1995

Scudder Oration on Trauma

VERIFICATION: The pursuit of optimal trauma care

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"I am called eccentric for saying in public that hospitals, if they wish to be sure of improvement, must find out what their results are. Must analyze the results to find their strong and weak points. Must compare the results with those of other hospitals... Such opinions will not be eccentric a few years hence."

E.A. Codman, MD (1917)

I am confident that the honor of delivering the Scudder Oration was extended to me because of the importance and success of the American College of Surgeons' "Verification/Consultation Program" with which I have been associated for eight years. I accept this honor as a representative of the Verification Committee and the more than 60 Committee on Trauma surgeon-reviewers who have dedicated so much time, effort, and thought toward developing, implementing, and improving the trauma center Verification/Consultation Program.

Dr. John Davis, in his 1979 Scudder Oration, "We've come a long way, baby, in improving trauma care," discussed the impressive progress in the care of the injured patient during the previous 50 years.[1] He concluded by challenging the Committee on Trauma to do as much in the next 50 years, and more specifically "to implement the Committee on Trauma categorization and optimal criteria programs." The Verification/Consultation Program has served to implement the categorization and optimal care programs and has assisted hospitals throughout the United States in their pursuit of optimal trauma care.

History and purpose

In 1976, the Committee on Trauma first published the *Resources for Optimal Care of the Injured Patient* as guidelines for the organization and performance of trauma centers. During the 10 years following this original resource document, surgeons and hospital administrators repeatedly asked for direction in understanding and meeting these specific guidelines. In addition, governmental agencies began development of trauma systems and requested assistance from the Committee on Trauma to determine if specific hospitals were performing as trauma centers. We had no way to respond. The Committee on Trauma had created a credible and respected document based on the knowledge and judgment of experienced trauma surgeons, but had no means to assist in its implementation. The definition of the guidelines was left to local interpretation, which was not always accurate and occasionally self-serving. It became clear that the Committee on Trauma must develop an organized program that would assist in evaluating, defining, and improving individual hospital trauma care capabilities and performance as outlined in the American College of Surgeons optimal care guidelines.

In 1986, the Committee on Trauma received approval from the Board of Regents to organize the Verification/Consultation Program. The original Verification Committee, charged by Dr. Erwin Thal to develop and implement the program, consisted of Drs. Henry Cleveland, David Root, C.T. Thompson, Donald Trunkey, Charles Wolferth, and Frank Mitchell. The opportunity to develop a program that could truly affect optimal care at the patient care level was apparent to us all.

In order to meet the professional standards of the American College of Surgeons and establish credibility, the program had to be objective, unbiased, factual, consistent, and professional. Since many different trauma surgeons would be reviewers, achievement of these goals required a well-organized review process. The committee developed: a pre-review questionnaire to better understand the existing trauma care capabilities of the hospital; guidelines for detailed conduct of the review; an organized review agenda time table; and an outline for writing an organized report. Review and final approval of the report by the Verification Committee was required to ensure consistency of the reports, accurate interpretation of the criteria, well-documented conclusions, and professionalism.

Confidentiality to the hospital for the review and report has always been considered critically important. The program would be of modest benefit for those hospitals that were already performing as trauma centers and were reasonably certain of successful verification. However, for those hospitals that were not yet functioning as trauma centers, the program had the most potential to benefit the optimal care of the injured patient. For those hospitals, the possible exposure of an unsuccessful review could be intimidating. Confidentiality is our assurance and encouragement to an institution that the Verification/Consultation Program is designed to be a positive program in which a hospital can place its trust: no penalties, no recriminations, no embar-

Dr. Mitchell delivered this Scudder Oration at the 1995 ACS Clinical Congress in New Orleans, LA

Table 1

ACS Verification/Consultation Program
Aug. 1987–July 1995

46	States/District of Columbia
463	Hospital site reviews
52	Multidisciplinary reviews
65	Trauma surgeon reviewers
97.9%	Overall satisfaction

Table 2

ACS Verification/Consultation
Aug. 1987–July 1995

	Visits	Verified	Reverified
Level I	133	90 (68%)	26 (6)*
Level II	130	61 (47)	16 (7)*
Level III	13	7 (54)	
Pediatrics	22	11 (50)	
Total	298		*Failed
Consultation	165		
Total	463		

rassment, only a genuine interest to assist in their pursuit of optimal trauma care. To publicly congratulate a hospital on its successful verification would be very satisfying. To publish a list of ACS-verified hospitals would be a public service. However, we have the potential to reach out to more hospitals and to affect the trauma care of many more critically injured patients by maintaining our confidentiality policy.

