

TRENDS IN ANESTHESIOLOGY *

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THE ever changing pattern of the practice of medicine might well be reviewed from time to time, in order to furnish to those of us who are vitally concerned with medical service a continually up-to-date basis for conjecture as to the probable situation in the future. We would like to know the economic, social and political future because, just as we are determined that effective service for patients shall continue to be provided, so are we convinced that plans for such service can best be made by those who are bred to the responsibility of taking care of the ill. We do not have confidence in the knowledge of our work possessed by those whose business or profession is something else, however brilliant such persons may be or of whatever the political authority with which they are clothed may consist. It may be profitable, therefore, for us who are here today to conjecture, in the light of the past, what the future holds for anesthesiology, with respect to agents, methods and personnel.

PRIOR TO TWENTY-FIVE YEARS AGO

Earlier than a quarter century ago, agents in use for general anesthesia were largely ether, nitrous oxide and chloroform. For local anesthesia, cocaine preceded in favor its safer derivative, which first was known as "novocaine" and, later, as "procaine." Compared with the broad selection now offered to those concerned with anesthesia, such a supply of agents seems pitifully small.

Nor was the equipment, mechanical or human, lavish. The ether can, through the cap of which a safety pin was thrust, formed a rough cruet from which ether was delivered, through a gauze mask, to the respiratory passages of the patient and, even more directly, to those of the hovering anesthetist. This functionary, by the way, was likely to be any handy physician who was too compliant or too poor to refuse his services. If the hospital possessed a mechanical device for anesthesia, it was likely to be a wasteful gas machine and few available people could satisfactorily manipulate it. Just as small a number could carry out methods of local, regional or spinal anesthesia with

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satisfaction. However, the demand for hospital service of any kind was not so insistent twenty-five years ago as it is now. The population was not so great and the number of hospitals was relatively small; at least, hospitals were not as large as they are today and the number of surgical operations performed was fewer.

THE TWENTY-FIVE YEARS JUST PAST

We stand on a knife edge in time. Everything to one side is past; everything to the other side is to come. Therefore, since there is almost no present, I shall include the present in the quarter century just past.

In that period a great deal of research was carried on with respect to new anesthetic agents, new preparations for supportive therapy and new methods. The first of what I now have to say will deal primarily with agents, although the methods of anesthesia in which they played parts sometimes will be incidentally mentioned.

One of the first developments was the introduction of successful narcosis by use of avertin injected rectally. Another of the new agents which was put to use in this period was ethylene. Shortly thereafter, carbon dioxide began to be used in anesthesia and a means of employing soda lime to absorb excess carbon dioxide was developed. About then, those engaged in anesthesia became acquainted with cyclopropane. Shortly thereafter, intravenous use of barbiturates led to employment of pentothal sodium intravenously; this development was highly important.

Since, for years, I have considered that the skill which an anesthesiologist acquires in intravenous technic qualifies him above most of his colleagues to conduct intravenous therapeutic procedures, it seems appropriate that one of these procedures be mentioned here. Use of plasma in World War II saved many lives but the attendant hazard of hepatitis in even a small percentage of cases influenced eager search for a substitute for plasma. It seems possible that 6 per cent dextran in physiologic saline solution, which has the same colloidal osmotic pressure as plasma, is the sought substance. The molecular weight of therapeutic dextran may be as great as 200,000 or 300,000. The solution of dextran may be even better than plasma, since its larger molecules tend to stay in the circulation longer than can be expected of substances of which the molecules are smaller.

A variety of vasopressor substances was introduced in the quarter century here considered. Some of these, used alone or in combination with dextran, already have become important in supporting patients, both during operation and afterwards. They aid in maintaining satisfactory circulating volume, and satisfactory pressure, of fluid in the blood vessels. These substances, accordingly, have increased the satisfaction with which spinal anesthesia is used.

However, as will appear in a moment, the recent introduction of curare changed the picture with reference to spinal anesthesia, as well as with reference to other means of producing anesthesia. Now, therefore, for a few moments I shall deal primarily with the methods of anesthesia and the agents will be of secondary interest. Within this section, as well as within others of this article, an indistinct attention to chronology is abandoned whenever something else seems more important.

Fairly early in the twenty-five years just past, Magill's intratracheal tube offered a marked advance in providing the good airway that is essential to administration of anesthetic substances by inhalation. Fairly late in the period, recognition of the Rh factor in connection with blood transfusion made possible a valuable precaution in preparing patients for operation, as well as in supporting them during operation and in the postoperative period. Knowledge of the Rh factor began to be applied, also, in obstetrics and in nonsurgical cases.

