Critical Care Medicine

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Critical care medicine—quo vadis?

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At the conclusion of my term as president of the Society of Critical Care Medicine, I would like to review its history, summarize its progress during the past year, and offer some thoughts on its future direction.

We have come a long way in a short period of time since the first informal discussions between Hal Weil, Burt Waisbren, Will Shoemaker, Herb Shubin, John Kinney, Ake Grenvik and myself during the latter part of 1968 and the year of 1969 on the desirability of a *multidisciplinary* society of critical care medicine. These were followed by the formation of the Society of Critical Care Medicine on February 10, 1970 in Los Angeles, with incorporation in 1971. The first annual meeting was held in Los Angeles in February 1972. We are indebted to Hal Weil for his efforts and inspiration during the formative years of the Society.

Our stated purpose was simple—"to improve the care of patients with acutely life-threatening illnesses and injuries and promote the development of optimal facilities for such care." To accomplish this, our goals were to counteract outdated and fragmented care; bring together leaders from various medical disciplines, nursing, basic sciences, medical technology, bioengineering, and allied health professions; develop standards; and commit ourselves to education and academic leadership in the area of critical care medicine. We have defined "critical care medicine" as the triad of 1) resuscitation, 2) emergency care for life-threatening conditions, and 3) intensive care; including all components of the emergency and critical care medicine delivery system, prehospital and hospital.

Although our criteria for membership have been rather stringent, from the original group of 27 physicians (nine anesthesiologists, nine surgeons, seven internists, and two pediatricians) in 1971 the membership roster was expanded to 114 in 1972 and to 238 at this our 2nd Annual Meeting. We have included 25 pioneers in critical care medicine from other continents in the world.

PROGRESS REPORT 1972/73

During the past year, our continuing efforts in standard setting, education, and activism at the national level have borne fruit: 1) A Federation of Societies of Emergency and Critical Care Medicine was formed—a formal alliance with the American College of Emergency Physicians and the University Association of Emergency Medical

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Services. 2) We continued our informal collaboration with the rapidly growing American Association of Critical Care Nurses. 3) We published guidelines for organization of critical care units and for training of physicians in critical care medicine formulated by special committees of SCCM chaired by Drs. J.J. Downes and P.M. Winters. *(JAMA 222:1532-1535, 1972; Crit Care Med 1:39-42, 1973).* 4) We created an official journal of the Society of Critical Care Medicine—"CRITICAL CARE MEDICINE."

Since the inception of our society we considered the pros and cons of having an official journal as part of our educational and communication program. Creating a new journal was the most difficult decision of this year's presidency, in part because of our small membership, but it became a reality because of the confidence, optimism, and hard work on the part of the publisher and the editor. The journal came into being without a financial investment on the part of the Society.

We participated in a conference on physician education in emergency and critical care medicine, held by the American Medical Association Council on Medicine Education, at which we supported the request of the American College of Emergency Physicians for residency and specialty status in emergency medicine and recommended an inspection and approval system for CCM fellowships and criteria for physician examination, and certification of special competence in CCM. Dr. William Hamilton in the name of the American Board of Anesthesiologists proposed to the boards of Internal Medicine, Surgery, and Pediatrics a joint creation of such certification of special competence.

We also participated in a conference on standards for cardiopulmonary resuscitation and emergency cardiac care held by the American Heart Association and the National Academy of Sciences/National Research Council. A number of educational programs were supported and/or co-sponsored by SCCM during the past year, including the 11th Annual University of Southern California School of Medicine Symposium on Critical Care Medicine, and the 7th Annual University of Pittsburgh School of Medicine Symposium on Critical Care Medicine. We also agreed to co-sponsor the International Mobile ICU Symposium at Gutenberg University, Mainz, Germany in September 1973 and the First International Congress on Intensive Care in London in June 1974.

We have had communication with the National Research Council, Veterans Administration, Joint Commission on Accreditation of Hospitals, the "Study of Surgical Services of the United States", and other programs and organizations relative to critical care medicine. We testified in support of the Kennedy-Cranston Emergency Medical Services Legislation (S #504) which is designed to counteract the sudden "antievolutionary" discontinuance of federal funding for education, health care and research. The success of this, our second annual meeting, is largely due to the efforts of our program committee and Dr. Bulent Kirimli's local arrangements.

