The management of an anesthesia department entails much more than merely seeing to it that an anesthetist is available to give an anesthetic when an operation is to be performed. To the head of the anesthesia department is assigned the responsibility of making sure that all phases of the work of the department are properly correlated and that the department functions smoothly as a unit of service in the hospital.

In order to manage a department efficiently, the chief anesthetist must know exactly what is expected of her and her staff; to whom she is responsible; and the amount of authority delegated to her. Hospitals vary in their approach to this problem, largely because hospitals differ in the type and amount of service they are organized to give to the public.

We shall first discuss the paths of authority found in some institutions:

A. The chief anesthetist (as shown by Graph No. 1) is directly responsible to the chief surgeon in regard to all professional problems; and to the hospital administration for decisions relative to purchases, salaries of anesthetists, et cetera.

B. The chief anesthetist, as shown by Graph No. 2, is directly responsible to the medical anesthetist, who, in turn, is responsible to the chief surgeon in regard to professional problems and to the hospital administration for all decisions relative to purchase of supplies and equipment, staff salaries, et cetera.

Read at the October, 1945, Institute for Instructors of Anesthesiology, Chicago, sponsored by the American Association of Nurse Anesthetists.
C. As shown by Graph No. 3, the chief anesthetist is directly under the medical director, who is responsible to the administration for all activities of the anesthesia department.

(Hospital administration)
  ↓
(Medical Director)
  ↓
(Chief Anesthetist)

(Graph No. 3)

It is not our purpose to condemn any one of the above arrangements, or to say that one of these arrangements is far superior to the others. The only comment I would like to make in this connection is that any of the above arrangements is a protection to the nurse anesthetist because, obviously, as nurses, we must have a doctor responsible for the professional activities of the department. The doctor need not necessarily be a medical anesthetist. Occasionally, we find in the more loosely organized department that the nurse anesthetist is directly responsible to the superintendent of nurses. This arrangement is not satisfactory because, obviously, the superintendent of nurses knows little about the work, is not particularly interested in it, and consequently, is not in a position to make decisions in this specialized field.

We occasionally find, particularly in the hospital employing only two or three anesthetists, that there is no delegated head of the department; in other words, each of the anesthetists has the same standing and, as a result, each is directly under the superintendent of the hospital. I do not believe that this is a good arrangement; regardless of the number of anesthetists employed (unless, of course, there is only one), one of the nurse anesthetists should be primarily responsible for the smooth running of the department.

What are the responsibilities of the chief anesthetist?

1. The chief anesthetist should have a voice in the selection of personnel and an opportunity to check the qualifications of applicants. She should know the prevailing rate of salaries and make recommendations in regard to adjustment of salaries of staff members.
2. Daily assignment of duties and of cases, including twenty-four-hour anesthesia service to the institution.
3. Exercise of constant care to minimize explosion hazards.
4. Supervision of the keeping of anesthesia records—a very important part of the chief anesthetist's responsibilities.
5. Upkeep of equipment and purchase of supplies.
6. Oxygen therapy.
7. Furtherance of education of anesthesia personnel.

1. Appointment of personnel: The chief anesthetist should investigate thoroughly the qualifications of any applicant for a position as anesthetist on her staff. She should obtain the following information in regard to the applicant:

   Age
   Religion
   Marital status and family responsibilities
   Health
   Character and attitude
   Background of education
   Experience since graduation
   Letters of reference from former employers should be obtained before the indi-
individual's application is passed upon.

The chief anesthetist should have a voice in the appointment of new personnel because she is in a position to know the type of person who will work agreeably with the other anesthetists. Her first interest, however, should be to make certain that the applicant is qualified to give the type and quality of anesthesia service required in that institution.

The number of anesthetists employed in any hospital will logically depend upon (1) the number of operations that can be performed at any one time during the scheduled operating hours of the day; (2) the average number of emergency operations performed after regular operating hours; and (3) the demands from the obstetrical service.

