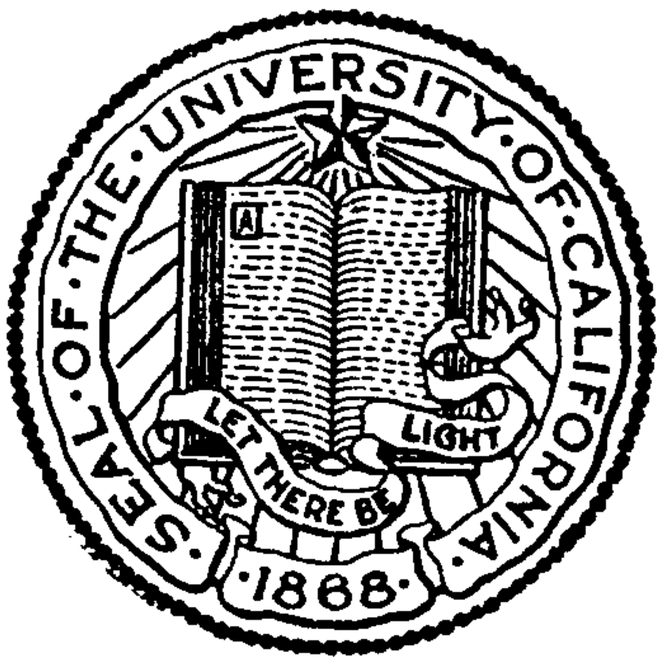

GOLDEN RULES OF SURGERY

GOLDEN RULE SERIES

GOLDEN RULES

OF

SURGERY

ESPECIALLY INTENDED FOR STUDENTS, GENERAL PRACTITIONERS, AND BEGINNERS IN SURGERY

BY

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MY FRIEND

CHARLES H. MAYO, M. D.,

OF

ROCHESTER, MINN.,

WHOM I ADMIRE AS A SURGICAL ARTIST,

I DEDICATE THIS LITTLE BOOK.

HE HAS EYES THAT FEEL AND FINGERS THAT SEE. HE TEACHES ALL THAT HE HAS LEARNED IN THE ONLY POSSIBLE WAY ONE MAN CAN TEACH ANOTHER — BY LETTING THE OTHER SEE HIM WORK; AND HE WEARS NO CLOAK!

PREFACE TO SECOND EDITION.

The complete exhaustion of a large first edition demands the present issue.

Practically all that particularly relates to rules of surgery in the first edition is retained in this. Some parts have been altered or rejected to suit our changed viewpoint, and all have been rearranged. Several new chapters have been added because of additions to our knowledge in surgery.

The book is intended for students, general practitioners, and beginners in surgery. I am not persuaded that it is vastly more beneficial to learn a fact by searching for it in a volume than by seeing it in a line. In surgery I do not believe it best to let the student find out all things for himself. Sixteen years' experience as a teacher convinces me that the short positive assertion is the most impressive.

Should any statement herein contained require later to be forgotten or unlearned, I ask to be forgiven and beg of you to remember that "there are exceptions to *most* rules."

W. F. COUGHLIN.

January 1, 1913.

PREFACE TO FIRST EDITION.

In this guide to the study of surgery, short space compels me to deal only with the important and frequent occurrences, and not with rare cases.

Throughout the little volume will be found philosophical *causeries*. May they amuse the reader if they fail to convince him. If I may guide the student and keep him on the scientific track, I shall be content.

Many of the rules are taken from the fine selection of Golden Rules of Surgery, by Hurry Fenwick, F. R. C. S., England. I have altered them to suit my views and have added much new material. Rules on some subjects, for instance on genito-urinary subjects, are quoted unchanged and *in toto*. I desire to express my indebtedness to this author. On all doubtful or new matter, I give my views based on my own experience, whether differing from accepted views or not.

My experience of thirty years has been interspersed by frequent visits to my most renowned colleagues, both in this country and abroad. My judgment has been broadened and tempered by these annual voyages, and still I am often in error because I am only human.

A. C. BERNAYS.

St. Louis, Mo., April, 1906.

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GOLDEN RULES OF SURGERY

CHAPTER I.

GENERAL CONSIDERATIONS.

Surgery is a jealous mistress, and no man can hope to meet with success and attain prominence therein unless he, properly prepared and trained, devote his whole time to the work.

The young man contemplating the study of medicine or surgery today should be the holder of a degree in arts from a good university before taking up his medical studies.

A medical education such as is furnished by our best university medical schools should next be acquired.

No one should be granted the degree of Doctor of Medicine until he has finished a year as interne in a large hospital, after having completed his course in a medical school.

For those wishing to practice surgery, additional qualification, and a special degree as a mark of their special qualification, should be necessary, and this degree should be obtainable only by examination.

The examiners conducting such examinations should be named by the State or National Surgical Association, and should be men who are actively engaged in *the practice and teaching* of surgery in the best university medical schools.

No examiner should be permitted to question or grade a candidate from his own school.

At least three examiners in each subject should examine and grade each candidate, and the average should be taken.

Examinations should be partly written and partly oral and practical.

Anyone wishing to practice any of the specialties of surgery shqould be required to first qualify as a general surgeon.

No one is fitted for the practice of surgery unless he have:

1. A special knowledge of anatomy, including embryology and histology.

2. A special knowledge of physiology and physiological chemistry.

3. A special knowledge of pathology—microscopic and macroscopic (clinical).

4. A wide clinical experience in general medicine.

5. Sound judgment, *sang-froid*, and some natural mechanical ability.

It is not uncommon to hear some surgeons (?) boast that they know nothing of diagnosis, that *they* are *surgeons*. This is said (sometimes it is partly true) to flatter the medical colleague.

There is pain until both kinds of rest are given to the injured parts.

In a carbuncle or abscess there is pain because of *physiological unrest*—the unrest caused by the response of the body-cells to the injury being done by the bacterial toxins. This unrest will continue, and therefore the pain will continue until exit is afforded for the products engendered by the bacterial invasion. We thus see that *the surgeon's knife may be a means of giving rest.*

Remember that, whenever such a part of the body is injured that increased motion would tend to make matters worse, *Nature tries to put the part at rest* —for example, the intestine in wounds of the same, joints after injuries. Try to take your cue from Nature, and aid her.

Keep in your mind the value of *rest* as a means of relieving *pain*—read Hilton's "Rest and Pain."

Rest secured by means of poison injected into the human organism is apt to do more harm than good. I am convinced that the administration of such drugs as belladonna, cocain, morphin, strychnin, veratrum, digitalis, and other poisons by even our most highly educated physicians is wrong. I am convinced that the physician who uses these drugs upon his patients overestimates his own knowledge of the action of drugs, and nearly always has been misguided by his blind trust in textbooks on materia medica. I wish to go on record as being opposed

to the general use of drugs in the treatment of disease.—B.[1]

STUDY.

Study your pathology—no pathologist, no surgeon. To know each form of tumor in microscopic section is part of pathology, but its macroscopic appearance is more important to you. To know both the microscopic and macroscopic appearances of a tumor without knowing its life history, its habits, its methods of growth and spread, and its effects as clinical manifestations will render *you* more *ornamental* perhaps, but can never be of practical benefit to your patient.

Study your pathology beside the operating-table while someone who *knows it* is operating. Study your pathology in the deadhouse, and study it in the laboratory.

The reason why some American surgeons excel European surgeons is because most of our knowledge is derived from actual observation at the operating-table, while the European bases his knowledge and judgment largely on autopsies.

Attendance at autopsies is of very great benefit, but there would not be so much to learn at autopsies if students studied their pathology at the operating-table—autopsies would be fewer in number.

[1] The letters *B* and *C* are used where it has seemed needful to saddle responsibility for the statements made. *B*, abbreviating Bernays and *C* abbreviating Coughlin, the author.

One reason why so much poor surgery is done in America is that, in spite of the fact that the technic is excellent, the surgeon's knowledge of pathology (and therefore the treatment) is very poor.

Therefore never miss an opportunity to witness an operation, and *always examine the diseased tissues.*

Visiting Surgeons.—American surgeons have the good habit of traveling about from place to place "to watch the other fellow do it." This is laudable and to be encouraged. Do not close your operating-room doors. You will not do so anyway if you are proud of your work.

It is often urged that "each onlooker adds to the risk of the patient"—arrant nonsense! Each additional *assistant* increases the risk, but quiet, gowned onlookers—bosh! The surgeons who get the best results have the most onlookers, other things being equal, and those who have few visitors have the most assistants.

Do not forget that when you visit clinics it will do your patients more good if you try to learn as much about the pathology and diagnosis of the cases seen, than if you learn about the surgeon's manner of pinning towels and tying knots, etc.

The day will come when American surgeons will take as much delight in calling attention to points in diagnosis and pathology as they do now in showing a new stitch.

PRACTICE.

Let it be your custom from the outset of your career to make a complete physical examination of every new patient who consults you and to *keep a record of your findings.*

Positively refuse to prescribe for a stranger without a physical examination.

There should be a difference in price paid commensurate with the difference in the work done and the skill required, and the sooner the laity know this the better for them and us.

Keep good records of all cases: the physical findings and history at first visit; the operative findings and postoperative course after operations. And never prescribe even a dietary without recording it *at the time.*

Beware of diagnosing diseases of which you have recently read or heard, or of which you have lately seen a case.

Do not forget that old persons, drunkards, children, and jaundiced patients bear loss of blood badly.

Old persons do not thrive if kept in bed too long.

No patient can be expected to do well if kept too long in one position.

If you are going to use your hands to do clean surgery adopt the rule of never putting them where their skin may be brought in contact with infectious material.

Never use a hand, a finger, or an instrument on a conscious patient without letting the patient see you wash it just before and just after using.

Beware of prescribing morphin on slight provocation, and never tell the patient that you are giving morphin or other opiate. It is a fact to make us blush that at least seven out of ten morphin fiends say that they were first made so by their physician.

Never forget that morphin is very likely to make the symptoms appear relieved while the disease grows worse. And remember that every time you use the hypodermic syringe the patient thinks you are giving morphin.

Do not talk much, and be careful not to express an opinion until it is asked for; this is especially good in regard to making a prognosis.

It is not well to talk medicine and surgery with the laity except in so far as to educate them in matters of right living. We must teach them, as well as we are able, how to avoid disease. It is said that we should not talk medicine to the laity because our opinions differ so. As a rule, our opinions coincide pretty well as long as we confine ourselves to the realms of truth. We should teach both cause and cure.

Never boast of what you've done. The nurses, hospital attendants, and the patient's friends will let the truth be known—slowly, but it comes out right in time.

You should be a member of your local and state organization, and take an active part therein. However, do not be perniciously active, and never—never seek an office.

There should be a local surgical society to be composed of all the local men of real worth in that profession—a society for scientific and never for social achievement, none admitted except after proved merit. Be sure that you do not affiliate yourself with a social surgical (?) society.

Be very careful in making a diagnosis of malingering, and always fear that an unconscious "drunk" may have a fractured skull.

Think of how poorly you feel the day you are well purged. Then why do you wish to make a patient feel so poorly the same day that you are going to subject him to the severer strain of operation? You would lower his resistance, and then operate? *"Que le bon Dieu le protège!"*

In the weak and broken-down avoid cathartics, fasting, and loss of blood.

Give patients plenty of water; they may not be able to take it by mouth, but give plenty of water.

Be on the watch for delirium tremens after accidents and operations. Don't suddenly deprive the habitual drinker of his daily allowance; preferably increase it.

Be careful of opium in delirium tremens when the pupils are contracted.

You must never make a *per vaginam* examination

without the consent of patient or without the presence of a reliable third person.

When you are sent to examine a prisoner you should warn him (or her) that the results of your examination are to be used as evidence.

Remember the difference between a case and a patient, and be sure to treat the patient as well as the disease.

Do not forget that in all organic lesions of any part of the body which the patient himself can see or feel there is a psychic element, and that this feature of the case may require treatment. If, for any reason, the radical cure of a condition is not feasible, much may be done by suggestion and persuasion by a clever physician. In many cases a change of environment, voyage, a trip or a visit, a month or so in a sanitarium, with gymnastics, massage, electricity, or baths, etc., will work wonders.

Be brave enough to accept all the responsibilities which may come. If there be the slightest chance of success, *the patient must be given the chance*, no matter how *your reputation* may suffer. *Our* reputation often suffers needlessly because operation is granted when no possible chance of success exists.

Under the protecting *ægis* of antisepsis and asepsis fools rush in with seeming impunity—but only with seeming impunity—and operate where experience-ripened sages would hesitate.

Those institutions whose work is followed con-

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can point with satisfaction as to their spiritual progeny.

If this should lead, as it sometimes does, notably in the cases of v. Langenbeck and Billroth, to a general recognition of their pupils as the leading surgeons of their generation, the ambition and the glory of such teachers of surgery will have reached the summit.

There is great danger of overlooking the human or philanthropic side of a case in the enthusiasm which scientific research arouses in a student of biology. This science, being the basis of modern medicine, is so interesting and such an enticing field for research that to an intense worker a case may appear to be merely an object upon which to make scientific observations. Beware of this error, and remember that there is but one object in the practice of medicine, and that is: to make the patient well, to cure his ills.

The scientific *study and diagnosis* of a case is one thing, the *treatment* is another. Both functions are demanded of a surgeon, and the ability to fulfill both well combined in one man has made great masters in our profession. It is not to be understood, however, that all scientific requirements be exacted from one man. Let all obscure cases be examined by *expert* specialists.

Do not have exposed to view in your office gruesome pictures or professional appliances, charts, or instruments,

Never use the words, "the knife," "the bloody method," "operation," "cutting," etc., in the presence of patients. Protect the psychic sense from injury, and your sensitive patients will love you more.

Remember that consent of the patient is necessary to make an operation legally permissible. In certain states the consent of the husband is necessary before an operation on the wife is legally permissible. In unconscious patients, however, should it be difficult to find the proper person from whom to obtain consent, go ahead and operate, but always have counsel. In the case of children at boarding-school where the delay incident to obtaining consent would probably be fatal, have counsel with you, and act according to the indications.

When you have permission to perform an operation, and at operation meet with a surprise, e. g., to find a pus-tube where you expected to find an appendix, you are expected to deal with the condition found, and special consent is not necessary. It is better, however, to obtain consent to do all that may be necessary before undertaking any operation.

Considerable minor surgery is done in the office, and very likely such will continue to be the case. Remember that there is always some risk in even trivial operations. Curettement, operation for hemorrhoids, dilatation of stricture, etc., etc., are often done in the office. This is dangerous!

After all such operations the patient should be

kept quiet for twenty-four hours at the very least.

It is dangerous to do surgery in your office! You never can tell how a patient will behave toward any anesthetic, or can you by any known means estimate in advance the amount of shock which will follow even the slightest operation. All contingencies must be provided for, and this can rarely be the case in the ordinary office.

Of course, to have the idea go out that you can perform cures in your office without the need of hospital will bring patients who fear the hospital or who hate to lose time. Nevertheless, if a patient operated on for hemorrhoids, for example, and at once allowed to go about her work or pleasure, develop lung or liver abscess, and die of that, the primary operation is the cause of death, and the surgeon is the person at fault.

Many specialists have their offices fitted up expressly for the performance of minor operations, and patients are under the care of well-trained attendants, and cared for as they would be in a hospital. With them the case is different; they are prepared for emergency, and take measures to avoid unpleasant sequelæ. Unless you are likewise prepared, *the hospital is the place to do surgery.*

Beware of making promises as to results or as to length of time required to obtain a cure. But never express to the patient even a hint of doubt on your part as to the ultimate success, once operation is decided upon.

Accidents will happen, to you as to others. They have happened to the greatest surgeons who have ever lived, and they will happen to you. Death following a minor operation is the most awful accident that can occur. Some such deaths are due to unavoidable septic infection—unavoidable, because you have taken all the precautions known to avoid it, and yet it has occurred. You have followed the same technic in thousands of cases and with unfailing success, and yet once in a great while the accident occurs. Some of them are due to the anesthetic—and to the anesthetic in skilled hands. But mark it well—the greater the surgeon, the fewer the accidents!

Nothing but the kindest sympathy should be extended to the surgeon to whom such an accident happens in the course of a long and successful career. But the man whose work shows a continued series of such accidents or a continued death-rate much above the average should be summarily expelled from our profession.

The fact that accidents do happen to the recognized masters in the profession is often taken advantage of by the unskilled and inexperienced. For example, a healthy young woman, who has been persuaded by a "smart young man" to have an operation done for a retroversion, develops peritonitis and dies on the fourth day, and the operator shrugs his shoulders with a "Well, we can't save them all"—while the autopsy shows an incised

wound in the bowel! Such an event is no accident; it is due to lack of preparation, lack of sense of responsibility, lack of fitness, and is as heinous a crime as willful murder!