Achievements

It is with a great deal of satisfaction that the Verification/Consultation Program has had the opportunity to visit so many hospitals that have demonstrated their performance as trauma centers. Although far short of the national need and correct distribution, the 132 hospitals verified as trauma centers document the achievability of the ACS criteria and encourage our confidence in the future of trauma care. Based on our consultation visits, unsuccessful verification site reviews and application requests, I would estimate there are, at this moment, more than 200 hospitals preparing to be American College of Surgeons verified trauma centers.

The Verification/Consultation Program has performed hospital site visits in 46 states and the District of Columbia (see Table 1, above). Fourteen states have requested American College of Surgeons assistance in review of their trauma centers, either for designation or system development. The 65 trauma surgeon site visitors are all present or former members of the Committee on Trauma or state/provincial chairmen. Twenty-eight of these trauma surgeons have performed 10 to 71 visits. Fifty-two multidisciplinary visits have involved seven emergency physicians, four neurosurgeons, three orthopaedic surgeons, and eight trauma coordinators.

In eight years the Verification/Consultation Program has made 463 hospital site visits (see Table 2, above). Two hundred and ninety-eight visits were for verification and 165 were consultation visits. Successful verification was achieved in 68 percent of Level I, 47 percent of Level II, 54 percent of Level III, and 50 percent of pediatric trauma center visits. There were 169 successful verification visits; 42 of these were for re-verification. As of July 31, 1995, 127 individual hospitals had been verified as trauma centers. Today, five additional hospitals have been verified for a total of 132 American College of Surgeons-verified trauma centers.

Peer review. The Verification/Consultation Program has been established as the purest form of a peer review process. No other medical specialty in all of medicine has developed performance guidelines to the depth of the Committee on Trauma. No other medical specialty has ever mounted such an in-depth peer review process to assist in implementing this performance. No other medical specialties have been willing to objectively evaluate themselves in such an organized process in the interest of improving their patients' care. The recent development of the American Burn Association Burn Center Verification/Consultation Program as a cooperative venture within the framework of the ACS Committee on Trauma is to be commended.

Standardization. The local designation of

trauma centers, or in many cases "self-designation," had resulted in fragmented expectations of a trauma center. The ACS *Resource Document* and the Verification/Consultation Program have brought a national standardization to these expectations. It is understood that all ACS-verified trauma centers have met the same criteria for Level I, II, or III. All the criteria must be in place *before* verification is confirmed, and there are no provisional verifications. Each verified trauma center must know that all other verified trauma centers have met the same criteria.

Verification/Consultation Program approval. The Verification/Consultation Program conducts a quality improvement (QI) program of its own performance. Opinion surveys are sent to each hospital following issuance of the official site review report. The overall satisfaction with the program and its process is 97.9 percent.

Specific components of the program have been identified as problems needing modification. Ten percent of the respondents felt the pre-review questionnaire was confusing. Our trauma coordinator reviewers revised this document. One week before the time of the review, we routinely request specific charts to be available for the site review. Thirteen percent of the respondents considered this too short a time frame, but the time frame has not been modified. The committee thought the purpose of the pre-review meeting was clear; 15 percent of the respondents did not. This information has been restated. Documentation of conclusions was considered weak; however, this complaint was expressed by 17 percent of hospitals that were unsuccessfully verified, and expressed only by 5 percent of successfully verified trauma centers. Documentation of conclusions, especially criteria deficiencies, is emphasized in our review instructions and at our annual senior reviewers meeting. The Verification Committee carefully screens all reports for accurate documentation. Eleven percent of the respondents were concerned that the exit interview and written report had variances. This discrepancy occurred because the Verification Review Committee had requested reviewers to modify their conclusions based on the committee's interpretation of the written report content and documentation. Thus, it appeared that the reviewers had changed their conclusions. The Verification Committee now places a cover letter on the final report stating any Committee modifications of the reviewers' conclusions. There is no change in the report.

Consistency of reviews and reports. Three (1.8%) consultation visits did not identify all criteria deficiencies. This oversight resulted in the embarrassing situation of an unsuccessful verification review after the hospital had corrected the identified consultation criteria deficiencies. Our checklist should have prevented these oversights. We are currently completing a list of questions that reviewers must answer in the official report, which should help address any future oversights by our reviewers. Four (1.3%) hospitals were dissatisfied with their review and appealed the findings and conclusions of their verification report. A new survey team was sent to each hospital. Three reports were confirmed as accurate. Perhaps because the second review team gave a more detailed explanation of the criteria deficiencies, all three hospitals were satisfied with the conclusions after the second review. The original report was not accurate in one (0.3%) hospital and corrections were made.