The question of salaries is just now somewhat in a state of uncertainty. During the war, many hard-pressed institutions have been offering unprecedentedly high salaries in a desperate effort to attract much-needed anesthetists. This has, of course, created dissatisfaction in other institutions and unsettled the minds of a number of anesthetists. In the postwar period, it will undoubtedly be necessary for anesthetists taking new positions to accept lower salaries than have been offered during the war years, but it will be some time before the situation resolves itself. The return of many anesthetists from Army and Navy service will be a definite factor in the relation of supply and demand and may further accentuate the progressive drop in the prevailing rate of salaries for anesthetists, as well as for other hospital personnel. The fact remains that the services of a competent and reliable anesthetist will continue to be highly appreciated by both hospital and surgeon and her concern need be only to continue to give a high quality of anesthesia service.

2. Assignment of duties and daily assignment of cases: If anesthesia service is to be available throughout the twenty-four hours of the day in an institution, the anesthetists' time on duty must be arranged in eight-hour shifts, or according to a rotating “on call” schedule. In my opinion, an eight-hour shift is not practical, except on a very active obstetrical service, where it is advisable to have one anesthetist available at all times for emergencies. In such active departments, supplementary service will be necessary occasionally; this can be arranged for by the rotating “on call” anesthetist from the general surgical division.

The anesthetist should be allowed to remain on one service sufficiently long to become thoroughly familiar with the problems of anesthesia and needs of the surgeons on that service, but should not be left in one department indefinitely, so that her field of interest and experience in administering anesthetics is narrowed. If the individuals in a department are allowed to devote themselves too exclusively to one special field, a definite problem may be created during times of vacation or illness. The organization of the anesthesia service should be flexible enough to take care of all such emergencies; this flexibility can be developed only by long-range planning in the assignment of cases.

After careful study of the needs of the combined anesthesia services, an arrangement should be made so that the anesthetists will not be obliged to give anesthetics continuously for hours, without interruption or a period of rest. Sitting in one position for a long period produces extreme muscular discomfort;
the taking of blood pressure every few minutes makes the ears sore; after a few hours, the finger tips tend to become less sensitive to the feel of the pulse; and the anesthetist may suffer great physical and mental exhaustion.

An anesthetist who has been in the surgery the greater part of the night, or whose rest has been broken repeatedly, is not physically or mentally capable of giving anesthetics the following morning. She is entitled to one and one-half days a week for relaxation and she should not be expected to spend that time recuperating from long hours of night work. I am frankly opposed to "counting hours" because of the nature of the work, but the demands on the anesthetist's time should be studied carefully in each institution and arrangements for twenty-four-hour coverage should be based on a definite knowledge of the requirements for service.

Maintenance of efficient and uninterrupted anesthesia service entails careful watch in regard to conditions which might impair the health of staff members. Unless the anesthetist is required to spend unusually long hours administering ether, she is subjected to no danger of inhaling large quantities of noxious vapors and gases. The nervous tension under which she works is probably the most important consideration in regard to the health problem. If the anesthetist shows signs of unusual fatigue or nervous irritability, a few days off duty taken early may save her from a serious breakdown. Most anesthetists are able to stand the emotional and nervous strain, day after day, without interruption other than the regular vacation period, but circumstances may arise in the operating room that profoundly affect the mental stability of the individual. Such occasions demand sympathy and understanding on the part of the supervising executive.

Because of night calls, most anesthetists are forced to live in the hospital and often do not obtain sufficient outdoor exercise and relaxation. For their protection an annual physical examination, including an x-ray of the chest, should be compulsory.

The anesthetist with an acute upper respiratory infection should not be allowed to report for duty, both to safeguard her own health and to protect the patient from an exposure which would increase the potential hazard of postoperative pneumonia.

3. Explosion Hazards: Constant vigilance on the part of the entire anesthesia staff should be maintained and a definite code of regulations rigidly adhered to, in order to prevent explosions in the operating room. Every anesthetist today handles explosive mixtures of anesthetics, and, aside from the insidious static spark which may develop in the operating room, there is added danger from electrical apparatus. Surgeons are not electrical engineers and sometimes are forgetful of this hazard. The mere fact that an explosion has never occurred in a certain hospital is no reason to believe that the danger is less real.

