

tenance of detention hospitals for women will be necessary for a considerable time to come. Detention hospitals not adequately equipped and provided with proper facilities to accomplish the work at hand are worse than none. Jails when used for hospital purposes are an abomination, and serve only further to degrade and debase the poor unfortunates who come within their confines.

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SAFETY FACTORS IN THE TEAM WORK OF OPERATOR AND ANESTHETIST.*

BY

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"THERE is nothing new under the sun" is an old and true adage. While new things may arise, there are often new applications for old things. I beg leave to ask your indulgence if the thoughts expressed in this paper are not entirely new. The purpose is chiefly to emphasize and lay special stress on ideas and facts already known, but not sufficiently heeded by all who should notice them. A mere perusal of the title of this paper suggests the presence of danger. How fortunate that we should live in an age that makes use of the slogan "Safety First!" The railroads have their "Stop, Look, and Listen" signs. We have received the admonition or noticed the sign of "Watch your Step;" the streets of the cities have their traffic officers or signs "Keep to the Right;" shops have been compelled by law to safeguard all machinery. In short, in civil life it has become not alone a necessity, but a habit to safeguard life where there is any possible danger. Have we, as members of the medical profession, taken all the precautions we should have taken? To this we may answer "Yes" or "No." Inasmuch as this paper deals only with operator and anesthetist, the remarks will apply only to them. Surgery, properly considered, is a therapeutic procedure. There is always an element of danger in connection with it, even though a general anesthetic is not administered. The dangers attending surgery and anesthesia have, in great part, been recognized. Much has been done to overcome and prevent them, and investigations

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are continued to prevent and minimize those dangers which have not yet been conquered. We are all proud to note the safety signs which have thus far been erected to guide surgeon and anesthetist, in order that the surgical patient may have a safe journey to relief and eventual cure.

To those who have given thought to the matter of safety, there always arises the short-sightedness of our medical colleges in not properly training the medical student in these branches. We appreciate that an anesthetic is administered to allay pain and overcome muscular contractions. The fundamental teaching of this art, as Flagg calls it, must come from the medical school. Dr. Isabel Herb, in her paper, "The Anesthetist in the Hospital Staff," says: "The slogan to be adopted, the safety device to prevent anesthetic deaths, is education." Dr. W. D. Gatch, in his paper, "Anesthesia in Curriculum and Clinic," very forcibly portrays the defects in teaching. He suggests a co-relation of the subjects so that there is a very forceful application of the subject of anesthesia in conjunction with physiology, pharmacology, internal medicine, and operative surgery. As Gatch further says: "Where would the advances in surgery be if it were not for the advances in anesthesia?"

The surgeon requires education just as much as the anesthetist. The real surgeon seeks intensive training under an able leader before he branches out for himself. The question is not only how well an operation may be performed, but, also, how much good will come from the operation. The proper training of both operator and anesthetist, and the working together of both will terminate in good team work and better surgical results.

One can state with perfect safety that team work in surgery has decided advantages. It is, indeed, no longer an experiment, but rather a well-established fact. Encouragement is given the anesthetist, who, being recognized as a full-fledged specialist, takes his place in the surgical team, not alone as the one who administers the anesthetic, but as a consultant. His help weighs in the balance the advisability of operating and the selection of the safest time to operate, and it is he who makes the choice of the anesthetic. He helps prepare the patient for operation. To do all this, the anesthetist must be a trained physician.

The object of a trained surgical team is not alone to prevent death, but to overcome and minimize the discomforts attending surgical operations. This manner of work has brought about specialization in anesthesia, and, in turn, encourages further study toward new and hidden paths that would otherwise remain unknown.

We cannot, to-day, overlook the fact that meetings of this kind, where two or more special branches of medicine come together in joint session, must bring benefit to all concerned. They should be encouraged, because in such joint sessions the shortcomings of all may be brought out and remedies suggested. This will exemplify the old saying: "Always speak well of yourself; the other fellow will take care of your faults."

