Correlation of the Old and the New in Anesthesia

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In discussing the subject of Correlation of the Old and the New in Anesthesia, a philosophical approach seems more reasonable than one which would attempt to go into detail defining and comparing differences in drugs which are used today and those which were used only ten years ago. Very little has been added except for the relaxant agents and changes in techniques. As recently as World War II the chief anesthetic agents which were being used were diethyl ether, nitrous oxide, cyclopropane, ethylene, and sodium pentothal as an intravenous agent. Curare was being advocated as a relaxant drug to be used in conjunction with general anesthetics, especially with cyclopropane.

During the latter part of the war, and during the mid-forties, Doctors Ralph Knight and Joseph Baird at the University of Minnesota advocated the use of curare in combination with sodium pentothal. This technique gained some favor throughout the central part of the country; but its widespread use was only fleeting, for the combination of the two drugs without a satisfactory analgesic agent left a great deal to be desired in the over-all care and protection of the patient.

Since the advent of the use of curare in anesthesia, other agents have been used to suppress skeletal muscle activity. Succinylcholine seems to be the agent which has gained the most widespread use since that time. Other agents have been added. Chief among them have been the halogenated substances such as Fluothane, Fluoromar and Penthrane. They are especially valuable in handling patients upon whom actual cautery or electrosurgical units are used. Each of these agents probably has a useful place. However, Fluothane is, in my opinion, the one which will stand the test of time.

In discussing the changes in anesthesia procedures and techniques, it seems important to discuss briefly the changes which have taken place since World War II in the pattern of the development of our specialty. During the war many hundreds of young men and women were selected by the military service to receive special training in the art and science of anesthesia. Some of the physicians were sent to civilian training programs throughout the country. However, training centers were set up in many of our large military hospitals in the United States. Those centers were staffed largely by men who are now well-known within the specialty.

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They trained physicians and nurses in periods of instruction lasting from one to several months. Following the war, most of the trainees were mustered out of the services. A large majority of them sought additional knowledge and experience in civilian anesthesia training centers throughout the country. Those men and women became the stalwarts of our specialty. They are serving anesthesia today, not only in this country, but throughout the world.

Two words have been coined, primarily to set aside and give autonomy to the physician who is practicing the art and the science of anesthesia. These terms are "anesthesiology" and "anesthesiologist." Anesthesiology is defined by Webster's Dictionary as "a branch of medical science dealing with anesthesia and anesthetics"; anesthesiologist is defined as "a physician specializing in anesthesiology"; and an anesthetist is defined as "one who administers anesthetics." I believe we should use the terms "physician-anesthetist" and "nurse-anesthetist" to distinguish between the two bodies of specialists, for those of us who are working in clinical anesthesia are all anesthetists in the truest interpretation of the Webster definition. The art and science of anesthesia are equally important; but the science must retreat in favor of the art once the patient takes his first breath of the anesthetic mixture, or the first injection of the intravenous agent is given. At that precise moment anesthesia becomes strictly an art — and one of the most important arts known to man. The components which make up the art of anesthesia are constant, undivided attention and observation, keen perception, diagnostic acumen, and an almost automatic ability to act promptly in order to avoid or correct dangerous conditions.

I mention this because of the modern trend to dependence upon monitoring devices to tell us the condition of our patients. Monitoring should be defined! According to the dictionary, "monitor" means: (1) "one that warns," (2) "a student appointed to assist a teacher," (3) "a person or thing that warns or instructs." There are many types of monitors: the mechanical or electronic monitors such as the electrocardiograph and the electroencephalograph; the chemical monitors which determine pH, pCO₂, oxygen saturation, etc.; and monitors which measure arterial and venous blood pressures and body temperatures.

Most important are the human monitors who constantly observe the patient's color, whether or not he is sweating, the rate and character of his respiration, the rate and — most of all — the quality of his pulse, the degree of muscular relaxation, the rate and quantity of blood loss. These are the important observations which are not detected by our present day electronic devices. The patient may be severely obstructed and cyanosed, or may be clinically dead with a comparatively normal electrocardiographic pattern. He may have a weak or even imperceptible pulse and no obtainable blood pressure, with little or no changes in the electrocardiogram. For these reasons I believe we might question the wisdom of capitulation to the ultra-scientific systems for monitoring patients under most conditions. Some of our monitoring devices can be likened to the bird which flies backward. He doesn't see where he is going; neither can he determine where he is. He simply sees what he has passed, and then
frequently too late to make corrective alterations.

Much of the anesthesia seen and advocated today is not anesthesia in the truest sense. It is merely deep sleep and skeletal muscle paralysis, leaving the nervous system relatively intact. The sympathetic and parasympathetic nervous systems, during sleep without analgesia, are comparatively unaltered and capable of damaging responses. Laryngospasm, bronchial spasm, tachycardia, multiple focus ventricular tachycardia, ventricular fibrillation, bradycardia, and cardiac standstill can all be caused by painful or noxious stimulation to the unconscious patient. Pain perception is in fact absent, if we think only of mental alertness or comprehension of pain. However, without true analgesia, all defense systems will respond except the skeletal muscular system.

Let us use fire and burning as an example. If one is exposed to fire under normal circumstances, his skeletal muscles will move him away from danger. At the same time, the chemical responses to pain, such as those seen in the sympathetic and parasympathetic nervous systems, are activated. But, as soon as the stimulus is removed, the various systems quickly resume their normal balance. If, however, the body is paralyzed and cannot respond by moving away, the autonomic systems will continue to be stimulated by pain and fear. The same will happen if the patient is lightly anesthetized and paralyzed without analgesia. This points out the fallacy and danger, under many circumstances, of using only very light anesthesia.

