Between Alarms

Fighting the Good Fight

Shocktrauma. *By Jon Franklin and Alan Doelp. 251 pp. Fawcett Crest Books, NY. $2.95*

There is no better way to capture the essence of this engrossing book than by quoting the remarkable opening paragraph of its own forward: "Trauma is a disease that fingerpaints its signature in blood and brain; this is not a book for the timid. It is a work of painstakingly documented nonfiction, the product of five years of research, accurate in fact and context."

Shocktrauma is a chronicle of the conception and birth of the Maryland Institute for Emergency Medical Services, a highly controversial establishment, an embodiment of the compulsive dream of one man. But to describe the book as a simple story about the founding of a hospital is to do it an injustice; the book has much more breadth than that.

Shocktrauma is also the story of a medical detective, Dr. R Adams Cowley. Dr. Cowley, a heart surgeon, decided to investigate why heart patients, like trauma victims, were dying of shock following the extreme loss of blood pressure caused by heavy bleeding. He was frustrated by the mystery of the classic joke: "The operation was a success, but the patient died."

The doctor performed research on animals, and made detailed observations of dying humans in his "death lab." He also noted that the faster a surgeon performed, whether due to skill or the pressures of war, the fewer the patients that died. He concluded that after the body sustains trauma with great loss of blood and decreased circulation, there is precious little time to foil the more subtle enemy, shock.

"You think people die from accidents or heart attacks, but they really don't. Not directly. Those things produce shock, which is sluggish or nonexistent circulation, and that's what kills you . . . What we've discovered is that if you stay in shock for very long, you're dead. Maybe you'll die in ten minutes or maybe you'll die next week, but you're dead . . . You've got, at most, sixty minutes. If I can get to you, and stop your bleeding, and restore your blood pressure, within an hour of your accident . . . then I can probably save you. I call that the golden hour."

With this conclusion, Dr. Cowley fought for the rights of dying motorists to get competent medical treatment within that "golden hour." He argued that the prevailing medical practice of taking accident victims to the nearest hospital emergency room, without regard to whether or not that hospital's emergency room was equipped and ready to handle the trauma, was causing thousands of unnecessary deaths. Patients were living or dying based upon where they had their accidents, whether the nearest hospital had the depth, such as extensive blood banks and sophisticated equipment, to deal with their trauma.

But the authors of *Shocktrauma* cover more than facts, figures, techniques and procedures. They are also highly successful at dramatizing the tension and pressure of the work at Shocktrauma, the effect that pressure has on the staff, and the fact that despite all this there is genuine care and concern for the victims they treat so tirelessly. The book is also a story about people.

Today Shocktrauma uses half of all

embolism, a hospital corpsman, paramedic or physician must enter the chamber with the patient. Inside the chamber, the tender ensures that the patient is lying down or positioned properly to permit free blood flow to all his appendages. Once the door is closed, pressurization begins. The rate of pressurization will vary depending on the severity of the condition. During early stages of treatment, the inside tender must constantly watch for signs of relief of the patient's symptoms.

If you come across a victim of a diving accident, avoid administering any drugs which will mask the signs of the sickness. Observation of these signs is the principle method of diagnosing the patient's sickness and the depth and time of their relief designates the treatment table to be used. The final recommendation as to which treatment table should be used, however, must be made by the diving supervisor or attending physician outside the chamber. Once the treatment has begun, it may only be altered by a diving medical officer with the concurrence of the commanding physician.

The treatment for diving accidents have come a long way. Don't ever have the diver's buddy take the patient back down into the water for treatment. This article was meant to explain the personnel involved in the treatment of a victim of a diving accident and the levels of responsibility. □

Dudley J. Crosson is an EMT instructor and Master Scuba instructor in Miami, Florida.

Help! Received

In the February 1980 issue, *Emergency* asked readers for HELP! Our thanks go out to those who participated in our equipment survey. This has encouraged us to do other surveys periodically.

We received many interesting responses and would like to share what prehospital personnel around the country had to say.