The change in anesthesia that was brought about by curare, and which was mentioned a moment ago, was a decrease in the use of spinal anesthesia consequent on extension of general anesthesia. For example, use of curare made it possible to effect satisfactory anesthesia with intravenously injected solution of pentothal sodium plus administration, through a Magill intratracheal tube, of a mixture of 50 per cent nitrous oxide and 50 per cent oxygen. This combination permits pleasant induction, an adequate supply of oxygen throughout maintenance, an almost perfect airway and whatever degree of relaxation is needed. I prefer to administer the pentothal sodium and the curare from separate syringes through a three-way stopcock and an 18 gauge needle; a connection is thus provided for parenteral administration of blood, blood substitutes or other fluids (fig. 1). Use of this combination is attended by no hazard of fire or explosion and it gives the anesthetist excellent control of the situation. Nearly all surgical operations can be performed with the patient under anesthesia so effected and all patients prefer it certainly to ether given by the semi-open drop method. Most patients prefer it to local, spinal or regional anesthesia.

However, use of regional anesthesia to effect diagnostic and therapeutic blocks for patients with undiagnosed pain paths developed over the period under consideration. The development first was slow but now is rapid. Moreover, new methods introduced in regional anesthesia increased its effectiveness. Continuous caudal anesthesia was employed for both obstetrics and surgery and continuous spinal anesthesia for surgery. In either of the two methods just mentioned a catheter or a malleable needle may be used. These new methods increased considerably the number of conditions for which regional and spinal anesthesia can be used although, owing to the improvement in other methods, the total number of cases in which spinal anesthesia is employed actually has decreased.

In this period of twenty-five years, the number of persons engaged in anesthesia became augmented along with the increase in population, in number of hospitals, in amount of surgery performed and in number of anesthetic agents and methods available. World War II was a large factor in increasing the number of physicians who interested themselves in this field and the demand for their services by surgeons of our army and navy stimulated the demand for physician anesthetists in civilian practice. The period of apparent prosperity associated

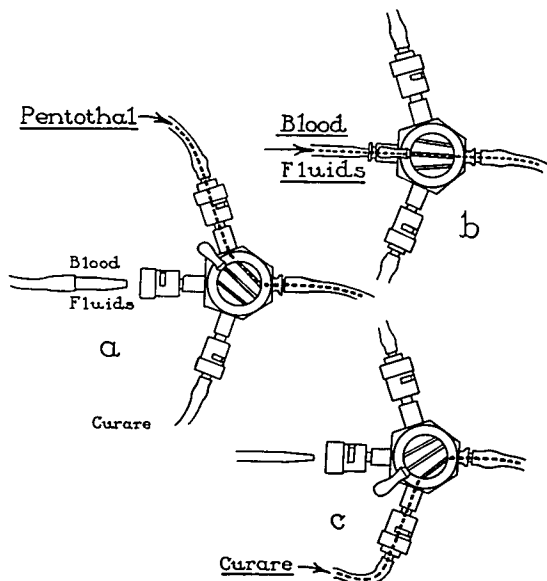


FIG. 1. Modification of Courtin's device for giving separately curare, pentothal sodium and blood or fluids.

with the war effort greatly encouraged people to seek elective medical care and this increased the load of every department within the hospital. Today, the need for both physician anesthetists and nurse anesthetists, especially for those who are more or less expert in the work, cannot be met.

Much was done by both groups, physicians and nurses, toward self-improvement. Both groups set up standards and offered examinations that must be passed in order for candidates to become certified as trained anesthetists. The establishment of certifying boards for phy-

sicians had its effect in the field of anesthesia as well as in other fields. Many hospitals now limit membership on their staffs to physicians who are certified by the various boards. Whether this is a good or a bad thing is not for me to say. The American Board of Anesthesiology has been active for ten years and yet fewer than 500 physicians hold its certificate. The number of candidates has increased each year, however. Physician anesthetists have adopted as a designation for themselves the term "anesthesiologist," a word by which they hope to indicate the wide scope of their activities as compared with that of anesthetists of the past who used few agents and methods and who were not necessarily grounded in medical sciences and medical practice. They have not appropriated to themselves all derivatives of the words "anaesthesia" and "logos." The anesthesiologist is expected to be able to supervise activities germane to him in the hospital, to untangle difficulties within his department, to train others, and, in general, to improve the quality of the care of the patient with regard to anesthesia and related fields.