The policy of charging the unavoidable accidental deaths to heart failure, or to some obscure form of nervous disturbance, or constitutional condition, is a bad one, and should be discontinued. If you don't know the cause of death, be honest, and demand an autopsy, that you may if possible avoid a like catastrophe in the future.

The legitimate way to acquire a reputation is to deserve it by working hard and long in the right way to establish and maintain it.

It has been said that "merit is bound to win," but it is not enough that you know your work well; you must show your brothers in the profession, and the laity, that you know it. Hide not your light under a bushel. A self-advertising man is despised, but you must have confidence in your own ability, if you wish to win. Beware that you do not have more confidence than your attainments justify. You must get your own measure right; otherwise you are certain to fail. If you do what comes to hand with your whole heart and soul in the work, patiently and faithfully striving to excel in the quality of your work, without giving so much attention to the quantity for the first few years, you will obtain a permanent success.

The young surgeon who suddenly becomes rushed

to death within a few months or a year or two after his entry into private practice is regarded with suspicion by his fellows, and it is generally believed by them that his methods are not legitimate.

Do not believe that you will do better by trying to please everybody—remember the man and his ass. Please yourself as far as you may do so without injuring others. Have an opinion of your own and a voice to express it. The best and shortest rule is "Do as you would be done by," and do it with force and politeness.

A gentleman needs no code of ethics for his guidance.

No consultant will refrain from having your aid because of your opinion or manner, once he knows that you do better work than the others.

You are liable to be sued for malpractice. There is no way of avoiding this once it becomes known that you own property. If you have done the right thing, you will hardly lose the suit. Never compromise. Most surgeons now carry insurance against malpractice suits. The best way to put an end to these suits would be for the lawyers and surgeons to get to know each other better. The lawyers should know something of surgery, and surgeons should know something of law. A local medicolegal society could be of immense benefit, not only to its members, but to the community.

Avoid going into court; that is, avoid it in so far as you reasonably can. You will often be wanted

as a witness. This is always unpleasant when you are selected by either of the litigants. Know your subject before you go there, and if you remember that in medical matters a lawyer is a layman, you will be less nervous. I have never seen a witness much confused when he was telling the truth, though I have seen a great deal of embarrassment when truth was being concealed or distorted. Most suits for malpractice are attempts to get money for nothing, but not all; you should feel that a patient who trusts life or limb to a surgeon has a right to expect as good as can be had in his locality, regardless of the price, and you should not feel it to be your duty to protect wrong-doing in even a professional brother. If you know that the patient has been grievously wronged, expose the wrong-doer.—C.

Do not try to befog the jury by using technical terms; speak simple English, and they will think better of your testimony.

Never betray undue enthusiasm while on the stand.

Beware of "letting" your services to corporations or individuals to act as "promptor" at a trial—remember that *your profession is surgery.*

Finally, avoid frictions and jealousies with colleagues; keep out of cliques; remember that strong men can stand alone, while weak ones must lean on each other; and if you are persecuted by jealous rivals, cheer up. Men do not combine against insignificant foes or train parks of artillery against

must be small, but let the patient feel that he is paying for his operation.

Never allow the remark "the doctors make the rich pay for the poor" to go unrefuted. I have heard a surgeon on the witness-stand agree to this statement. The assertion is untrue. The poor man pays for himself just as the rich man does. Neither one ever pays what the service is worth because, as was said before, our services are invaluable. The richer the patient the more the annoyance and worry and the greater the risk. All agree that the rich give far more trouble, and it is just that they should be obliged to pay more.

When you are in doubt as to the fee that you should charge consult a true friend among the older members of the profession. Remember that the fee is always in proportion to the service rendered and its value to the patient.

When a patient wishes to have a definite understanding beforehand about the price to be paid, never side-step. Have a definite understanding by all means. But where the patient makes no such inquiry, it is not well—unless you have reason to suspect the patient to be a "dead beat"—to mention money first.

A great deal has recently been said and written concerning division of fees, the paying of a percentage or commission to men for work referred. A maudlin ill-advised stand in favor of the practice is taken by some, the argument in favor of it being that

the poor general practitioner is underpaid for his work, gets a mere pittance on long time payments, and often nothing at all. The argument is without force, because no man is obliged to render valuable service for nothing. If he does not charge and does not collect, it is to be presumed that his services are of the cheap sort and that he knows it, always supposing the patient able to pay.

I believe that most often the physician is sadly underpaid.

I have heard it argued that the physician shares the responsibility by recommending the surgeon and should be paid for that. Then let the patient know this, and let the patient know he is paying for the recommendation!

It is my opinion that very often it is better to have the family physician in the case, and in very many cases the family physician can do the dressing, etc., and care for the patient just as well as the surgeon. Where such can be done I think it should be so, and the patient could be submitted a joint bill. Where the physician is anxious to secure a portion of the fee and unwilling to have the patient know of it, his position can be construed in only one manner.

A surgeon, who, while operating with his own trained corps of assistants, asks the family physician to wash up and don a gown, merely in order that he may divide the fee with him, has an elastic conscience. There can be no gainsaying the fact that secret division of the fee tends to lower the standard of serv-

ice—the poorest equipped will pay the highest commission.

The ordinary advertising quack is practicing in a far more honorable way than the ethical surgeon who secretly splits fees and pays commissions.

CHAPTER II.

PREPARATION FOR OPERATION.

ROOMS.

The operating-room of a good modern hospital is, of course, the best place to operate, but you may have to improvise sometimes; when you do, have a room that is well lighted.

Have all unnecessary furniture removed.

Have the walls cleaned, and if of plaster, white-washed or kalsomined the day before.

Never have a draught blow through the operating-room before or during an operation.

Persons in an operating-room should move about as quietly as possible and as little as possible before and during an operation.

Never have your operating-room cooler than 80° F., or hotter than 85° F. (if you can prevent it).

Do not encourage visitors to engage in conversation in an operating-room.

Persons who cough should be excluded.

All persons coming near the patient, surgeons or assistants, should have their clothing covered with sterile gowns.

The floor of an operating-room should be kept damp with an antiseptic solution, before and during operations. It is quite odd to see how careful visitors are to cover their clothing with gowns, and how little attention is given to removal of street dirt from the shoes—surely we are inconsistent.

No one not gowned is ever allowed to pass between the instrument or sponge table and the operating-table, from the time the patient is put on the table till the wound has been dressed.

PATIENT.

Do not keep a nervous patient long in the hospital waiting for an operation.

Patients to be kept in bed after an operation should be made to accustom themselves to the use of the bedpan before the operation.

Always be sure that the mouth is as nearly surgically clean as it is possible to get it before sending the patient to the operating-room.

It is not the custom, but it would be better, to have the anesthetist examine the patient the day before the operation.

Never, if you can avoid it, give the patient a purge the evening before, or the morning of, the operation.

If an enema is given the morning of the operation, let it be given long enough before that the bowel may not move while the patient is on the table.

Do the operation in the morning, the earlier the better.

Never, except in emergency, operate on a woman who is menstruating—a week after it has ceased is the best time.

If a patient be weak, a warm enema with black coffee and brandy a short time before operation is a good rule.

Always insist that the patient be well wrapped in dry woolens while on the table, and during transportation.

Remember that you must do your utmost to banish fear and inspire hope.

If the patient be nervous, the fewer people she sees the morning of the operation the better.

Insure a good night's sleep the night before.

Never rub and scrub the skin over the field of operation; it does harm and increases the risk of infection.

If you use pure tincture of iodin, wash it off with alcohol after five minutes.

Never apply strong antiseptics to the scrotum, vulva, or around the anus.

If it can be avoided, never operate in a field in which are pustules, vesicles, scabs, or papules, etc.

Nothing but the actual cautery can sterilize a pustule, no matter how small—have your doubts about the efficacy of even that.

SURGEON AND ASSISTANTS.

Street clothing is always changed for clean operation clothes, before beginning to wash up.

Do your scrubbing and don gloves before being gowned.

Never attempt any operation while there is an abrasion, hangnail, fissure, or papule on your hands or forearms.

Do not use stiff brushes for scrubbing up. Wash long and well with soap and brush, or gauze, in running hot water.

Never apply to your hands any antiseptic that may cause a dermatitis. Some are susceptible to one drug, some to another.

Do not put on gloves filled with an antiseptic, if that antiseptic causes roughness of your own skin—it will soon be quite impossible to cleanse hands so abused.

It is not desirable or necessary that nails be pared to the quick, but they should be as short as can be tolerated, without having the finger ends become sore.

The cap should cover all the hair on the head.

If you perspire freely, or if you intend to talk or cough while operating, always wear a mask—otherwise it is unnecessary.

Always wear long sleeves—and keep them tucked into the gloves during operation.

Remember that, once sleeve or gown becomes wet, bacteria come readily through to the surface.

If you must wear glasses of any kind, nothing but spectacles are safe.

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anesthetists, although the number of physicians who are ready to give an anesthetic is exceedingly large. —C.

Never administer a general anesthetic or allow it to be administered in your own house, except in the presence of a third person. Remember to have all false teeth removed, to secure an empty stomach and a horizontal position, to release tight clothing, and to use an absolutely pure drug.

The urine, heart, and lungs should be examined the day before the operation, and by the anesthetist. Know the patient's *blood-pressure.*

The *mouth* and *pharynx* should be rendered as nearly *sterile* as possible before any general anesthetic is given.

The less fear experienced by the patient before or during beginning anesthesia, *the less the shock.* Get the confidence of the patient. Let onlookers be few. *Have all quiet.* Don't talk too much.

Remember that sudden failure of respiration sometimes occurs in cases needing tracheotomy. Therefore give as little of the anesthetic as possible —do what is indicated to supply the air or oxygen needed.

If you have any rule about the giving of morphin before the induction of general anesthesia, let it be this: to prescribe for the individual patient and not to have a routine dose for all.

Always remember that there are patients who have an idiosyncrasy toward opiates.

Remember the effect of morphin on elimination, especially on the bowel.

Atropin combined with morphin enhances the value and diminishes the danger of the latter, and also lessens the secretion of mucus.

Be especially warned of the dangers of opiates in the young and old, in the debilitated and bronchitic.

Always percuss the presternal region in looking for enlarged thymus in the young.

Never be satisfied that all is well with the circulatory system, just because you hear no murmur in the cardiac region—look for hypertrophy.

Fat persons are especially bad risks.

There is one crying evil seen in American operating-rooms, that is seen nowhere else, and that is the custom that so many anesthetists have of talking to the patient while the latter is being anesthetized, and the custom that visitors, and some surgeons, have of talking aloud in the hearing of the patient. Keep quiet yourself, and see that those around you do so; and let the patient go to sleep.

Always remember that *chloroform is a dangerous anesthetic:* that it kills by stopping the heart; that, if the anesthetist does not take measures to resuscitate before respiration fails, it is too late; and that chloroform generally kills early in its administration.

Where you have decided to use chloroform, always select the purest and freshest that can be obtained.

Never use chloroform that has been standing in an unsealed bottle. Use a freshly opened vial every time.

Always remember the value of saline and adrenalin intravenously in sudden cardiac or respiratory failure, and always have the apparatus ready.

Do not forget that ether can kill your patient; that it generally does so by paralyzing respiration; that it may do so by causing suffocation, the mucus secreted filling the bronchi and bronchioles; and that it may cause cerebral hemorrhage.

The danger of postoperative pneumonia is greater after ether. Try to prevent it by having the mouth and pharynx surgically clean before the operation by preventing the entrance of mucus from mouth and pharynx to the trachea; by preventing vomiting, while unconscious or semiconscious; and if this is impossible, by having the stomach free from food for three hours before operation, and by having the head in such a position that vomited material may not be drawn into the trachea; by keeping the patient warm, while on the table and during transportation, and by frequent change of position after the operation, trying to have the patient raised to the sitting or half-sitting posture as soon as possible.

Never forget that, while enough of the anesthetic should be given to secure complete anesthesia before the surgeon commences and while he is operating, care should be taken to see that the patient is never given more than is needed.

Deaths from anesthetics are more frequent in operations for trivial troubles. Fright generally increases the danger.

Some deaths during anesthesia are unavoidable. Fortunately the unavoidable deaths are rare. I have made a most careful analysis of all existing statistics and find that the mortality of anesthesia for all surgical purposes is in round numbers 1 in 4000.—B.

Nitrous oxid and oxygen for anesthesia has become popular during the past few years. It is about the safest general anesthetic known.

Bear in mind, however, that gas and oxygen is not entirely without danger. I know of one death, and I am sure that with this, as with ether and chloroform, not all deaths are published. When an anesthetist has a fatality with a rather new anesthetic, or a surgeon one with a new procedure, I believe that very often results are not published, lest the accident be attributed to faulty technic.—C.

Never forget the special danger of anesthetics in acute septic conditions—most of them get worse for a while after the anesthetic has been used.

Chloroform is quite likely to kill early in its administration to septic patients, and should the septic patient survive the operation, he is likely to die later because of the effect of the chloroform on the already poisoned liver.

Never give an anesthetic in an acute abdominal condition, without first washing out the stomach. If the patient be so low that the introduction of the

tube will kill him or militate against him, no operation can help him.

When it is decided to give a general anesthetic, always positively assure the patient that he will bear it well.

Never express a doubt or fear to the patient, once the decision is made. Before the decision is made is the time to express doubts—never afterward. Remember that confidence in the good outcome lessens fear and so lessens shock.

Postanesthetic vomiting can be almost eliminated by the expert administration of the anesthetic, and by the use of the stomach tube just afterward.

As a rule, four or five times as much of the anesthetic is given as is needed.

Unless you are in haste to get the patient in bed, wash out the stomach while the patient is on the table.

A local anesthetic will sometimes be followed by as great shock as a general one—psychic effect of the operation.

Never try local anesthesia in children.

Do not attempt to produce local anesthesia in an inflamed area, by hypodermatic injection into it.

Freezing with ethyl chlorid lessens the pain (sometimes), but never produces anesthesia as ordinarily used.

Remember that it is the skin itself which, being most sensitive, really needs the anesthetic. If the injected fluid be brought into contact with the under

surface of the skin, the skin overlying it becomes insensitive. If the fluid be thrown into the skin itself—blanching it—anesthesia is also readily produced. If you use the intradermal injection, do not use much force or inject much fluid; otherwise necrosis will follow.

Cocain is still in use, but is now rarely used hypodermatically in solution stronger than ½ per cent.

Novocain is less toxic, and can be boiled, and we obtain good results with solutions of ¼ to ½ per cent.

Find out all you can about any anesthetic before you use it; other things being equal, use that which is least toxic, and stick to it.

Adrenalin chlorid mixed with the local anesthetic just before use increases the local effect and prolongs the duration of the same, but remember that adrenalin has done harm in arteriosclerotic, debilitated, feeble, and old persons, and may do harm in those with high blood-pressure.

I have seen local gangrene in three places follow the use of saline with adrenalin subcutaneously, in a woman markedly arteriosclerotic. The tension of the fluid under the skin was not great.—C.

Spinal analgesia has its advocates. The bad results are probably not all published.

Remember the level of the conus medullaris, and do not let any one persuade you to stick a needle into the spinal canal as high up as this.

Keep the head, neck, and upper *thorax raised*

while giving it, and also for some hours after the operation.

Never inject fluid into the subdural space without first withdrawing as much as you are going to throw in.

Do not forget that even a slight movement on the part of the patient may be enough to break your needle.

Always introduce the needle with its stylet or obturator in place; this prevents blood from blocking the needle.

Take special precautions to prevent infection; no part of the body is more easily infected than the subdural space.

Never use a solution stronger than needful to produce anesthesia.

Do not inject irritant fluids; dissolve your novacain in normal saline, and don't use adrenalin or alcohol with it.

Nerve-blocking is reliable if your knowledge of anatomy is.

Remember that the anesthetics must get into the perineurial sheath.

Do not forget that you may do harm to a large nerve with a large blunt needle.

If your fluid be an irritating one, or contain alcohol, degeneration of the nerve-fibers may ensue.

Schleich's infiltration anesthesia works well, but the amount of fluid injected changes the normal ap-

CHAPTER IV.

SHOCK.

Prevent shock as far as possible by having a skilled anesthetist; a warm, not hot, operating-room; and a patient covered as well as may be with woolens while on the table. Banish fear; quiet your patient. Stimulate a weak patient. Prevent loss of blood. Don't handle or expose to the air tissues or viscera more than can possibly be helped. Don't pull and haul on tissues or viscera, or use large cold retractors. Have assistants who can help you, and who work like you do. Work rapidly. If a patient is shocking, have treatment for the same begun at once, and don't spend much time on matters of small moment, for example, on fine adjustment in closing —your patient may perhaps die because you tried to avoid a postoperative hernia. It is better to have a live patient with a fecal fistula than a dead one with a well-done resection, or a well-repaired hernia.

