it rolled off the highway shoulder at 60 m.p.h. His injuries were appalling. But his accident happened in Baltimore, a city that is superbly prepared for this kind of casualty.

A cruising state trooper saw the car and radioed headquarters. Officers there summoned to the site one of their two helicopters and also, on their direct line, called the Center for the Study of Trauma at the University of Maryland Hospital in downtown Baltimore. (Several other hospitals were nearer, but Baltimore, unlike most communities, was geared to get him to the best.) At 2:17 the helicopter landed the patient on the roof of the adjoining building. He was rolled down a ramp and into the trauma center. Time of arrival: 2:25.

The room he entered has no superior in this country when it comes to emergency treatment. It is 50 feet square, dominated by a raised center island from which doctors and nurses can keep an eye on each of the 12 cubicles for patients. It is manned continuously by two or more physicians and five or six nurses. Every patient area contains a full complement of respirators, catheters, sensors for blood pressure and other vital signs, data-monitoring systems that can signal a change in the patient's condition or detect a malfunction in the equipment. Each patient-monitor is duplicated on the central observation island.

Today's patient, on admission, was scarcely breathing; his blood pressure was dangerously low, and he was in a deep coma. The onset of shock appeared imminent. To head it off, Dr. Paul Hanashiro, clinical director of the unit, ordered intravenous injection of the proper fluids to replace those lost, and the placement of a tube in the windpipe to establish an airway. When X rays revealed fractures of three ribs and the left shoulder blade, plus a broken back, orthopedic and neurosurgeons were called in at once.

The patient remained unconscious for four days. Given the ordinary circumstances—slow transportation to a run-of-the-mill hospital—he would surely have died. But he made a successful recovery, and was released from the center. In fact, of the 300 gravely injured patients hurried to this trauma center in the past 12 months, 225 recovered. With ordinary treatment, doctors believe, at least half of these survivors would have died.

No Charms. The trauma center got its impetus in 1966, when the National Institute of General Medical Sciences (a division of the National Institutes of Health) became so concerned about trauma that it offered grants for research into this subject to several hospitals. One was the University of Maryland Hospital.* There, since 1961, a pilot clinical shock unit had been operating under the direction of Dr. R Adams Cowley. Starting with the concept of a 12-bed patient area—which still makes it one of the largest emergency facilities in the world—Cowley and his colleagues designed the five-story, $2-million unit that opened for service in June 1969. The Baltimore organization clearly represents dramatic progress in trauma therapy. Today, doctors from other institutions are being rotated on its staff, and last year more than 100 came to study the center's operation.

Obviously, not all communities can afford such a facility. But *many more* can. Will and leadership are necessary: on the part of doctors, for clear reasons; on the part of industry, which loses hundreds of millions of dollars each year because of disabled employes; on the part of insurance companies, which pay the claims; and, finally, on the part of the taxpayers themselves. After all, none of us leads a charmed life.

*Others to date: Columbia Presbyterian Medical Center, New York; Parkland Memorial Hospital, Dallas; Hospital of the University of Pennsylvania, Philadelphia; Albany, N.Y., Medical Center; Cincinnati General Hospital; E. J. Meyer Memorial Hospital, Buffalo; Boston University Medical Center.

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NEEDED: MORE HELP FOR ACCIDENT VICTIMS

By James R. Miller

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Condensed from FAMILY SAFETY
By JAMES R. MILLER

Each year, one of every four Americans suffers accidental physical injury. Yet our facilities for dealing with this "epidemic" remain shamefully—even lethally—out of date

A YOUNG soldier steps on a land mine in Vietnam; a young civilian steps in front of a speeding car in a Midwestern city. Both suffer grave multiple injuries. Only one has an excellent chance of survival. Which is it?

The soldier—and no doubt about it. Accidental physical injury is the fourth-greatest killer in this country, but few hospitals here can cope with it as expertly as a combat-area medical unit.

The problem is an important one. Consider:

• Annually in the United States there are more than 50 million accidental injuries, accounting for 115,000 dead, 400,000 permanently disabled, and 10.5 million temporarily disabled. (Each year, accident victims occupy more than 65,000 hospital beds for a total of 22 *million* bed-days.)

• Only heart disease, cancer and stroke cause more deaths, and these are outranked by accidents in the one-to-37 age group. In fact, accidents cause almost *45 percent* of all deaths of children between ages one and 15.

• The annual cost to the nation in medical expenses, wage losses, insurance costs and property damage totals $25 billion—roughly equal to the annual appropriation for the war in Vietnam.

