr. Farrington points out, are those for a national trauma registry, replacement of lay coroners by medical examiners, compulsory autopsy of all accident victims, and expansion of research in trauma.

The Scudder Oration on Trauma was delivered by Dr. Farrington during the 59th annual Clinical Congress of the American College of Surgeons, October 15, 1973.

accidents at work totaled 14,500 for a rate of 7.4 per 100,000 persons. This rate had been decreasing steadily over the previous 30 years due to concerned action by industry, unions, and government including education, training and surveillance of workers, and elimination of hazardous machinery, evidence that solutions to the problems of injury do exist.

The costs of accidents totaled \$18 billion, and the care of accident cases imposed a staggering load on medical and allied health personnel and facilities. When the 400,000 sudden deaths from heart attacks, over half of which occurred before the victim reached medical facilities, were added to the accidental deaths, the load on existing EMS systems was enormous.

How was the nation prepared to cope with such a staggering problem in 1966? Poorly, I believe. The ability to do so rests with having EMS systems capable of providing total emergency care, and one of its greatest strengths is an active advisory council. Except for scattered areas, there were few functioning EMS systems and fewer advisory councils. It is ironic that a great deal of money and effort was being exhausted on civil defense in the 1960s, working from the top of the pyramid so to speak, preparing for a man-made national disaster, when most communities could not take care of a two-car accident in their own backyard.

Prevention is the best solution to the problems of injury, as was evident in 1966 in the improved record of workers in industry. Rigid standards were designed and then followed in the construction of buildings and in the design and manufacture of equipment and appliances. Hazards to the consumer in the use of these products, however, often went undetected or uncorrected. Nor were there any national or state standards or codes with respect to vehicles and their equipment. Thirty states did not require periodic automobile inspection, and often were dumping grounds for vehicles from states that did. While there had been a great deal of activity and expression of concern from professional groups, this, for the most part, fell on deaf ears.

Let us look at the various elements of total emergency care, one at a time, and see exactly where we did stand seven short years ago.

Identification and notification

There was no nationally recognized method of notifying proper authorities of an accident in 1966. In those few communities that did have an established method, each emergency service (police, ambulance, fire) had its own number. If there was one emergency number to call, it was not posted on public phones, there were too few phones on highways, and fewer still could be activated without a coin. Many of the less frequently traveled roads were poorly patrolled so that much valuable time could elapse before help arrived, more so if no one from an accident was capable of leaving the scene.

First aid

From its inception in 1909, the American National Red Cross had trained some 28 million persons to at least the standard level of first aid, and in 1966 there were some 73,000 instructors to conduct such training. In addition, 52 percent of the ambulance personnel had received advanced first aid training, and approximately 3 million persons had completed the medical self-help programs.

Ambulance services

Although a model ordinance was developed in the early 1960s by the Joint Action Committee of the American College of Surgeons, the American Association for the Surgery of Trauma, and the National Safety Council, only 25 percent of the states had any kind of legislation regarding ambulance service. And too much of this was token in nature, often weakened by special interest groups, ineffective, and poorly enforced. Most only concerned the operation of the ambulance as an emergency vehicle.

Ambulance services were provided by a number of different organizations, and the vehicles varied considerably.³ (See tables 1 and 2)

Table 1: Organizations providing ambulance services

Funeral homes	44 percent
Voluntary units	24 percent
Commercial firms	14 percent
Municipalities	13 percent
Hospitals	3 percent
Unspecified	2 percent

Table 2: Types of vehicles used as ambulances

Custom ambulances, high powered and expensive	37 percent
Station wagons, also used by police as chase vehicles	24 percent
Hearses, temporarily converted via warning device	21 percent
Panel trucks or vans	10 percent
Rescue vehicles	9 percent

Only five percent of all the ambulances had the minimum headroom of 54 inches, and the equipment was just as inadequate, consisting too often of only a blanket, a bottle of oxygen, and an occasional first aid kit from the corner drug store. The subcommittee on transportation of the injured of the ACS Committee on Trauma, under Dr. Oscar P. Hampton, Jr., prepared a list of minimal equipment for ambulances as early as 1961,⁴ which was revised in 1966, but less than one-third of the ambulances carried even this.

Communications facilities between ambulances and hospitals were practically nonexistent. Although 56 percent of the ambulances had radios, these were used to contact the dispatcher or to monitor police calls in order to beat a competitor to the accident scene. Only six percent of the ambulances had the facilities to talk directly to hospitals from the scene or during transport.

