

## President's Address

# Care of the Injured

## Who Will Do It?

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I WISH TO THANK the members of the Midwest Surgical Association for allowing me to serve as president. It was a mere 12 years ago that I first attended a meeting of the Midwest Surgical Association. I was 2 months out of my general surgery residency, an instructor in the Department of Surgery at Wayne State University, and in love with the field of emergency surgery, in particular, the area of trauma. During the course of that meeting 12 years ago, I was privileged to present a film entitled "Priorities in the Care of the Critically Injured Patient." That was the first formal showing of the film, which was developed for the specific purpose of teaching medical students and surgical residents. I was grateful for the opportunity to learn about the care of the injured patient and the opportunity to teach others about this field.

Strong personal beliefs were held about how injured patients should be cared for and how residents and medical students should be educated in the area of trauma. A trauma victim would be cared for by the general surgeon from the time of admission to the emergency room until discharge from the hospital and return to gainful employment. The general surgeon would provide the initial and definitive care for all injured patients in the emergency department. All resuscitative measures and diagnostic procedures would be performed or supervised by the general surgeon. The general surgeon would repair all injuries except those within the cranium and complicated fractures; this included intra-abdominal, intrathoracic, cervical, vascular, hand, and soft tissue injuries. Consultation would be obtained from the surgical subspecialist as needed;

more often than not, this was simply to provide education for the residents on the consultant services as advice was rarely needed. The general surgeon would also serve as captain of the ship. Any patient who required consultation from more than one consulting service was automatically admitted to the general surgical service. A patient with a skull fracture and a mandible fracture would be admitted and cared for by the general surgeon. The consultants were usually interested in a small portion of the anatomy, while the general surgeon was concerned with the well-being of the entire patient. The consultants would need to obtain permission from the general surgeon before performing any procedures. The general surgeon, in turn, would need to spend much time and energy trying to contact the consultant to determine exactly what was planned for the patient and when it was to be done. The general surgeon was also the intensivist. He provided for total patient care in the intensive care unit just as he provided care on the ward.

My strong convictions about care of the injured patients extended into the realm of general surgical, surgical specialty, and medical student education. The resident would be directly involved in all aspects of care as outlined for the general surgeon. This included rotations in the emergency department with progressive responsibility. Indeed, the chief resident on the trauma service had probably spent 12 to 24 months in all aspects of trauma care. He was a "god" who was worshiped by all younger residents and who was respected by all ancillary personnel who had painstakingly trained him during his repeated tours on the trauma service. He had a prepared mind, and each day brought new challenges. Education occurred out of necessity and pride. The chief resident was continually preparing himself for the next case that might come in.

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Certainly, no patient would die from a ruptured liver due to his lack of knowledge on how to perform a right hepatectomy. There were other duties to be performed by the general surgeon but often left to his designee, the ever present house officer or medical student. These included: blood drawing and blood hanging, dressing changes and suture removal, nasogastric tube and foley catheter insertion and removal, and physical therapy; they also served as social worker and psychiatrist, should the need arise. Interestingly, the nurse would also be considered "all purpose" as she served as social worker, psychiatrist, respiratory therapist, pharmacist, dietician, intravenous therapist, stomal therapist, and discharge planner.

The surgery resident learned by apprenticeship the care of the injured. Medical student education in trauma needed to be more organized. The movie presented to this society 12 years ago was a step in that direction.

Personal bias in the care of the injured patient has been altered by harsh realities. Accidents and injury have no respect for time of day or location of a trauma center. A national survey of surgeons' involvement in the care of the injured patient was conducted of active fellows by the American College of Surgeons.<sup>1</sup> Almost 20 per cent of the respondents indicated that the injury victims admitted to their hospitals frequently or routinely received their care from nonsurgeons. The education of the general surgeon in trauma is not uniform. Trunkey<sup>2</sup> reported a review of 933 applications to the American Board of Surgery in 1980. Interestingly, 18 per cent of all applicants that year had operated on fewer than 10 trauma patients, and 65 per cent had operated on fewer than 30 patients. Trauma constituted less than 5 per cent of the operative experience of 95 per cent of the residents applying to the American Board of Surgery in 1980. This lack of experience is associated with a lack of knowledge. As a guest examiner of the American Board of Surgery, I asked six applicants how they would treat an isolated fracture of the right inferior and superior pubic rami; four applicants indicated they would treat this patient with bed rest and traction for 6 weeks. Such a response by one applicant would have called for a failing grade; when this is the response of the majority, the educational system, not the applicant, is at fault.

Societal changes also affect trauma frequency and educational opportunities. In 1972 there were 122 patients treated for liver injury at Detroit General Hospital, including 76 patients with major injury; 50 patients required sutures, anatomic resection, or resectional debridement to achieve hemostasis. In 1981, 38 patients were treated for liver injury, including 12 patients with major injury.<sup>3</sup> Hemostasis was required in

13 patients by sutures or resectional debridement. No senior resident sutured the liver or stopped active bleeding more than twice, and some residents never had the opportunity to suture a bleeding liver wound. This 69 per cent reduction in liver injury and 84 per cent reduction in major liver injuries appears to be continuing throughout 1982 and 1983 at Detroit Receiving Hospital.