In 1930, the University Hospitals of Cleveland, realizing that the advice of an electrical engineer was necessary to the solution of this problem, employed a professor from Case School of Applied Science to make an exhaustive study under actual conditions in the operating room. This work was later followed up by Victor Phillips, consulting engineer of the hospital, who developed and proposed a "Code of Safeguards" against the explosion hazard from anesthetics. This was published in The
Modern Hospital, May, 1936. Later, as a result of this study, routine rules and regulations were adopted by the chief surgeon, the hospital administration, and Mr. Phillips. A set of these rules is posted in each operating-room corridor. The anesthetist is responsible for seeing that the rules are carried out and, if any questions arise, they are immediately referred to Mr. Phillips and the administration.

The members of the surgical staff have cooperated well because they realize that the subject has been studied by those who are familiar with the problems involved and also that such routine procedures have been instituted for their own protection and the protection of their patients.

The hospital administrator, in fulfillment of his responsibilities, should make certain that the operating-room personnel is aware of potential dangers and that no routine procedures exist violating fundamental principles of safety. Any rules and regulations which do not have the support of the administration are worthless and any institution which does not have adequate rules and regulations is not fulfilling its obligations to the public and to the members of its working staff.

4. Anesthesia records: A graphic chart should be provided for the anesthetist to be used for each anesthesia given. This chart should be incorporated as part of the patient's permanent hospital record, with space for the surgeon to enumerate the factors increasing operative risk. As corroborative evidence, this chart should contain a statement as to whether or not the general clinical and laboratory examinations have been made. The anesthetist should know the physician's findings and the condition of the patient before she begins to administer an anesthetic drug. The pulse, respiration, and blood pressure should be taken and recorded every five minutes; to an experienced anesthetist, this information yields a graphic picture of the patient's condition during anesthesia.

The anesthetist should also make postoperative observations. Space should be provided on the back of the chart for a record of the results of her follow-up investigation. A check on postoperative complications is of particular interest and the anesthetist's visits to the patient following operation furnish data in this regard.

In regard to any records kept by the anesthesia department, the question should be asked: "Can detailed information be obtained from other sources aside from this record?" The record room and the statistical department are the logical places for the compiling and filing of detailed information.

We have found it unnecessary to keep detailed information in regard to individual operations in the department of anesthesia because, if full and accurate information is desired, reference must be made to the original chart of the patient. As far as other records in the department are concerned, there should be a daily record of all anesthetics administered—the type of anesthetic, the duration of the anesthesia, and the name of the anesthetist. At the University Hospitals of Cleveland, a daily record is submitted to the accounting and statistical departments and a duplicate copy is kept in the operating room.

Information for the monthly report of the department of anesthesia is obtained from figures compiled from these daily reports to the statistical department. This has proved a satisfactory
arrangement and saves time for the director in the compilation of the report. The statistical department must have this information and work is duplicated if the anesthetist keeps an additional record of each case.

It is also necessary for the department of anesthesia to submit an annual report to the administration of the hospital covering all essential facts which will furnish a complete picture, year by year, of the progress of the department. This should include the total number of cases, total hours of anesthesia and analgesia, and, of course, a breakdown of the cost of the various drugs. One of the most important points is an analysis of the proportion of cases in which the various drugs are used.

The annual report also contains a record of the activity of the members of the staff in state and national organizations, meetings attended, offices held, and papers read.

A report of deaths on the operating table, regardless of causes, should be included. If a death occurs in the operating room, a report should be sent immediately to the administrator and the chief surgeon, and at the end of the year, these facts should be included in the annual report. It is desirable to have a complete record of the deaths attributable to anesthesia, or those recorded as of unknown cause, as well as any others which may have occurred in the operating room not definitely attributable to the administration of an anesthetic. These reports are essential for at least three reasons: (1) They insure a thorough investigation of the circumstances at a time when the details are fresh in the minds of those concerned. (2) The facts in regard to the case will be available in written form for future reference should there be trouble or litigation against the hospital. (3) In the preparation of such reports, an impartial review of all circumstances is made and, possibly, in this process, methods of avoiding recurrences of similar misfortunes may be suggested.