The distribution and training of the attendants was equally poor. Only 54 percent of the ambulances had two persons on board at all times, and there were no nationally accepted standards concerning their competence. Slightly over half of the attendants had received some first aid training, but the remainder had none. Almost one-fourth of the services provided no first aid at the scene or during transport, doing nothing more than placing the patient in the ambulance and rushing, with siren wailing and red light flashing, to the hospital with the poor patient, unattended, hanging on for dear life.

Emergency departments

Rather than the term department, most hospitals used the word *room* to designate their area, and that is what it usually was, a poorly equipped and poorly manned room. The staff consisted of inexperienced nurses rotated through at the whim of their supervisor, or of interns fresh from medical school, where emergency care had not been a part of their curriculum. There were a few nationally accepted courses in trauma, but education in this area was, for the most part, by trial and error. Cast-off instruments and equipment from the surgical suite were deposited here, rather than in the ash can. Nearly 40 percent of the hospitals had an emergency room committee, but, surprisingly, only half of these were chaired by a physician. Slightly over half had written policy procedures, but only 42 percent had written medical and surgical procedure manuals. Only 17 percent had a physician in the department or on call from in-hospital 24 hours of the day. While 42 percent of the hospitals had highway directional signing, there were no guidelines available as to the

categorization of the emergency capabilities of the hospitals.

This then was the situation in 1966 when *Accidental Death and Disability* . . . turned the cold, harsh light of truth onto the EMS systems of the country. We have been at war now for seven seemingly long years in an attempt to correct these deficiencies, to improve the delivery of emergency care, and to win the war against sudden death and disability. How much has been accomplished? Have we won the war, or even a few battles, or are we on the verge of being routed?

A review of 1972, as we did for 1966, should give us an answer.

Emergency medical services systems

The Airlie Conference, a joint venture of the American College of Surgeons and the American Academy of Orthopaedic Surgeons, though it did not take place until 1969, added a great deal of impetus to the activity concerning solution of the problems of EMS systems.

Every state now has an executive council on emergency medical services. There has been a great increase in the number of EMS systems with appropriate advisory councils at local and regional levels. The number and structure of these vary from state to state, but there are now over 500 nationwide, formed on either county or hospital service lines.

Prevention

While a national council on accident prevention at the executive level has not yet been formed, as was recommended, there have been productive activities in this regard. A number of organizations, in addition to the National Safety Council, have become concerned and active, including the American Association of Automotive Medicine, the Insurance Institute for Highway Safety, the Women's Highway Safety Leaders, and a number of insurance companies. Publicity on the dangers of alcohol and the automobile has increased, and, equally important, so have laws in this regard. Improvement in the safety features of vehicles has been slow but progressive, with research on bumpers, passenger restraints, less hostile interiors, and vehicular structure continuing on an ever increasing scale. Concerted programs

Continued

of public information and education have not reached the proportions possible or necessary, only 19 states report such activity. One of the tragic and ironic aspects of prevention is the public's apathy, and even active resistance, to the use of restraints in vehicles despite the irrefutable evidence that at least 30 percent of the deaths on the highways could be prevented by this measure. On the positive side is the encouraging fact that now 30 states require periodic automobile inspection, up from 18 seven years ago.

Identification and notification

The use of a single entry number, such as 911, into the EMS systems of the nation has not been accomplished. Difficulties have been encountered in some states due to problems of overloading and integration of the metropolitan systems with the surrounding communities. There has been an increase in the number of dispatch systems mostly in metropolitan areas or groups of small communities making up a single hospital service area. Today, 23 percent of the population of the country is covered by single entry numbers, but only one state, North Dakota, and the District of Columbia report 100 percent of their populations covered.

First aid

New manuals on first aid have been developed by the American National Red Cross and half a million copies have been printed. These have a much improved format and content, and should be of great value as a prerequisite to the basic training program in emergency care being taught by physicians to ambulance personnel. During the past seven years, five million persons have been trained to the standard level, and one and one-half million to the advanced level of first aid. During that same period 15 million persons have graduated from medical self-help programs.

Ambulance services

Although 26 states now have legislation regarding ambulance services, a 50 percent increase from 1966, much of this legislation, when examined carefully, is too watered down to be meaningful. Only 16 states have comprehensive legislation, and too much of that is

quite specific in terminology and does not provide for the hopefully inevitable improvement in vehicles, equipment, and training of personnel.