As has been stated before, the duty of the anesthetist is not merely to administer the anesthetic, but to help prepare the patient for the operation. When should he begin, and what preparation is needed? If possible, the anesthetist should begin his work when the surgeon has decided that an operation is needed. It is advisable to have the patient in the hospital at least forty-eight hours before the operation. Some cases may require several days, others a number of weeks, for proper preparation. A full physical examination of the patient is advisable. In connection with this there should be a quantitative and qualitative examination of the urine. When possible, a functional test should be made. The examination of acetone before operation is too often neglected. It should be a routine practice. A complete blood examination, including the clotting time, should be made. While it is perhaps rare to find delayed clotting of the blood, we may save ourselves considerable anxiety if this test is made before the operation. The works of McKesson, Miller, and others on "Blood Pressure" show the great importance of this valuable, but too-often-neglected examination. The work of Polak on "Blood Pressure and Phthalein Output" shows very conclusively a *safety first* sign, if properly heeded. All these examinations are mentioned, not for the purpose of creating a mountainous obstacle to surgery, but merely to indicate some of the *safety signs* that, when heeded, will spell success to the surgeon and gain the best end-results for the patient.

At this point, let me speak a word in favor of the great work done in the clinical laboratory. Too little use is made of this in our pre-operative preparation of the patient. One of the most trying and obstinate discomforts encountered at times is acidosis. The laboratory will be of great help to us in this condition and proper diet and medication will overcome or mitigate this condition to such an extent that surgery may be undertaken with perfect safety. The laboratory work in diabetic cases is of inestimable value.

Argument is often raised against this preliminary stay in the hospital on the basis that, owing to the great nervousness of the patient, it would cause an unfavorable reaction. This fact is true,

if no explanation is given the patient why this extra time is needed. Too much thinking is too often done for the patient, and not enough by the patient. Outside of the great good that accrues to the patient by these examinations, there are other benefits to be derived from them; viz., becoming accustomed to the hospital, and forming an agreeable acquaintance with the nurse who is to have charge of the case.

Especially in genitourinary surgery does this preoperative care and preparation of the patient show up to the best advantage. Without this preoperative care, some patients were formerly doomed to die without operation; with it, they are now rendered fit subjects for surgery, obtain relief, and, not infrequently, are cured. At any rate, comfort is given to patients who formerly were destined to untold suffering. Another great advance in preoperative preparation is the care given the gastrointestinal tract. The surgical patient is no longer starved and purged. How true the comparison of the surgical patient to the athlete who prepares himself for a race! Let common sense prevail. The better the physical condition of the patient at the time of operation, the shorter and more uneventful will be the convalescence. Giving the patient the usual diet the day before the operation, supplemented, as suggested by Flagg, with one-half pound of chocolate, or some other form of glucose, will help to neutralize the acidosis produced by the anesthetic. Purging or active catharsis is not only useless, but is one of the great causes of postoperative gas pains and distention of the bowels. Our emergency cases, where preparation is impossible, seldom suffer gas pains. The patient should have ample rest before the operation. If necessary, some sedative, like bromide, chlorotone, or veronal, should be given the night before the operation to secure a good night's sleep.

Shall we administer preoperative medication? While there is a great deal of argument against it, I believe there is much to be said in favor of it. For a long time it has been my rule to use preliminary medication in the majority of cases. When I use it, I give morphine $\frac{1}{8}$ grain, or pantopon $\frac{1}{8}$ grain, with atropine $\frac{1}{150}$ grain in ether cases, and hyoscine $\frac{1}{150}$ grain, in gas-oxygen cases. While occasionally I have seen a slowing of the respiration, due to the morphine, I have never regretted its use in a single instance. The value of the administration of morphine or pantopon, both before and after operation, is too little appreciated. There may be a marked disadvantage with inexperienced anesthetists when this preoperative medication is used; but with the

experienced anesthetist, who relies on no one sign or symptom to indicate the condition of the patient, there can be no disadvantage. If there is an idiosyncrasy, or known contraindication, no preliminary narcotic medication is used. The length and type of the operation are also influenced by preoperative treatment. Of late, my choice has been to employ the medication sublingually, rather than hypodermatically. The action of the medicine is fully as good, and the psychic effect on the patient is very marked and in favor of the patient.

