

ANESTHESIA SERVICE FOR SMALL HOSPITALS *

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IN the United States and Canada there are approximately 7,000 general hospitals, containing 525,000 beds, or an average of 75 for each hospital. There is no arbitrary dividing line between small hospitals and large ones, but for purposes of our discussion today let us consider that the term "small hospital" refers to any hospital of less than 150 beds, and we shall think particularly of the many hospitals which have less than 100 beds. In every one of these general hospitals, no matter how small, anesthesia is an essential requirement, and by every standard of morality and ethics patients in a small hospital are as truly entitled to safe and efficient administration of anesthesia as those in the largest teaching institutions. To meet the needs for anesthesia in this host of small hospitals, how many qualified anesthetists are available? The current Directory of Anesthetists of the I. A. R. S. contains the names of approximately 1,900 American and Canadian physicians who devote all or part of their time to anesthesia. The A. M. A. Directory lists only 500 as specializing in anesthesiology and of these only 234 who limit their practice entirely to anesthesia. Where, then, will 7,000 hospitals find anesthetists when less than 2,000 physicians are at present available? I believe we are agreed without further discussion that the solution does not lie in turning over small hospitals to nurse anesthetists. For safe modern anesthesia one must have a medically educated anesthetist, and this is particularly true in small hospitals where help in emergencies is not always readily available. Approximately 200 young doctors are now being trained annually as anesthetists by internships and residencies in our larger hospitals, although relatively few of these will complete the full requirements for recognition by the American Board of Anesthesiology. The supply, therefore, of fully trained anesthetists at present is inadequate to meet the needs of the larger hospitals, let alone all the thousands of small hospitals, so something must be done to attract more good doctors toward Anesthesia.

When the board of any small hospital decides that a modern department of anesthesia should be established they must make the conditions favorable enough to attract an already trained anesthetist, or to induce some member of their own staff to undergo a course of study, and, al-

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though doctors are not mercenary, they must think of their livelihood, so the primary consideration is a financial one. How can hospital boards expect to secure high-class and permanent medical anesthetists with the niggardly salaries which are now being offered in many places? For too long many hospitals which have depended on nursing anesthesia have become accustomed to charging professional fees for non-professional service, and using the anesthesia department as a revenue producer to help overcome the deficits of other departments. This practice is, to say the least, unethical, and, fortunately, the principle has now been laid down by the American Hospital Association and the Council on Medical Education of the American Medical Association that "The anesthesia service of the hospital shall be maintained primarily for the benefit of the sick," and that "Hospitals and anesthetists should recognize that their primary obligation is efficient service to the patient, with the maximum economy to the patient that is consistent with quality of service. The arrangements between hospital and anesthetist and the financial arrangements with the patient should be in the spirit of these principles. Neither the hospital nor the anesthetist should exploit the patient or each other."

An anesthetist should be able to earn an income comparable to that of other specialists in his community who are equal to him in experience and training. Two or three hundred dollars a month may look like big money to a young doctor who is just starting to practice, but too many hospitals expect their anesthetists to continue indefinitely at this income level. The result is that ambitious men look around for something more lucrative after a few years. There is no hospital so small that it cannot be made worth while for one of the staff members to devote himself seriously to anesthesia provided there is, first of all, a real desire for good modern anesthesia, followed by sympathetic cooperation on the part of the hospital board and the medical staff. Whether the anesthetist's remuneration is to be on a salary or a private fee basis and whether he is to be full time or part time will depend, of course, on the size of the hospital and local conditions. It seems to be most generally satisfactory that in small hospitals the anesthetist should be on a private fee basis unless there is too much free public work to make this feasible. In this way the anesthetist receives remuneration in proportion to the amount of his time which is occupied with anesthesia, he is on the same financial basis as other staff members, and is not a hospital employee. The department of anesthesia in a hospital is not exactly comparable to that of radiology or pathology where there is a large capital investment for space and equipment and where technicians are employed, and where there is some justification for a so-called "operating profit" in order to meet interest on investment and depreciation charges. Anesthesia is purely a professional service, for which the patient pays a professional fee, and the only financial interest of the hospital is to see that it is remunerated in some way for cost of supplies

used and the upkeep of equipment. In the small hospital to which I am attached we have found it satisfactory to both patient and hospital to make separate charges on the private patient's bill for "anesthetic supplies" and "anesthetist's fee." The "supplies" charge averages about 20 per cent of the anesthetist's fee and goes directly to the hospital, as do also any anesthetic fees collected from public patients. In this way we have been able to cover the cost of all anesthetic supplies and equipment, pay the resident anesthetist's salary, and show a small balance to the credit of the department. No anesthetist expects to get rich, but they do feel that they are entitled to an income commensurate with that of their professional colleagues, whether their work is done in a large hospital or a small one.