While the number of ambulance services has increased by only seven percent, the organizational structure has changed materially. The number of funeral homes in the business has dropped to 32 percent, while voluntary and commercial services have risen in number. Some metropolitan areas have turned to the fire department exclusively for service. Among smaller, one-hospital communities, the number of hospital based ambulance services has risen from three to five percent, a small, but significant, increase.

In 1967 a *Summary Report on Ambulance Services* was published by NAS/NRC⁵ and, though brief, this report did point out deficiencies and make recommendations. In 1969, *Medical Requirements for Ambulances*, and in 1970, *Ambulance Design Criteria*, were developed by the same organization.^{6,7} Members of the ACS Committee on Trauma were active in all this work. Now, for the first time, there are rigid and specific regulations as to ambulances, and no ambulance may be purchased with matching funds unless these are met. From 25 to 30 percent of the ambulances in use today meet these requirements, and 55 percent carry the essential equipment as recommended by the American College of Surgeons. The communication capability of ambulances has improved, but only 20 percent have the capacity for direct radio contact with the emergency department. Last year both *Communications Guidelines for Emergency Medical Services* and *Dispatcher Training Course for Emergency Medical Technicians* were published by the National Highway Traffic Safety Administration (NHTSA),^{8,9} and should prove to be of great value in improving the communication networks. To date, five states report dispatcher training programs in effect.

Starting in 1967, due to the success of helicopters in combat theaters, nine different research projects to determine their effectiveness as ambulances for civilian use have been funded by the NHTSA with some varying opinions being reported:

(1) the service is not feasible for large metropolitan areas, but is for rural and smaller community hospital service areas; (2) to be financially feasible and practical, such service must be part of a multi-purpose system; and (3) the investment in a helicopter ambulance service should be held in abeyance until all other elements of the EMS system are complete and operating effectively.¹⁰

The use of surplus helicopters from Vietnam

as civilian ambulance units is intriguing to some, but military helicopters do not meet FAA regulations for civilian use and I am told conversion would cost \$300,000 per unit.

Training of personnel

In 1960 the Chicago Committee on Trauma, under the direction of Dr. Sam Banks, developed a curriculum for a short, but complete course on emergency care of the critically ill and injured for ambulance personnel. Material from this course formed the background for much of the activity in education of ambulance personnel that followed.

In 1968 *Guidelines for Training of Ambulance Personnel* was published by NAS/NRC,¹¹ and a year later a curriculum for a basic course of instruction in emergency care, consisting of 24 lessons and tested in a rural community for two years, was published by the American College of Surgeons.¹² Shortly thereafter, the NHTSA published a more detailed, but almost identical, curriculum with lesson plans and an instructor's guide.¹³ This basic course has been adopted by 44 states as their standard program, and at last report more than 50,000, or 20 percent, of all ambulance personnel had completed the program.

Prior to 1966 there was no nationally acceptable textbook that could be used with a basic program. In that year a pocket manual, *Emergency Care of the Sick and Injured* was prepared by the ACS Committee on Trauma,¹⁴ having been edited by Dr. Robert H. Kennedy, and to date some 39,000 copies have been sold. In 1971, after five years of preparation, a textbook *Emergency Care and Transportation of the Sick and Injured*¹⁵ was published by AAOS. This effort was the brainchild of Dr. Walter Hoyt, Jr., and was finalized by an ad hoc committee of experts in emergency care, including many members of the Committee on Trauma. This is now recognized as the national text for the basic course, and over 250,000 copies have been sold. Since then, two additional reference texts have been published, one by Grant and Murray,¹⁶ and the other by the College of Education of Ohio State University.¹⁷

Various training aids have been produced. In 1969 the Committee on Trauma developed 120 570-slide sets covering most of the ACS basic course. In 1971 these were incorporated with slides by the Committee on Injuries of the American Academy of Orthopaedic Surgeons into an extensive set of 1,700 slides, with a syllabus, covering the chapters of the AAOS textbook, and 400 sets are in use today. In order to ease the burden of the physician-instructor, and to provide means of self education for the emergency medical technician

(EMT), these have since been converted into sound-slide sets covering each lesson plan of the basic course.