Never forget in shock and collapse that the essential of successful treatment is to obtain time for your patient to rally. Keep the heart going, but do not trade on its exhausted power; maintain its action, but do not force it.

Many patients are killed in shock by the syringe, and some get well in spite of it.

Do not resort to strychnin, digitalis, and *other poisons.* If you will give poisons, do so before the heart and diaphragm are too weak to stand the dose. Of drugs, neutral camphor and atropin are probably least injurious and often do good.

Remember that minimum doses suffice to kill a patient in shock after an operation, or after loss of blood.

Apply warmth to body and limbs. Use saline with adrenalin intravenously. Lower the head. Tightly bandage limbs and abdomen. Electric stimulation of vagi and phrenics and artificial respiration may do good. The hypodermic use of poisons is no longer in vogue.

Be careful not to inject too much saline or too much adrenalin at one time, or to repeat too soon. Better he should die than that you should kill him! On the other hand, let the case and the condition govern the quantity.

Don't be misled by the expression *"delayed shock." Delayed shock* is most likely *hidden hemorrhage;* find it, and treat it. Don't delay; a blood examination may help to show you the difference. Don't treat a patient for shock unless you are sure all bleeding is controlled; otherwise you'll simply wash all the blood out of his vessels.

Never put a shocked patient in the Fowler position.

It is better to write on the certificate, "Shock, due to operation," than to cover it with the cloak of "heart failure."

CHAPTER V.

WOUNDS, INJURIES, AND INFECTIONS.

WOUNDS.

Bear in mind that the most dangerous minor wound is the punctured wound of the bare foot. Never swab it out with carbolic until after you have incised it to the bottom—make it at least an inch long and drain or fill with gauze, and do not allow it to close up for at least ten days. *Give the anti-tetanic serum at once.*

Before you give antitetanic, antidiptheritic, or any other serum, always ask whether the patient has ever had serum of any kind injected previously. If serum have been injected more than ten days previously, *there is danger* in its use.

Remember that "Fourth of July" wounds are prone to be followed by tetanus.

Bites of animals susceptible to rabies are to be laid open, and burned out and drained, only if seen when fresh—to cauterize such a wound made more than a few hours previously is worthless.

The above also applies to other poisoned wounds —such as snake bites, etc.

Never have the people immediately kill a dog

which has bitten someone. Watch it to see whether it develops rabies. Should it be immediately killed, send the brain and cord to a competent pathologist.

Do not forget that the lacerated and contused wound (crushed wounds) can never be made a sterile wound without favoring later infection.

Never flush out such a wound with strong antiseptics.

Remove all non-viable tissue at the first dressing —use scissors and forceps.

Never be guilty of closing such a wound without drainage.

Do not forget attention to the general health of the patient while treating any wound.

Any wound not inflicted by a surgeon at operation is to be regarded as infected.

But no matter whether you are sure that it is infected, you must be as careful in your technic when treating it as you would be if you knew it to be sterile—you might carry in bacteria not already there.

Remember that there are various degrees of infection. Do not forget that the healthy blood and lymph have an antiseptic value, and that the body can take care of a certain number of germs.

Incised wounds can often be closed without drainage. If you fear that you may need drainage, use interrupted stitches, that one or two may be removed without allowing the whole wound to gape.

Always regard gunshot wounds as clean wounds.

Never probe any *fresh* wound. There are other ways of finding foreign bodies that do not favor deep infection.

Never be overanxious to get the bullet in gunshot wounds. Wait. If the bullet be sterile, it may never bother the patient; if not, an abscess will form later; and the removal of the bullet would not have prevented its formation, but could have caused death from septicemia.

Remember that the higher the velocity of the bullet, *the less* the destruction of tissue, and the safer the wound.

Do not forget that all penetrating wounds of the abdomen, seen within six hours of their infliction, call for immediate laparotomy—never wait for symptoms of peritonitis to arise.

Penetrating wounds of the chest call for operation only for the control of bleeding.

Never bury silk or other non-absorbable suture or ligature in any wound likely to suppurate.

In wounds where much destruction of skin has occurred, always give the patient the benefit of an attempt or two at skin-grafting.

Remember that grafts grow best when taken from the patient.[1]

Bear in mind that grafts will never thrive in the presence of pus, also that the use of antiseptics on the skin from which the grafts are cut, on the bed

[1] The drainage and dressing of wounds is taken up under these headings —pp. 59–64.

on which they are to be on, or on the grafts when in place is very likely to kill all the grafts.

Remember that the granulations on which grafts are "set" must be firm and healthy and vascular.

Always be sure that there is no active bleeding, no clotted blood, and no serum on the surface before you place your graft. Use hot gauze followed by dry gauze.

Be sure to apply pressure over your grafts for the first few days—this prevents accumulation of serum under them.

Bear in mind that if serum accumulate or pus form under it the graft will die.

Always look next day for the accumulation of fluid under the grafts, and if blebs be seen, puncture with a sterile needle, and reapply pressure.

Never use any antiseptic over your grafts. The dry dressing kept dry is the best.

Don't give up, graft again—and again, if necessary.

BURNS.

Never fail to treat the shock, and relieve the pain.

Be very chary of giving morphin hypodermatically in children.

The deeper the burn, the less the pain.

The more extensive the burn, the greater the shock.

Remember that normal saline and soda bicarbonate solution, a teaspoonful of each to a pint of warm water, as a bath, will stop all pain very promptly.

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Make no prognosis early in the case; burns, like frost-bites, are generally worse than you think.

Never forget the real value of skin-grafting in promoting healing and preventing later contractures.

Do not allow any flexion of the head, and if possible, keep the jaws fastened together while treating a burn between the chin and the chest.

If a burn involve the skin of the axilla, the arm must be kept at right angles to the body while healing is taking place.

Generally speaking, dress burns in the flexures of the joints, with the joint in extension on a splint, and keep the limb so till healing is complete.

When burns involve adjacent surfaces and the angle where these surfaces are continuous—as the fingers, for example—the adjacent surfaces are very likely to adhere and grow together.

Spread the surfaces as widely apart as you can, and skin graft if possible. If grafting cannot be done, throw a flap into the angle and fasten it there, thus separating the two surfaces.

By far, more than three-quarters of the horrible deformities, due to scars of burns, are preventable by proper attention while treating the burn.

FROST-BITES.

Do not forget that the part frozen must not be thawed out quickly.

While restoring circulation to the part, rub well with cold water or ice or snow.

Never make a prognosis early in the course of treatment; it is often quite impossible to say just how much has been injured.

In the event of gangrene it is ordinarily best to wait for a line of demarcation.

Never apply any dressing likely to constrict the vessels of the part.

Dress ordinary frost-bites as you would burns.

Do not forget that in old persons the gangrene is apt to ascend.

While waiting for a line of demarcation, take care to keep the part dry and warm, and as nearly sterile as possible.

ABSCESS.

Never try for fluctuation across a limb, or across a muscle. More than one should elicit it, in a doubtful case. Always try over the well tissue near by, or over the same area on the other side of the body, in doubtful cases—remember that fat, and soft new growths often give the sign.

Abscess near a joint often communicates with the joint.

Always think of aneurysm before you open an abscess near a large artery.

Abscesses of the abdominal wall often originate in affections of the viscera.

It is cowardly and culpable carelessness to wait for "pointing," once you know an abscess exists—also it risks your patient's life.

Remember that, though it be a collection of pus, you are required to take the same precautions to prevent infection as in dealing with clean wounds—to keep out other bacteria.

Don't fail to open at what will be during recovery the most dependent part. Open widely; explore with the finger. Drain or pack. Never pack tightly, except in bone abscesses.

It is seldom necessary to remove and repack daily. Split tubes and strips of rubber make the best drains.

Never forget to fasten your tubes in place so that they cannot slip in.

Always open early:

1. In the neighborhood of joints.
2. In the abdominal wall.
3. In the neck and submaxillary region—Ludwig's angina.
4. In the palm of the hand.
5. Beneath the periosteum.
6. In the marrow of bone.
7. About rectum, prostate, or anus.

Do not irrigate or scrape out an acute abscess cavity, and if you *squeeze out* pus (even from a boil), you do not know pathology at all, and of course are not a surgeon!

Bear in mind when dealing with deep abscess that not one bit more raw surface than is necessary

should come in contact with the pus. You may do a brilliant operation and establish drainage after it, but lose your patient in a few days from general septicemia, as often happens after panhysterectomy in the presence of suppuration.

Beware of the danger of general pyemia in abscess of bones and joints, and in all abscesses forming in contact with the walls of large veins. Often the first signs are those of brain abscess or meningitis.

Always open metastatic abscesses in pyemia as soon as you find them. These cases may be apparently hopeless, and yet recover.

Although it is true that in abscesses long encapsulated the causative organism tends to lose its virulency, one should always treat the contents as one would virulent pus.

In chronic suppuration we have a valuable aid in the bacterins. Those made with cultures from the patient's own pus are better than the "stock" variety.

Never plunge the knife as you would a trocar in opening an abscess. Do not fail to use the stethoscope, and if need be the exploring needle, before opening an abscess near a large artery.

Always use a hollow exploratory needle, never a grooved one—it soils clean tissues. Use Hilton's method [2] when opening abscesses, where important vessels and nerves are liable to injury.

[2] Hilton's method: Incise the skin and then insert a closed blunt artery forceps into the abscess cavity (a Mayo scissors will do), and open the blades before withdrawing.

Always remember that there may be virtue in a counteropening with through-and-through drainage.

The incision radiates:

1. In abscess of the breast.
2. In anal abscess.
3. In scarifying chemosis of the conjunctiva.

The incision is longitudinal:

1. In the limbs.
2. In the perineum.
3. On the vertex.

The incision is transverse or as nearly as may be parallel with lines and folds:

1. In the neck.
2. In the face.

In abscess of the breast do not be afraid of injuring the ducts and acini. Make the radiating incision, and make it deep and long.

Open palmar abscess early; go in below the superficial arch (lower border of outstretched thumb), and keep in the axial lines of the fingers, or at sides of palm.

Remember that a sinus has always a present cause and will not get well unless that cause is removed, but that the cause of a fistula may have long since disappeared.

Do not forget that probing a sinus may cause fever—a clean probe improperly used or a dirty one though properly used; and this applies even to all sinuses and fistulæ.

It is useless to merely scrape a sinus—remove the

cause. "The best way to follow the branches of sinus or fistula is to inject first with methylene blue." —C. H. Mayo.

The Bier treatment is useful in treating all abscesses, either suction or obstruction hyperemia. It should never cause pain, cold, or edema.

Active hyperemia also does good—the moist pack and hot bag.

In abscesses in the thigh or gluteal region, remember that you are never likely to obtain fluctuation, if the pus be under the deep fascia. Do not wait for a gluteal or a femoral abscess to point—it may spread widely between the muscles before it shows at the surface.

Never fail to explore all deep abscesses with your finger—small openings in the walls often lead into other cavities.

Don't forget to give rest to the part while the abscess is healing—the more so if muscles are involved.

GANGRENE.

It is only gangrene of the "moist" type that can quickly cause death.

Do not forget that the gangrene may be due to arterial plugging, and still be "moist."

No matter what the cause of the moist gangrene, there is always absorption of toxins from the dead part. Keep this in mind, and try to prevent absorption.

When gangrene is due to bacterial infection, there

is always gas in the tissues, and the gangrene runs a rapid course.

In all cases of gangrene examine the circulatory apparatus and the urine.

Do not wait for the gangrene to get well before beginning to treat the diabetes.

In cases of gaseous phlegmon, gangrene due to the gas bacillus or to that of malignant edema, you must act promptly. Incise freely, separate the muscle planes where the gas collects, wash with peroxid of hydrogen, and be sure to support the heart.

Never wait too long before advising amputation.

Before you make a diagnosis of Raynaud's disease or of ainhum, be sure you exclude syphilis and diabetes.

Bear in mind that diseases which increase the coagulability of the blood tend to produce gangrene, and the more so in those afflicted with arteriosclerosis. In these besides, the heart is weak, which is also a contributory cause.

Watch out for the premonitory signs of arteriosclerotic gangrene—numbness, tingling, cramps, etc.

Never forget that the poisons absorbed from the part serve to weaken the heart—watch the pulse.

Remember that simple embolic gangrene in a leg may kill the patient in two or three days. Never wait, if the patient's pulse keeps high, for him to get weak and drowsy.

careful that the patient makes no movement which may create, or enlarge, a cavity at the inner end of the tube, and cause air to be sucked through the tube into the cavity. If such a movement must be made, keep the end of the tube well covered with gauze while making it.

Remember that, if a cavity be infected, it should be packed (not too tightly) with gauze.

For packing use only gauze with selvage edges, and use, if possible, only one long strip.

A small speculum or a urethroscope (endoscope) makes a first-rate gauze carrier in packing deep cavities.

Do not leave packing in so long that the patient may become a nuisance in the ward, but too frequent changing is harmful.

Small portions of the gauze-packing should be withdrawn and cut off daily.

Cut all drains close to the surface—they are then less likely to loosen and do not cause pain by becoming caught in the dressings.

Be sure to drain all lacerated and contused wounds, except those caused by projectiles—they are always infected.

Never forget that you just *cannot* make clean a wound once infected. You may have obtained union by first intention after sewing up such a wound, but you did so in spite of the fact that infective material was still in it.

Remember that the incision should be large enough to permit free flow of fluid.

Be sure to drain at what will be for the longest time during the twenty-four hours the most dependent part of the cavity.

If an abscess or compound fracture in a limb need drainage, you will get better results if you make a counteropening and fasten tubes in all openings.

Always remember that if your drainage is good the patient's temperature will not rise much above 100° F. unless complications set in.

Do not irrigate abscess cavities unless the pus is so very thick that it will not flow through your tubes.

Never use peroxid of hydrogen to flush a cavity. Pieces of débris may momentarily block the exit, and the walls of the abscess may rupture and cause the spread of infectious material.

Never permit a widely undermined area to drain through a small opening—incise the overlying tissues from one edge of the cavity to the other unless important structures would be cut in so doing; in that case, it is better to make openings at the edges, and in the center, and insert drains.

After having packed a cavity with iodoform gauze, for instance, at operations on the bones, it is worse than useless to remove the same the next day. Leave it in place at least a week or ten days before you disturb it, unless, of course, there are signs of irritation or putrefaction.

DRESSING.

Never dress a wound unless it needs it.

Remember that the function of gauze is to absorb secretions, and that of cotton is to keep out bacteria and to afford physical protection.

Always bear in mind the fact that wet cotton does not keep out bacteria, but favors their entrance.

Be sure to change all dressings on clean wounds just as soon as secretions begin to come through.

Whether to use wet or dry dressings over clean wounds is still a debated question in some places. There are those who still insist that healing is more kindly under the moist dressing—but in some hospitals in England they still insist that results are better under antiseptic dressings! The best surgeons in the world today dress clean wounds dry.

When changing a dressing on a clean wound, be just as clean as you would be at an operation.

Have the fresh dressing ready to apply just as soon as the soiled one is removed—never allow the wound to be unnecessarily exposed to the air.

We see a lot of "frills" lately in doing dressings. That of not allowing even the sterile gloved hand to touch the dressings of a clean case, but rather using sterile forceps, is the most recent. If you know how to avoid infecting a wound at operation, and there use sterile gloved hands, surely you may apply sterile dressings to a wound with sterile gloved hands.

Always, however, remove dressings with forceps if you can.

In dressing an infected wound never allow even your sterile gloved hand to come in contact with the dressings. Here is the place to use long sterile forceps. *Keep your hands clean* that you may do clean surgery.

All acutely inflamed wounds should be dressed wet.

Do not use strong antiseptics as wet dressings. The days of the bichlorid pack and the carbolic compress have passed; and it is well, for they were dangerous. It has been proved experimentally and clinically that even better results are obtained by normal saline solution.

Acetate of aluminum, 2-4 per cent solution, is very widely used. It hastens separation of sloughs and promotes healing.

A wet dressing will absorb better if not covered by rubber-tissue, or oiled silk; allow evaporation, and change the dressing frequently—keep it moist.

The alcohol pack is popular for acute infections. It is used from 50 per cent to full strength, and both the denatured and the pure ethyl alcohol are used.

Do not cover an alcohol compress with rubber or oiled silk, unless you know that the patient's skin will not blister therefrom. There are patients whose skins are very sensitive to alcohol and blister readily —also gangrene of fingers and toes has been so caused, even with weak solutions.

Do not use denatured alcohol as a pack, i. e., do not cover with rubber, etc.

All ulcers and chronic wounds "clean off" much more rapidly under hot fomentations—hot moist dressings.

