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SCUDDER ORATION ON TRAUMA

We've come a long way, baby, in improving trauma care

by John H. Davis, MD, FACS, Burlington, VT

In honor of the fiftieth anniversary of the first oration on trauma given by Dr. Charles Scudder, I would like to take a close look at the accomplishments that have been made in the care of the trauma patient in the past 50 years and look ahead to the next 50. The title of my lecture could be adapted from the popular advertisement, "You've come a long way, baby," to read, "We've come a long way in improving trauma care."

Doctor Scudder gave his oration in 1929. At that time, the stock market had gone to pieces and the Great Depression was underway. The Great War had been over for 10 years, and although some of its lessons were forgotten, others had been put into clinical practice. The American College of Surgeons was about 16 years old; neither the American Association for the Surgery of Trauma nor the American Board of Surgery had been conceived. Specialization was relatively rare except in major centers, and the background and training of many of the surgeons were minimal. The medical profession had heard the Flexner report, and efforts were underway to improve our system of medical education.

Journey in time

> *"People can be divided into three groups: those who make things happen; those who watch things happen; and those who wonder what happened." (John W. Newborn)*

Let us look back for a moment and recreate the conditions under which Doctor Scudder, a person who made things happen, labored. He was a general surgeon intensely interested in the care of the injured patient and distressed by the quality of care they received, particularly in the treatment of fractures. He had been appointed Chairman of the American College of Surgeons Committee on Fractures just seven years before.

Go back in time with me to February 28, 1928, when Doctor Scudder was summoned to the emergency room of the Massachusetts General Hospital to see a 25-year-old man who had been injured when struck by a motorcar on Massachusetts Avenue. The patient had been rather unceremoniously picked up and placed in the back of a truck that took him to the emergency room. The emergency room personnel had no idea he was coming because no communication system existed. However, at the hospital entrance he was placed on a stretcher and moved into the emergency room.

Examination revealed that he was pale, somewhat gray in color, with a rapid, thready pulse. He had a contusion over the left lower rib cage, which was tender. In addition, the left thigh was deformed, suggesting a fracture of the left femur, and the leg distal to it was cold and pulseless. Vital signs were: blood pressure 80/60, pulse 130, and respiration 28.

Oxygen was administered by face mask, and a clysis of 5% D/W was started in the right thigh to supplement his fluid volume and correct the shock state. Vasopressors were also administered.

Careful physical examination suggested the possibility of a ruptured spleen (he had multiple rib fractures on the left) and revealed a fractured left femur with an ischemic foot due either to vasospasm or to injury to the femoral artery. Doctor Scudder felt that the patient was in the most stable condition that could be expected, and surgical exploration should be carried out as expeditiously as possible. He was moved to the operating room after receiving two liters of 5% D/W by clysis into the right thigh. Preoperative blood pressure was still 80/60.

***Dr. Davis** is professor and chairman of the department of surgery at the University of Vermont and surgeon-in-chief at the Medical Center Hospital of Vermont. He delivered the Scudder Oration on Trauma at the 1979 Clinical Congress in Chicago.*

Open-drop ether was administered and as the patient passed through the phases of anesthesia, the abdomen was prepared with green soap and alcohol. Exploration revealed a ruptured spleen that was removed with minimal abdominal wall relaxation, and after some struggle the surgeon closed the abdomen.

Management of the fracture was then undertaken by using a steel boneplate inserted through a medial thigh incision. The femoral artery was not visualized because of the hematoma about the fracture site. If the artery had been damaged, Doctor Scudder knew that amputation was likely unless the collateral circulation through the profunda femoris artery was adequate to maintain viability.

The surgeon noted that the patient was still of poor color, and the left leg remained white, cold, and pulseless. Doctor Scudder wished for some way to visualize that femoral artery. He was also very concerned about the state of shock, the low to absent urinary output, and the inevitable "pneumonia" that might occur postoperatively.

Postoperative care

The postoperative course was a difficult one. The left lung developed a "pneumonia," and respiratory effort was maximal. Oxygen-tent support coupled with the fact that the patient was young and strong permitted him to recover. The left leg continued to be cold and pulseless after reduction of the fracture, and amputation was necessary. He was discharged on the forty-fifth post-injury day. Rehabilitation and prosthesis-fitting were planned for the future.

The year was 1928. Endotracheal anesthesia with subsequent pulmonary support for the pulmonary contusion was not available. Blood transfusion using multiple syringes had been tried, but was not in common clinical usage. Intravenous saline was available, but its value in the treatment of shock was not yet established. Antibiotics were as yet unknown, and arteriography and vascular surgery were still laboratory procedures.