In 1971 *Advanced Training Program for Emergency Medical Technicians*¹⁸ was published by NAS/NRS, and this furnished the guidelines for an advanced course, pilot-tested now in 12 areas. This is a minimum of 480 hours of study, with the greatest emphasis on in-hospital activity. A standard curriculum has been finalized and is soon to be published. Many EMTs, especially in metropolitan areas, have been trained to a level of competence higher than outlined in the basic program, including intubating patients, performing venipuncture for the administration of fluids and medicines, and defibrillating patients with cardiac arrest.

No nationally accepted curriculum has been developed yet for the graduate of two-year programs in emergency care, nor has any job description been written for such a graduate.

In January 1970 an ad hoc committee of the AMA Commission on Emergency Medical Services was convened under the leadership of Dr. Hampton and, as a result of its deliberations, the National Registry of Emergency Technicians was born. The registry is still going through the painful youth of a new organization, but is on firm ground. Over 16,000 EMTs have been examined and registered. At the present time, due to obvious need, four levels of competence and function have been established: EMT, EMT-ambulance, EMT-advanced, and EMT-hospital. Many states already recognize the registry as the national organization to which they may turn for evidence of competency of ambulance personnel. Hopefully other states will follow.

Emergency departments

A number of new organizations concerned with emergency departments have emerged during the past seven years; including the University Association for Emergency Medical Services, the American College of Emergency Physicians, and the Emergency Department Nurses Association. Along with long established organizations, such as ACS, these will play a major role in increasing the caliber of emergency care at medical facilities.

Continued

The number of hospitals with 24 hour in-hospital coverage of the emergency department has risen to 26 percent, and full-time physicians working on a contractual basis are becoming more numerous. Many are well trained, but many rely only on years of general practice for their knowledge and skill. Training programs for the emergency department physicians are growing in number across the country, and the ACS and the AAOS have been, and still are, conducting such courses in strategically located cities. Short films and sound-slide programs covering the management of the more common life-threatening problems have been and are being developed for use as education and re-education tools.

A healthy majority, 85 percent, of the emergency departments now have policy and procedure manuals and the number with written and tested disaster plans has risen from 50 to 75 percent. A great number, especially among the smaller hospitals, still do not have an emergency department committee.

The Joint Commission on Accreditation of Hospitals has updated its manual regarding emergency departments, and the surveyors are taking a closer look at these areas.

Guidelines for the categorization of emergency capabilities of hospitals were developed by representatives of many organizations and published by the AMA in 1971.¹⁹ The intent was that these would be used nationwide, that those demands which proceed to be controversial would be removed, and that new, workable, and generally accepted standards would result. At last report, only 12 states had completed categorization, but not all had used the published guidelines. The majority of hospitals fell in the basic category, and too many did not qualify for even this level.

Finally, national action of any kind requires money, and emergency medical service is no exception. Despite repeated testimony that \$2 billion in new money would be required each year from all levels of government to bring about the improvements congress claimed it wanted, only \$267 million was authorized for the first three years when the National Highway Safety Act was passed in 1966. In 1971, five years later, all of this had not been appropriated. Only \$67 million was authorized for fiscal year 1972. Only \$10 to \$12 million of

these funds have actually been available for emergency medical services each year.

What has all this activity accomplished, if anything? As the politicians say, the record should speak for itself.

In 1972, accidents were still the leading cause of death between the ages of one and 37.

In 1972 motor vehicles were still the leading cause of death for persons below the age of 75.

In 1972 the total costs of accidents rose to \$32 billion.

With the increase in population, accidental deaths increased to 117,000 but the rate fell from 58 to 56.2 per 100,000 population, for a saving of two lives per 100,000. Deaths from motor vehicles were 56,300 but the rate fell to 4.5 per 100 million miles traveled, the lowest record ever. However, 70 percent of these deaths still occurred in rural areas. Despite marked improvement in the pre-hospital care of patients with heart attacks in certain areas such as Portland, Seattle, Miami, and Jacksonville, to name a few, over half a million such deaths occurred in 1972, half of them before the victim reached medical facilities.

Let us look to the future. I am sure we will all agree that while we have not won the war, we have won some important battles, and we are still in the fight. What can we do now to assure victory? Where should we concentrate our troops and our resources? What are the actions to be taken?

There are a number of general activities of less immediate need directed toward long term improvement of emergency medical services which need only be mentioned: a national trauma registry; replacement of lay coroners with medical examiners, preferably pathologists; compulsory autopsy of all accident victims; expansion of research in trauma; and a national institute of trauma.