At present as in the past one must work with what is at hand and this applies not only to agents and methods but to personnel as well. I feel that it is most desirable for a hospital to have on its staff at least one anesthesiologist. He must staff that department with interested persons who are available. Just as there are not enough nurses on duty in this country, so, as has been said, there is an insufficient supply of nurses who have done the graduate work requisite to qualification as nurse anesthetist. I am no Pollyanna but, if any elements of a silver lining can be found in that cloud, perhaps one of them is perceptible on my own service at St. Marys Hospital. There we were confronted with a greater number of surgical patients than there were persons of any kind—nurses, nurse anesthetists, physicians or physician anesthetists—to accompany postoperative patients to their rooms and to stay with them through their recovery from anesthesia. We had to work with what we had, however, and to this end, we set up, in the Department of Anesthesiology, a post-anesthesia observation room. It is a kind of ward where ten to fifteen patients who are unconscious from general anesthesia are watched over by two nurses and an orderly; moreover, a physician from the Department of Anesthesiology is in the room about thirty minutes of every hour during which the room is in use. Administrators in the hospital are strong in their praise of the "P. A. R.," as it has come to be called. Floor nurses and supervisors now consider it essential. Obviously, consolidation of effort has reduced individual and total effort. It seems to be one answer to the problem presented by reduced personnel. It seems likely, also, that the patient is safer than he was under the old system of individual care during recovery from anesthesia. Every device which conceivably might be needed in care of him is instantly at hand; no errand could call all of his guardians away from his side at one time and,

finally, a physician trained in anesthesiology can be brought to his side at any moment.

One of the newest activities of the anesthesiologist I already have mentioned; namely, performance of diagnostic and therapeutic nerve blocks for determination of pain paths. Necessity of collaboration with the roentgenologist has now become apparent and has, I am sure, firmly established the making of these blocks as part of the field of practice of the anesthesiologist. Roentgenograms, wherein are represented the needles in place, reveal startling discrepancies between the position of the point of the needle and the direction of what can be visualized of the base of the needle as it protrudes above the skin. Roentgenologist and anesthesiologist, working together in this way, can so assist in differential diagnosis that often it can be known whether a patient should be given injections of dolamin or of alcohol, whether roentgen therapy should be employed, whether a nerve, or perhaps more than one nerve, should be cut, whether cordotomy or even pre-frontal lobotomy should be performed, or whether the patient is of a type who probably will respond poorly to any treatment. The psychiatrist will find that many of his patients who are in pain can be treated, if the pain is controlled, more satisfactorily than otherwise.

THE FUTURE

From the vantage point of more than twenty-five years of practice in the field here considered, I think I foresee an increasing demand for anesthesiologists. I foresee, also, a tremendous effort to meet the demand by training physicians in the specialty, so that they can carry out the duties, which are multiplying almost daily. When an informed patient is asked, "Who would you prefer as your anesthetist?" his answer will be, "The one who can employ with greatest skill the largest number of agents and methods." That answer once given, the implication is clear that competition will exist within the group of physician anesthetists, between physician anesthetists and nurse anesthetists, and within the group of nurse anesthetists. For any foreseeable future, however, there will exist a demand for more physician anesthetists and for more nurse anesthetists than can be met. Credit will accrue, I believe, not only to the man or woman who excels in clinical work but also to the person who engages in research and thereby augments fundamental knowledge in the field or contributes new agents or methods. Also, physician and nurse instructors will deserve recognition for the contributions they will make, by example and precept, toward swelling the ranks of aspirants to expertness in the field of anesthesia and then devoting much effort toward increasing the knowledge and enhancing the aptitude of these candidates.

And finally, in order to consider an administrative problem which may grow more acute before it becomes less so, it is necessary to describe what obtains now. I am thinking of the relationship between

the hospital and its department of anesthesia. Physician anesthetists seem to prefer that patients pay them fees for their services just as surgeons are paid. Many physician anesthetists, however, and nearly all nurse anesthetists, receive salaries from the hospitals where they work. Some hospitals have profited financially more than has seemed justified, by hiring anesthetists and then charging the patient a fee for anesthesia. If the fee has been great and the anesthetist has been paid little, both patient and anesthetist appear to have been done injustice. Yet each needs a hospital, one as a place in which to be ill, the other as a place in which to work. The hospital, moreover, must buy new anesthesia equipment, keep it in repair, buy expendable supplies for the department of anesthesia, pay adequate remuneration to the departmental personnel, and provide funds for travel so that the department may keep abreast of current practice. Obviously, the department of anesthesia should contribute its share towards maintenance.

Certainly no one will advocate lowering expenses by lowering standards. We must be prepared to maintain standards and to elevate them. I expect that time, and the know-how in common enterprise that Americans display when things get sufficiently tough, will mitigate and all but eliminate what, in this period, seems to be some inevitable friction. I think I shall live to see the day when the surgical team will be well balanced from the standpoints of the team itself, of the patient and of the hospital.

(Continued from page 237)

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