THE FUTURE

The ultimate goal of CCM can be highly significant in our overall health care system. We should consider our future priorities within this framework, remain flexible, and change with evolution.

The biggest problem facing us is the salvage of useful life. If all components of emergency and intensive care were ideally implemented, an estimated 60,000-200,000 people in the U.S.A. who die each year from medical and surgical emergencies might survive.

Let us broaden our horizons from "ICUs", to include all the components of the system which the critically ill or injured patient may need: 1) recognition of the emergency and aid by bystanders; 2) initiation of the response system (universal emergency telephone number); 3) treatment at the scene; 4) transportation with life support; 5) emergency department; 6) operating room; 7) ICU; 8) organization and communications of 1-7; 9) planning, education and evaluation for 1-8; and 10) research.

The most sophisticated intensive care often becomes unnecessarily expensive terminal care where phases 1-5 are uncoordinated or undeveloped. Our main influence in the extra-ICU components of the system should be through teaching, organization, quality control and evaluation (research). We should improve continuity of monitoring and life support when patients are transferred to hospitals, between hospitals, and within the hospital.

In an ideal, coordinated CCM program, the surgical patient will also be observed by the internist, the medical patient by the surgeon, with all patients' life support under the supervision of a CCM physician and continuity provided through involvement of the primary physician. In so doing, the proper treatment will more likely be instituted before irreversible organ deterioration takes place. It is essential to designate one

team member as coordinator.

In university hospitals, specialty parochialism and individuals' egos have led to fragmentation and multiplication of ICUs and inadequate interaction between disciplines. We should not tolerate authority over the care of critically ill patients by inexperienced house staff. The time for tiptoeing around these issues has passed. Progress is often made only by confrontation. I suggest that we obtain documentation to support our plans and stick to our principles.

Some hospital service departments of CCM already exist, with the directors reporting directly to the staff and administration. Some of us have been talking about CCM departments in medical schools. However, since our goal is to remove traditional interdisciplinary boundaries, such departments may build new walls. I favor a multidisciplinary "program" with a director and a committee of faculty members of several departments who are involved and committed to CCM, either full-time or most-time. By focusing on education and research, care can be influenced indirectly, without the threat of "taking away" patients. The program director should have his own budget and report directly to the Dean of the Medical School. Interdisciplinary CCM programs could: 1) foster cooperation between physicians and nonphysicians; 2) coordinate patient care, teaching, and research; and 3) cross-fertilize laboratory research, clinical research, and health care delivery research. Multidisciplinary mission-oriented endeavors could also be administered as "institutes" (a term frowned upon by traditionalists).

We should pay more attention to the hopeless case and how we can help such patients to die with dignity. Emergency resuscitation is inexpensive and painless. Prolonged advanced intensive care, however, is often expensive and may make relatives and patient suffer. Quality of life after discharge must be considered. I can therefore see need for our collaboration with neuroscientists, psychiatrists, psychologists, lawyers and philosophers.

Specialists of traditional disciplines will not give up their base specialty practice to devote themselves to leadership, administration, teaching and research in CCM full-time or most-time. Furthermore, most of them lack the volume of experience with critically ill patients to keep their knowledge current. Thus, physicians with special competence in and commitment to CCM are required.

We should intensify CCM education for medical students and residents, and establish fellowship programs. We should improve postgraduate courses and scientific meetings on CCM. We should help close the manpower gap in hospitals by fostering imaginative and flexible multiple career opportunities in CCM for physicians and non-physicians; and provide a more comfortable working environment with lower frustration/satisfaction ratios. We should develop expertise in planning, catalyzing, and evaluating community programs in order to aid administrators and public health officials in establishing the necessary priorities in the overall health care system.

We must pay more attention to upgrading intensive medical care in community hospitals, for these facilities provide care for more than half of our population. The emphasis should change from equipment to personnel, primarily nurses and therapists under the guidance of expert physicians. An expansion of the two-year residency in emergency medicine with a fellowship in CCM is an exciting possibility for solving problems of physician coverage in emergency departments and ICUs of small community hospitals.

In addition, there is a great deal of research to be done and problems to be solved at community, national, and world levels.