Do not refuse to apply an ointment to a wound—a clean granulating wound is the *place for an ointment*. Use some mild stimulating antiseptic, but always use a little less than the pharmacopeia indicates until you see how your patient bears it.

Never allow the granulations to become higher than the surrounding skin surface, else healing will be retarded. When they attempt to pass this level, or if they are unhealthy at any time, use stick nitrate of silver or desiccated alum.

Do not pull off dressings from a granulating surface. To do so is to destroy some of Nature's work. A weak solution of peroxid of hydrogen will do less harm, and acts well in loosening dressings.

If pus is thick and clogs the dressings, put citrate of soda, oz. 1 to a pint, in the solution from which you wring the gauze.

Remember that you *can* dress a wound *too* often.

Very often you will have to do extensive and painful dressings in nervous, weak, hyperesthetic individuals. Accustom yourself to use the Ether Rausch in such cases, and your patients "will rise up and call you blessed."

Always bear in mind the value of hot wet dressings in allaying pain in acute inflammatory condi-

tions, and you can keep a wet pack warm with hot-water bottles, or Japanese stoves.

SYPHILIS.

Never forget that one can have acquired syphilis without knowing that he had a primary sore. The primary sore may have been an insignificant "pimple."

Do not take the patient's word that he had or has not had syphilis—get a history.

Be very suspicious of urethral chancre, if there be an acute painless discharge from the urethra.

You can never make a diagnosis on the clinical characters of the sore.

Always remember that the secondaries may be delayed three months—more, if mercurials have been given.

The Wassermann test seems to mean syphilis, but its absence does not mean "no syphilis." It is still *sub judice.*

Ehrlich's "606" does not cure in one dose, but it does act wonderfully in most cases of active lues—don't give it in your office.

Never fail to warn the patient with syphilis of the communicability and seriousness of the disease.

Do not begin mercurials until you have put the mouth in order and told the patient how to keep it so.

Never conclude that a former rash was syphilitic, without making sure that the patient was not taking the balsams at the time.

Although you may think of congenital syphilis whenever you see an opaque cornea, or "Hutchinson's teeth," you must never make a diagnosis of lues on either one alone. But both together with "rhagadic" scars, or early deafness, mean congenital syphilis and nothing else.

Always remember that a syphilitic rash may itch, though as a rule it does not do so.

Never fail to have good daylight in examining for skin lesions.

Do not forget that the earlier treatment is begun the more likely is cure to result.

Give not your sanction to the marriage of a syphilitic for *at least three years* after the termination of a full course of treatment—not then if "reminders" have appeared in the interval.

It is generally useless to persist in a therapeutic test if no improvement is evident after three weeks.

As a matter of routine give mercury with the iodid, and both with "606."

Remember that luetic lesions are made worse by alcoholic drinks.

Syphilitic otitis media (congenital) rarely, if ever, causes pain, but can and does cause permanent deafness, and of course, dumbness, if not promptly treated. Watch for it, and combat it.

Congenital syphilitic iritis comes on in the first six months and may leave the child blind for life before you notice it—watch for it, and be sure to use atropin.

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and the patient's condition be serious it is very dangerons to wait for the action of syphilitic remedies—much better do a decompression operation, and then exhibit your specifics.

Do not forget that epilepsy in a child may mean congenital syphilis.

Never be in haste to excise a testicle because of abnormal enlargement, but try antisyphilitic remedies first.

Remember that congenital lues may attack the testes early or late, and don't believe that it "always attacks the body of the testes alone."

Bear in mind that the more cachectic the patient the worse the prognosis, since these bear the treatment badly.

CHAPTER VI.

DISEASES OF BONES AND JOINTS.

SURGERY OF BURSÆ.

Remember that bursæ form under the skin wherever it may be exposed to remittent or intermittent long-continued pressure with friction.

Do not forget that an infected bursa does not heal readily after "incision and drainage" as ordinary abscesses do—the lining membrane of the bursa must be completely destroyed before healing can occur.

It is never good surgery to try to dissect out an acutely inflamed bursa or cyst.

Bear in mind that a goodly number of chronically inflamed bursæ are tubercular.

Don't forget the frequency of subacromial bursitis as a cause of stiffness of the shoulder and "deltoid paralysis."

Always remember that bursæ and ganglia near a joint may communicate with the joint—always examine in both flexion and extension, and try to reduce the cyst content into the joint if it be near where a bursa normally communicates with a joint.

Before you inject an irritant fluid into a bursa for

the purpose of obliterating it, be sure that the bursa does not communicate with a joint.

SURGERY OF BONES AND JOINTS.

Before you make a diagnosis of acute rheumatism or rickets in a child, be sure that you have excluded acute osteomyelitis.

Remember that the most common cause of acute, usually multiple, arthritis in infancy is pyogenic infection, and it generally, but not necessarily, follows some one of the infectious diseases.

Always remember that pus forming in the epiphyseal end of a bone, or pus under the periosteum of the epiphysis, will very soon invade the near-by joint.

You must operate at once if you make a diagnosis of acute osteomyelitis. If operation is refused get out of the case.

Never be satisfied with simply incising the periosteum even though it be "floating on pus." If you made a diagnosis of acute osteomyelitis before operation, you must open the medullary cavity of that bone, or your operation is incomplete.

In operating for acute osteomyelitis, do not forget that though you open the medullary cavity at what was the most painful point and do not find pus yet you must drain—you reached it early, before pus formed, and saved the patient from harm.

Be on the watch for metastatic abscesses after suppuration in bones and joints.

Do not forget that you must keep that bone wound open and packed if it is to heal from the bottom—granulating wounds in bone heal better if they are firmly packed.

Never forget the principle, "rest to the injured part," when dealing with wounds and infections of bones and joints, and don't forget splints to prevent fracture after opening for osteomyelitis.

In chronic osteomyelitis never wait for a sheath of new bone (involucrum) to acquire strength before operating.

Do not forget that in necrosis of bone it takes longer for the dead tissue to loosen from the living than in necrosis elsewhere. A good line of demarcation will not form in less than eight weeks.

Be sure to remove all the dead bone, and with the minimum of injury to the living, else someone will have to finish your task.

Bear in mind that in the young osteomyelitis of the shaft is not likely to extend beyond the epiphyseal cartilage and so infect the joint—be careful lest you be the cause of joint infection by injuring the epiphyseal cartilage while operating.

In chronic osteomyelitis of children always have a "Wassermann" and a "von Pirquet" made.

Remember that slight injuries over subcutaneous bone are likely to be followed by subperiosteal suppuration in certain individuals.

Bear in mind that the periosteum ends at the articular surface and is most firmly attached at the

epiphyseal line; therefore pus under the periosteum between these two points soon invades the joint.

Never forget that, if acute periostitis occur, and pus form under the periosteum, necrosis of underlying bone will soon follow. Do not wait for suppuration; make an early, free, and aseptic incision and drain.

You will sometimes find painful nodes on bones in luetics, and find that neither the pain nor the nodes disappear as if by magic under KI and Hg. Incise them, and scrape out their jelly-like contents.

Do not fail to investigate for malignant disease when a bone fractures with very slight violence; and remember that the malignant disease at the fracture site is either primary sarcoma or metastatic carcinoma.

Never be too hasty with your knife in fluctuating swellings in and around joints—aspirate first, and examine the fluid.

Do not forget that fluid in a joint is a condition to be treated surgically, no matter what the character of the fluid may be, or no matter in what disease the condition may arise, but bear in mind that surgical treatment is not always operative.

The injection of liquor formaldehydi in glycerin into infected joints is strongly advocated by Doctor John B. Murphy, instead of the present custom of drainage—it is too early for us to be dogmatic about it.

Always remember that most cases of chronic joint

swelling are due to tuberculosis and that the disease begins in the neighboring bone.

The very first and most important principle in the cure of tuberculous disease of joints is: *rest to the joint.*

If you make a diagnosis of "rheumatism" or "growing pains" and fail to exclude tuberculosis when a child complains of persistent pain in a joint, a judgment for malpractice is too good for you—ten years in the penitentiary should be the minimum.

Do not forget that, in tuberculosis of bones and joints of young people, if you make an early diagnosis and apply proper treatment, practically all get well without impairment of function.

In the old or debilitated or those with progressing tuberculosis elsewhere, do not trifle with tuberculosis of bone or joint—operate early where accessible, and be radical.

Do not be in a hurry to operate on early bone and joint tuberculosis in young people, even though effusion be present—never forget the great liability to secondary pyogenic infection, and this always makes a bad condition worse.

Do not inject quantities of bismuth, iodoform, etc., into joints without remembering that one *can* poison a patient with these remedies—don't use too much, and watch for symptoms.

"How long must the child wear the 'brace,' the 'jacket,' or the 'cast,' doctor?" is a question you

must often answer. In cases seen early keep the part at rest for at least one year after all pain has ceased.

When you apply a jacket or brace for a curvature or Pott's disease of the spine, be sure to warn the people that it is not to cure the deformity present, but to prevent it from getting worse.

Never forget that the very best way to rest the spine is to put the patient in bed, and remember that children have to be fastened in the recumbent position or they do not remain long in it at a time.

In tuberculosis of bones and joints remember that, try how you may, you are not likely to get rid of all the tubercle unless by wide and complete excision. This is rarely necessary. The great remedy is *prolonged absolute rest*. Never forget, however, that you can greatly aid Nature by even incomplete removal, when there is extensive disease, and by hygienic and dietetic treatment. They almost all get entirely well if taken in time, and treated properly.

In bone and joint tuberculosis be sure to try tuberculin according to the late methods of usage. If you fail to get results with tuberculin in the bone and joint tuberculosis of children, try that made from the bovine type.

But though you use tuberculin, be sure that you use the other essential measures as well.

The joints and bones of the lower limb can never be perfectly put at rest, no matter what appliance

(3) That your efforts may be followed by the "lighting-up" of an old quiescent tuberculosis.

Always grasp the bones near the joint, and proceed slowly.

Be sure to apply the ice bag afterward.

Never forget that rapid wasting is *never* seen in the muscles around a "hysterical" joint.

Before you make a diagnosis of tubercular disease in the swollen painless joint of an adult, be sure to examine the nervous system for tabes, syringomyelia, etc.

Always remember that after forty in many persons even normal joints become ankylosed if kept immobilized too long. Use massage and passive motion and prevent such a condition.

Joints are notoriously hard to drain. Be sure to apply the rule "drain at the most dependent part." Through-and-through drainage is better, but don't pass tubes or other drains right through; insert from opposite sides just within the capsule.

Never flush a joint with strong antiseptics—use nothing stronger than normal saline, and you will destroy the function of fewer joints.

Do not rub and scour internal surfaces of joints unless you want to promote the formation of fibrous adhesions.

Don't forget that sinuses near a joint often communicate with the joint.

Remember that a sinus always has a present cause—remove the cause, and the sinus will heal.

Never operate on a sinus without first injecting bismuth milk and "taking the x-ray picture."

Where many sinuses are found in the subcutaneous tissue, methylene blue, injected before operating, makes their excision easier.

Do not forget the possibility of "hemarthrus" before you make a diagnosis of sarcoma in the knee-joint.

Remember that syphilis attacks the joints in both the secondary and tertiary stages, and that the tertiary is the more dangerous.

CHAPTER VII.

FRACTURES.

No matter who you are, you can never become expert in the treatment of fractures unless you know osteology and myology better than the average.

You cannot always bring the upper fragment into line with the lower, but you can always bring the lower into line with the upper, and hold it there.

Always apply your traction in the line of the upper fragment.

See all fractures within eighteen hours after applying the first dressing.

Never give a patient morphin or other opiate after dressing a fracture.

Delirium tremens and pneumonia are serious complications in any fracture—prevention is better than cure.

Fat-embolism is predisposed to by improper fixation; fat patients with delirium tremens are the most liable to it—it will not likely happen after the fourth day.

When reduction of a simple fracture cannot be obtained or maintained, open operation is indicated—wire, stitch, peg, or plate.

Never put even a gloved finger into the wound when operating on fractures.

For the past few years some surgeons have been following (or trying to) the lead of Mr. Arbuthnot Lane, of London, and using plates very freely to properly "set" the fracture. If we should plate all fractures as some advise, we would have a great deal more operating (which has certain advantages); for one surgeon often puts them in, and another takes them out.

In hardly any other branch of surgery do aseptic technic and gentle care, combined with skill and speed, count for so much as in the operative treatment of fractures.

If you decide to plate or do other operation on a fracture, it is better to wait till at least nine days after the accident—much less danger of infection.

A *surgeon* finds the number on which he must operate forms a very small percentage of his total.

You cannot treat a fracture properly until you have made a diagnosis, and no diagnosis is complete that does not state the *displacement*.

You are more likely to know the displacement if you know the direction of the violence and the attachments of the muscles that control the fragments.

If you can do so, always use the x-ray after reduction; to do so before is advisable, but not so important.

Remember that in the presence of great swelling

even an expert without the x-ray cannot say when good reduction has been made; better wait for the swelling to subside before "setting" than to have a persistent deformity.

Next in importance to learning how to properly apply splints and dressings is to learn that better results can be obtained by using an anesthetic while you reduce and fix.

Confirm your diagnosis before you attempt reduction when your patient is anesthetized.

Crepitus is a valuable sign but should be the last one sought; it is often absent in:

(1) Impaction.

(2) Entire separation of fragments.

(3) Interposition of soft parts.

Pseudocrepitus may fool you—look out for tenosynovitis, osteoarthritis, and caries.

Always look at once for pulse below in fracture of the limb above.

For your own protection be sure that you know whether nerves were involved or not when you took charge of the case, and warn the patient. When discovered later, the patient attributes them to the treatment, and brings suit for malpractice.

Be certain to examine *all* the bones and joints in unconscious or shocked patients after accidents.

Always examine the neighboring joints in all fractures.

When dislocation complicates a fracture, reduce the dislocation, and then set the fracture.

Never place recent fractures in plaster of Paris or other permanent dressing, if there is much bruising of the soft parts.

If you apply plaster to a recent fracture, warn the patient that there may be swelling; and if so, you must at once remove it. Pain after the plaster sets means imperfect reduction; while pain coming on later means swelling, so that in either case you must remove the plaster.

It has been said "pad all bony prominences"—don't do it! Pad around the prominences so that there be no pressure on the bony part. Be sure to *pad* all *normal hollows* under your splints. Do not allow skin surfaces to come in contact with each other—pad and powder.

Never use absorbent cotton for padding.

Do not fail to apply a snug bandage from fingers or toes to the point of fracture in a limb—it increases comfort and prevents swelling.

Never bandage over the site of fracture.

Whenever you fear a stiff joint after a fracture, fix the limb in the position of greatest utility, and warn the patient.

Ischemic paralysis—"Volkmann's contracture"—is due to lack of blood supply to the part, and it follows tight bandaging, or tight splinting over recent fractures with ensuing swelling. The limb can be lost in twelve hours; be on your guard!

Children with simple fractures of the long bones sometimes develop osteomyelitis at the site of frac-

ture. Look for foci of suppuration elsewhere—gums, teeth, tonsils, middle ear, furuncles, etc.—and inquire as to their presence during the past month.

In all open fractures *use the mixed staphylococcus vaccines at once.*

In epiphyseal fractures give a guarded prognosis—growth of the limb may be interfered with, but not necessarily so.

In separation of broad epiphyses shortening is not likely, but irregular projection the rule.

Don't forget the value of passive motion and massage in preventing stiffness in immobilized joints and in all joint fractures. Begin not later than the second week.

In open fractures remember that drainage must be secured, the poison introduced must be removed. Never wash and scrub the interior of the wound, or flush it with antiseptics, hoping to sterilize it.

Remove what dirt you can with forceps and scissors. Trim off all lacerated tissue and take out spicules of bone likely to perish. If you must wash, irrigate with normal saline. Set the fracture—plate or wire if need be. Drain with strips of rubber-dam (dental rubber), laid to each recess and corner of the wound. Do not leave drains in place longer than forty-eight hours unless suppuration has ensued. Close the skin wounds, and reopen if temperature rises after twenty-four hours.

Primary closure of wounds in the soft parts has

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The first danger is pressure; the second meningitis.

Urotropin, grains 30–40, should be introduced into the patient's system as soon as possible, and the daily use of a like quantity continued till danger of meningitis is passed—it may cause acute nephritis; watch the urine.

If you do a craniotomy for fracture of the skull and find the dura intact and pulsating, do not open it.

If there is an extravasation of blood under it, the dura has a bluish color and does not pulsate.

Do not conclude that because it does not pulsate there is clot underneath—it may be elsewhere.

Always remember how easy it is to infect the subdural space.

The best instrument for making a small hole in the skull is the Doyen "fraise," or one like it.