The American Board of Anesthesiology requirement that in order to be certified one must confine his practice exclusively to anesthesia is probably a hindrance to the establishment of good anesthesia in small hospitals. A hospital with less than 1,200 anesthetics a year does not need a full time anesthetist, and many 100-bed hospitals need the part-time services of two anesthetists because so much of the surgery is done in the mornings. I believe that the American Society of Anesthetists in its "Fellowship Certificate" and the Royal Colleges of Physicians and Surgeons of England in their "Diploma of Anesthesia" take a more realistic view of the situation when they base their requirements for certification entirely on experience and knowledge, as determined by examination, and do not insist that an anesthetist confine himself exclusively to anesthesiology. However, the fact remains that in many smaller hospitals there are not enough anesthetics to keep an anesthetist reasonably busy, and in other hospitals there is more than enough work for one man full time but not enough for two. What is the anesthetist in such hospitals to do with his spare time? Oxygen and other forms of inhalation therapy, resuscitative measures and blood transfusion service seem to fall naturally into the anesthetist's sphere and in many large hospitals are so recognized. In small hospitals, besides these things the anesthetist may usefully interest himself in cardiology and electrocardiography, in basal metabolism estimations, in physiotherapy or radiology, or he may continue to spend some of his time at internal medicine and general practice. I am still old-fashioned enough to believe that an anesthetist can give better anesthetics if he examines and treats a few patients in the medical wards of the hospital or in his office, and thus keeps abreast of medical problems and progress in diseases of the heart and lungs, kidneys, blood vessels and glands. He can thus in a small hospital, by clinical observation, make up for the advantages of pharmacological and physiological laboratories possessed by anesthetists in the large teaching hospitals. Or he may, as I have foolishly chosen to do, take on some of the worries of hospital administration, and the direction and supervision of nursing education.

From the hospital standpoint, the conditions prerequisite to the establishment of an efficient department of anesthesia in even the smallest institution are, therefore, first, that there must be a cooperative attitude on the part of hospital administration and medical staff to assure the anesthetist that he will be able to earn a proper professional income; and secondly, that he will be recognized as an important member of the medical staff and not a mere lackey to take orders from the surgeons or superintendent. Provided these conditions are assured I don't believe any trained anesthetist should hesitate to accept an appointment to a small hospital for fear his professional life will be obscure and unsatisfying.

There are many advantages to be found in a small hospital. The anesthetist here may have the great satisfaction of a department where all the factors are under his own direct control and supervision, like a scientist in his own private laboratory, and where the failures due to inefficient assistants and uncontrolled equipment are at a minimum. He may, by working constantly with a small friendly group of surgeons, so improve the teamwork that actually better surgery will be done in the small hospital than is possible in a large and busy institution. It is true that anesthesia research in a small hospital must be mainly clinical, but is not this as important as any laboratory study? Most valuable clinical statistics of anesthesia can be secured in a small hospital where personal supervision and exact observation are so easy, and by extending the time element such statistics may be comparable to those of even the largest institutions. For example, eight years ago, on October 30, 1933, I gave my first cyclopropane anesthetic. Today, in the small hospital where I have done practically all my work, I administered cyclopropane for the 7,425th time. That number of cases is sufficient to allow an anesthetist to speak with the authority of experience on any particular anesthetic agent, and the value of such clinical statistics is certainly not limited by the size of the hospital from which they come.

At the risk of appearing egotistical, I thought it might be of interest to present a brief report of the Department of Anesthesia of the Homoeopathic Hospital of Montreal, a general hospital of 125 beds, as an example of the kind of work which is possible in an institution of this size. This report covers a period of two years from October 1, 1939 to September 30, 1941, and records 4,873 anesthetics or an average of 203 a month. The anesthetic staff consists of myself, who gives most but not all of my time to anesthesia, and Dr. Enid Johnson who is now in her third year as resident anesthetist. The internes on rotation service all have an opportunity to learn some anesthesia during the three months they are on the medical service.

Table 1 records the various anesthetic agents used in the different departments of our hospital work. It will be noted that cyclopropane is used in 89 per cent of our regular operating room procedures. It is not my purpose here to discuss the reasons for this preference, but I

TABLE 1
SUMMARY OF ANESTHETICS, 125 BED HOSPITAL, 2 YEARS

Agent	Operating Rooms	X-ray Dept.	Delivery Rooms	Outdoor Dept.	Wards	Total
Cyclopropane.....	2780	17	453	168	1	3419
Nitrous Oxid.....	6	2	8	7	5	28
Nitrous Oxid and Cyclopropane...	3	0	568	3	1	575
Ethylene.....	2	0	0	0	0	2
Ether.....	14	0	35	256	0	305
Chloroform.....	0	0	20	0	0	20
Chloroform and Ether.....	1	0	51	0	0	52
Ethyl-N-Propyl Ether.....	21	0	0	0	0	21
Spinal.....	75	5	0	0	0	80
Spinal and General.....	15	0	0	0	0	15
Intravenous.....	12	0	0	0	0	12
Local.....	186	0	1	110	0	297
Others: Ethyl Chloride, Cyprome Ether, etc.....	9	0	0	34	4	47
Total.....	3124	24	1136	578	11	4873

will say that we are continuing to use it because of the very general satisfaction it has given to both surgeons and to patients. With us, cyclopropane anesthesia is never complicated by the addition of ether, and we believe that this is one of the reasons for our continued success with this agent in all types of operations.