We asked which items are the most frequently used on emergency calls. Readers responded with O_2, BP cuff, bandages, short board, trauma kit, gurney, air splints and stethoscopes.

Asking which items they would like to have to improve performance in the field brought forth these responses: MAST suit, heart monitor, Hurst tool, defibrillator, airways, IV equipment, build-a-board, and "lighter" telemetry.

Twenty percent of our readers felt that available equipment in the EMS field is behind the available training, while an overwhelming 80 percent felt EMS training is behind the available equipment on the market.

The pieces of equipment our readers felt are doing the most to improve EMS are the MAST suit, heart monitors, defibrillators, and the Hurst tool.

The Thomas Edison's that answered our survey had many ideas for new products or inventions to improve EMS. Several were interested in seeing all-in-one IV kits, portable oxygen warmers for victims of hypothermia, fool-proof airways, smoother ambulances, and one reader conceptualized a device that would "nibble" away the dashboard of a wrecked car.

NEWS AMER 9/14/79

Aggressive medicine

Two *Evening Sun* reporters have authored an 83,000-word book on the "aggressive medicine" practiced at the life-saving shock-trauma center here. Jon Franklin, who recently won a Pulitzer Prize for his science reporting at the *Evening Sun*, and Alan Doelp researched the book, called "Shock Trauma," for five years. They spent 32 days in June writing it, "locked in a tiny little office," Doelp said. The book will be published in February by St. Martin's Press in New York. During the research, which traces the treatment given critically ill patients at the center, Franklin and Doelp donned scrub gear and went into the operating rooms to see first-hand the techniques of the doctors, who maintain an 82 percent survival rate of patients generally near death when they arrive.

—Jan Pogue

'Shocktrauma,' a shocker that happens in Baltimore

SHOCKTRAUMA. By Jon Franklin and Alan Doelp. 256 pages. St. Martin's Press. $9.95.

YOU WILL PROBABLY not read every word of the new book "Shocktrauma," by Pulitzer prize winner Jon Franklin and Alan Doelp, both *Evening Sun* reporters.

There are passages where the description of the sights, smells, the horrible reality of routine procedures in the business of saving lives at Baltimore's pioneering trauma center, about which this book is written, is so vivid, so accurate that your senses will want to reject the mental picture being drawn for you.

Various body fluids and puses empty through a myriad of tubes into a container that some poor night attendant has to empty — a job he hates. That's after the horrendous initiation procedure, the admission shakedown with competent, professional surgeons and nurses and an anesthesiologist surrounding the patient's naked body from head to toe with prearranged tasks of probing, cutting, looking inside to locate all the damage.

Such a patient can forget painkillers. A main concern of the medical team is that he or she is in shock or may go into shock and narcotics will slow down the already slowed circulation and breathing systems. Pleas of "give me something for pain" are politely answered but usually unheeded for some time.

In fact, the swiftly dellvered patient may be put on curare, a paralyzing drug, and not be able to scream or fight at all; yet, if the accident has left him or her conscious, the patient will still be aware of what is going on.

Reading all this, a well person dreads the thought of going out into highway traffic. Which is one good reason for writing, and publishing, such a book. Motor vehicle accidents are the major cause of the torn limbs, ripped guts, bashed brains and broken spinal cords that fill the trauma center's beds. Drivers, many of them drunk drivers, usually cause the accidents.

But there is another excellent reason for writing the tale of Dr. R Adams Cowley's struggle to build such a system in Maryland: a 24-hour, well-staffed, fully-stocked professional trauma center to which critically injured patients would be helicoptered.

The bottom line is that if you care about living, it is comforting to know your state has a trauma system like the one conceived by the unconventional Dr. Cowley.

Dr. Cowley fought against the tide of medical politics in Maryland for years. He insisted that the traditional rule of taking an injured person to the nearest hospital had to be broken. Some hospital emergency rooms were killing people who didn't need to die, said the outspoken heart surgeon. He was right, say the authors.