Be sure that your bur-holes are not too far apart, or you will saw brain or membranes.

Do all you can to lessen cerebral congestion—use the ice bag, quiet, and darkness.

Prefer bromids to opiates.

Don't forget the value of venesection in the plethoric.

Never use forcible restraint.

The crosser the patient, the better the prognosis.

Do not forget that there are late sequelæ of fracture of the skull, and warn the people.

Have a competent neurologist in the case with you.

NOSE.

A bad result in fracture of the nose is a lasting advertisement. If you fear you are not able to cope with it, do not touch it.

An internal deformity is not so bad for you, but is really worse than an external one for the patient—it also gets worse with time.

An unnoticed hematoma of the septum will likely soon lead to perforation—look for it.

Once properly reduced, the deformity does not tend to recur.

Never try to set a fractured nose without a general anesthesia—Ether Rausch.

Always treat fracture of the nose as compound; the nasal cavity is almost always opened—use the precautions against infection.

The most serious complications are sinus infection, pneumonia, and meningitis.

LOWER JAW.

Fracture of the lower jaw is nearly always compound. If there are teeth, the wiring of the lower to the upper, both sides, is the easiest and best procedure.

Never use a general anesthetic while wiring jaws together—postanesthetic vomiting may kill your patient.

Be sure to keep the mouth as nearly sterile as possible.

Give the mixed vaccines at once.

Never remove a tooth unless it prevents reduction.

The old four-tailed bandage and box splint, modcled on the same pattern, are good agencies for increasing the deformity.

In case there are no teeth and the fracture is in the body of the bone, have a good dentist in the case with you, and try to apply an inside, or inside-and-outside, splint. If you are unable to maintain reduction in this way, wire or plate.

LARYNX.

Fracture of the larynx is generally fracture of the thyroid cartilage. For fracture here or in the hyoid bone, you may have to do a tracheotomy for edema of the glottis.

SPINE.

Always remember, before you attempt to treat a fractured spine, that the patient may die suddenly while you are moving him or applying a dressing—warn the people.

The higher the fracture, the higher the immediate death-rate, and the greater risk of death while reducing.

If all reflexes are lost, let there be no expectant treatment—operate at once.

Remember that the usual displacement is upper

fragment forward with flexion of the column at the point of fracture.

Bear in mind that there can be complete paralysis and no fracture, also that one may operate on a fracture with complete paralysis and find that the cause of the paralysis is inside the cord, and so, unrelievable.

A fracture can be present without complete paralysis.

If a paralysis comes on or grows worse after the accident without movement of the fragments, it is due to hemorrhage or edema.

The lower the fracture, the better the prognosis.

You never can tell how far restoration will progress, or, when once begun, when it may cease and degeneration ensue.

There is no way of telling unless you see the cord —and sometimes one cannot then tell—how much injury has been inflicted.

If there are no pressure symptoms, make no strenuous attempt to correct the deformity.

Watch that retention of urine does not occur, but do not catheterize more frequently than need be—every twelve hours will generally suffice.

Try to prevent cystitis—argyrol injection after catheterization, and urotropin internally.

Bedsores will appear and must be treated.

The question of operating is an unsettled one. Operation should never be attempted by an occa-

sional operator. In low fractures I favor early investigation when it can be done under good surroundings, and by an expert. Under other circumstances I advise suspension and fixation.—C.

RIBS.

Always examine all the ribs when called to a patient unconscious after an accident.

Be sure you are palpating the same rib in front of as behind the fracture—remember the natural slope, downward and forward.

If the patient cannot feel the crepitus and you cannot elicit it in the usual way, the stethoscope may aid you.

If you suspect a fracture treat as one.

Remember that pneumothorax may develop, and unless soon relieved, kill your patient.

Also bear in mind that, if pneumothorax persist, it is very likely to give way to pyopneumothorax.

Watch for signs of internal bleeding after even simple fractures.

You may fix the chest either with an adhesive swathe or plaster-of-Paris jacket.

It is certain that unless the adhesive goes at least two thirds around the chest it does little good.

Take off your fixed dressing at once, unless it immediately makes the patient more comfortable.

Always be careful about immobilizing the chest in elderly or emphysematous patients.

Be sure you do not mistake the crepitus of a normal interchondral articulation for that of a fractured rib—watch it in the 8th, 9th, and 10th.

When immobilizing the chest wall be sure that you do not immobilize the abdomen as well.

An adhesive swathe should extend at least 3 inches above and the same below the fracture, and be sure to put it on in forced expiration.

PELVIS.

Remember the most usual site—through the thyroid ring.

Always believe the urethra to be torn if there is bleeding from the urethra after the accident, and observe great caution in trying to pass a catheter.

Do not use a metal catheter if you fear the urethra has been ruptured.

In case of retention, after fracture of the pelvis with injury of the urethra, it is safer to tap the bladder suprapubically than to make many attempts to catheterize, but remember that you must operate anyway; so act promptly before the retention can do harm.

Watch for bleeding from the rectum, and be sure to palpate the pelvis either through rectum or vagina.

Never allow your patient to try to sit up or above all to try to walk within at least eight weeks after a fracture of the pelvis.

If you apply an adhesive swathe, be careful you do not apply it too tightly, and increase the displacement.

Do not attempt to treat a patient with a fractured pelvis without having him on a fracture-bed.

Coccygodynia is often traceable to kicks, etc., in the region of the coccyx—look for old fracture.

CLAVICLE.

Remember that in fracture of the clavicle in children no displacement is the rule—the fracture being subperiosteal.

It is easy to fail to diagnose a subperiosteal fracture—impaired function and local tenderness are always present.

An untreated fractured clavicle can cause acute wry neck and scoliosis in children.

Do not apply adhesive straps in the case of young children; they are uncomfortable, and the skin excoriates easily.

SHOULDER AND ARM.

Three things to differentiate in fracture at the upper end of the humerus: dislocation of shoulder, fracture of neck of scapula, and fracture of humerus.

In fracture of the acromion or neck of the scapula do not pad the axilla; it acts as a fulcrum and throws the head of the humerus outward, thus tending to separate the fragments.

Remember that, as the arm hangs by the side,

FOREARM BONES.

When both bones of the forearm are broken at the same level, and there is approximation of ulnar to radial fragments, take no chances of impaired function by treating expectantly, but operate, and plate or wire.

Even an expert may be unable to obtain perfect reduction and retention in a Colles' fracture, and deformity may persist—warn the patient.

Never immobilize the fingers for a Colles' fracture. A stiff hand after a Colles' fracture should be cause for a damage suit.

Take an articulated forearm and hand or look at the bones of the same, just after the muscles have been removed, and place the hand in straight line with the forearm bones. Observe that the backs of the radius, carpus, and metacarpus are nearly in the same straight line; and notice anteriorly a hollow above the lower end of the radius, below this a rough projection of radius and carpus, and again below this the larger hollow of the metacarpus. Therefore apply and fix the posterior splint first, and remove it last in treating the Colles', and don't forget to "cut out" for the head of the ulna.

If you *know how to apply* ordinary board splints, you will never use anything else.

Remember that ordinarily there is displacement in two directions in the Colles'—overcome both.

If there is much tendency to redisplacement in a

Colles', it is nearly certain that soft parts are interposed—reduction is incomplete.

Do not get the habit of calling any fracture in the lower half of the forearm a Colles'.

Adhesive strips at the proper points to hold your posterior splint in place are better than a bandage.

Always allow for swelling when you apply two splints.

FEMUR.

Never let your diagnosis be "only a contused hip" in old people, without a very careful and thorough examination to exclude fracture of the neck of the femur.

Never look for crepitus when examining for fracture of the femoral neck—lest you break up an impaction.

Remember that old and feeble patients, if kept in bed in fixed dressings, develop pneumonia or bedsores, or both.

Do not be in haste to advise operation for fracture of the neck of the femur in old persons. The death-rate is high. Many old people would prefer to live a while longer, even though they might have a permanent limp.

Watch the fracture in the upper third of the shaft. Non-union and vicious union occur so often here because few know the usual displacement or realize the importance of having the line of traction in the line of the upper fragment or near it.

Always have a support under the patient's mattress to prevent sagging at the hips.

Use coaptation splints (four), but first bandage the limb from the toes to the site of fracture.

Never attempt to set a broken thigh-bone without an anesthetic.

Bear in mind the danger of traction with the knee extended, when reducing or treating a fracture just above the condyles. The jagged upper end of the lower fragment is brought into contact with the popliteal vessels by the pull of the gastrocnemius.

The Hodgen splint is ideal for comfort, and those who know how to use it get good results with it—if you don't know it well or if you can't see your patient daily, do not use it.

PATELLA.

When the fragments are widely separated, there should be no question of the advisability of operation.

If you are doing surgery only occasionally, you should never operate on a *large* or *important* joint.

In all compound fractures the fragments should be held together by wiring or by 20-day catgut.

When there is not much separation of fragments, non-operative results are as good as, if not better than, the operative, but the operated cases get well sooner.

When you operate for a recent fracture of the

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only the "Best Dental Plaster," and keep it in a tight tin box in a dry place.

Use either gauze (coarse cheesecloth) or crinoline for the bandages—and don't have glue in the crinoline.

Work the plaster into the bandage, but never roll your bandages tight—always very loose.

Wrap your plaster-bandage in one or two thicknesses of soft paper—Japanese napkins—and tie loosely in bow-knots.

If you use the plaster named, kept as directed, put no salt in the water.

Always use a bucketful of water to moisten your plaster-bandage; in basins or bowls the water is often too shallow. Use cold water.

Put the paper-wrapped bandage into the water and do not squeeze it—when bubbles stop rising, it is ready.

Remember that if you have to cut a window you must reinforce at this point.

Do not use absorbent cotton under plaster. Use "raw cotton." The best of all is the glazed "sheet cotton," applied bandage-wise over close-fitting drawers or undershirt.

Never put a plaster-mold on the leg or thigh without anchoring it with adhesive or using a suspender; it sags as the limb becomes thinner and becomes uncomfortable, perhaps causing pressure sores.

When the ankle must be fixed in plaster, be sure

to let the plaster come well out on the toes, and thus avoid swelling of these.

In holding the limb in position be sure not to grasp the soft plaster so as to cause denting, and thus have spots of local pressure to cause discomfort or pressure sores.

Don't forget the scratcher under the plaster next the skin for the comfort of the little patient.

Remember that it is the business of the surgeon himself to hold the limb in proper position while the plaster is being applied.

CHAPTER VIII.

DISLOCATIONS.

Never attempt to reduce a dislocation of the humerus in an old person, without knowing the condition of the arteries. You can easily rupture an atheromatous or brittle vessel.

Always try to make the dislocated bone retrace its steps in reduction. Manipulation is much better than pulling.

After a humerus has been dislocated four weeks, it is dangerous to use much force in attempts at reduction. You'll injure vessels or nerves or break the surgical neck! Better to cut down and replace.

When you have failed in every other method and are going to try "*the heel in the axilla,*" be sure to first remove your shoe.

Don't forget that "the heel in axilla method" is the one for injuring vessels and nerves.

When the elbow is dislocated, the olecranon has always lost its normal relation to the humeral condyles—in the supracondylar fracture their relations are unchanged.

Do not try to reduce a dislocated elbow by forcibly flexing the elbow over your knee.

To reduce a backward dislocated elbow: increase

Dislocations at the hip are best reduced by manipulation. Locate the head, and the acetabulum; then remember the relation of the shaft of the femur to the neck and head, and reduction is easy.

If the deformity recur after reducing a dislocated hip—and it may be said after reducing any dislocation—suspect a complicating fracture, x-ray, operate, reduce, and fix. In case there be a fracture which favors recurrence of a dislocation, if possible fix the joint in such a position that there is no pressure on the broken part; otherwise you must use traction—therefore, in fracture of the acetabular rim with dorsal displacement, fixation in the Stimson position is indicated.

An epiphyseal separation at the lower end of the femur may be mistaken for a dislocation of the knee, and shortening may occur later. If you are not certain and cannot x-ray, be careful in your prognosis and treat as a fracture.

Compound dislocations are as dangerous with regard to sepsis as compound fractures, and are most often complicated by fracture. Secure reduction, drainage, and fixation, and expect a stiff joint.

If a dislocation be compound do not irrigate the joint-cavity or swab the joint-surfaces with strong antiseptics. Sterilize the neighboring skin, pick out all foreign matter with sterile forceps, and cut away devitalized tissue. If you must irrigate to get rid of fine particles, use nothing more irritating than warm normal saline—reduce, sew up rent in capsule,

without draining the joint, drain wound in tissues down to sewn capsule. Inject 10–20 cubic centimeters of 2 per cent formaldehyde in glycerin, and immobilize. Inject again after 24 hours, first aspirating if necessary. A third injection in two or three days if temperature rises will prevent infection and preserve the function of the joint.—John B. Murphy.

Do not forget that, whenever you have to drain a joint through and through, or where you use strong antiseptics in a joint cavity, you favor the formation of fibrous tissue and the lessening of the function of the joint.

If you are called to a dislocation which someone else has tried to reduce, look for pulse, and paralysis below the dislocated joint, before you attempt reduction; also test for fractures.

Be sure to guard your thumbs in reducing a dislocation of the jaw.

Let it be your practice as well in dislocations as in fractures to take an x-ray picture whenever you can; you will be surprised at the frequency of accompanying fracture.

UPPER LIMB.

Hand.—Dactylitis arising "idiopathically" in infauts is practically always syphilitic.

Always have the radiographic plate near by so that you may consult it frequently, when operating for foreign body in the tissues.

Never try to remove a needle or other elusive foreign body through a "linear incision at right angles to the long axis of the foreign body." Raise a flap that has for its center the site of the object sought. Should it not be found in the superficial fascia, raise another flap of deep fascia, and so on, till the object is reached.

Ever remember the value of fixation in all hand injuries and infections—the splint and the sling are the most important parts of the dressing.

Be sure to splint not only the finger, but the whole limb, if an injury or infection be more than very slight.

Do not forget that the deep felon causes no swelling at first; watch for the intensely painful, but non-swollen, finger—it means felon in the early stage. Look for the painful point, and plunge a narrow-bladed knife down to the bone at that point.

Never forget that scars should not be so placed as to be exposed to pressure, or so as to interfere with tactile sensation.

Bear in mind that failure to act promptly with felon means loss of at least the phalanx involved; the bone dies very quickly.

Look again at the anatomy of the hand. Remember the dangerous digits—little finger and thumb.

Be careful that you do not make a bad matter worse by opening through superficial suppuration into a synovial sheath—infection of the latter is sure to follow.

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Remember that infections spread easily along the tendons—along the flexors more easily.

In palmar abscess keep in mind the fact that there are three compartments.

I take this opportunity to say that the work of Kanavel on the Hand should be studied by every graduate in medicine.—C.

Do not forget that the strong palmar fascia prevents early "pointing" of pus under it.

Do not wait for fluctuation before incising for pus in the palm.

Local anesthesia—especially ethyl chlorid—is responsible for a great deal of the improper treatment in acute infections generally, and in those of the hand in particular.

When about to amputate for crushed fingers or hand in working-persons, never mind how it looks; save just as much as you can.

Remember that to be of most use the stump of a finger must have tendons to manipulate its most distal portion. If you amputate proximal to the tendon attachments, fasten the tendons to the stump.

When you operate on a hand or foot or anywhere, where skin and bone are not widely separated by soft structures, do not use thick material for ligatures or sutures. Use fine catgut, "O" or "OO," or fine silk—and do not tie large knots.

The tendons of the fingers are often severed. Never undertake to sew them unless you are sure you can identify them. Primary suture should be

the rule, and remember that tendons take about six weeks to heal properly.

Do not lightly attack a Dupuytren's contraction; remember they have a habit of recurring.

Remember the value of massage, passive motion, and dry-heat baths in limbering up stiff fingers, wrists, etc., after infection or long immobilization from any cause.

Be on your guard in putting on packs and compresses on fingers or toes. Remember that carbolic acid and lysol, etc., often cause gangrene and that alcohol in some persons does the same if covered with rubber or oiled silk, etc., while denatured alcohol even without the rubber or silk has been known to blister.

You will be consulted about certain non-traumatic contractures appearing in the hand—think of the muscular atrophies, injuries, or disease of the peripheral nerves, and disease of the central nervous system.

Wrist.—Ganglion of a tendon-sheath should never be ruptured subcutaneously—it may be tubercular.

Remember that tendon-sheaths, both flexors and extensors, are subject to tuberculosis. Never temporize. Clean and complete removal of the diseased sheaths, closure without drainage, and immobilization with early passive motion will bring good results. Also, use tuberculin.

Long flaps on the back of the hand often slough, and they are far more likely to do so if roughly

handled or washed on the raw surface with strong antiseptics.