By luck, the patient had been taken to an excellent hospital and treated by a surgeon who was skilled in the management of trauma. At that time, no special skills were considered necessary for the management of injury, and in most hospitals the injured patient was assigned to the youngest and least experienced member of the staff. The concept prevailed that anything done for the injured patient was better than nothing. The results of this philosophy were often disastrous. In many areas of our nation this philosophy persists even today.

Hospital standards

The care of the injured has always been a major concern of surgeons; however, between wars interest seems to lag. In 1912, one year before the founding of the American College of Surgeons, at a meeting of the American Surgical Association in Montreal, concern was again revived. A committee of five was appointed to prepare a statement on the management of fractures and the value of radiography in determining the proper method of treatment. The final report of this committee was made in 1921. It concluded: "The first step in the betterment of practice is the study of results achieved by present-day methods. An adequate study is impossible without complete records."

In the interim, the American College of Surgeons, founded in 1913, had begun its hospital standardization program in 1918. The program required that hospitals maintain adequate records so that evaluation of their care could be determined. This great

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effort of the College continued until 1952 when the Joint Commission on Accreditation of Hospitals was founded.

On May 1, 1922, the Board of Regents of the American College of Surgeons appointed the first Committee on Fractures with Doctor Charles Scudder as Chairman. Through the hospital standardization program, records of fracture patients were available. Hospitals approved by the American College of Surgeons were asked to prepare report forms on the ways fractures were treated and the results obtained. The first report of the Committee was given in 1923. It noted that along with the regional committees of the College, more than 200 men were studying the problem of fracture management. Working closely with the Committee on Standardization, the Committee on Fractures accumulated data on the management of fractures. Improved care resulted.

Industrial standards

The year 1926 saw the formation of the Board of Industrial Medicine and Traumatic Surgery. The American College of Surgeons was joined by the medical departments of insurance carriers and industrial organizations for the purpose of improving the lot of the sick and injured in industry. Investigation of the many problems in this area led to the formulation of minimal standards for medical service in industry applicable to all industrial organizations regardless of their size. Acceptance of these standards was voluntary, and in 1933 a list of approved medical services was published. By 1937 a total of 1,657 industrial establishments representing 5,500,000 employees had been surveyed to see if these standards had been adopted. A certificate was issued to about 50 percent of them.

This effort resulted in the following statement by the first chairman of the Medical and Surgical Section of the American Railway Association. "Wherever possible only hospitals that had adopted these standards and thus were rated as Class A by the American College of Surgeons be recognized, and, where railroads have their own hospitals, that such institutions not already so classified will be brought to such a standard."

Through the efforts of the American College of Surgeons, standardization of hospitals in an effort to improve the lot of all patients was underway, and the Committee on Fractures had joined in this effort to improve the care of the injured patient.

Progress in trauma care

Great progress has been made in the 50 years since Doctor Scudder gave the first fracture oration. Today the seriously injured patient is much more likely to survive with a shorter period of hospitalization and a greater chance for total rehabilitation. Let us look at a number of the developments that would have helped Doctor Scudder had they been available to him in 1928.

We have seen the beginning of a system of transportation of the injured that, while incomplete, has occurred through the labors of the late George Curry and many others. Ambulance standards have been set; ambulance personnel undergo rigorous training in various parts of the country; and in recent years, helicopters and fixed-wing aircraft have been added to the emergency transportation system.

Information about the patient is now sent to the receiving hospital by radio communication from the ambulance. For certain types of injury, telemetry allows receiving physicians to monitor the patient throughout his entire prehospital period, once the ambulance has arrived on the scene. The receiving hospital, with advance information of the patient's condition, can mobilize personnel and equipment to begin treatment literally as the patient enters the doors.

The efforts of the Committee on Trauma to eliminate the isolated emergency room as a concept and to develop the emergency department as an active part of all major hospitals have resulted in great improvement in the initial in-hospital care of the patient. Trained personnel, including physicians, nurses, and technicians who are highly skilled

in the management of the severely injured, are available 24 hours a day to provide the injured with the utmost in modern medical management. The immediate threats to life are the ability of the patient to breathe and to maintain an adequate circulation. Even severe head injury, which ultimately may kill the patient, is rarely life-threatening in the first few minutes.