Then there are the specific actions which should result in more rapid improvement in emergency medical services and reduce the toll of sudden death and disability, some of which require a great deal of effort, others only money. These have been defined time and time again, but, as all of us know, they are not being accomplished.

An informed and educated public is essential, but this remains one of our biggest failures. Only 19 states report an established public information program. The public must be informed regarding the problems, the effectiveness of an EMS system in solving these problems, and the public's place in such a system. It must be aware of the importance of meaningful legislation, and that it can "have the ears of the politicians". Other aspects of public understanding include the need for

financial support from local, state, and federal sources, which has been woefully lacking in the past. The importance of preventive measures, such as passenger restraints in vehicles, and the apathy and resistance to the use of such restraints is intolerable. Distasteful as this may be to some, the use of passenger restraints must be mandatory for we are our brother's keeper.

The entire population, starting at the fifth grade level, must be trained in first aid, and this is the greatest challenge to the American Red Cross. In addition, those persons most frequently exposed in their daily life to the critically ill and injured, the firefighters, policemen, etc., should be trained in cardio-pulmonary resuscitation as well. Think what it would mean in lives saved if in every home and in every vehicle on our highways, there was someone with knowledge of life-saving measures.

I have not mentioned the American Trauma Society earlier on purpose. I feel that this now-established organization, with its potentially large non-professional membership, along with its other projects, is the logical one to make certain that an informed and educated public becomes an accomplished fact.

Replacement of sub-standard ambulances should proceed nationwide, and essential emergency care and communication equipment should be acquired as quickly as possible. Certainly, the dangerous one-man station wagon ambulance must be eliminated immediately. With the interest already generated, these actions should present no real problem especially if deadlines are set in each state to prevent the foot-dragging of the past.

Our biggest problem is education of those who provide emergency care. All the most sophisticated equipment in the world is of no value without properly trained personnel to use it. This is our responsibility and if we ignore it there is a real danger of deterioration of the expertise of ambulance personnel, as an example, and we will slip back to the days of 'first aid' rather than emergency care in ambulance service. There are 200,000 ambulance attendants who must be educated to the basic level of emergency care. Physicians must supervise and conduct this education for, after all, the care provided at the scene and during transport is in reality an extension of such care in the emergency department. I doubt that this can be accomplished before the end of 1974, as some think, but every effort must be made to get this done as soon as possible without sacrificing quality in the process.

Obviously, the basic level of knowledge and skill is not the answer to the problems of sudden death and disability; more sophisticated

emergency care is required at the scene and during transport. Until the curriculum for the advanced program is published, and until courses are established in medical centers nationwide and are being used, this need can be satisfied only by adding an increased amount of in-hospital education to the basic curriculum. This must be done by local option, where it is recognized by physicians to be feasible and possible, and must involve such areas as intubation, venipuncture for administration of fluids and medicines, care of patients with actual or potential cardiac arrest, and other life-saving measures, to be performed under the direction of physicians while in contact with technicians by radio.

Work must continue to develop a job description and a curriculum for the diploma or two-year associate degree program in emergency care which, ideally, should be conducted by physicians at medical centers with busy but well organized emergency departments. But in view of the great need for the basic and advanced programs, it would seem premature to spend a great deal of effort on any 'degree' program in the foreseeable future.

There must be nationwide increase in educational programs in emergency care for medical students, practicing physicians, and emergency department nurses, with no question as to the availability of such courses anywhere in the country. An increase in the amount of visual aid material of all kinds covering the management of life-threatening problems, to be used by personnel of smaller hospitals for education and re-education, is essential.

It is time for another conference to develop acceptable guidelines, eliminate the controversial demands of the original document, and accomplish categorization of the emergency capabilities of hospitals in a uniform manner nationwide, with improvement of emergency departments the inevitable result.

With the momentum already generated, improvement in emergency medical care will occur in the natural order of events in urban areas with medical schools, medical centers, and concentration of specialists. The biggest problem, and the one on which we should concentrate our efforts and resources, is the EMS systems of rural areas, small communities, and

Continued

isolated cities. Rather than continuing to spend funds and effort in metropolitan areas with already established or rapidly developing EMS systems, it is time we pay attention to the areas with greater need.