A sprained wrist should be immobilized and x-rayed. Many a sprained wrist is a fractured carpal bone, or radius.

The saying that "a Colles' fracture always leaves persistent deformity" is a falsehood.

Do not forget if in doubt about whether to resect or to amputate that a resection is better than an amputation.

When you have pus in the front of the wrist, decide what relation it bears to the tendons before you attempt to open it.

Remember that the possibilities of its position in relation to them are three, and each requires a different method of attack.

If dealing with pus in the forearm, do not use through-and-through antero-posterior drainage, but pass transverse drains in front of or behind the tendons or muscles, or between them in the normal anatomical planes.

Do not forget the value of "Bier's hyperemia" in infections, acute as well as chronic, but do not rely on it alone. Use all other aids that you can with it.

Forearm.—Do not forget that there is a bursa between the radial tuberosity and the biceps tendon at the elbow, and that it sometimes becomes inflamed.

An unreduced "pulled elbow" will not much interfere with the function of the limb later in life, but if the patient be a female, the surgeon consulted will

LOWER LIMB.

Foot.—Pains in the feet and legs without apparent cause point to poor circulation or poor support.

A sense of pain or undue fatigue on slight exertion is an unfailing sign of lack of arterial blood supply—arteriosclerosis is the cause; if in one limb or if the patient be under fifty, think of syphilis.

All wounds, injuries, ulcers, and infections in the lower limb get well more quickly if the part is elevated and put at complete rest.

You cannot give complete rest to a lower limb and permit the patient to walk about at the same time.

Remember that as long as there is acute inflammation in any part a hot moist dressing is the best.

When you cannot give complete rest to a part or all of the lower limb, apply a bandage from toes as far as the upper limit of your fixed dressing.

When for any reason you must constrict a limb in its continuity, you should always apply a snug bandage from the toes as far as the point of constriction.

Always put the joint at rest when a wound, injury, ulcer, or infection is in its neighborhood.

Bear in mind that talipes equinus may be the first symptom of serious disease of the nervous or muscular system.

Watch for flat-foot in all cases of vague chronic pain in back, hips, thighs, knees, and calves, as well as in the foot itself.

Lay stress on exercise and massage for the weak calf muscles in treating flat-foot.

Do not attempt to put a brace or orthopedic appliance on a deformed foot or limb, unless you know well the mechanics of the causation of the deformity and the physiological anatomy of the whole limb.

Do not forget that, if proper treatment is begun early enough and persisted in, almost all cases of congenital club-foot will recover without operation; persevere in passive motion, manipulation, and massage, and use the "night shoe"—the child grows by night as well as by day.

Be sure to have the patient bear his weight on the foot when examining for flat-foot.

Remember that pain in the middle toes, without signs of inflammation, is a symptom of flattening of the transverse arch.

Do not fail to give the antitetanic serum at once in all punctured wounds of the foot, and also after all burns and frost-bites in the same region.

Remember that it is better to drain than to cauterize a wound which you suspect to be infected. If a punctured wound, enlarge the wound and insert a loose drain to the bottom of it. Rest and elevation are the other essentials to rapid healing.

You may have difficulty in controlling the bleeding when the plantar arteries are cut. If to ligate the bleeding ends would require a long incision where weight is borne, and you cannot control by packing, ligate the posterior tibial at the ankle. Never by

choice make an incision where the scar will be exposed to pressure, and do not ligate the bleeding ends if you expect the wound to suppurate.

Chilblains are nearly always an expression of poor general circulation; improve both local and general circulation while giving temporary relief.

In patches of local eczema in foot or leg think of syphilis; of general eczema look for circulatory or constitutional cause.

Remember that the etiology is the same for both "hard" and "soft" corns—shoes.

Always bear in mind that a soft corn of long-standing is prone to become malignant.

Do not forget that a bursa forms under a corn or callosity long exposed to pressure, and that this bursa often suppurates, and that it must be treated like an infected bursa elsewhere if it is to get well quickly.

Never confuse "perforating ulcer of the foot" with a suppurating corn or callosity.

Bear in mind the sites for perforating ulcer—points of greatest weight-bearing.

Never be satisfied with a diagnosis of "perforating ulcer" or "trophic ulcer," but find the cause—the ulcer is always a symptom.

Even though it be a perforating ulcer, remember that it must be treated surgically. Pare the hard edges back to good living tissue, keep clean, and remove all pressure while treating the cause.

Caution all elderly persons against paring corns

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never fail to apply a dressing that will maintain the restored arches in their normal position.

Remember that tuberculosis is prone to attack the cancellous structure of the bones of the tarsus, and more often in adults. Unless you act promptly, it will soon involve the extensive synovial cavities, and the foot will be lost. Make the diagnosis early, and remove the focus, or the bone, lest you have later to remove the foot.

Bear in mind that tuberculosis of the bones in children has a better prognosis than the same disease in adults. Use tuberculin in conjunction with your other measures.

Bear in mind that pain about the tendo Achillis may be a sign of gout or overexertion, and also that there is a bursa between the tendon and the os calcis.

If the tendo Achillis be torn from the point of insertion, operate; but if the tendon rupture in its continuity, good function may follow fixation with the knee flexed and the ankle extended (plantar flexion). Do not permit use of the tendon for eight weeks.

Do not be in a hurry to incise multiple, red, painful nodules in and under the skin of the legs—it may be erythema nodosum.

Painful nodules on the bone near the crest of the tibia should warn you of syphilis. If they do not soon yield to antisyphilitic treatment (and as a rule they don't), incise, scrape out, and dress antiseptically.

Don't forget the favorite site for gummata (cutaneous and subcutaneous)—the outer side of the leg near the knee.

Never massage a limb in which there are varicose veins without being sure that no phlebitis is present.

Pay especial attention to trivial wounds in the lower limbs of those with varicose veins—ulcers readily develop.

When you find acutely inflamed areas arising spontaneously in the legs of persons with varicose veins, think of thrombophlebitis.

Do not forget the favorite site for the varicose ulcer—the lower inner side.

You will have far more success in treating chronic ulcers of the leg if you will first take the pains to make a correct diagnosis, naming the cause.

Watch out for those peculiar round deep ulcers on the legs, calves chiefly, of girls about puberty; and don't make a diagnosis of syphilis till you have excluded Bazin's disease.

Never fail to make a section and examine microscopically for carcinoma, when you are consulted for an ulcer with a "rampart" border.

Remember that an irritable ulcer has nerve-endings exposed in its floor. Locate the sensitive points with a probe, and apply pure carbolic acid to them.

Do not apply a dressing that will cause pain or discomfort in an ulcer—the patient removes the dressing, and consults another surgeon.

When you "strap" an ulcer with adhesive, be

sure you do not have too much tension on your straps —even "Z O" plaster may cause blistering when so applied—and *always leave apertures* through which secretions may escape.

Do not forget that secretions from an ulcer can cause an eczema in the neighborhood, and that an eczema may cause ulcers in the leg.

Beware of attributing all chronic ulcers of the leg to syphilis.

Ulcers whose bases are adherent to unyielding deep structures, e. g., those over the inner surface of the tibia, do not heal readily because the base cannot contract in the usual way—undercut.

Always remember that any chronic ulcer with hard tight indurated edge can never heal until the edge is either loosened or removed.

Never advise amputation for ulcers until skin-grafting has failed, unless you are dealing with ulcer of malignant type.

There are two types of sarcoma common in the lower part of the thigh or at the knee which do not call for amputation of the limb: one grows from the fascia or periosteum, and one from the bone—the fibrosarcoma, and the myeloid or giant-celled sarcoma.

Open abscesses in the thigh early, and *keep the part at rest.* Once the pus spreads among the muscles, drainage is difficult. Pus burrows along the vessels and along the intermuscular septa.

Pus in the popliteal space may be evacuated in

CHAPTER IX.

AMPUTATIONS.

Never do an immediate (primary) amputation if the patient be already suffering from shock.

In amputations about the hand, the rule is to save just as much as you can; in the lower limb leave the most useful stump.

Never, if it is possible to avoid it, have the scar where it will be exposed to undue pressure.

When you amputate through a phalanx, be sure that the tendons, both flexors and extensors, are attached to the proximal portion of that phalanx, so that the patient may have control over it.

If the tendons have a normal attachment to a phalanx, it is needless to stitch them to the periosteum of that phalanx, or to each other.

Always bear in mind that the thumb is the most useful finger.

Do not forget that the removal of a metacarpal bone or of its head very materially weakens the hand.

Handle all flaps with exceedingly great care; do so especially in those suffering from arteriosclerosis.

Never direct the edge or point of your knife toward the skin when dissecting up a flap, but always

keep your blade parallel to the skin, and at least a quarter of an inch from it.

Be sure that no flap ever has a sharp corner.

Do not fail to round off sharp corners or edges after sawing the bone, especially where the bone end comes close to the surface.

It is quite unnecessary to cover the end of the bone with a flap of periosteum.

Remember that your saw may so heat the bone as to cause death of a thin layer of the same near the sawn surface—dead tissue favors suppuration —or that the wound may reopen later to discharge a sequestrum. Use cool saline as you saw.

It is said—mainly as an excuse for lack of surgical skill, or anatomical knowledge—that it is not necessary to learn to amputate as our fathers did with speed and accuracy, following a well known definite technic; that we may use an ordinary scalpel and proceed leisurely, dissecting carefully each structure. This, I do not agree with; the less handling of the tissues the better.—C.

Guard your Esmarch, especially in thin persons and in the arteriosclerotic.

Never fail to allow at least one third for shrinkage of your flap.

Be sure your flaps are so cut as to favor blood supply—the short flap on the side less well supplied with blood.

Always make due allowance for growth of the bone in amputations before epiphyses have united.

Do not try to exsanguinate the limb when you are about to amputate for malignant growth, or when you have reason to suspect thrombosis of any of the veins therein, large or small.

Do not forget that after a disarticulation the artificial limb applied does not permit of motion at that point (joint).

You must amputate for malignant disease of bone, unless that disease is myeloid sarcoma, and when you do so, a disarticulation is indicated as a rule.

It has often been said that "any kind of leg is better than an artificial leg"—this is not so. A limb may be saved and require removal later because of inconvenience or discomfort.

Most of the discomfort in wearing artificial limbs arises from: first, amputations at improper sites; second, amputations improperly performed; and third, improperly made or improperly applied artificial limbs.

In amputating for arteriosclerotic gangrene, remember that you must go high enough up to get vascular flaps; otherwise your flaps will become gangrenons.

Do not dissect up skin-flaps in amputating for arteriosclerotic gangrene; that is to say, do not perform a circular amputation.

In the event of ensuing suppuration it is comforting to know that you have used absorbable sutures and ligatures.

If you must disarticulate at the hip, and are not

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Never be too proud to cut another inch or so from the bone if you fear your flaps are too short.

Amputations following accidents have the highest mortality, probably because many of them are done while the patient is in shock.

You can prevent spasmodic contractions of the muscles in the stump by a snug bandage applied from above downward, and then put the part on a splint in a comfortable position.

CHAPTER X.

VASCULAR SURGERY

ARTERIES.

Aneurysm of the aorta is a *noli me tangere* in regard to radical surgical procedure—not that one may not operate, but so far, no operative procedure has been of benefit to the patient.

Never try to cure an aneurysm by thrombus formation in the presence of suppuration in any part of the patient's body—yellow softening in the clot is apt to follow.

Matas' method seems to be the best radical procedure for the cure of aneurysm.

Complete excision of the sac is also successful in small aneurysms, but is not possible without danger of great damage to the collateral and return flow in large aneurysms. Ligation above and below (Antyllus' method) is often followed by cure, but permanent cure is not likely to result if any large branches come off at the site of the aneurysm.

Obey the rule in ligating—"pass the needle from the vein."

Do not forget that acute inflammation (infectious process) causes the walls of vessels in the neighbor-

hood to soften and become so friable that they break very easily.

Suturing of arteries is nowadays quite common, and to acquire skill therein requires considerable practice. Don't wait to acquire it on your operative cases. You will probably be quite old before you have success if you do—again go to the lower animals, practice, and be ready.

Bear in mind that the intima must be protected from the air while you work.

Always be sure that your suture is not exposed to the blood-stream.

Do not have any raw surface exposed within the vessel—intima to intima is the rule.

If there is any bleeding at the suture line, a "whip-over" stitch will control it.

If an embolus lodge in an accessible location, and collateral circulation is not re-established within twelve hours, operate and remove it.

If, soon after the lodging of an embolus in an accessible location, you have reason to believe that thrombus is rapidly filling in the vessel above, operate at once.

After you have opened the vessel at the site of embolism, if you think that there still remains clot lower down, go to the end of that artery, insert a cannula, and flush upward with normal saline.

Never ligate the main vessel of a limb at or above a point where there is an acute infectious process involving the deeper structures. The exudation and

below the point of ligation or embolism of a vessel, to wrap in dry sterile dressings, to swing in a cradle, and to apply external heat.

In terminal ligation be sure to tie both ends of the divided artery.

The best ligature material for small vessels is catgut—plain, sterile No. O, Bartlett process.

Always use as thin a ligature as seems consistent, and never pull and jerk as though you were reefing a hawser—it takes very little strength to occlude an ordinary vessel and break its intima.

Remember that large knots are slow to absorb and may be discharged from a wound a month after healing has occurred.

Tie no more of the small arteries than those which bleed on the removal of clamps at the end of operation.

Twisting is not much used at present; it is just as safe as tying, when properly done. One can tie more easily and quickly, but proper torsion is preferable, as it leaves less foreign material in the wound—learn it.

Loss of blood *must not occur!* If bleeding occur slowly, a patient may lose one half of his total quantity and recover. If lost rapidly, the loss of much less than one half may prove fatal.

Always remember that loss of blood predisposes to infection.

Beware of "delayed" or "secondary" shock, and suspect hidden hemorrhage.

Never give stimulants until you have secured the bleeding point.

The best stimulant after checking the hemorrhage is normal saline by subcutaneous, intraperitoneal, intravenous, or rectal injection.

Never use strychnin, digitalis, or other poisons hypodermatically after hemorrhage.

Don't use intravenous saline unless certain that all bleeding points have been controlled—you may wash the remaining blood out of the vessels otherwise.

VEINS.

It is far more important to know when not to operate on veins than to have all the technic.

Never operate on varicose veins in the presence of acute phlebitis or periphlebitis.

Before advising the removal of the internal saphenous vein for the cure of varicosities or ulcers in the leg, be certain that its valves are incompetent and that the deep veins are functionating properly; otherwise the operation will fail to cure but will make the condition worse.

If in operating you accidentally tear, cut, or puncture a large vein, don't forget to quickly put your finger on it, save the blood, and don't get excited—a stitch or lateral ligature will usually close it.

When operating to remove deep-seated growths, whose removal may necessitate injury to or occlusion of the deep veins of the part, be careful when going in not to injure any of the superficial veins.

CHAPTER XI.

SURGERY OF THE HEAD.

Never be in a hurry with your good prognosis in even apparently slight head injuries.

Do not fail to shave far enough from the edge of the wound to enable you to cleanse it properly.

It has been said .“in case of injury to the scalp, the whole head should be shaved”—this is rank foolishness. Exercise judgment. I for one would be in favor of fining a man who would shave a woman’s head for a trivial scalp wound.—C.

Never shave “against the grain” or use strong antiseptics or too much friction in cleansing a scalp. To do any or all of these is to court infection of the skin, and you may want to do a craniotomy on the same head in a few days.

In all contused wounds fear a fracture. If the skin is lacerated at the same time, cut down, and look for one.

Do not scrub and maul the tissues when trying to remove the dirt from a wound, and avoid strong antiseptics. Use forceps, scissors, and saline spray.

Never close a lacerated wound here or elsewhere without drainage.

Remember that scalp flaps do **not** readily slough.

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Bear in mind that seemingly trivial injuries to the head may be followed even many years after by subdural abscess at the site of the injury.

If you suspect cerebral abscess, you should act promptly in the acute cases.

A subnormal temperature with the usual symptoms of pressure should warrant a diagnosis.

Remember the influence of otitis media as an etiological factor in both acute and chronic abscesses of the brain.

After all compound fractures and before and after all serious operations on the head or face give the bacterins and urotropin.

Do not forget that the skull may be fractured with very slight violence. Watch all head injuries for fracture symptoms.

Patients brought in drunk or comatose with signs of head injury but with no other sign of fracture should have lumbar puncture done at intervals until the diagnosis is cleared up.

Never operate on the skull without having the blood-pressure watched throughout, and *don't wait to finish* if it get very low.

The first thing to do after you have made a diagnosis of intracranial neoplasm is to give the patient large and increasing doses of potassium iodid with mercury, and have a Wassermann done if possible.