The patient who reaches the emergency department may have an endotracheal tube inserted to maintain his airway and to provide oxygenation of the lungs in support of respiration. Positive pressure or controlled ventilation are added when indicated. This method has been used to some degree in the field since the advent of the esophageal airway and the training of emergency medical technicians in advanced life-support systems.

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Support of circulation has been improved by the routine administration of intravenous salt solutions, most commonly Ringer's lactated solution. Intravenous saline had been introduced some ten years before Doctor Scudder's original fracture oration but had not become a common method of therapy. Arguments raged as to the validity of fluid therapy in the management of shock. Whole blood had been tried as early as 1666 but was not in common usage; much of the information necessary to use it properly was still undiscovered. The blood bank as we know it was unheard of, and transfusion was by direct means using the multiple syringe technique, directly from donor to patient. Because many believed that the veins were often collapsed during shock, the intravenous route was considered a difficult method of administering fluids. Subcutaneous clysis was the standard of the day, but marrow transfusions using a needle in the sternal marrow were first tried at about this time.

The modern blood bank resulted from recognition of the need for whole blood in the management of the severely injured patient. That need was brought into full focus by World War II. Thanks to modern blood banking techniques, plasma and its components, which can be frozen and stored, are also available. They provide necessary support for specific conditions in the injured patient.

Monitoring and diagnosis

The ability to provide an adequate airway and to support failing circulation were the first steps in improving the care of the severely injured patient. The need to know how much fluid is needed and how quickly it must be administered mandated the development of methods of monitoring the patient. The necessary equipment quickly followed. The ability to analyze the patient's blood gases, serum electrolytes, and other biochemical phenomena, and to measure central venous pressure, pulmonary wedge pressure via the Swan-Ganz catheter, and cardiac output provides an ongoing basis for constantly correcting the patient's condition.

X-rays, introduced by Wilhelm Conrad Röntgen in 1895, proved to be a major advance in the management of trauma. The phenomenal growth of radiologic techniques and their many offshoots has provided the trauma surgeon with a diagnostic accuracy not even considered a few years ago. Routine high-quality films taken by high-speed x-ray equipment and developed through high-speed x-ray processors are commonplace in modern hospitals. Sonograms, radionuclide scans, arteriography, and CAT scans have helped immensely in the study of certain kinds of injuries.

Once surgical intervention has been determined, the anesthesia of today provides a much safer transition from the awake state to the anesthetized state. The highly trained anesthesiologist of 1980 is a physiologist in airway and fluid mechanics.

The ability to provide general, regional, or local anesthesia has made operations much safer, has eliminated the need to operate in haste, and has allowed the surgeon visibility of and access to all organs. The head, chest, abdomen, genitourinary tract, skeletal system, and vascular system are now easily accessible to the surgeon. All organs of the body are subject to trauma, and today all are subject to some form of repair. Trauma may be so great that no repair is possible, but

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when the patient is viable, surgical technique generally allows repair of the injured organ. In addition to repair, certain substitutes have become available, such as synthetic vascular grafts and synthetic meshes for the repair of defects in large wounds.

Replantation of severed tissue using microsurgical techniques has altered our thinking about the injured patient and provided the possibility of replacing completely severed tissue, such as an extremity or part of an organ.

Postoperative support

If the patient survives the injury and the operative procedure, his chances for survival are increased by postoperative support, which has also undergone remarkable change in the past 50 years. Continued fluid and electrolyte support is routinely used and well-understood by surgeons dealing with the seriously injured patient. Our ability to support circulation is not enough because the total body economy needs support. This total support has been achieved through various methods of nutrition that have become practical in recent years. Parenteral nutrition, enteral nutrition, and hyperalimentation are now routine procedures in the management of the seriously injured. How many surgeons have watched a seriously injured patient fail to recover because recovery would take longer than endogenous caloric support could maintain him? A certain store of caloric energy is available to all of us, but a time comes when the bills that must be paid through caloric support can no longer be met without a loan of calories from outside sources. Using these newer alimentation methods, the patient can be supported almost indefinitely.

Surgical intervention is always clouded by the specter of infection. The development of specific antibacterial agents has provided the surgeon with methods of prevention and treatment that were unheard of 50 years ago. Much more research is needed to uncover mechanisms of microbial action so necessary to eventually eradicate this problem, but we have made great strides since 1880 when Lister showed that bacteria were the cause of putrefaction and infection in wounds.

A myriad of drugs have become available to support the various organs and systems within the body, and when used with a full understanding of the patient's abnormal physiology and biochemistry, they often permit correction of these problems.