Given the extent of the problem, why does our handling of accident victims leave so much to be desired? One of the main reasons is the gap between knowledge and application.

Four Soft Spots. For the man who falls off his roof or tangles with a power saw, four things are needed immediately: first aid, fast transportation, effective communications, a good emergency medical facility. In most communities, not one of these elements can be taken for granted.

First Aid. With serious injury, the first 15 to 30 minutes are critical. And the first aid required is of the advanced kind that the average citizen rarely knows: training in what to do—and not to do—about fractures, hemorrhage and impaired breathing. The best hope, then, is that an ambulance will arrive quickly with skilled attendants who can give the patient expert attention.

Unhappily, to quote a report of the Division of Medical Sciences of the National Academy of Sciences-National Research Council: "First-class ambulance service exists in few cities. There are no generally accepted standards for the competence and training of ambulance attendants. Attendants may be unschooled apprentices lacking training in even elementary first aid." Untold thousands die or are permanently disabled because of inadequately trained ambulance and rescue crews.

Transportation. The report continues, "Approximately 50 percent of the country's ambulance service is provided by 12,000 morticians, mainly because their vehicles can accommodate litters. No manufacturer produces from the assembly line a vehicle that can be termed an ambulance" (with low floor and high dome, for example, so that attendants can work on their feet). "Most ambulances are impractical for resuscitative care, have incomplete fixed equipment, and carry inadequate supplies."

Communications. The report also says, "Although it is possible to converse with astronauts in outer space, communication is seldom possible between an ambulance and the emergency department it is approaching." Yet it is hard to imagine anything more obvious than this need. The ambulance attendant should be able to alert the hospital for an admission, to report on the victim's condition and receive advice. He should also be able to reach police and fire departments so that they can clear traffic lanes or mobilize additional rescue equipment. But, with rare exceptions, ambulance radios (if any) provide communication only between the driver and dispatcher.

Emergency Facility. Ninety percent of the 7000 accredited hospitals in the United States provide "emergency rooms." In general, these are small and poorly equipped, often little more than outpatient clinics crowded by people with head colds and sprained ankles. They are understaffed, usually having on hand one attendant and one intern. They are shortest of staff on nights, holidays and weekends, when a great percentage of serious accidents occur.

Ambitious Idea. Clearly, much could be done to improve the chances of the accident victim. The requirements for good ambulance service are tough but not beyond reach.* They can best be met, doctors argue, if our communities will look upon the ambulances as a "third service," alongside police and fire departments, to be supported, as these are, by community taxes. The equipment should be every bit as good as that used by policemen and firemen; the ambulance attendants should have equally intensive training, comparable wage scales and security provisions. Also recommended is a much wider use of helicopter ambulances, especially for rural areas and towns of 2500 and under—where 70 percent of traffic fatalities occur.

Finally, doctors are endorsing an ambitious scheme to upgrade the emergency medical centers themselves. The essence of the idea is categorization—reducing emergency facilities in some hospitals, increasing them in others, to provide an integrated network with four categories:

1. *Advanced first-aid facility.* Part-time physician and nursing staff. Capable of handling minor injuries. (Most existing hospital emergency rooms are in this category.)

2. *Limited emergency facility.* A nurse and perhaps a physician always available; no ready access to specialists. Adequate in many cases, but, for the critically injured, emphasis here is on resuscitation and preparation for transfer to a center with greater resources.

3. *Major emergency facility.* Physicians and nurses, highly trained in lifesaving methods, available 24 hours a day. Specialists always on call. Must have blood bank, complete resuscitative equipment, X-ray instruments, around-the-clock laboratory services, and immediate access to operating rooms. Should be integral element of a large hospital and university medical center.

4. *Emergency facility and trauma-research unit.* This is the ideal, combining everything in the third category with an intensive program of research in support of therapy. ("Trauma" is the physician's word for all states of physical damage caused by blows, cuts, blasts, falls, shocks, poisons, burns.)

All this, doctors admit, will cost heavily. But they insist that in the long run the economic saving would be immense.

Case History. At 2:10 p.m. one day last May, a 22-year-old man lost control of his car on a curve, and

*A single copy of (1) a manual on ambulance design and equipment, and (2) a manual on training ambulance personnel is available without charge from the U.S. Public Health Service. The U.S. Government Printing Office will fill bulk orders of these manuals, at a cost of twenty-five cents per copy.