RESEARCH

Future CCM research, based on need and the possibility of breakthrough might consider the following:

1. More attention should be paid to the human brain, the target organ of resuscitation. Although routine monitoring of intracranial pressure and other cerebral variables in comatose patients following head injury, ischemic-anoxic insults, and metabolic or infectious brain damage is feasible, it is not generally practiced. We know little about these conditions and I predict that the salvability of neurons is greater than we are taught at present. We should learn more about post-ischemic-anoxic encephalopathy—its prevention and the amelioration of secondary neuronal loss. Diagnosis of brain death in patients with spontaneous circulation is now established and widely used for discontinuance of senseless efforts; however, we need guidelines for discontinuance of life support in patients with irreversible coma who do not have an isoelectric encephalogram, but are in the vegetative state.

2. We should study means of controlling the microcirculation by amelioration of capillary and cell membrance failure and intravascular sludging, plugging, and clotting; since these events may determine the reversibility of the dying process.

3. The high mortality encountered in the past

in the adult respiratory distress syndrome is being progressively reduced through early prevention of pathogenetic factors, suspicion, recognition, and modern therapy. We must learn more about the healing processes in the lungs following pulmonary edema and consolidation, and the means for treating the lungs actively. Extracorporeal oxygenation will be required less often than appeared to be the case at a time when respiratory care and other life support measures were less advanced.

4. It is possible that lung transplantation will become feasible prior to solution of the immune rejection problem, as has been the case with kidney transplantation. Solution of the immune rejection problem would allow successful heart-lung transplantations and open new horizons for CCM physicians, such as the logistics of organizing and coordinating life support in recipients while procuring donor organs.

5. The results of pilot projects on prehospital advanced life support with arrhythmia control, cardiopulmonary resuscitation, and defibrillation, have proven that Dr. Claude Beck was right 15 years ago with his vision of "hearts too good to die." Organizing and evaluating emergency medical services systems on a regional basis in a free enterprise society is a challenge for health care delivery researchers.

6. The incidence and mortality of ventricular fibrillation and cardiogenic shock (pump failure) may be reduced by early prehospital arrhythmia control. In addition, we need simple means for assisting the circulation early in the course of illness. The expensive but logistically challenging combination of cardio-pulmonary resuscitation, assisted circulation, emergency coronary angiography, and emergency coronary revascularization operations will make the coronary care unit multidisciplinary.

7. Collaboration between bioengineers and CCM physicians is beginning to open new horizons. There has been a tremendous time lag between feasible and accomplished bioengineering innovations in life support and their applicability through commercial availability. We should turn our preoccupation from monitoring everything and being buried in "wall-to-wall data" to closing the loop from sensors to treatment through automated or semi-automated feedback systems with alarms. Manufacturers of life support equipment and pharmaceutical companies should be stimulated into greater responsiveness to needs than to demands, with the former being based on facts and on advice from experts with first-hand experience.

8. Basic scientific breakthroughs require moderate funding to free time and to support facilities for investigators with promising ideas. I doubt that we can "buy" scientific breakthroughs with millions of dollars as is pretended presently with the funding of cancer programs. In contrast, billions of dollars may be required for application of existing knowledge as is the case in emergency and critical care medicine.

THE COMMUNITY

We must find simple ways to explain CCM to the public. Heart attacks or strokes are easier to understand than multiple organ failure. Some of us have helped in the development of national guidelines, goals, and standards for emergency and critical care medicine and have promoted their implementation for over one decade. The implementation of these recommendations in communities has been possible only when there were dedicated experts who could devote most of their time to health care activism, a cooperative and enlightened local government, and sufficient funds.

The implementation gap in the USA is not due to lack of money, manpower, or knowledge, but rather because nobody is in charge. The authoritative governmental approach of some European countries has led to better organization and higher uniform standards of emergency medical services; and the voluntary multifaceted approach of the USA to greater peak performances and local initiative. Therefore I propose combining the best of each by seeking a system with maximal input from consumers, experts and providers, but authoritative decision making and quality control. (Even industry has disciplinary restraints through market and public regulation).