Another problem for the seriously injured patient, particularly if he has been in shock, is that of renal failure. Thirty years ago many of these patients died of a problem that would have corrected itself if support could have been provided long enough. The development of the artificial kidney and renal dialysis has provided that support while the patient's kidneys undergo internal repair.

I have, no doubt, overlooked many other important advances of the past 50 years, but I merely wanted to illustrate some of the major accomplishments.

Eminent surgeons

Let us ask Doctor Scudder and some other of our departed colleagues in trauma to return for a brief moment to review a similar injury and its management today. We will call on Charles Scudder, Charles Venable, Charles Johnston, George Curry, Harrison McLaughlin, Bob Kennedy, Curtis Artz, Oscar Hampton, and Jack Moncrief.

The scene is now a mountain road in Vermont. State police have just arrived at the crash site. They note in Yankee terms that "the driver failed to negotiate a turn" and went over the hill. Fortunately, he is alive. They radio for a rescue squad. No attempt is made to remove the patient, who is wedged into the front seat of his car. The ambulance, a large box-like vehicle, arrives, and the emergency medical technicians (EMTs) begin their operation. They strap the patient to a spine-board prior to extrication. Once he is out of the car they undertake additional measures. The airway appears to be OK, but his blood pressure is 80/60, pulse 130 and "thready." An IV of Ringer's lactated solution is begun. By radio they inform the Medical Center Hospital of the accident and the

patient's condition.

The EMTs suspect that he has multiple rib fractures on the left, possible internal injuries, and a rather obvious fracture of the left femur just above the knee. The left lower leg is white, pulseless, and numb. Oxygen is administered via a face mask, the left leg is placed in a traction splint, and the patient is placed in the ambulance. The estimated time of arrival at the hospital is given by radio and the ambulance departs. The driver uses flashing red lights and a siren, but maintains a safe speed to protect the patient and others on the highway.

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In the interim the trauma team at the medical center has been mobilized and the trauma room is ready. In fact, the room is always ready and fully equipped for any possible type of injury.

The ambulance crew continues to inform the medical center of its position and the patient's condition. The general surgeon in charge is listening and giving advice en route when needed. Because of the nature of the injuries, the in-house orthopedic and thoracic surgical teams have been notified to stand by. The operating room is alerted and set up for the possibility of early surgical intervention. The anesthesiologist has joined the trauma team by the time the ambulance is ten minutes away.

The ambulance pulls into the ambulance bay and the patient is moved out on a collapsible wheeled stretcher. Exchanges of equipment are made with the ambulance crew as the patient is wheeled into the trauma room. The crew is now ready to roll again, fully equipped, within minutes of their arrival. (Their intense interest in "their patient" often keeps them around for some time to observe his progress.) A full critique of their entire course of action will take place the following Tuesday morning at 6:30 in concert with all other "runs" that were made that week by all ambulance teams.

Meanwhile, the patient is receiving care from the trauma team. A second IV is in place using a central venous line as a means of monitoring fluid therapy. A urinary catheter is inserted and a flow sheet is begun. Blood has been sent to the laboratory to check for blood gases, and baseline chemistries, and to the blood bank for typing and crossmatching.

Diminished breath sounds at the left base and continued hypotension suggest fractured ribs and a possible ruptured spleen. Chest x-ray reveals fractures in ribs six to ten, and a pulmonary contusion of the left lower lobe. In addition, the mediastinum appears to be widened and there is a change from the normal angle of bronchial markings.

Peritoneal lavage reveals gross blood, but with the second IV running, the pressure has risen to 110/60 and the pulse decreased to 120. An aortogram demonstrates an intact thoracic aorta and good renal function. No attempt is made to visualize the left femoral artery at this time. The patient's condition continues to stabilize. Once in the operating room his ruptured spleen is removed under anesthesia. The abdominal wall is relaxed. Closure is without difficulty and attention is turned to the leg. The foot is still cool, white, and pulseless. The fracture is reduced by the orthopedic team using an intramedullary rod and image intensification. Cross-matched blood is administered and the patient is doing well.

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The foot remains in jeopardy, so a direct femoral arterial puncture is accomplished in the groin. An arteriogram reveals a transected superficial femoral artery in Hunter's canal. The area is explored and the contused segment of vessel removed, then an end-to-end anastomosis of the severed vessel is accomplished. The foot immediately pinks up and the veins fill. A Doppler pulse is recorded on an automatic recorder that had been placed on the ankle prior to the repair.