5. Equipment and Supplies: The fundamental principles of all gas machines for anesthesia are the same. Consequently, the equipment in all, except teaching hospitals, may be standardized. At the University Hospitals in Cleveland, all the more popular makes of gas machines are available because of the training school for anesthetists, but the equipment has been standardized on various floors insofar as possible. Standardization decreases the investment in accessory equipment.

For years, there was no particular reason for purchasing new gas machines because no outstanding improvements facilitating the administration of anesthetics had been added. When the circle respirator containing a soda lime canister was introduced, however, the older equipment became obsolete, for this could not be attached to the machines then in use. This feature made the purchase of new gas machines a necessity, because it offered the following advantages: (1) greater control of respiration during anesthesia; (2) elimination of the collection of explosive mixtures in the operating room surrounding the table (thus contributing to the reduction of explosion hazards); and (3) decrease of the rate of hourly consumption of gas, made possible by the complete rebreathing system. The best argument for the use of the new equipment is the elimination of the gases and vapors from the operating room. One explosion might cost the hospital many times the price of modern equipment.
A large hospital may have an investment of several thousands of dollars in anesthesia equipment, which must be kept in perfect working condition at all times. The cost of one gas machine ranges from $300 to $700 and the parts are correspondingly expensive. Responsibility for the maintenance of such equipment is one of the important duties of the chief anesthetist, with emphasis on the points of technic which prevent undue wear and tear on the machines. It is important, therefore, that anesthetists who are entrusted with this expensive apparatus should appreciate its full value in dollars and cents and should be made conscious of the cost of upkeep and repairs, in order to increase the efficiency of the whole department. Every hospital has at least one good mechanic in the maintenance department and the institution will save money if he familiarizes himself with the machines used for anesthesia, so that he can make minor repairs and replacements. The machines should be tested daily for leaks and all equipment must be kept scrupulously clean.

The anesthesia department should have a suitable place for storage of cylinders of gases delivered to the hospital, no matter what department is to use it, and the gases should also be requisitioned and supplied from this central source. If one department is responsible for the entire supply, a more careful check of the return of cylinders will be made and rental charges for cylinders can be eliminated, thus effecting a considerable saving for the hospital. Several years ago, each department in the University Hospitals was ordering its own supply and when the central supply room was established, it was discovered that empty cylinders had been left in some of the laboratories for several years. Since small quantities had been used, no new supply was needed and return of the cylinders was neglected. The hospital had been charged for the rental of these cylinders and costs had accumulated until they equaled, or even exceeded, the price of the cylinder.

A record of supplies purchased and their cost should be available, not only to the chief anesthetist, but to everyone in the department. In our department, an indexed card file is kept in which every article, date of purchase, date of delivery, and its price is recorded. One anesthetist is responsible for maintenance of the equipment and replenishment of supplies. At weekly meetings, any possible saving to the department is discussed and any facts pertinent to effecting an economy in supplies and equipment are emphasized. For example, such points of technic are discussed as the fact that the weight of the two or four ounces of water remaining in a breathing bag will cause leaks to develop in the bottom of the bag if left on the machine. Therefore, the bag is removed from the machine and placed on the anesthesia table when the apparatus is not in use.

All rubber parts should be replaced when leaks develop because the expense incurred through loss of expensive gases greatly exceeds the cost of replacing these parts, and further, explosive mixtures are freed in the operating room. If patching of rubber supplies is necessary it should be done properly; adhesive tape is not only unsightly, but suggests carelessness and inattention to essential details.