Resistance to needed change in hospitals can usually be overcome by devotion to patient care and demonstration of competence. In the community, obstacles to change have been: 1) fear, 2) ignorance, 3) bureaucracy, and 4) indifference. Through man's expanding consciousness, more and more people will become reasonable, secure and competent and thus try to overcome these obstacles by communication and understanding. Let us start by suppressing egotism, refraining from "attacking the enemy" as the first step of our activism, and trying to persuade with reason. You can succeed if you can convince a highly respected political leader or a financial donor to join your movement. Having tried this and failed, you may have to resort to more drastic

methods: the "helicopter technique" (bypassing channels and dealing with the top man); the "bulldozer technique" (negotiating first with reason and if this is not successful, proceeding full speed through the obstacle); and the "waterdrop technique" (talking and promoting incessantly until others sell the program for you). These methods have worked with professionals, intelligent lay persons, and intelligent politicians. They have not worked with "average" politicians who are primarily influenced by what they think will bring them votes and power. You may first try to arouse such politicians by illustrating them as victims, by becoming "political" in a subtle way, by giving them a chance to earn "brownie points" with the public, and finally by threatening with the news media. Thus, the last and most time-consuming step in implementation efforts is to go to the news media and arouse public pressure. Pursuing any of these paths to its end requires individuals with tenacity and high frustration tolerance.

THE WORLD

We shall become a truly international society whose members are proud of being world citizens. In this spirit we health technologists and scientists of the western world should not forget that the majority of people in the world live in rural areas of developing countries which lack not only critical care but also sanitation and basic medical care. In such countries, the development of emergency care and transportation with life support should have priority over sophisticated ICUs.

The numbers of persons killed or injured in wars and natural disasters who could be saved, make our ICU triumphs appear small indeed. Once there are pioneering members of SCCM around the world we will be able to explore global projects. For example, a standby CCM physician response system for natural and manmade disasters around the world could be organized in cooperation with the United Nations or World Health Organization, utilizing the air forces of the various countries to transport the rescue teams, CCM specialists, equipment, and supplies. Preparation for and execution of self help, communications, extrication, resuscitation, air lift, long-term life support and definitive therapy in disasters have so far been erratic, improvised, and too slow to prevent death; eg, the recent Peruvian and Nicaraguan earthquakes. Some of the reasons for this inadequacy are: the complexities of international bureaucracy, the trend of organizations to put self aggrandizement before their missions, local politics, and logistics of communications and transportation. Thus, CCM orientation of disaster planning is greatly needed.

The human brain may be the peak of cosmic evolution. We should use it to build this earth (Teilhard de Chardin). Although passive evolution of nature has created man, future evolution is malleable through man's thoughts and actions. Man's efforts on this earth can actively support, stop or reverse evolution. One example of positive evolution is CCM's potential in increasingly controlling the cruel chances of nature, thus providing qualitatively and quantitatively full lives for an ever increasing proportion of human beings.

Many physicians and nonphysicians of the CCM movement have much in common with activist members of the new generation. We should call upon young people who are direct, honest, and sensitive to human needs to help bring about needed change. They have a fresh approach based on reason, logic, and compassion unencumbered by historic prejudices. On the other hand, youth needs some historic perspective and should appreciate the fact that in order to improve certain aspects of our society the "mover" may require many years of experience. Medicine should learn from the fact that materialistic power is rarely used wisely. Sole preoccupation with science, technology and administration may lead to a self defeating victory unless we simultaneously develop humanism.

Health professionals can become links in the chain of evolution if they rise above technology and become realistic idealists. We should concern ourselves with issues beyond direct patient care, such as world citizenship, war and peace, violence, overpopulation, poverty, starvation, environmental pollution, racial intolerance, educational opportunities, and the philosophy of quality versus quantity of life, with particular emphasis on the beginning and end of life.

Although physicians find it difficult to suppress their egos for the higher common goal, history has shown the efficacy of mission-oriented team programs. The future will be challenging and bright if our efforts are guided by the wisdom of broad global views. Let us make critical care medicine a demonstration project to prove that human beings are capable of influencing in a positive way the evolution of human life on this earth.

To all of you my sincerest thanks for your confidence in having elected me as your president, your help during the past year, and your understanding. It is with great pride and enthusiastic predictions for the future that I am turning the leadership of this Society over to Will Shoemaker.