Trauma medicine has now become a board-certified specialty, a recognition on the part of the medical profession that there is a better way of caring for battered victims who may die of shock than just leaving their fate to the residents in training who often staff hospital emergency rooms and to the on-call surgeons.

Yet state emergency medical systems with specialized trauma centers like Dr. Cowley's still do not exist everywhere, and "Shocktrauma" takes the position, from first page through last, that they should.

Dr. Cowley talks of "the golden hour," the first critical hour after the patient's injuries during which a first-class respirator may be needed, a "belly tap" to find out if there is internal bleeding in the abdomen, the many other diagnostic and life-support procedures ready and waiting for routine use at the Maryland Institute for Emergency Medical Services — today's shock-trauma center at (but jurisdictionally separate from) the University of Maryland Hospital, which Dr. Cowley and his team built up.

The reader gains an admiration for Dr. Cowley as a bullheaded fighter and "genius" in his work. But the reader also at moments grows a little uneasy with the extent of glorification and credit that the authors choose to give the trauma chief. Have authors Franklin and Doelp, championing a cause they believe in, became a part of the loyal Crowley team they describe?

"Shocktrauma" is the stunning inside story of how a major trauma center works. The observation and comprehension of detail is a credit to the authors' reporting ability, yet the book never bogs down in this immense detail. "Shocktrauma" interweaves short chapters picturing the mounting tension of step-by-step dramas, as specific patients enter the trauma unit, with other chapters depicting the center's background, philosophy and growth. The reader's urge to find out what happens next carries through to the end.

One disappointment is that the patients themselves never tell their stories. What was it like? How much did they know? Where were they headed when their lives suddenly were so violently interrupted and changed?

This book tells the trauma system's story from the point of view of the men and women who staff it. And, in that framework, the reader knows as much and as little about the patients as do the staff who work long, wrenching, painstaking days and nights, often to burn out within about three years, and escape.

MARY KNUDSON

SHOCKTRAUMA

ABOUT THE AUTHORS

Jon Franklin

Jon Franklin, Pulitzer prizewinning science writer for the Baltimore *Evening Sun*, is a native of Oklahoma. After dropping out of high school in 1959, Mr. Franklin enlisted in the Navy and served aboard several aircraft carriers in the Pacific before being transferred to Washington, D.C. to write for the Navy's *All Hands Magazine*.

After his discharge, Mr. Franklin enrolled in the University of Maryland School of Journalism. In 1970, he graduated with high honors and joined the staff of the Baltimore *Evening Sun*.

Since becoming the paper's science writer, Mr. Franklin has won a variety of awards, including the American Chemical Society's 1975 James T. Grady medal for bringing science to the layman. In 1979, he won the Pulitzer Prize for feature writing, the first time the award had been presented in this category.

Alan Doelp

Alan Doelp was raised in Big Spring, Texas. He attended Texas Technological University, where he studied political science and journalism. At the same time, he worked as a radio and TV announcer at station KSRL-TV.

After graduating from college in 1971, Mr. Doelp became a reporter for the Baltimore *Evening Sun*, where he has worked ever since. During this time, he and Franklin have collaborated on several stories for the paper, including a report on the city ambulance service which attracted national attention and resulted in a number of major reforms.

St. Martin's Press, 175 Fifth Avenue, N.Y., NY 10010 212-674-5151

Metro & Region
BOSTON SUNDAY GLOBE MARCH 23, 1980

Needless deaths?

Trauma centers urged for Mass.

By Richard A. Knox
Globe Staff

If 136 people died in a single plane crash at Logan, there would be legislative committees demanding better airport safety equipment and procedures.

If 136 people were found to have died because of medical malpractice in a single hospital in a single year, public outrage would be automatic.

However, last year at least 136 people died in Massachusetts needlessly from injuries following auto accidents, according to Dr. Edward P. Hoffer, medical director of the state Office of Emergency Services. These people — 15 percent of the state's 909 motor vehicle deaths in 1979 — "died of treatable injuries," Hoffer says.

The reason? They were taken to hospitals unable to treat them properly.