The next thought after proper preparation of the patient and fixing the time for operation, will be the choice of the anesthetic. It is really surprising to read and hear the differences of opinion as to the best anesthetic. Statistics are of no assistance to us. It seems that certain sections of the country have fads and fancies in the choice of anesthetics. It is true that all anesthetic agents are poisons; it is also true that only experienced physicians should administer anesthetics. We know that ether anesthesia is the safest with the inexperienced. The experienced anesthetist adds safety to nitrous oxide and oxygen. The latter anesthetic is the most pleasant and has the least postoperative effects. Those who use gas oxygen to any extent agree that there are practically no contraindications to its use. A short time ago, I read a paper in which the chief contraindication to gas oxygen was shown to be the surgeon. That still holds true when the surgeon is not accustomed to work with gas oxygen anesthesia. The surgeon who has been in the habit of working with the patient under deep ether anesthesia must first be taught to operate with the aid of gas oxygen to recognize its real value. It means a re-education of the surgeon. Once accustomed to the use of gas oxygen, he will work with as much ease and comfort as he ever did with ether. The appealing factor in this change is the patient. One always hears how pleasant it is to go under the influence of gas oxygen, and how pleasant is the awakening. The surgeon is surprised at the good condition of the patient, even after a long operation. It is conceded that there is not the amount of muscular relaxation with gas oxygen as there is with ether. In a certain class of cases only a small amount of ether may be necessary to produce the desired amount of relaxation. The success lies in the team work between operator and anesthetist. The greatest objections of gas oxygen anesthesia are made in abdominal surgery, because of lack of muscular relaxation. In great part this will be overcome if the operator will make a sufficiently large incision to begin with, so that he can make all necessary

examinations without the use of great force in inserting his hand into the abdomen. The position of the patient on the operating table, to insure the greatest amount of relaxation of the involved parts, is another feature of importance. Guthrie and others have commented favorably on the use of the Trendelenburg position when starting the anesthetic. This has its advantages in certain cases. Still, there is greater danger in extreme Trendelenburg position, especially in a long-continued operation. Here good judgment on part of the operator is necessary to determine how much and how long the Trendelenburg position will be tolerated by the patient. Proper relaxation of the parts involved may be obtained by properly placing pillows, or sandbags, under the patient. The newer type of operating table is so constructed that relaxation may be accomplished by adjustment.

The one great field that is surely but slowly being invaded by the gas oxygen method on anesthesia is obstetrics. Chloroform has done noble work in this department, and will never be entirely displaced by gas oxygen or any other anesthetic. Chloroform is a very valuable anesthetic agent when carefully used in properly selected cases. Ether will, of necessity, be the agent most extensively employed. Ether has its definite indications, and in many cases its advantages over other anesthetics are clear and undeniable. The difference in cost, no doubt, has been a drawback to the more liberal use of nitrous oxide. Greater experience has thus been gained with ether, which, when properly administered, compares quite favorably with gas oxygen.

Somnoform, which is a combination of ethyl chloride, methyl chloride, and ethyl bromide, is extensively used by dentists. It is of great value in short administrations, and produces greater relaxation than gas oxygen. This combination of drugs is also largely used to begin ether anesthesia. It has the further advantage in not requiring a large apparatus for administration. Ethyl chloride has enthusiastic advocates, as have also ether and gas. Its chief use is for short operations, or as a preliminary to ether anesthesia, especially in children.