The development of the subspecialist has taken its toll on the general surgeon dedicated to the care of the injured. The emergence of microsurgery has led to reimplantations and musculocutaneous flaps for soft tissue injury. Currently, few general surgery residents are being adequately trained to repair a simple tendon injury in the hand. Facial trauma was abandoned by the general surgeon long ago and is still being battled for by the otolaryngologist, plastic surgeon, and oral surgeon. Repair of an injured extremity vessel will probably be done by vascular surgeons, as the general surgeon will be denied such surgery in centers where vascular surgeons are available. Thoracotomy surgery will be denied to the general surgeon in centers where thoracic surgeons are available. None of these administrative decisions will acknowledge the distinct difference between emergency vascular and thoracic surgery compared with elective challenges. The fact that the well-trained general trauma surgeon may be better equipped to treat these vascular and thoracic emergencies will be irrelevant. The orthopedic surgeons have developed their area of critical care, namely the spinal cord unit, and the neurosurgeons are competing for beds in the intensive care unit to provide for monitoring of the intracranial pressure. The patient with a burn has been segregated to a separate area with specialized care from a plastic surgeon. The general surgeon with an interest in trauma has difficulty keeping up with advances in the subspecialty areas of trauma at the same time as he stays current for elective surgical challenges. Indeed, at a recent meeting of the American Association for the Surgery of Trauma, parallel sessions were held with subspecialty papers on hand, orthopedics, and neurosurgery being held in one room and papers on basic research in trauma in another room. This obviously led to indecision by those attending the meeting, since most spent this portion of the meeting conversing in the hallway.

Finally, care of the injured will follow capitalistic rewards. I would like to emphasize the problem of economic rewards and sacrifices with an example.

A 26-year-old unemployed man was hit by a car as he stepped off a curb after consuming large quantities of alcohol. He was brought by the emergency medical services to the emergency department at 8:27 p.m. in shock with a blood pressure of 74/0 mm Hg, a pulse of

123/min, and respiratory rate of 36/min. He was responsive with shallow respiration and a weak thready pulse. There was an obvious right-sided facial laceration, a tender zygomatic arch, a torn left tympanic membrane, a left flail chest with subcutaneous emphysema, and fractures of the left wrist and right femur. Resuscitation was begun by the 2nd-year surgery resident assigned to the emergency department. The chief surgical resident advised left chest tube placement that yielded 330 ml of blood. A nasogastric tube and foley catheter were placed; the first 2 U of blood were begun. The portable chest film showed multiple left rib fractures, an expanded lung with complete blood evacuation, and a left lung contusion. The chief resident notified the attending general surgeon that laparotomy was needed for intra-abdominal bleeding. The attending surgeon saw the patient at 9:00 p.m. and recommended blood transfusion for blood loss due to fractures and a peritoneal lavage. The lavage revealed no blood in the abdomen. Laboratory studies showed a  $pO_2$  of 53,  $pCO_2$  of 41, and pH of 7.22. There was gross hematuria. The patient was intubated and placed on a ventilator. Multiple roentgenograms were obtained that revealed fractures of the pelvis, right femur, left distal radius and ulna, and left ribs (2-10). A fracture of  $C_8$  could not be excluded, and the neck collar remained in place. An intravenous pyelogram, cystogram, and urethrogram showed a tear-drop bladder. A gastrograffin swallow revealed an intact duodenal sweep. While in the emergency department, the patient received 6 U of blood, and the facial lacerations were sutured. He was seen in consultation by orthopedic surgeons who casted the left arm and placed a tibial Kirschner wire. He was also seen by neurosurgery, urology, and otolaryngology. He was transferred to the surgical intensive care unit 10 hours after arrival in the hospital.

The patient remained in the intensive care unit for 15 days. A tracheostomy and bronchoscopy were performed on the 2nd hospital day. Following transfer from the intensive care unit the patient was seen daily for the next 24 days by the general surgeon. His lung contusion cleared, and he became afebrile. Multiple procedures were performed by the orthopedic service during this time.

Many hours were spent in the care of this patient by the general surgeon, who billed the patient for a tube thoracostomy, peritoneal lavage, tracheostomy, bronchoscopy, and 10 days of intensive care. The total fee submitted by the general surgeon was \$1625. The fee collected was \$0. This patient has no insurance. A bill submitted to the patient was returned marked "address unknown." It could be stated, of course, that no fee should be expected as the attending surgeon is al-

ready being paid as a "school teacher"; unfortunately, the "school house" does not pay for the attending surgeon's malpractice insurance or society dues. Incidentally, the general surgery resident who spent 10 hours in the emergency department and many hours in the intensive care unit with this patient was unable to document this trauma exposure on his operative experience form. This patient would be included as a tracheostomy on the operative experience form.