To reduce the number of these "unnecessary" deaths, a 25-member task force of the Massachusetts Department of Public Health has recommended the creation of a two-tiered, statewide system of trauma centers.

Under the proposal, each of the six Massachusetts health planning regions would contain at least one designated trauma center; most areas would have two or three. A trauma center would be an existing hospital with a full range of personnel and facilities to guarantee optimal first-line emergency care for the severely injured.

Five of the 11 proposed trauma centers in the state would be designated as "comprehensive," meaning that they could also receive transfers from the areawide trauma centers for the approximately 5 percent of the patients who need the most sophisticated care.

The proposal, which will probably be modified before a final report is issued in June, specifies the kinds of patients who should be taken to designated trauma centers and the professional staff and services that must be available at all times in the emergency room or on the hospital premises in order for a hospital to qualify for trauma center designation.

Trauma centers urged for Bay State

★ TRAUMA
Continued from Page 41

The system would be linked to ambulances via two-way radio so that physicians in the trauma center could consult about the appropriate place to transport individual cases and get advance warning of arrivals and the patient's condition.

Eventually the system would incorporate sophisticated "advanced life support" care at the scene of injury, with radioed direction from trauma center physicians.

The committee also recommends:

- That legislation be filed requiring post-mortem examinations on all trauma patients within 24 hours of death.
- That a statewide trauma registry be established to monitor the quality of the current and proposed systems.
- That emergency physicians not practicing in designated trauma centers rotate through centers periodically to maintain skills in the management of trauma.

The plan envisions two comprehensive trauma centers in Boston, one comprehensive center in west suburban Boston; one areawide trauma center each for the Merrimack Valley and North Shore regions; one areawide center in Cape Cod and one in New Bedford; one areawide center in Fitchburg-Leominster and a comprehensive trauma center in Worcester; and a comprehensive center in Springfield and areawide center in Pittsfield.

The proposal, 13 months in the making, will be circulated this week to Massachusetts hospitals, health planners and professional groups such as the state Medical Society and physician specialty groups.

Those involved in the effort acknowledge that the plan will be controversial. Neither individual hospitals nor the surgeons who staff emergency rooms are likely to be happy if their institution loses in the competition to become an areawide or comprehensive trauma center. Yet obviously only a tiny fraction of the state's 110 hospitals with emergency rooms can win the designation, if the system is to work as envisioned.

The competition may be especially intense in Boston, since two comprehensive trauma centers are envisioned, while there are a dozen large teaching hospitals affiliated with three medical schools. Since severely injured patients represent an important sort of "teaching material," the centralization of these cases in two centers might require young physicians and surgeons in training to rotate through the comprehensive trauma centers to gain experience in such care.

"There are hospitals that are real touchy about the whole issue," said Michele Goody of the state Health Department's Office of Emergency Medical Services. "It varies from region to region — they're pretty much all at different stages right now. But anything recommended in this kind of report wouldn't be expected to happen overnight anyway."

There has already been controversy within the statewide trauma committee about the proposal. Some believe there is now no shadow of a doubt that such a system saves lives, while others remain unconvinced.

The result, Dr. Enzo Di Giacomo of Springfield's Mercy Hospital, committee chairman, said in an interview, is that some regions will probably go ahead with the plan and others will stall and wait for more "proof."

"The major point of politics right now is the philosophy," Di Giacomo said. "No one can prove or disprove that a trauma system will save more lives."

Di Giacomo acknowledged that the economic implications of the proposal may generate opposition in some quarters. However, he believes such concerns are overstated, since only a small percentage of all injured patients would need trauma center care.

For instance, the task force estimates that only 5578 of the 111,624 claiming injuries in motor vehicle accidents last year would have needed trauma center care, or about five percent of the total. In Boston, that would amount to about 865 of the more than 17,000 auto accident cases.

Hoffer and some other committee members believe that the evidence is already sufficient to justify creation of a trauma center network. "The available literature strongly suggests that in all parts of the country, trauma victims die unnecessarily," Hoffer wrote in a preamble to the draft proposal. "It also suggests that most of the unnecessary deaths could be avoided if the patients were brought to a trauma center."