The consistency and accuracy of the verification/consultation site reviewers appears to be excellent.

Optimal care document modifications. The Verification/Consultation Program has served as a laboratory or testing ground for the *Resource Document* criteria. We have clearly shown that the *Resource Document* criteria are achievable—169 times. We have also found criteria needing clarification or modification. The Committee on Trauma responded with changes in the 1993 issue of the *Resource Document.* Definitions were added, the QI program was emphasized, the trauma service was clarified, and criteria for anesthesia and computed tomography technicians were modified.

Trauma system consultation program. The Trauma Center Verification/Consultation Program currently assists the individual hospital. However, we have observed that some of the associated trauma systems are highly fragmented and do not adequately support the trauma center. In addition, we have had frequent requests to evaluate or consult regional or state trauma systems. The Verification Committee realized the

importance of a new program that would assist the development or evaluation of trauma systems. The Committee on Trauma is now organizing a Trauma Systems Consultation Program.

Has the Verification/Consultation Program assisted in improving the care of the severely injured trauma patient? By the many positive comments from trauma directors and trauma coordinators, we can respond with an enthusiastic "yes." However, I suspect that surgeons desire some more objective proof. I am grateful that the trauma directors of two American College of Surgeons-verified trauma centers have given me permission to forgo our confidentiality agreements so that I might present their published results relating to ACS criteria and the Verification Program:

1. The East Texas Medical Center in Tyler, TX, implemented Level II American College of Surgeons criteria in 1992 with the purpose of improving trauma care and achieving Level II verification. Their performance as a Level II trauma center was subsequently verified by the ACS. The survival of patients with injuries predicted to be less than 25 percent was raised from 7.5 percent before the ACS Level II performance to 26 percent when the hospital was organized and functioning as a Level II trauma center.[2]

2. In the February 1995 *Archives of Surgery*, Demetriades published the results of criteria changes made at Los Angeles County Hospital between an unsuccessful ACS verification visit and a subsequent successful Level I American College of Surgeons verification.[3] Within a two-year period, mortality for injuries with an Injury Severity Score (ISS) greater than 15 were reduced 18 percent, and blunt injury mortality was reduced 33 percent. Penetrating injuries with an ISS greater than 30 had a reduction in mortality of 43 percent. In a personal communication, Dr. Demetriades credited the Verification/Consultation Program as the major factor in obtaining the resources and reorganization that resulted in the change in trauma center performance.

Lessons learned

The critically injured patient requires the 24-hour availability of an immediate and organized response by a knowledgeable trauma team with essential diagnostic and treatment facilities. The optimal care document delineates the guidelines for providing this response. Although there are over 100 essential criteria defined in the *Resources Document*, the verification and consultation on-site reviews have identified only 39 different criteria deficiencies in various combinations.[4,5] Only 19 deficiencies (see Table 3, above) have occurred in more than 5 percent of the 463 reviews. In both the verification and consultation reviews, the most common deficiencies are essentially the same. Rarely has there been a deficiency relating to the hospital facility, equipment, or nursing.

Table 3

463 Verification/Consultation Reviews
19 most common criteria deficiencies

Quality improvement	42%
Trauma service	25
Trauma surgeon in ED	21
Trauma surgeon CME	20
Neurosurgeon availability	15
Surgical director ICU	14
24-hour operating room	13
Trauma director	13
Trauma registry	12
CT technician in-house (Level I)	12
Trauma surgeon credentials	12
Trauma coordinator	11
Commitment	11
Outreach program	9
Research (Level I)	8
Anesthesia in-house	8
Admits to nonsurgical service	8
Trauma surgeon ICU response	8
Board certification	8

The Quality Improvement Program is the most common deficiency, both in the verification and the consultation reviews. In 1917, Dr. E.A. Codman, an early member of the American College of Surgeons, was the first to suggest that evaluation of outcomes would lead to improved medical care. Unfortunately, we still encounter a poor understanding of the process and the benefit. Simple deduction would conclude that improved outcome is obtained by identifying problems, de-

veloping a course of correction, implementing this improvement, and monitoring to determine that the problem has been corrected. If we genuinely wish to improve the quality of patient care, we must have the honesty, dedication, and humility to objectively evaluate the care we provide our trauma patients.