The general surgeon taking trauma call during a 24-hour period needs to be available to see this patient at any time. He cannot schedule elective surgical procedures or office hours. He also is taking a chance by scheduling elective surgery the day following trauma call, because he may have patients needing emergency operation who arrive in the early morning hours or he may suffer from lack of sleep having been busy during the previous 24 hours. The economic sacrifice made to provide for the care of this injured patient is great; the economic reward is somewhat lacking.

We need to define a solution as to who is going to care for the injured patient so that educational programs can be developed to meet those needs. It appears that the majority of injured patients will be treated in hospitals near the site of injury. The type of care delivered will be determined by the economic rewards and educational backgrounds of the surgeons and physicians working in that hospital. Few general surgeons can afford the time and inconvenience of emergency department care of the injured patient considering the rewards received. Consequently, in most hospitals, the emergency physician will care for the injured patient in the emergency department. This will include definitive care in many instances. They will serve as captain of the ship in the care of the multiply injured patient in the emergency department and will seek consultation from the neurosurgeons, orthopedic and plastic surgeons, thoracic surgeons, and even the general surgeons. Conceivably, the general surgeon will be consulted only if the peritoneal lavage is positive. The general surgeon will provide care within the realm of privileges granted him; in some cases, this will be limited to the abdominal organs exclusive of the vessels. Following resuscitation, the seriously injured patient will be treated in the intensive care unit where the captain of the ship will be an intensive care specialist. The general surgeon will have few privileges and little responsibility, except to assess the abdomen. The intensive care specialist will provide for ventilatory, cardiovascular, and nutritional support. The patient will have many physicians, each looking after his area of interest. Each physician will bill for services rendered including each consultant, emergency physician, and intensivist. The cost of care of the injured in

this setting will probably increase. The morbidity, mortality, and quality of care will most likely not be evaluated by this team of physicians each doing their own thing. We can be assured that the judicial system will continue to evaluate trauma care.

There will be a need for trauma centers to care for patients with complicated injuries and a place where others may refer patients they do not have the time or the talent or the desire to treat. The physicians treating these patients should be true trauma surgeons with the capability of treating nearly all the injuries including intracranial, thoracic, abdominal, vascular, hand and soft tissue injuries, and most fractures. They would also qualify as emergency physician for the trauma patient and as the intensive care specialist. These physicians would be a new breed, *i.e.*, a special mongrel type that has a strong general surgical base and that incorporates the traumatic aspects of the surgical subspecialties. I would envision a training program for this trauma surgeon to include 2 years general surgery with intensive care experience followed by 12 months traumatic orthopedics, 6 months traumatic neurosurgery, 6 months hand, plastic, and burn surgery, 6 months thoracic and vascular surgery, and an additional 18 months general surgery. This individual would initially be trained by the subspecialist, but eventually they would qualify to clone themselves. This would be a new specialty and demand its own certification. Consultation could always be obtained from the standard subspecialties and hospital privileges could still be granted by the standard established subspecialties. The romance of trauma and care of the injured will entice physicians to enter this area, and the economic rewards will hopefully be sufficient to keep them there. Certainly a referral to this trauma surgeon would be made knowing expert and definitive care would be provided. Finally, research in the care of the injured would flourish in such centers where total patient care is provided by one specialist. The effect of one organ system on another, *e.g.*, the effect of increased intracranial pressure on gastric acid secretion, could be evaluated in a more meaningful way.

Education of the physician, subspecialist, and general surgeon in the area of trauma will follow patient care patterns. The general surgeon learns care of fractures from the orthopedic surgeon; is there anything

wrong with him learning care of the injured patient in the emergency department from the emergency physician? The surgeon and others will learn care of the injured as they are exposed to those who provide that care. Residency program directors in general surgery need to keep a close watch on the trauma exposure their residents obtain. Patient management problems and postgraduate courses can be used to supplement the cognitive areas. The psychomotor skills involved in treating liver and spleen wounds can and should be obtained in the dog lab. The general surgeon's exposure and responsibility for the care of the injured will continue to narrow and in some cases be nonexistent as the subspecialist becomes more trauma-oriented and new specialties develop.

Medical student education needs to follow a more structured format. Every student is entitled to learn the essentials in the care of the injured. A core curriculum should be defined and developed by the Committee on Trauma of the American College of Surgeons and provided to each medical school. Audiovisual materials can be developed to implement the educational objectives. The movie presented to this society 12 years ago was a step in that direction. That movie has served to educate 2848 medical students at Wayne State University to date and has required minimal faculty time after the initial preparation. Certainly, more needs to be done. Such topics as hand and eye injury readily lend themselves to audiovisual presentation.

The care of the injured is multidiscipline- and multi-physician-oriented. The education of residents and medical students in the care of the injured will also be multidiscipline- and multiphysician-oriented. Basically, education will follow patient care patterns. This is best presented in a quotation taken from a notable Chicago surgeon, Dallas B. Phemister, who stated: "A man cannot teach well what he does not do."

#### REFERENCES

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