Hoffer reviewed studies in San Francisco, the rural mountain west, Baltimore, Wisconsin and Illinois. They all indicate that severely injured patients are more likely to die in smaller hospitals less experienced in the treatment of such cases and less equipped and staffed to offer comprehensive and aggressive care.

The study of trauma centers in Illinois, which set up a statewide trauma system in 1971, confirmed that trauma centers improve the outcome for injured patients who got to the centers as intended, "but failed to have a major impact on patient flow patterns," Hoffer said.

SHOCKTRAUMA

THE GOLDEN HOUR

"What we've discovered is that if you stay in shock for very long you're dead. Maybe you'll die in ten minutes or maybe you'll die next week, but you're dead. So if you're in shock we have to work fast. You've got at most sixty minutes. If I can get to you, and stop your bleeding, and restore your blood pressure within an hour of your accident, I can probably save you. I call that the Golden Hour."

7:20 BRAKES SCREECH, GLASS SHATTERS, AND METAL CRUNCHES AS A CAR AND A BUS COLLIDE.

Accidental injury is the leading cause of death among all persons under the age of 37.

7:48 A TROOPER LANDS THE EMS HELICOPTER ON THE HIGHWAY AND RACES TO THE DRIVER OF THE WRECKED CAR. TOGETHER, HE AND THE AMBULANCE CREW PUT THE PATIENT INTO A STRETCHER, GIVE EMERGENCY AID, AND RUSH HIM TO THE COPTER. IT TAKES OFF IMMEDIATELY.

Each year more than 60 million people are injured. More than 115,000 of these injuries are fatal.

8:03 AFTER ITS 120 M.P.H. TRIP, THE HELICOPTER LANDS. . . . THE DOORS OPEN, AND ATTENDANTS RUSH THE MAN INTO A WAITING AMBULANCE.

One out of every eight hospital beds is occupied by an accident victim.

8:07 WHEN THE AMBULANCE ARRIVES AT THE SHOCKTRAUMA CENTER, THE NURSE JUMPS OUT AND RUNS AHEAD TO THE ADMITTING AREA. THERE SHE TELLS THE MEDICAL TEAM WHAT TO EXPECT: "HE'S IN SHOCK—PULSE IS WEAK. . . ."

Major deficiencies exist in current medical care. In spite of the establishment of hospitals specializing in the treatment of shock, it is still common practice throughout the country to transport the trauma victim to the nearest hospital regardless of its facilities for handling severe injuries. The patient is either inadequately treated or eventually transferred to another hospital, resulting in the loss of precious time.

8:09 ATTENDANTS WHEEL THE PATIENT IN. DOCTORS QUICKLY SURROUND HIM. WHILE ONE DOCTOR TRIES TO STOP THE BLEEDING, ANOTHER STARTS A BLOOD TRANSFUSION. AT THE SAME TIME, ASSISTANTS ARE PREPARING TO TAKE X-RAYS OF THE PATIENT'S SPINE AND LEGS.

"It's time. I can go out and get money, and I can hire doctors. I can hire nurses. I can get helicopters, and I can buy monitors and equipment, but I can't buy time."

8:15 LESS THAN AN HOUR AFTER HIS ACCIDENT, THE PATIENT IS IN SURGERY. . . . JUST FIVE DAYS LATER HE GOES HOME.

"I can't buy back that golden hour."