The lack of day-to-day experience is a stumbling block to maintaining the caliber of care, as knowledge and skills deteriorate if not used regularly. This is particularly true in the case of the emergency medical technician. One answer to this is the hospital-based ambulance service. The organization of such a service need not be hospital oriented, but it may be. To take advantage of a larger population such an ambulance organization could encompass a number of hospital service areas, and result in improved relationship among all concerned. The delivery of emergency care and education and re-education of personnel would be easier, and the financial burden would be divided between the two organizations.

I am sure that I have told you nothing new, but we have taken a closer look at an area of medical care that requires a great deal more action. I would like to close with one last thought—a word of warning.

Emergency medical services has become a very attractive subject in the past year or so. We as physicians must become involved vig-

orously, individually and collectively, on all levels, community, state, and federal, in emergency medical services. If we do not, we will be swallowed up by lay planners who have appeared on the scene in great numbers recently, eager but often uninformed, ready to take our burden onto their shoulders. If we allow this, EMS systems will be developed to their liking without regard for the needs or desires of the medical profession. These lay planners are standing in the wings waiting to get into the act; some are already on the stage performing, but they really don't know their lines; this is nowhere more evident than in the field of education of ambulance and other ancillary personnel. The American Red Cross has changed the name of one of its new manuals on first aid to "Advanced First Aid and Emergency Care". Lay planners in community colleges, without close association with medical centers, are developing the curriculum for a two-year educational program in emergency care. And there are other examples.

Physicians are morally, ethically, and legally responsible for all aspects of emergency medical care. We must not delegate this task or allow it to be assumed by anyone else if we are to bring about the improvement in EMS systems that every citizen of this country deserves.

References

1. *Accidental Death and Disability: The Neglected Disease of Modern Society*, National Academy of Sciences, National Research Council, Sept. 1966.
2. *Highway Safety Program Manual*, US Dept of Transportation, National Highway Traffic Safety Administration, vol.11, Jan. 1969.
3. Huntley, H.C.: *National Status of Emergency Medical Services*, New England National Meeting on Emergency Health Services, June 14, 1973.
4. Minimum Equipment for Ambulances, American College of Surgeons, Committee on Trauma, *Bull Am Coll Surg* 46:136, 1961.
5. Summary Report of the Task Force on Ambulance Services, National Academy of Sciences, National Research Council, Apr. 1967.
6. *Medical Requirements for Ambulance Design and Equipment*, National Academy of Sciences, National Research Council, 1970.
7. *Ambulance Design Criteria*, National Academy of Sciences, National Research Council, May 1971.
8. *Communication-Guidelines for Emergency Medical Services*, US Dept of Transportation, National Highway Traffic Safety Administration, Sept. 1972.
9. *Dispatcher: Emergency Medical Technician*, training course, US Dept of Transportation, National Highway Traffic Safety Administration, Nov. 1972.
10. *Helicopters in Emergency Medical Services*, NHTSA experience to date, US Dept of Transportation, National Highway Traffic Safety Administration, Dec. 1972.
11. *Training of Ambulance Personnel and Others Responsible for Emergency Care of the Sick and Injured at the Scene and During Transport*, National Academy of Sciences, National Research Council, 1968.
12. Farrington, J.D., and Hampton, Jr., O.P.: Curriculum for Training of Emergency Medical Technicians, *Bull Am Coll Surg* 54:273-76, 1969.
13. *Basic Training Program for Emergency Medical Technician—Ambulance*, US Dept of Transportation, National Highway Traffic Safety Administration, Oct. 1969.
14. Kennedy, R.H. (ed): *Emergency Care of the Sick and Injured*, American College of Surgeons Committee on Trauma, Philadelphia, W.B. Saunders Co., 1966.
15. Rockwood, C.A.: *Emergency Care and Transportation of the Sick and Injured*, Chicago, American Academy of Orthopaedic Surgeons Committee on Injuries, 1971.
16. Grant, H., and Murrar, R.: *Emergency Care*, Washington, D.C., Robert Brady & Company, 1971.
17. Trade and Industrial Education Service, Columbus, Ohio, College of Education, The Ohio State University, 1971.
18. *Advanced Training Program for Emergency Medical Technicians—Ambulance*, National Academy of Sciences, National Research Council, Sept. 1970.
19. *Categorization of Hospital Emergency Capabilities*, Commission on Emergency Medical Services, Chicago, American Medical Association, 1971.