The use of oxygen with other anesthetics is of great value. It increases safety without diminishing the value of the anesthetic. It is a stabilizer of blood pressure, it diminishes or overcomes nausea and vomiting, and it facilitates an early return to consciousness. In obstetrics, I have found it of great value in resuscitating the asphyxiated child.

Emergencies are best met when there is team work. It may be

necessary, in some cases, to transfuse before operation. The experienced anesthetist can give warning to the operator in ample time to speed the operation, or even cease his work, if the patient's condition becomes threatening. If blood pressure observations are taken during the operation, one will find the evidence of danger long before it manifests itself, and proper measures may be taken to meet it successfully. The anesthetist should know all emergency measures and have them ready for use when occasion demands. The operator, too, should at all times use such speed as is consistent with safety and good technic. All bleeding should be controlled at once. Unnecessary bruising of tissues should be avoided. Surgical shock is a nightmare that, as yet, has not been fully dispelled. The theory of Cannon that it is due to absorbed toxins arising from the bruised tissues, may explain why operations of long duration and severe manipulations are followed by shock. We know that hemorrhage and nerve irritation are causes of shock; but there are some cases of shock that have not, as yet, been satisfactorily explained. No doubt further investigation will, eventually, solve this problem. In the meantime it behooves us to consider all the supposed causes of shock, and try to avoid them.

What care, then, is to be given the patient after the operation? The patient, properly protected, is taken back to a warm bed. Hot water bottles should be placed about the patient to keep up the body heat. The room should be light enough so that changes in the color of the patient can be recognized. The position of the patient in the bed should be such as to afford the greatest comfort. Enough anodyne should be ordered to give relief from pain for the first forty-eight hours. Water should be given as soon as consciousness is fully established. Recital injection of alkaline solutions, with or without glucose, should be ordered if the case demands them. Feeding should be started at a very early period. Careful watching of the patient is necessary to detect change in color and in pulse rate. Absolute quiet is essential for the first few days.

If the anesthetic has been properly administered, a very early return to consciousness usually takes place. This means that there is a minimum amount of anesthetic for elimination. Less time will be required in watching the return of consciousness, and the discomforts attending it will be practically nil.

In conclusion, I wish to emphasize, first: a change in college curriculum to meet the above suggested requirements; second: a greater preoperative care and examination of patients; third: improved team work in our hospitals.

In limiting my remarks to operator and anesthetist, I do not wish to minimize the value of other participants in the operation. There must be a concerted action of all of them in order to insure success.

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SOME ADJUNCTS WHICH PROMOTE EFFICIENCY IN
THE USE OF LOCAL ANESTHESIA.*

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(With five illustrations.)

NOTWITHSTANDING the boon that the discovery of general anesthesia has been to surgery, chloroform, ether, and gas have so many shortcomings and dangers, both immediate and remote, and their use is accompanied by so much discomfort to the patient, that local anesthesia is gradually gaining in popularity. In considering the problem of anesthesia, it is evident, however, that the ideal method has not yet been developed. The virtues of any anesthetic are purely relative.

All general anesthetics produce their toxic effects almost directly in proportion to the amount used and to a large extent the quantity used depends upon the length of time during which the patient is under their influence. While this point is not of special importance in a large percentage of cases, there still remains a fair number in which it is of the utmost importance; a fact which, I think, is not sufficiently appreciated. It is difficult to decide, in a given case, just what part a heavy dose of a general anesthetic has played in an untoward result following a major surgical procedure.

The future will develop a great improvement upon the present method of producing general surgical anesthesia; and local anesthesia is making marked encroachment upon the field. My personal point of view has changed from year to year, increasing experience having invariably broadened the scope of local anesthesia and decreased the field of general anesthesia, even where it was believed absolutely necessary. In this, with few exceptions, my experience has not varied from that of others who have used local anesthesia in a fair percentage of their cases. Increasing experience has made it possible

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