An exact record should be kept of the quantity of gases consumed each month and of the total number of hours of gas anesthesia in order that the hourly consumption may be computed. A record also should be made of the

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quantity of ether used each month and the total number of instances in which it is administered. In one year, the cost of drugs in the University Hospitals was 10.91 per cent of the total cost of salaries and upkeep of equipment. To illustrate the value of a careful study of drug costs, it is interesting to note that, since 1933, the hourly consumption of nitrous oxide has been reduced 51 per cent. In 1944, in the surgical division, the average consumption of nitrous oxide per hour of anesthesia was sixteen gallons.

If the anesthetist makes a study of costs and realizes that the record of her department will be compared with that of others, she will think twice before she soaks a sponge with ether for the surgeon to use in removing adhesive tape, an act she should never be guilty of, in any event, from the standpoint of explosion hazard. She will also be much more alert in watching for leaks around the face mask, because these mean a loss of gas which will be revealed by the increased average consumption of gas. An anesthetist’s technical skill and her knowledge of the physiologic requirements to produce and maintain anesthesia can be judged from the hourly consumption of gas. This also furnishes a criterion as to the safety of the operating room from explosion hazards. If the hourly consumption is beyond physiologic requirements, it means that the atmosphere of the operating room is saturated with gases and vapors while anesthetics are being administered.

6. Oxygen Therapy: Oxygen therapy service in all institutions has become extremely important and there is a great question as to whether the department of anesthesia should be responsible for it. In the smaller institution, it may be possible for the anesthetist to take charge of the oxygen therapy service, but in the larger institutions, anesthetists are too busy and the service is too heavy to be controlled properly by this department. One individual in the institution, preferably a physician, should take charge of this service as a definite responsibility; otherwise, the oxygen therapy service will be poorly managed and gas will be wasted.

In the University Hospitals, 1744 cylinders of oxygen were used in 1944 by the medical service. It can readily be seen that it would be utterly impossible for the department of anesthesia to take care of this service efficiently without increasing the anesthesia personnel. Therefore, an assistant to the director of medicine has charge of oxygen therapy; he in turn, appoints a resident whose job it is to see that the tents are properly set up and in working condition, that the soda lime is changed, and that the oxygen in the tent is tested. Thus, someone who knows the service is available at all times when oxygen is needed.

Oxygen cylinders for the medical service are set up in the gas room with a gauge attached and the cylinder is well anchored to a cart. This eliminates careless handling of gauges and cylinders by orderlies. The gauges are expensive and if dropped are costly to repair. When oxygen cylinders are on the cart, there is no danger that they will be dropped in transportation.

The expansion of oxygen therapy presents a definite possibility of great waste. Although one cylinder of oxygen is comparatively inexpensive, the total loss in a month may be considerable. To show that waste is not merely a theoretical consideration but an actuality, some facts from our own experience are pertinent. During the heavy season of oxygen therapy, cylinders are
returned to the gas room anywhere from 10 to 50 per cent filled. We occasionally send back to the medical service cylinders returned to the gas room with large quantities remaining in them. But, since we pipe oxygen and nitrous oxide to the main operating rooms from the gas room, any cylinder that is less than 20 per cent full is attached to the compression tank in the basement and used on the surgical service. As a result of this practice, oxygen used on the surgical service has been supplied by the oxygen returned from the medical service. If it were not possible to use the oxygen in this manner, the physician in charge of the oxygen service would, of course, insist that the cylinders be completely emptied. In an institution in which no one person is responsible for the oxygen service, there is reason to believe that a great quantity of gas already paid for, which could have been used in the hospital, would be returned to the commercial companies.

7. Development of efficiency: One of the most important duties of the chief anesthetist is to encourage the members of her staff to review and continually carry on their study of the properties and effects of anesthetic agents and other drugs used in connection with anesthesia, and to keep abreast of the latest developments in regard to new drugs and methods in the field. Regular meetings of the staff should be held and each member assigned certain current journals to review and present to the group abstracts of published articles of value.