Commitment. Sixty-one to 90 percent of general surgeons have been reported to have little or no interest in participating in the care of the trauma patient.[6-9] Negative factors include reimbursement, clientele, nocturnal nature, elective practice interference, medicolegal risk, and time commitment. There is an additional reason, which we have observed in the verification process: surgeons who have had limited training and experience in trauma are intimidated by the responsibility of managing the sudden and critical nature of multiple life-threatening injuries.

Fifty site reviews, or 11 percent of the hospital reviews, have determined lack of commitment by the surgeons or hospital administration. There are probably more instances in which lack of commitment accounts for an unsuccessful verification, but such a conclusion requires clear confirmation. Only two hospitals that had documented lack of commitment of the surgeons or hospital administration were subsequently verified. In both instances, the trauma director and trauma surgeons had been replaced by the subsequent successful verification. Commitment is essential to trauma center success.

The trauma coordinator is the glue that binds the activities of the trauma program together under the trauma director. These activities include the QI program with its trauma registry, on-site monitoring of performance, and education. We found that the lack of an effective trauma coordinator was associated with 8.2 additional deficiencies, the highest number of associated criteria deficiencies for any individual.[4]

Board certification is the standard for identifying the surgeon with appropriate training, knowledge, and skill. Board certification has been a requirement for inclusion on the trauma service for all surgeons since the original *Resource Document*. Only 8 percent of our reviews have found non-board-certified surgeons taking trauma call. Hospitals and the surgical staff have uniformly been able to make the necessary modifications in the trauma call roster.

However, as we make increasing numbers of site visits to rural areas, we find the presence, distribution, and percentages of board-certified surgeons to be decreased. This finding is supported by American Medical Association (AMA) data that indicate the percentage of specialty board certification decreases in counties of less than 50,000 population.[10] Although an extreme example, in one rural state, the AMA lists six neurosurgeons with only one board certified. A neighboring rural state has six neurosurgeons with five board certified. Olga Jonasson, MD, FACS, Director, ACS Education and Surgical Services Department, estimates that 17,000 to 23,000 general surgeons are actually performing general surgery, of which 85 percent are board certified.[11] However, in the rural states, the AMA data show a variation of 62 to 83 percent board-certified general surgeons.

To develop trauma systems and trauma centers in some of our rural areas, with the limited numbers of surgeons and additional limitation of board certification, we must consider some method of recognizing the essential "non-boarded" specialist who demonstrates the appropriate training, knowledge, and skills to meet the challenges of the critically injured patient.

State designation programs: Several states perform their own review and designation programs. Although some states with designating authority have made modest modifications to the ACS criteria, I am aware of only three states that have trauma center criteria significantly less stringent than the ACS criteria. Some states have additional requirements. We have had the experience of reviewing 29 hospitals in seven states where hospitals, already designated as trauma centers by their state, have requested an ACS verification or consultation visit. Only six (21%) met American College of Surgeons guidelines on the first visit. The number of deficiencies ranged from three to 11, with an average of 5.3 deficiencies. Six additional hospitals were verified on the second visit for a total of only 12 (43%) meeting ACS guidelines.

Our sample is small, and we have not reviewed all hospitals or all states that perform their own reviews. I do not wish to castigate the state des-

ignation programs, but I must observe that there seems to be a problem in consistency and reliability of some of these programs. The difference may be interpretation of criteria, inexperience of the reviewers, a hospital promise to implement after designation, inconsistency of the on-site review process, or reluctance to dedesignate. In any event, the injured patient deserves better. If a designating agency is to franchise a hospital to receive the critically injured patient, the designating authority has the obligation to ensure the optimal performance of that trauma center. I would encourage the state chairmen of the Committee on Trauma to review their state designation policies and assist in any needed improvement in consistency.

Future

Quality of care with cost efficiency. Ben Eiseman, MD, FACS, in his 1993 Scudder Oration, eloquently discussed the trauma surgeon's responsibility to society "to provide trauma care at an affordable cost."[12] If our trauma centers and trauma systems are to survive, this is not just a good idea, it is mandatory. Although our responsibility to our patients would seem to conflict with reducing costs, we should see this as an opportunity. We know that trauma centers save lives, reduce complications, and return the injured patient to a useful life sooner than nontrauma centers. These are cost-effective in themselves. If we concentrate our efforts toward providing our optimal trauma care in the most cost-efficient manner, employers and the managed care industry will welcome our trauma centers and trauma systems. Trauma centers can win on both cost and outcome.