Table 2 tabulates the methods of administration of cyclopropane anesthetics. I would like to call attention to the value of the "Leech

TABLE 2
CYCLOPROPANE ANESTHETICS, METHODS

Mask.....	2739
Leech Gasway.....	285
Endotracheal.....	970
Avertin in combination.....	442

Pharyngeal Bulb Gasway" as an exceedingly useful piece of equipment in cases where it is difficult to secure a good fit with the face mask. We use Avertin always as a hypnotic rather than an anesthetic, and it is always followed by some other anesthetic agent, usually cyclopropane. We use it for good risk patients, generally in lower abdominal operations, principally because the patients like it so much. We are now avoiding it in poor risk patients, in the aged and obese, and in upper abdominal and tonsil operations. In all such cases we prefer to stick to controllable cyclopropane alone.

Table 3 shows the number and types of operations done under endotracheal anesthesia in the various age groups. I believe that the secret of uniformly successful endotracheal anesthesia lies in the use of the method with sufficient frequency for the anesthetists to become experts.

TABLE 3
ENDOTRACHEAL ANESTHETICS, 2-YEAR PERIOD

Age Periods	Tonsil Operations	Other Head and Neck	Upper Abdomen	Lower Abdomen	Other Operations	Total
Up to 5 years.....	52	4	0	0	2	58
6 to 14 years.....	228	14	2	0	3	247
15 to 40 years.....	283	85	16	18	21	423
41 to 60 years.....	61	54	34	27	14	190
Over 60 years.....	1	14	12	16	9	52
Total.....	625	171	64	61	49	970

This is one reason why I am glad that our surgeons prefer endotracheal anesthesia for all the tonsil operations, even in small children.

Table 4 is a classification of upper abdominal operations under cyclopropane according to the method of administration. We believe that

TABLE 4
UPPER ABDOMINAL OPERATIONS WITH CYCLOPROPANE, 115

	Mask	Endotracheal	Leech Gasway
Gall Bladder.....	11	37	17
Stomach.....	0	19	2
Exploratory Laparotomy.....	16	3	10

we can obtain adequate relaxation for most upper abdominal operations with cyclopropane alone and that the advantages of this agent over spinal or ether have been demonstrated in our postoperative results. Our attitude toward the use of an endotracheal tube for abdominal surgery is that an adequate and unobstructed airway must be obtained at all costs. If the patient breathes quietly and smoothly with the face mask and ordinary airway, we use that method. If the mask will not fit properly, we use the "Leech" gasway. If this method is not satisfactory, we then introduce an endotracheal tube, using an inflatable cuff or a "Guedel" sponge rubber plug to obtain a completely closed circuit. It would probably be easier to intubate every patient routinely, but there is almost always some slight postoperative irritation of the trachea after intubation and we do not feel justified in subjecting the patient to this discomfort unless there is a real reason for doing so.

SUMMARY

We believe that it is possible to have as good anesthesia in small hospitals as in large ones, and an appointment in a small hospital may offer just as satisfying life work to a good anesthetist as any of the large teaching institutions, provided that the hospital will live up to the conditions which are considered as essential for a successful de-

partment. I have purposely not said much about the anesthesia equipment necessary in a small hospital. The gas machines and other apparatus required for a small hospital are no different from those needed in a large one, and the amount of equipment is to be governed entirely by the number of operating rooms; but equipment alone does not create an anesthesia department in a small hospital any more than in a large one. In too many hospitals the authorities have purchased a gas machine and a few of the other anesthetic supplies and have then announced that they have a "Department of Anesthesia." It is the anesthetist who uses these inanimate pieces of equipment and drugs who really creates a department of anesthesia; and on his interest, ability, and skill, plus the cooperation of the rest of the staff, will depend the success of that department in any hospital, large or small.

For the information of anesthesiologists who are contemplating examination for fellowship in the American Society of Anesthetists, Inc. or who are training physicians for the specialty, the following questions have been employed in the past in *Physics and Chemistry*:

1. Outline methods of minimizing explosions of anesthetic mixtures for static sparks in an operating room.
2. Are the following statements true or false? (a) Nitrous-oxide-oxygen-ether mixture is nonflammable; (b) Cyclopropane is lighter than air; (c) Chloroform is nonflammable; (d) Subcutaneous oxygen is not rapidly absorbed; (e) Adequate humidity prevents static explosions; (f) Commercial oxygen is safe for therapeutic use.
3. Compare the "circle" type and the "to and fro" type carbon dioxide absorbing units with relation to temperature, resistance and dead space.
4. (A) What is the chemical formula for (1) helium, (2) nitrous oxide, (3) ethylene, (4) cyclopropane, (5) divinyl ether, (6) alcohol? (B) What percentage of helium is employed in helium-oxygen mixture for therapeutic use?
5. (a) What is the vehicle other than water for tribromethanol when used in anesthesia? (b) What are the physical properties of this vehicle?
6. What is the chemical composition of (a) soda lime; (b) Baralyme?