The wound is closed and the patient, who is now quite stable (blood pressure 120/70, pulse 100, and good urinary output), is moved to the intensive-care unit for continued respiratory support on a ventilator. Antibiotics started in the emergency department are continued, and the patient continues to improve. He is weaned from the respirator on the fourth day and returned to the general surgical unit. He is discharged after a period of recovery and physical therapy and followed up by the trauma service at a later date.

Doctor Scudder looks at his colleagues and says, "Gentlemen, from what I have just witnessed, I would say your efforts have not been in vain." Doctor Scudder wants more information and asks Doctor Hampton.

Oscar replies that it was not all due to the efforts of this group, and observes: "Much of the advance has come from scientists working at their benches with their test tubes and animals. I always called them mouse surgeons," he says with a twinkle at Artz. "As those in the laboratory began to understand the mechanics of shock, metabolic derangements in injury, and the role of the microbial world, better treatment began to emerge. Their surgical colleagues picked up this information and began to apply it cautiously to patients. As each advance was tested and proven, it was presented and discussed at various trauma meetings. The Committee on Trauma then began to publicize it in various ways, through the College manual, *Early Care of the Injured Patient,* and with posters to be placed on emergency department walls. Your former committee, Doctor Scudder, has been blessed with men of vision who have been able to transform basic science into clinical practice and then to push on and make that practice the standard of all."

Perhaps we have eavesdropped long enough on this fine group of surgeons and should let them enjoy the fruits of their accomplishments unburdened by the troubles of today.

Look to tomorrow

Those of us who are still in the vineyard must look to tomorrow if we are to continue to improve the care of the trauma patient. What do we want our Scudder orator to say about our efforts 50 years from now? Perhaps the easiest answer is improvement in all aspects of trauma care; however, I would like to discuss three areas that are of paramount importance.

The first is continued improvement in medical education. We must provide students with a real working knowledge of the scientific method and how to apply it. It is as important for the student who plans to practice clinical medicine as it is for those interested in laboratory research. I frequently hear the statement that we need to teach more courses in trauma because our graduates do not know enough. The treatment of trauma is not a course to be taught; rather it is a way of thinking based on a solid grounding in basic science and clinical medicine.

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The trauma patient is an experiment of man designed to see what stresses human biology can withstand. Disease, on the other hand, is an experiment of nature. Nature responds to an injury almost instantly by deploying all of her forces to insure survival. Immense margins of safety are built into many organs by providing much more than we need so that some quantity of tissue can be sacrificed. The circulatory system, through its unique set of controls, can shut off some or most of the flow to various organs in order to maintain flow in more vital organs during periods of hypovolemia. Fluid is also mobilized from cells and the interstitial space to help make up the deficit of circulating volume. In addition to these emergency survival measures, healing begins at the moment of injury, and nature mobilizes additional forces to speed the reparative process. Osler said, "To know and understand typhoid fever is to know and understand all of medicine and surgery." I would say that to understand and properly manage the severely injured requires a broad understanding of human biology and its reaction to stress.

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Thus trauma should not be looked on as a course or subject to be taught, but instead as a thorough grounding in the scientific method, coupled with a broad background in the basic and clinical sciences. All of you have seen a hypotensive patient drown as fluids were poured in, when hypovolemia was not the problem in the first place. At the student level we must demand a return to acceptable standards of performance. It is unacceptable for the student to ignore the basic knowledge of shock, fracture healing, and inflammation under the guise that he wants to be a psychiatrist. We teachers must be held responsible for proper education. It is also imperative that we teachers work together to provide a meaningful educational experience for the student. Such an experience requires that the teacher has a thorough knowledge of the subject. In clinical teaching, it requires *active participation* in the care of the patient.

If our students are trained in the scientific method, it will not take another 50 years to decide which method of treatment is best. Correctly designed clinical studies from one or several institutions will help answer these vexing questions.

Graduate education

My second area of concern for the next 50 years is the graduate education of the surgeon. We have all witnessed a rapid proliferation of specialties in these past 50 years. Some specialties developed because of the interest of a few who began to limit themselves to a particular problem or set of problems and began to study them in depth. Others grew from defined societal needs. Doctor Scudder was a general surgeon with an interest in trauma, especially fractures. He developed the first fracture service in the United States.