Many of our advances in anesthesia have been made in the management of infants and children. Most of these advances have been made not so much in the development of newer agents, but largely in the development of more advanced methods of administration. Equipment has been developed which makes endotracheal anesthesia in the infant relatively simple and safe. Regional anesthesia has been adapted to surgery on infants and children much more vigorously in the past ten years than it had been previously.

In handling pediatric patients we must remember they are infants and children. We must not try to make them fit our standards of adult behavior, either awake or under anesthesia. Children, and even infants, are capable of violent reactions to fear and to noxious stimuli. They are, by the same token, relatively incapable of reason or understanding. Thus, we must protect them from untoward stimulations which can and do influence their morbidity and mortality.

We have come a long way in the management of children. No longer do we see the terrifying smothering ether inductions with little or no preoperative preparation. Adequate medication is usually used prior to anesthesia — this in the form of basal anesthesia given by the rectal route, or by the use of hypnotics, sedatives, and narcotic drugs. I believe a good deal more hypnosis is being used in pediatric care than we publicly admit. Those who are handling pediatric patients routinely and successfully perform a certain amount of hypnotism in gaining a patient's confidence and getting him to do as he is asked.

Dr. Robert Gross, in his foreword to Dr. Robert Smith's textbook of
Anesthesia for Infants and Children, states: “In some medical circles there seems to be an attitude that the surgical operator is managing the show; in others, the anesthetist has an overly possessive feeling toward the patient. Neither approach is proper. It is best for each to be cognizant of his own problems and also to know of the other's difficulties; both must work together for the total care of the patient. Certainly this is the most pleasant way to work, and surely it is the most effective way to conduct a child through a surgical ordeal.”

Dr. Robert M. Smith, in the same textbook, states: “There are now many anesthetists who have developed special skills and techniques for children. Spinal and local anesthetics, relaxants and intravenous agents which might be inadvisable in the hands of the inexperienced may be used with special advantages by those who have had adequate experience.”

Again I quote, “In general, simplicity affords greater safety in anesthesia, and this applies especially to pediatric anesthesia. Our aim should be to strip away unnecessary details and try to make difficult procedures look easy, rather than to introduce complicated methods and make easy procedures look difficult.” And, finally, “The term 'technician' has been used among anesthetists with a derogatory implication; however, technical ability is a first-line priority in the anesthetic management of infants and children.”

Specialized techniques have been developed within the specialty. Foremost among them are hypothermia, deliberate hypotension, hypnosis, and regional procedures for the control or abolition of intractable pain (the last especially for patients who are in the terminal phases of cancer). Hypothermia has made possible the surgical correction of many cardiovascular lesions and lesions of the brain. The anesthetic management per se is not too much different from the management of patients under normo-thermic conditions. Here, however, a team of electronic technicians and physicians, not the anesthetists, should be in charge of monitoring devices to control the patient's body temperature, to accurately calibrate the proper oxygenation of the blood, and to determine the degree of venous pressure as well as to determine the effects of surgical trauma or changes in arterial and venous pressures upon the heart. Monitoring under the conditions encountered in open heart surgery is vital; but it must be left to the experts who understand the operation and maintenance of electronic devices and to physicians who can interpret the measured changes instantly. These tasks must not become the burden of the anesthetist. He must be left to control his own mechanical devices and to interpret the clinical conditions of his patient. For an anesthetist to abandon the close relationship and contact with his patient in order to monitor a monitor is a breach of contract with the patient.

Deliberate hypotension, especially during some plastic surgery and surgery of the mammary glands, is warranted and relatively safe if done in patients with normal cardiovascular systems. Destructive nerve blocks, using agents such as phenol and alcohol, are important in modern anesthetic practice. Many patients who are suffering from incurable diseases can be relieved of much of their pain if a proper approach is used by someone who is willing to spend long hours working, explaining, and reassuring
those unfortunates who are too often abandoned to the relative oblivion of massive doses of narcotics and sedatives.

We must not forget the old entirely in favor of the new. Ether is still a wonderful anesthetic agent. If it were used routinely in pulmonary surgery or cardiac surgery, we would rarely see vagal reflexes producing bronchospasm, bradycardia and cardiac standstill! We would rarely see ventricular fibrillation in the absence of direct trauma to the myocardium. We would rarely see interference with ventilation due to decreased compliance. Ether remains a valuable agent for tonsillectomy in children. The distress of watching and listening to a child recovering from a Fluothane anesthetic following tonsillectomy should remind us of the comforting analgesia which is present following the administration of ether. I am aware that many in our specialty have sacrificed safety to the patient in order to allow the convenience of the electrosurgical unit. I am equally aware of the surgeon's willingness to give up the electrical equipment for the safety of his patient.

In closing, I would issue an appeal for closer cooperation between the physician-anesthetist and the nurse-anesthetist. Traditionally our aims are the same. We are dedicated to patient care and to the relief or abolition of pain. It is difficult for one group to progress in this clinical field without the other. If we work together, the result is nearly always improved patient care and an economic saving. Twenty-four hour coverage for all patients, including the obstetrical patient, can be assured. I realize the trend has been away from nurse-anesthetists in some localities. I do not believe this trend is for the benefit of the patient. On December 8, 1959, Dr. Rovenstine, a long time advocate and staunch supporter of physician-anesthetists, made what was probably his last public speech when he arose among the assembled directors of anesthesia residency programs in a meeting in New York City. He stated that it was his belief that better anesthesia coverage could be obtained by the presence of a limited number of physician-anesthetists working with and supervising nurse-anesthetists. As I recall, he predicted this would happen.