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SHOCKTRAUMA

The New York Times

Pulitzer Prize Awarded to Jon Franklin
Co-Author of SHOCKTRAUMA

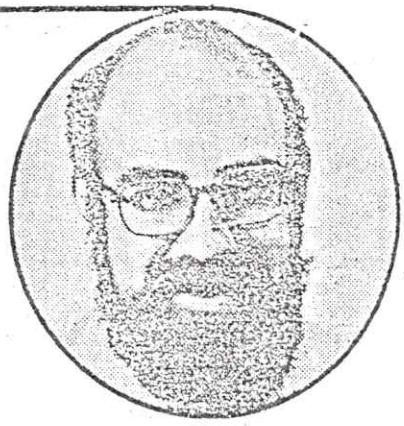
TUESDAY, APRIL 17, 1979

Jon D. Franklin

The Baltimore Evening Sun

Feature Writing

Gold prospector in the Southwest as a child . . . military journalist on aircraft carrier in the Pacific as young adult . . . his prize for feature writing is first in new category . . . 37 years old . . . born in Enid, Okla. . . . as science writer for The Sun, wrote two-part feature about delicate brain operation on woman suffering extreme pain from brain aneurisms caused by congenital defect . . . returned to school from Navy in 1967 and graduated from University of Maryland School of Journalism . . . joined The Sun in 1970 as rewrite man and became science writer in 1972 . . lives in Lexington Park, Md.



Feature Writing — Jon D. Franklin, science writer for The Baltimore Evening Sun, for a two-part report on a brain operation. He was the first winner in a category that was introduced this year.

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BOOK REVIEW

By Mark Johnson

SHOCKTRAUMA by Jon Franklin and Alan Doelp, 1980. St. Martin's Press Inc., 175 Fifth Avenue, New York, N.Y. 10010 $9:95 + $1.25 postage.

This book describes the development of the Maryland Institute for Emergency Medical Services, a trauma center in Baltimore, Maryland. It is written like a novel and offers some of the best arguments for developing trauma centers I've seen anywhere. The reader gets real insight into the personalites of the people who developed and work in the MIEMS trauma center, as well as a few of the patients and their families. Outstanding descriptions also are given of the impact of serious trauma on the various body organs, and necessary surgical and medical procedures for repairing the damage. These descriptions are given in easy to understand, non-medical terms, so the layman can understand what is taking place.

While we don't have the resources here in Alaska to develop an American College of Surgeons Category I Trauma Center, as described in this book, perhaps we still can make some improvements in our ability to treat serious trauma victims. I recommend that everyone involved in EMS in Alaska, and especially our medical advisors, take the time to read this book so we can discuss its implications, if any, for our state.

SHOCKTRAUMA

About *SHOCKTRAUMA*

"The system you see here is fast," Cowley says. "Sometimes it takes two to three hours for a patient's name to catch up with him. We're that fast. We don't care who he is. All we know when he comes in here is that he's hurt. If he got into our system, he's dying. We don't care whether or not he has a Blue Cross card. There isn't time . . . ."

Trauma is the biggest killer of people under the age of 37. Severe trauma frequently results in shock, which is a condition brought on by massive circulatory failure, an insidious process that leads inexorably to death if it is not treated and arrested within sixty minutes after the occurrence of a critical injury. For decades, doctors were aware of this phenomenon but unable to prevent it; and it was only recently that the inspired work of one man—Dr. R Adams Cowley—contributed largely to the identification of its causes and the establishment of special clinics for its treatment.

The first and still the most famous of these clinics is the Maryland Institute for Emergency Medical Services (MIEMS), more commonly referred to as "Shocktrauma" by critics and admirers alike. Since it was founded by Dr. Cowley in 1961, the history of this superbly equipped hospital has been marked by controversy, hampered by the intransigence of skeptical bureaucrats, and threatened by members of the medical establishment who continue to view Dr. Cowley's Institute as a personal and professional threat. Yet in spite of these obstacles, Shocktrauma has successfully revolutionized the procedures for handling serious accidents in the state of Maryland.

Until 1973, for instance, the policy of city and county ambulances in Maryland was to transport all accident victims, whatever the severity or nature of their injuries, to the hospital nearest the scene of the accident. Because many of these hospitals did not have the facilities or experience needed to deal with these injuries, this "nearest hospital" practice was resulting in hundreds of preventable deaths every year. As a result of Dr. Cowley's efforts, this policy was abolished and replaced by the finest emergency medical transportation and evacuation system in the country. In addition to ambulances, helicopters manned by the state police now rush accident victims to the Shocktrauma center, where a trauma team stands ready twenty-four hours a day to receive the patient and begin treatment the moment he arrives. A central communications network has been established in the Shocktrauma building to coordinate rescue efforts, and the medics responsible for administering to the victims en route to the hospital are specially trained to cope with the symptoms of shock.