As the specialties grew in stature and numbers, a strange philosophy began to appear. From broadly educated individuals with enough vision to become truly expert in an area, we began to hear that broad training is unnecessary, that we can educate the surgeon in a specialty without a broad scientific and clinical base. Soon after, the internship was abandoned, and today a third-year medical student in June can be a resident in a specialty in July. I find no fault with this philosophy when applied to the learning of the specialty, but what about the patient? The injured patient represents a most complex set of problems. The injured patient just seen by Doctor Scudder and his colleagues might have been divided up among six physicians: the emergency physician, a general surgeon, an orthopedic surgeon, an anesthesiologist, a thoracic surgeon, and a critical-care physician. Had complications developed, a cardiologist and an infectious-disease or pulmonary-medicine specialist might have entered the picture.

Specialists are necessary and can improve the care of many patients, but someone must continue to captain the team. We might visualize 45 different physicians on the team 50 years from now. No one expects to develop a man for all seasons, but my plea is to keep general surgery broadly based and thoroughly grounded in basic and clinical sciences. With this background, the general surgeon will be capable of serving as captain of the team. The role of this captain is to assess the patient, set priorities for care, determine which specialists may be needed, and see that they act in concert for the good of the patient and family. The injured patient was the loser when the two-year broad clinical training in surgery disappeared as a requirement for specialty training. Charles Scudder stated it quite clearly when he said, "Special surgery should not be practiced except by those with a sound training in general surgery."

Hospital approach

My third area of concern involves improvement in the hospital's approach to trauma care. Trustees are charged with setting the standard of care provided by the hospital, a most serious responsibility. They must transcend local pride, economic need, and medical pressure. In many hospitals, this responsibility is placed in the hands of the

chief-of-service or chief-of-medical-staff. A major frustration in carrying out this responsibility comes from medical-staff pressure to be relieved from the emergency call-list as soon as possible. I find it appalling that as a surgeon gains experience and stature in the community, when the skills that have been gained by hard work would be most valuable to an injured patient, he takes a step up the hospital-staff ladder and is removed from call duty in the emergency room. Being removed from the call-list is a sought-after "privilege" that many surgeons look forward to after a few years on the staff. The young surgeon is often able to survive in medical practice by adding his name to the emergency-room call-list, and a certain amount of skill and knowledge is obtained through this labor. Since medical knowledge is always obtained at a cost to the patient, *the real privilege* is being able to continue seeing injured patients, teaching young surgeons the skills necessary to render good treatment, and reducing the patient cost in the educational process. The fact that injury is never elective, cannot be neatly scheduled into one's daily activity, and often occurs at the most inopportune moment is insufficient reason to pull out.

Maximum care of the injured patient demands the most modern equipment and a highly-trained general surgeon backed by a cadre of specialists. Consequently not all hospitals can manage all injuries. However, all hospitals have some role in the management of the injured patient. That role may only involve initial resuscitation and removal of the patient to a higher level of care according to a prearranged transfer protocol.

"We have the responsibility to encourage and support basic and clinical research in medical science. This guarantees the trauma patient the best chance in the future."

The American College of Surgeons Committee on Trauma has provided guides for the categorization of emergency departments. In the August 1979 *Bulletin*, the College published guidelines under the title, "Hospital Resources for Optimal Care of the Injured Patient." [Various appendices to that document were published in the February 1980 *Bulletin*.] These documents provide the guidelines necessary for hospital standards committees in meeting the challenge of the injured patient.

I would hope that the next 50 years are as helpful to the trauma patient as the past 50 have been. If the Fellows of the American College of Surgeons continue to support their Committee on Trauma, progress is assured. The Committee on Trauma must put its weight behind improving undergraduate education, not in the specific area of trauma, but by supporting the teaching of the basic and clinical sciences. Many members of the Committee are major forces in teaching institutions and thus have the obligation to see that this goal is accomplished. Furthermore, we have the responsibility to encourage and support basic and clinical research in medical science. This guarantees the trauma patient the best chance in the future.

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Second, the Committee on Trauma must work to maintain broad education of the surgeon in all specialties and especially in general surgery.

Third, the Committee on Trauma, through its state committees, must push ahead with the implementation of its categorization and optimal criteria programs.

Finally, there are other unmet needs in prehospital care, transportation, communication, and continuing education. We must lend our continued support to the efforts initiated by our predecessors if we are to provide the best possible chance for the trauma patient from the time of injury through recovery. Let me close with the following quotation from Longfellow:

> *"The heights by great men reached and kept were not attained by sudden flight, but they, while their companions slept, were toiling upward in the night."*

This quotation clearly states what has happened during the past 50 years. We are fortunate to stand on the shoulders of these giants and I hope that 50 years from today the same quotation will be applicable.