Don't wait longer than three weeks for signs of improvement under antisyphilitic treatment.

Remember that an intracranial growth may not

disappear under the iodid of potash, and yet be syphilitic.

In the removal of intracranial tumors a two-step operation will often be followed by success, where an operation completed at one "sitting" would have ended fatally.

Don't forget that bromids and iodids cause pustules, and never, if you can avoid it, open a cranium in the presence of eruptions on the scalp.

Always exclude the anesthetist and his assistant by a screen.

Remember that loss of blood and hammering on the skull both increase the shock.

If you are a slow operator, you must take more than ordinary precautions to guard against shock and infection.

No part of the human body is so easily infected as the subdural space.

A strip of gauze laid in a wound of a venous sinus usually arrests hemorrhage without any trouble. Gauze placed between the dura and bone will also control bleeding from a small meningeal branch that one cannot tie.

"Small bits of fresh muscle laid on the bleeding points will often control hemorrhage from the subarachnoid and pial veins."—Cushing.

Gunshot wounds penetrating the brain are not necessarily fatal. If the patient be slowly dying of increasing intracranial pressure, it is your duty to operate.

Whenever you have to deal with an intracranial condition, do not fail to examine the fundus oculi.

If for any reason you decide to do a spinal puncture in the presence of high intracranial pressure, remember to keep the patient's head lowered while so doing. Sudden death has occurred during the procedure, presumably because of the pressure above having forced the cerebellum and pons hard down on the medulla, or through the forcing of all three into the ring of the foramen magnum.

A patient about to die of intracranial pressure due to brain tumor may sometimes have life indefinitely prolonged by the decompression operation. It also relieves the severe symptoms.

Never be too favorable in your prognosis after any operation on the brain.

Always give the patient the benefit of an operation if epilepsy or insanity have developed after a head injury.

Never probe about, looking for pus in a hernia cerebri. To do so is to court death from meningoencephalitis.

Remember that patients after operation on the cranium or cranial contents often act a great deal like many of those with fracture of the skull. The treatments for the two conditions are somewhat similar.

Always give plenty of water.

Always give urotropin.

Always keep up the nutrition of the patient.

teeth—the pus sometimes points far from its original site.

The neck is the ideal place from which to get flaps to repair defects in the lower part of the face. Be sure the pedicle is not constricted, and be sure to leave enough of the subcutaneous tissue attached to all flaps.

Don't miss the diagnosis of "noma." Remember that it begins inside, while carbuncle begins in the tissues of the cheek, and anthrax on the outer surface. Any one of the three is about as serious a condition as you can come in contact with.

Facial erysipelas is more common than erysipelas elsewhere. Erysipelas always makes a change either in the temperature or in the pulse, or in both most often.

Beware of confounding angioneurotic edema with erysipelas.

Don't forget the kind of erysipelas that kills most rapidly—the facial type with low fever and rapid weak pulse.

The lip and the tissues around the eye of the child, normal on retiring, are often seen swollen, painless, and edematous next morning—look to the digestive functions or to something eaten for the cause, angioneurosis.

NOSE.

Syphilitic ulceration on the end of the nose has often been labeled "lupus" or "tuberculosis." If in doubt, do a Wassermann.

In serious nosebleed don't fool away time with applications or in trying to "catch the bleeding point." Plug the nares anteriorly and posteriorly, and do it effectively. We have heard a good deal about "catching the bleeding point," and of "applying the cautery to the bleeding point," and have seen some who recommend it resort to plugging the nares. When you remove the packing, be prepared to plug again if need be.

Don't forget the ligatures on the plug for the posterior nares—one out through the nose to pull the plug in, the other out through the mouth to remove it, must be left long and tied together.

In nose-bleeders be sure to examine chest and kidneys.

Always think of a foreign body in the nose, when a child has a foul discharge from one nostril.

Be sure you try to lessen the flattening of the nostril when you operate on harelip.

Remember that acute inflammation of the antrum, and of the air-sinuses generally, will nearly always get well under proper treatment without operative procedure.

For "deflected septum" no treatment seems to have given so much satisfaction as the "submucous resection"—the danger is destruction or necrosis of the mucoperichondrium.

When nasal polypi exist, and the more so when they recur after removal, make sure that there is no underlying bone or sinus disease causing them.

Watch out for polypi in the nasopharynx. There is one—the fibrous—which grows from the base of the skull in patients from 14 to 25 years of age, and it is sarcomatous. Attack it early, and completely remove it. Be careful in your prognosis, and use Coley's fluid. They sometimes get well.

EYE.

Always look for a foreign body when examining an inflamed eye, whether there be a history of such or not.

Never try to remove a foreign body from the cornea without cocainizing.

In "idiopathic" occlusion of the nasal duct, think of syphilis.

Never forget to protect the good eye in gonorrheal conjunctivitis.

Do not fail to instil argyrol (10 per cent) in the eyes of the new-born babe, if you even suspect that the mother (or father) has had gonorrhea.

Remember that ophthalmia neonatorum untreated for 24 hours may render the child blind for life.

Familiarize yourself with the appearance of the normal fundus—would you send for a heart specialist to feel a normal pulse?

Remember the danger of meningitis in infections of the orbit.

Always think of intraorbital and intracranial tumors when a patient complains of double vision.

Do not make a diagnosis of stye in inflamed chal-

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glaucoma in a patient, or if glaucoma already exist, and you give something to dilate the pupil, you will very likely destroy the eye quickly and completely; bear this in mind always, but the more so when dealing with patients over fifty.

There are three common diseases of the eye, which treated well and early leave little or no sign, but which if untreated or improperly treated soon cause blindness: gonorrheal conjunctivitis, acute iritis, and acute glaucoma. Woe unto you if you fail to make a diagnosis, or making a diagnosis fail to secure the best expert services available.

Never put a leech to a black eye.

Remember that the antiseptic in your wet pack may destroy the conjunctiva—use very mild antiseptics or normal saline.

EAR.

Don't get excited about a foreign body in the ear.

Be calm and gentle in trying to get it out, else you may rupture the membrane or even kill your patient in trying to remove it.

Never forget that only insects and vegetable substances are likely to do early damage. If water is likely to cause the foreign body to swell, try syringing with olive oil.

Always be in haste to puncture the membrana, if it is tense, in acute otitis media—carry the special instrument devised for the purpose.

Don't make light of a discharge from the middle

ear—nothing is more serious than mastoiditis and intracranial abscess.

Never be lulled by the fact that the discharge has ceased while there is discomfort in the postauricular region—it frequently ceases when antrum invasion supervenes.

Do not forget to examine the nose as well as the nasopharynx in all cases of middle-ear trouble. Treatment of the nose will often cure the ear.

Remember that lateral sinusitis can develop from even a slight serous otitis media.

Bear in mind that the membrana is nearly horizontal at birth and that there are no mastoid cells before puberty, although the antrum exists at birth.

Unless you are trained in cranial surgery, and experienced in neck operations, you have no business to attempt any operation for mastoid or antrum diseases.

Don't forget that an aural polyp means most often dead bone in the middle ear.

Always think of foreign body in chronic discharge from the ear.

Never use force in removing impacted "wax." Get what you can today, and remove the rest after softening it.

When, without apparent cause, a child's face, neck, head, or even whole body becomes covered with scabs and sores, look in the ear for the original source of the pus infection.

Watch out for congenital syphilitic otitis media in

infants and young children—failure to recognize and treat it is responsible for a great deal of deaf-mutism.

MOUTH.

Repair a harelip as soon as you can get the baby—the earlier the better.

No one ever uses "pins" nowadays; take off the strain by means of the mattress suture (subcuticular) and the 8-shaped adhesive strip, or use lead plates.

Do not fail to loosen the lip from the jaw before sewing.

When "cleft-palate" complicates, push the bones together and wire "à la Brophy." If bilateral never throw away the premaxilla.

In these cases you'll not have success, if you do too much at one time.

Always tell the people that several operations may be necessary.

Never neglect a chronic sore on the lip. If it resists antisyphilitic treatment, insist on a microscopical examination of a section from it. Death from cancer of the lip is unnecessary.

Any operation for cancer that does not remove the regional lymph-glands as well as the primary growth can give no hope of cure.

Always remove causes for irritation when treating any sore about the mouth.

A diagnosis between syphilis and malignant dis-

against the roof of the mouth and then backward into the pharynx, closing the larynx.

Relieve this pressure and open the focus of infection, by cutting through the mylohyoid from the outside. Act promptly; the disease is a very dangerous one.

By macroscopical appearance alone you cannot tell whether you have to deal with a fibrous epulis or a giant-celled sarcoma.

Remember that a fibrous epulis will recur unless you completely remove the peridental membrane or periosteum from which it grew. It is better to remove that portion of the alveolar process completely.

Do not forget that a giant-celled sarcoma is not a very malignant affair. It will likely not be necessary to remove a section of the jaw, for one growing on the gums.

Carcinoma attacks the gums frequently enough. It often begins behind the last molar tooth; therefore always be suspicious of chronic sores on the jaws.

Never make a diagnosis of sarcoma of the jaw without noting whether any of the teeth have failed to erupt, or without taking an x-ray picture.

Rough jagged teeth have a habit of causing ulcers on the adjacent tongue or cheek, and cancer is prone to develop in such ulcers. Therefore look well for cause of irritation in chronic ulcer, and remove it; and always remember that even a seemingly trivial abrasion can be the point of origin for cancer.

It is not likely that radical measures will ever be necessary in treating tuberculosis of the tongue or palate, as there is usually advanced tuberculosis in larynx and lungs in these cases.

Even so simple an operation as removal of the tonsils has a death-rate. Never make light of it, and never do it except where you have at hand conveniences for treating patients for postoperative shock or hemorrhage.

Up to date, we have had many methods advocated, but that of Sluder is so simple and certain (in the hands of those qualified to *do* surgery), that it seems to be the best of all thus far described.

Remember that adenoids are removed when found, but tonsils when they cause trouble.

Never be afraid to put your finger into the child's pharynx when looking for adenoids, and also to do it as a matter of routine immediately after you have scraped them out.

Don't dally with applications to control bleeding after the removal of tonsils. If the bleeding be serious, either apply a tonsil hemostatic forceps or else anesthetize the patient, and take a stitch or two from one pillar to the other under the bleeding surface.

Remember that the tongue sometimes becomes acutely inflamed, that swelling takes place very rapidly, and that acute swelling of the tongue is always a serious matter. Also the tongue becomes acutely edematous in angioneurotic disturbance, without inflammation. One must act promptly. If

breathing is interfered with, do an intubation; but if this is not immediately feasible (and it will not be) and there is danger, do a tracheotomy.

When you find wounds of unknown origin on tongue, cheek, or lip, think of nocturnal epilepsy.

Do not use a sharp scissors for cutting the frenum linguæ.

Bear in mind that the fissured tongue and the tongue bearing leucoplakic areas are the tongues most often attacked by carcinoma, and do not forget that syphilis, smoking, spirits, and spices are very frequent causes of leucoplakia and fissuring.

Though leucoplakia be caused by syphilis, it cannot be cured by KI and Hg., any more than can tabes dorsalis—try salvarsan.

Whenever you find the tongue infiltrated and thickened, and almost or quite fixed in the floor of the mouth, think of syphilis, and fear carcinoma or sarcoma.

Bear in mind also that a streptococcus infection can be of very long duration and cause a very dense and widespread infiltration—woody phlegmon.

Remember that lymphatics cross the median line over the back part of the tongue.

Do not forget that carcinoma may begin well back in the paralingual sulcus, and give a great deal of pain over the fifth nerve or parts of it, long before the patient is aware of the presence of a sore.

If a carcinoma in the back part of the mouth be

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A salivary fistula will nearly always close if an opening be maintained between the duct and the mouth proximal to the fistula.

Whenever you must open an abscess inside the mouth, nose, or pharynx of a child, never allow the pus to gravitate toward the larynx—even completely invert the patient if necessary, but usually the Rose position will meet all requirements.

An acute retropharyngeal abscess is never tubercular.

Foreign bodies lodged in the pharynx or upper esophagus may kill by suffocation. Bear this in mind, and don't work too long trying to remove the foreign body. If the patient's condition be serious, do a tracheotomy, and then remove the foreign body at your leisure.

Always remember the possibility of cervical caries as a cause of retropharyngeal abscess—and open such an abscess from without if possible.

The esophagoscope and bronchoscope in skilled hands have obviated many operations and saved many lives—but in unskilled hands they are dangerous weapons.

CHAPTER XII.

SURGERY OF THE NECK.

Never neglect or think lightly of a stab wound in the neck.

When there is arterial bleeding in the upper part of the neck after stab wounds, it is safer to ligate the external or even the common carotid.

Remember that, if you ligate the external carotid too close to its origin, the clot which forms on the proximal side of the ligature may be loosened and forced through the internal carotid to the brain.

When you ligate terminally large veins or arteries in stab or other wounds, bear in mind that if the wound suppurates there will likely be a secondary hemorrhage after five or six days.

In cut throat be sure to remove all shreds that may be hanging into the trachea, before you suture the trachea—swelling of these, if left, may interfere with respiration.

Use only absorbable sutures when sewing deep structures in an infected wound in the neck or elsewhere.

After cut throat close the deeper structures with drainage, but if the trachea was opened, don't close the skin wound.

If, after treating a cut throat, you notice cellular emphysema developing, you may be sure that the wound in the trachea is not closed. Either close it at once or remove all the sutures in the structures over it, that the air may not be forced far and wide into the tissues.

Never forget that fractures of the laryngeal cartilages and wounds of the epiglottis or arytenoids are very serious. The nearer to the cords, the more serious the injury—if there are signs of emphysema or obstruction, do a tracheotomy at once.

In all cases of dysphagia or dyspnea of unknown cause in infants and young children, look in the pharynx for retropharyngeal abscess.

In all cases of sudden dyspnea in infants and young children look for foreign body in larynx or pharynx.

Always hasten to remove foreign bodies from the respiratory tract.

Never invert the patient for foreign body in the trachea or bronchi unless you are at once ready to do a tracheotomy if the foreign body become lodged in the glottis.

The bronchoscope properly used is the best instrument with which to remove foreign bodies from trachea or bronchi.

Be sure that a foreign body allowed to remain in a bronchus will cause trouble, and perhaps death later.

Open abscesses in the neck by Hilton's method—i. e., incise the skin, and then force a blunt artery

Before you make a diagnosis of branchiogenous cancer, be sure you search mouth, nose, and pharynx again for an overlooked primary carcinoma.

Never lightly attack small tumors in the parotid or submaxillary region. Tumors arising in these glands are deceptive, and often seem to be merely lying in the subcutaneous tissue—you may have to remove the whole gland or a large portion of it before you get through.

Be very careful in your prognosis of salivary-gland tumors.

GLANDS.

Never fail to examine the mouth when consulted for enlarged glands in the neck.

Do not forget that the favorite site for syphilitic enlargement is the posterior triangle, and for tuberculosis the anterior.

Remember that the lymphatics of fauces and naso-pharynx, and back part of tongue, cross the median line, and thus for the deep glands the focus of infection may be on the other side of the median line.

Bear in mind that glands sometimes become enlarged without apparent cause and get well of themselves—the more rapid the process, the less likely tuberculosis.

Always have a thorough blood examination made in every case of chronic lymphadenitis.

When a diagnosis of tuberculosis of lymph-glands has been made, the proper treatment is complete re-

moval first, and dietetic and hygienic measures later.

Never attempt the complete operation in the presence of suppuration or sinuses.

When treating a cervical abscess in children, never fail to exclude cervical caries.

Should you cut the thoracic duct, try to sew it at once; failing, be sure to ligate it.

Always drain after the radical removal of glands, but never change drains.

Do not get excited when you hear air sucked in through tissues—it does not always mean that you have cut a large vein or the pleura. Air may be so drawn through loose cellular tissue.

Press firmly on the part with a pad of gauze and prevent cellular emphysema.

Never cut structures while pulling on them.

Remember that you may, if necessary, remove a segment of the internal jugular on one side and fear no consequences—not so with the common or internal carotid artery, and yet, if the case demands it, remove these.

PHARYNX AND ESOPHAGUS.

When a foreign body lodged in pharnyx or gullet resists all your attempts at extraction through the mouth, it should at once be removed through the neck.

Never try to push such a foreign body down into the stomach.

Always use a sound in the gullet if possible, and

with it push the gullet up into the wound when doing a cervical esophagotomy.

Never use non-absorbable sutures when sewing up a wound in the esophagus.

Bismuth milk and the x-ray give a good deal of information about esophageal stricture or diverticulum.

Remember that gradual dilatation is very effective in treating stricture of the esophagus in children. It may be necessary to do a gastrostomy in order to sustain life while dilating the stricture.