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The story of these advances is an important and fascinating chapter in the history of modern medicine; at the same time, however, it is part of a larger, more profound drama that takes place every day at the Maryland Institute for Emergency Medical Services. Authors Franklin and Doelp spent five years there observing the heroic efforts of nurses and doctors whose speed, skill, and training are many patients' only hope of survival. *SHOCKTRAUMA* is the product of those five years—a meticulously researched, compelling account that takes us behind the scenes and shares with us the tremendous pressures faced by the men and women engaged in a ceaseless battle between the forces of life and death. Breathtaking in its immediacy, exhilarating in its message of hope, *SHOCKTRAUMA* is an unforgettable saga of medical pioneers and their struggle to conquer one of the most lethal killers of all.

SHOCKTRAUMA

PROFILE: DR. R ADAMS COWLEY

Dr. R Adams Cowley is one of the most distinguished and controversial medical figures of our time—a scientist and surgeon who was deeply involved in the race to build the heart-lung machine, invented a surgical clamp that bears his name, and developed the prototype of the electronic pacemaker that kept President Eisenhower alive. He is the most famous, however, for his pioneering work in the treatment of shock and for the establishment of the Maryland Institute for Emergency Medical Services (MIEMS), a revolutionary clinic established for the treatment of shock and trauma.

The history of MIEMS goes back to the early years of Dr. Cowley's medical career at the Army Field Hospital in Mourmalon, France. It was here that he first became fascinated by the apparent correlation between the speed with which critical injuries are treated and the victims' chances of survival. There were often more wounded men in the hospital than there were doctors to treat them; as a result, the Army surgeons were forced to work rapidly and, more often than not, crudely. But in spite of the primitive conditions, the survival rate was surprisingly high. Dr. Cowley suspected that the explanation had something to do with speed, and his hypothesis seemed even more credible after a visit to the renowned Allgemeine Krankenhaus in Vienna, where he observed the amazing swiftness of Europe's greatest surgeons. "They'd do their stuff, and they were finished. They were so good, and so clever, that what would take three hours in America would be over in 40 minutes." Even more impressive was that fewer of their patients died and that they recovered faster. Why?

After returning to the United States, Dr. Cowley became well-known as one of the few men to perform open-heart surgery successfully before the advent of the heart-lung machine. But Cowley was far from satisfied. Like other doctors, he was still losing a high percentage of his patients to shock—a condition caused by extreme loss of blood and wildly erratic blood pressure. "We were doing things nobody ever thought could be done. We were incredibly careful, we worked as a team, and we did our job perfectly. We got the patient through the operation and into the recovery room . . . and then, goddamnit, he would die. He would go into shock and die!" Another man might have said he was doing "all that he could" for his patients; Dr. Cowley chose instead to leave the world of heart surgery for a research lab where he hoped to discover exactly what shock is and how to arrest it.

What emerged from Cowley's dogged research was proof that speed saves lives. Translated into practical terms, this meant that a medical facility had to be established capable of treating critical injuries within sixty minutes of their

occurrence. By 1961, a clinic for this purpose was created at the University of Maryland under Cowley's direction. Cowley persuaded the Maryland police to use helicopters to transport accident victims to the Institute at high speed; he trained medics to perform emergency procedures that had hitherto been considered the province of certified doctors; he trained nurses to be as familiar with operations and equipment as the doctors with whom they worked. He outraged hospital administrators with his outspoken ideas and methods; he bullied, cajoled, and pleaded with government officials; he publicly defied the medical establishment. But he got results. Thanks to his efforts, the survival rate of patients at MIEMS has grown from 30% to more than 80% in ten years. Hundreds of people who would have died are now alive—and this, without a doubt, is the greatest and most significant of all Dr. Cowley's achievements.