I would propose that the Verification/Consultation Program should have additional clause in its contract with trauma centers. The Verification/Consultation site visitors currently review and advise hospitals on their organization and performance as trauma centers. The program should also assist in identifying inefficient trauma care and advising cost-efficient measures. The Verification Committee is currently inquiring of all ACS-verified trauma centers as to any cost-efficiency changes or programs they have initiated.

The Committee on Trauma must critically analyze all of the optimal care criteria to determine if they are essential for optimal care. Because of the significant costs associated with some of these criteria, they must be carefully analyzed for effect on optimal outcome and any possible modification. Some examples of criteria with significant cost that might be modified are: trauma team composition, trauma response indications, in-house surgeon, 24-hour operating room, and anesthesiologist availability.

The number of patients triaged to a trauma center influences both the quality of care and the cost. The Verification Program has been requested to verify Level II hospitals with as little as 15 critical trauma patients per year. Such exceedingly low volumes are not just in rural hospitals, but include some suburban metropolitan areas. The Committee on Trauma has always maintained that the volume of trauma patients is important to allow a trauma center and trauma surgeon to maintain and improve quality of care and outcomes. The more trauma experience the trauma surgeon and trauma center have, the better the results to be expected.

However, we have not had sufficient objective trauma volume studies to make specific criteria guidelines. Such information is now becoming available. Since Luft's 1979 study of improved surgical outcomes with increasing volume, there have been numerous other reports of increasing hospital or surgeon volume resulting in decreasing mortality in those relatively more complex technical procedures.[13] In 1990, Smith, using Chicago, IL, trauma system data from seven Level I trauma centers, was the first to demonstrate improved trauma outcome related to trauma center volume.[14] He was able to determine that 30 to 40 percent of the observed variation in mortality rates was related to volume. As volume increased, mortality went down. Those trauma centers with more than 110 critically injured patients per year had better results compared to those with less than 75 critically injured patients per year. Even more compelling was Mullins' report of two well-established and functioning Level I trauma centers.[15] After state trauma center designation, the trauma volume increased from 580 to 1,530 patients per year. Correcting for injury severity, the mortality rate was reduced 30 percent.

Based on these trauma-related volume studies

and the extensive literature that preceded them, the revision of the *Resource Document* should attempt to establish some basic minimum volume criteria for trauma center verification, at least for Level I and probably Level II.

The Verification/Consultation Program as part of the Committee on Trauma. It has been said that "those who do not know history are doomed to repeat it." On December 20, 1919, the Board of Regents of the American College of Surgeons established the Hospital Standardization Program. The emphasis of the program was on physician competency, clinical case studies, laboratory facilities, staff organization, and prohibition of fee splitting. There was personal inspection of the hospitals.[16] By 1952, the College had approved 3,352 hospitals with very significant improvements in the quality of hospital performance. However, there were increasing numbers of hospitals to be evaluated and increasing costs of the program. In 1952, the Hospital Standardization Program was transferred to a collaborative program with the AMA and AHA (American Hospital Association). This collaboration was called the Joint Commission on Accreditation of Hospitals.[17] Whatever we may think of today's Joint Commission, it is not a peer review program—evaluation of patient care is not performed by peers and assistance in improving care is not provided by practicing peers.

I would plead that the American College of Surgeons should never relinquish the Verification Consultation Program as a function of the Committee on Trauma, where the goal is improving the care of the injured patient; where the guidelines are developed, clarified, and modified by trauma surgeons; and where practical assistance in improving trauma care is provided on site by trauma surgeons.

As has been often stated, trauma is a surgical disease. The verification of trauma center performance and the consultation to assist in improving trauma care by and for trauma surgeons must remain a function of the ACS.

The Verification Consultation program is achieving its purpose in assisting trauma centers in their pursuit of optimal trauma care. The program has demonstrated the strength of a professional peer review process that is consistent, unbiased, objective, and constructive. The American College of Surgeons Committee on Trauma can rightfully be proud of the Verification/Consultation program and should build upon its success.

I wish to close on a personal note: my times as a state chairman and region chief, as a member of the Committee on Trauma, and especially as a participant in the Verification/Consultation Program have been the most satisfying experiences of my professional career. To have been associated with the men and women of the American College of Surgeons Committee on Trauma, both past and present, with their lofty goals, unified purpose, and unselfish motivation has been pure pleasure. Ω

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