Anesthetists should also be urged to take part in the activities of the state and national anesthetists' organizations by accepting appointments to serve on committees or as officers. The chief anesthetist should make every effort to see that as many members of her staff as possible are allowed to attend association meetings. At least one anesthetist in the department should attend the state and national conventions each year and time for such attendance should be allowed to her without loss of salary. Many institutions have adopted the policy of defraying part or all of the expense involved.

Opportunities should be pointed out to the anesthetists for study and research covering special phases of the work of anesthesia, which may be incorporated in a paper for submission to the Publishing Committee of the American Association of Nurse Anesthetists. The ability to write acceptable and instructive scientific papers can be developed only by constant practice, combined with study of standard books on the preparation of such articles. The anesthetist, in the process of developing her ability to transmit to others the results of her experience, will enrich her own life and make an invaluable contribution to her special group.

In conclusion: *What does the chief anesthetist expect from her staff?*

1. Promptness in reporting for duties assigned.
2. Loyalty and cheerful cooperation.
3. An alert and progressive spirit, always endeavoring to improve the quality of their work and to better the service of the department to the institution.
4. That each member of the staff continue her study in the field of anesthesiology and keep abreast individually of the advances in drugs and methods.
5. That each staff member take an active interest in the program and objectives of the state and national anesthetists' organizations.

*What do the members of the staff of*
the department of anesthesia expect of the Chief Anesthetist?

1. Definite assignment of duties, equitably distributed as far as possible as to amount and time consumed.
2. Salaries at a level prevailing in the section of the country in which the hospital exists.
3. Helpful and constructive advice in regard to all problems arising in their work.
4. Information in regard to new drugs and methods and instruction in their use, if approved for the institution.
5. Opportunity to attend anesthetists’ meetings as often as possible.

* * *

Dr. Malcolm T. MacEachern speaking at the October Institute for Instructors of Anesthesiology:

"I'd like to introduce to you a guest I brought over here with me, Captain Rhodes of Sidney, Australia. Beyond being a single man, girls, he has had a wonderful career. Captain Rhodes has, just within the last few weeks, been released from four years in a German prison. Before the war he was Director of the Sidney Hospital in Australia, the City Hospital there. Sidney is a city of about a million and a half, a grand city, and when I was over there in 1925 and '26, I spent a great deal of time in his hospital. I suppose he was just a baby then, but he has grown up now.

"He was the director of this big 500-bed hospital when he went into the Service. He was caught by the Germans in Greece while attending to their wounded. During those four years he has been shunted from prison to prison and I think he has been in twelve. He finally got to Nurnberg and was relieved by our own boys, the American boys, so he is very grateful to our American soldiers.

"He had many thrilling experiences and many close escapes. He told me last night the most interesting story I have ever heard about his work. He was one of the fellows who cooperated well. He showed the Germans his ability by what he tried to do as his duty and so they let him have the full responsibility of these camps as a medical officer under their jurisdiction but gave him free liberty in the way of doing the work. They were glad to have some doctor take care of the Russians, the English, the Americans and other soldiers because they were so limited in doctors.

"So in that time he and another fellow or two handled all the work. I think about twelve to fifteen thousand casualties passed through his hands in those various prisons. It was nothing for him to get orders to walk two hundred miles through snow and take everybody with him to keep away from the advancing Russians and I know on one occasion with five hundred patients, three hundred and fifty could take the march and one hundred and fifty had to be left behind in their beds by the orders of the Germans. I doubt if they had any medical care and probably they all died. They couldn't go on the march. He pleaded with the Germans to let him stay behind with the wounded, the one hundred and fifty that couldn't go on this march, but they would not let him do so.

"I told him last night that I wished somebody would write a book on his career, but he is like all these Australians—extremely modest. You have to pull everything out of him because he will not let on the many things that he did. He should have all the honors in the world for all he has done and come through. He has not been home for five years. He is on his way home."

* * *

"The teachers and staff nurses, as well as the anesthetists, in our hospital read THE JOURNAL of our Association and label it, 'The best professional journal they have read.'"—S.M.D. Sacred Heart Hospital, Yankton, South Dakota.