The occasional passage of bougies should be continued indefinitely.

Never use force when attempting to pass a bougie through a stricture.

Do not pass a stomach tube without a gag between the patient's teeth, or without being satisfied that the patient has not an aneurysm of the aorta.

TRACHEA.

Always have ready and keep wrapped in sterile coverings a complete sterilized set of tracheotomy instruments.

In doing a very urgent tracheotomy, grasp the thyroid and cricoid firmly in your left hand, trying to work fingers and thumb behind them, and make a hole in the trachea. You can control the bleeding when the child begins to breathe.

When the case is not urgent, proceed with care, and control all bleeding before opening the trachea.

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Remember that cystic goitres and adenomata in the thyroid do not get well with internal medication.

A goitre that is causing pain should be at once removed if seen early.

Partial removal of the gland with a prolonged rest-cure afterward gives apparently the best results in exophthalmic goitre. Not every case of exophthalmic goitre will be cured by operation. Study each case with a physician.

The earlier the surgeon gets the patient the better the final result, and the less the danger of operation.

A preliminary ligation of one or more of the thyroid arteries in all bad cases is the rule.

The question of the anesthetic to be used is very important. Those who have the best results with the greatest number use ether; but it is given by experts, and very little is used.

Follow the technic of Kocher or Mayo, and the mortality will be very low.

Nowhere do skill and speed count for more than in operations on the thyroid gland, and above all in cases of exophthalmic goitre.

Remember that every drop of blood lost and every needless touch to gland or raw tissues count against the exophthalmic patient.

Always make your first incision long enough.

Do not cut the depressor muscles of the larynx and hyoid bone below the point where their nerves enter —keep well to their upper ends.

Get inside the capsule of the gland before you begin the enucleation, and watch that you do not tear it and get outside of it again.

It is very unlikely that you will injure parathyroids or recurrent laryngeal nerve as long as you keep within the gland-capsule.

Never permit bleeding, either from the gland or from vessels in the wound—catch before cutting, where possible.

Bear in mind that the trachea when compressed by the goitre is nearly always flattened from side to side and is often pushed to one side of the median line.

The pressure may have caused softening of the rings of the trachea, and one may easily tear a hole in it—if you do so, suture it with catgut.

Patients die soon after operation on the thyroid gland of heart failure, shock, hemorrhage, hyperthyroidism, and tetany.

Heart failure can be guarded against by preliminary ligation, getting the case early, preoperative preparation and rest, and proper anesthesia.

Shock can be lessened by speed and skill in operating, and by proper anesthesia.

Hemorrhage can be prevented by a skillful operator.

Hyperthyroidism can be diminished, if not altogether prevented, by skill in operating, speed, prevention of bleeding, no handling of gland or raw tissues, and by good drainage in all cases.

Tetany can be prevented by keeping inside the

capsule of the gland, and so avoiding the removal of the parathyroids.

Bear in mind that if you are obliged to remove the whole gland you must feed the patient on thyroid extract ever after to prevent hypothyroidism.

Even on thyroid extract young patients from whom the whole thyroid has been removed do not thrive for very long. Older patients bear the loss of their thyroids with less disturbance.

Always drain after removal of the thyroid or part of it.

Always advise the rest-cure after operation in exophthalmic goitre.

a strong supporting bandage encircles the chest."—B.

Patients with emphysema and bronchitis bear chest wounds badly—do not leave on adhesive or plaster of Paris in such cases, unless benefit is at once apparent.

Give no opium preparation in injuries of the chest if the sputum is thick and tenacious—rather give an expectorant and whisky.

Old patients are often made much more comfortable by lying on the injured side, but too long in one position begets pneumonia.

Always auscultate and percuss over the spot at which you are going to insert your needle immediately before puncturing in exploration or aspiration.

Always be on the watch for pneumothorax after all chest injuries.

In all effusions into the pleural cavities watch for displacement of the apex beat. The more it is displaced the more urgent the need of removal of the fluid, and the greater the danger of sudden death while doing so.

Never stick your needle through the skin—incise it.

Always turn the patient toward the side on which you are working. When this is impossible, place him either on his back or on his face. Never hamper the working of the sound side.

Be certain that someone is watching the pulse (better blood-pressure) and respiration, and never evacuate fluid rapidly or too much at one time.

The anesthetic often kills in thoracotomy. Always prefer to use local analgesia.

In children, or in very bad cases of empyema, it is much better to quickly plunge the knife through an intercostal space than to resect; one stroke does it, and that alone may be sufficient to cure—at any rate it will cause such improvement that a few days or weeks later you may resect without killing your patient.—C.

Always remember to stop aspirating if much pain is complained of or if serious coughing should occur.

Always be sure that your needle and all apparatus are in order before inserting—this may be shown by allowing a little sterile water or saline to be sucked up by it.

Be sure to open low enough—"drain at the most dependent point."

It is quite unnecesary to irrigate or to wait till all the pus runs out before inserting your tube. Place it, and apply your dressings—get the patient in bed.

Never insert a long tube. It should enter the cavity and go no farther, unless you are draining the posterior or anterior phrenocostal sinus through a lateral wound. Have it large enough and non-collapsible.

Always remember to anchor the tube. It is important that it should not come out, but far more unpleasant if it slip in.

Leave the tube in place as long as pus comes out through it—no need to keep changing it.

Always inject your old pleural sinuses with milk of bismuth, and x-ray before making your final diagnosis—they may communicate with the gullet or other viscus.

Insufflation anesthesia is better in intrathoracic operations. It should be attempted only by the well trained. Try it on the dog.

It is very thrilling—in the newspapers—to have sewed up a wound in the heart. The patients who get well after such surgical exercise would very likely not have bled to death had the cardiac wound not been sewed. It is usually sufficient to remove the clot from the pericardial sac, but if bleeding is going on, control it, and close the sac without drainage.

Never forget that the dome of the diaphragm rises as high as the fifth rib in front, and always look for wounding of the abdominal viscera in penetrating wounds of the thorax below this level.

BREAST.

Don't forget that mammary abscess occurs both early and late in lactation.

Avoid early lactation abscess by proper care of the nipples, and prevent "caking" in the early days; and never let the child nurse after nine months to prevent the late.

It does not matter much if you do cut acini and ducts, and it does matter whether you secure early

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It is well to remember that "chronic abscess" in a young woman may feel just like a hard solid growth. The same is true of "cyst."

Never coquette with a tumor in the breast of a female over forty.

Examine every benign growth microscopically after you remove it—don't cut out pieces for microscopic examination. Take it out before you even cut across it. It takes only a few minutes for a competent pathologist to say whether it is doubtful, and *if it is even doubtful, be radical.*

Do not dare to remove a curable carcinoma of the breast without at once removing all of the axillary glands, and never hesitate about removing the sternal part of the great pectoral muscle—a patient never feels the loss of the minor pectoral, and you'll do a better job if it is also removed.

Never forget when making your first incision that you must not injure the cephalic vein—you may have to remove a portion of the axillary vein before you get through, and if so, the cephalic becomes very important.

Do not amputate the breast and chest muscles first, and then "using the mass as a handle," as a surgeon (?) once advised, "mess over" and soil the clean tissue with it while removing the glands from the axilla. Get the glands first unless there is some good reason for not doing so.

Always prefer to have suppuration, and skin-grafting afterward, rather than recurrence follow-

ing neat approximation with healing *per primam*—cut wide of the growth.

I believe that the reason recurrence is rare after healing with suppuration is not because of the influence of the suppuration so much as that wide excision is more likely to have been done, and this favors non-recurrence and suppuration.—C.

Wide undercutting favors approximation mightily; but don't undercut too close to the skin, or gangrene will be sure to supervene.

If you swing a skin-flap, get it from the belly—less likely to have carcinoma cells in its lymphatics.

Always remember that a skin-flap must have good arterial supply and unobstructed venous return—one is of as much importance as the other.

Never make a poor prognosis to your patient, but to her friends the prognosis must never be favorable in carcinoma of the breast—the younger the patient, the worse the prognosis.

Always hasten to remove a benign growth from the breast—eighty per cent of all mammary tumors are malignant—and then hasten to have a competent pathologist say whether it is malignant or not.

Never bandage the arm to the side after removing the glands from the axilla. Dress it in the "Treves position" at right angles to the body. If you do so, you need never bother about "muscle-flaps to obliterate or fill in the axilla" or "lymphangioplasty for restoration of the obliterated lymphatics." There will be no later swelling of the limb, or will the

patient go through life unable to raise the arm; but even after removal of both pectorals, she will be able "to do her back hair" within three weeks, and have excellent use of the arm afterward.—C.

Do not forget that belly-ache in a child is often due to the passing of uric-acid gravel.

Bear in mind the relation of the right ovary to the appendix; they are often in contact—and do not make a diagnosis of appendicitis without excluding "ovaritis," etc.

Never fail to examine *per rectum* or *per vaginam* in all cases of obstruction of the bowel.

Never forget that pain in the belly is often the child's first symptom of Pott's disease.

Remember that opium masks symptoms. Never give it before your diagnosis is made.

Do not forget that the pain of colic is relieved by pressure—watch the patient try to relieve it.

Remember that pressure increases the pain if any peritoneal inflammation exists.

Bear in mind that it is not impossible to have peritonitis and at the same time have bowel movements and pass flatus—it is, however, quite unusual.

Tenderness alone never means anything of a serious nature.

Always insist on having good light in examining any abdomen.

Never give a purge to recover a swallowed coin or any object that may cut or tear—give constipating foods for a few days.

Do not be too hasty with your purgative in any attack of acute abdominal pain—you may do untold harm with one.

Remember that growths starting in the pelvis can be pushed down toward the pelvis, while those starting in the loin cannot; but if renal, they can be pushed upward, but not downward.

Pancreatic tumors are the least movable growths found in the abdomen.

Do not forget the viscera which move with the diaphragm when palpating abdominal growths.

Always inflate the colon and the stomach, and then palpate and percuss the tumor once more.

In suspected renal tumor do not fail to have the patient sit up in bed and lean well forward on the semiflexed thighs, then look for bulging in the loin.

When you have made a diagnosis of large renal abscess pointing in the loin, be sure to look again for Pott's disease.

There are three things to be on the watch for when you feel a non-inflammatory growth in the abdomen: viz., fecal, phantom, and physiological tumor (pregnant uterus).

Always look for fat in the stools, and try for the "Cammidge" reaction if you wish to exclude disease of the pancreas.

Do not forget that frequency of urination and ardor urinæ are common in affections of the appendix, adnexa, and lower bowel.

Always try to make out the presence of free fluid in the peritoneal cavity in all conditions accompanied by icterus.

Remember that large solid abdominal tumors in children are most often either renal or retroperitoneal sarcomata.

Never forget that falls or blows on the abdomen may rupture a viscus and give no surface mark whatever.

In all stab or gunshot wounds seen at once operate if there is still hope.

Bear in mind that stricture of the bowel may form later as a sequela of a seemingly very slight injury.

Don't forget that in intraperitoneal bleeding on the left side of the root of the mesentery the blood collects in the pelvis and in the left loin; while in those on the right side the loin is first to be filled, regardless of the position of the patient.

Be careful in returning bowel to the abdomen that you do not force a loop of bowel between the peritoneum and the fascia transversalis.

Always be certain to control all bleeding before closing the abdomen.

You cannot control bleeding in the abdominal cavity by packing—neither can you do so with serious bleeding from the abdominal wall.

Be sure to remove all extravasated blood before closing, paying special care to the renal fossæ.

The question of drainage in clean cases is still discussed occasionally. The better the surgeon, the less often the need for drainage in clean cases. If in doubt, drain, but remove your drain inside of twenty-four hours, or very soon after that.

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thetist. After operations in the mouth or in the upper abdomen raise the patient to the sitting (or half-sitting) posture as soon as possible. Give plenty of water.

Gaseous distention of the bowels begins after twenty-four hours and causes a good deal of pain and discomfort. Never attempt to relieve the patient by giving morphin; it is always dangerous.

Use the rectal tube and the asafetida enema or pill, or both.

Be on your guard in using turpentine freely, lest you cause suppression of the urine.

The matter of giving a purge after an abdominal operation is one about which there is division of opinion. All are agreed that the bowel should move on the third or fourth day at the latest. There should never be given a drastic purgative.

Try a soapsuds enema or two, and if this is not successful, give a mild purge. A daily enema will usually be all that is needed.

The diet after abdominal operations varies.

Give no solids after any abdominal section till the bowel moves.

If the gastrointestinal tract has been opened, give no solid food for at least ten days.

If there be a tendency to distention, give no milk.

Be sure to *give plenty of water.*

Never be in too great a hurry to get your patient home again. The best surgeon is the most careful in this regard.

The time that patients are kept in bed after laparotomy is less than formerly. Clean appendix and inguinal hernia operations sit up in four or five days, and go home at the end of the second week. Cases which suppurate keep the retention sutures in place, and remain recumbent till deep suppuration has ceased; and then wear a support.

The wearing of a support is very seldom needed after clean operations.

Do not advise the wearing of a bandage or truss after laparotomy, unless that the incision was very long or healing was slow or the abdomen very pendulous.

Never forget to warn all laparotomy patients of the liability to hernia during the first six months (or a year is better) after operation.

Always impress on the patient the need for care in avoiding all straining efforts as long as there is danger of hernia.

Remember that an operation *does* to a certain extent weaken a patient, and where possible, advise a rest and recreation for some weeks or months afterward.

The good of many an operation is nullified by having the patient go back to work too soon.

After many abdominal operations adhesions form and cause pain at intervals. Reassure the patient, explain the cause, and keep the bowels open; after a year there will likely be no symptoms from this cause.

CHAPTER XV.

STOMACH AND DUODENUM.

So long as the medical treatment of cancer of the stomach has a mortality of one hundred per cent, it is your *duty* to *recommend operation* whenever you suspect cancer of the stomach or anywhere else.

Never forget that belching is always an accompaniment of gallstone disease, as well as being due to other causes, and don't confine your examination to the stomach in such cases.

Always remember that cancer may exist long before anacidity appears.

Blood found in the stools of a chronic dyspeptic should turn your attention to stomach or duodenum as the cause of the dyspepsia; if you don't find blood, suspect the bile-tract.

If called to a case of continued vomiting in a patient past the meridian of life, do not fail to investigate for herniæ—there may be no fever, pain, or tenderness, and yet strangulation kill your patient.

There will almost always be early rigidity of the overlying abdominal muscles in any acute inflammation of an abdominal organ.

The rigidity will not be demonstrable if distention be present, but distention is a late symptom.

sign of gastric ulcer and dilatation of the stomach a late one.

In any operation on the viscera never hamper yourself with a small incision, but remember that if you conserve the nerve supply of the muscles you will have fewer herniæ. If you find your incision too small, enlarge it at once.

Never forget that viscera are often adherent to the wall at the site of a scar, and that you are in danger of opening a viscus when incising the peritoneum in the line of a former incision.

Suture of intestines is an art, which, though not difficult to execute and not at all dangerous in itself, requires close attention to detail. The one principle underlying this manipulation is the appreciation of the physiological fact that serosa will adhere to serosa by mere contact, provided that the two surfaces are slightly irritated and are kept in contact long enough for the formation of organized tissue. This process is called primary union and is accomplished with surprising rapidity. The interposition of epithelial tissue between the two serosæ while the sutures are introduced is the main thing to be avoided. One line of sutures may be buried by a second and the second by a third, as may seem requisite to insure strength and safety. The hundreds of different suture methods which have been invented all depend upon the above-mentioned quality of the serosa and must be studied and tested by the surgeon. Then he can choose the method with which he is suc-

cessful and which suits his personal abilities and his own views of their efficiency. Some methods appeal to and are used with success by one surgeon, while other surgeons succeed equally well with other methods, so that I am constrained to advise young surgeons to try them all before making up their minds as to their relative merits or demerits. The above applies to both end-to-end and lateral sutures of intestines to each other. I have found it a good rule never to judge of a method until I have tried it myself. *A priori* verdicts or opinions are always unreliable, often false and misleading.—B.

Never do any operation in the human abdominal cavity until you have mastered the technic and operated successfully on the dog or other lower animal.

Operations on the stomach are among the most dangerous, and should never be attempted by the occasional operator.

Except in emergency work, always prepare the stomach by the method of Crile or Moynihan for some days before.

Be sure that the medical examination has been complete and careful before you ever attempt a stomach case.

Before operating for stomach hemorrhage be sure that the bleeding is not due to splenic anemia, cirrhosis of the liver, or cardiac disease, and that the blood does not come from the nose.

If you operate for acute bleeding from an ulcer,

you are bound to control the bleeding in some way. You must not merely do a gastrojejunostomy.

Chronic ulcer should not be treated medically longer than six weeks. If it does not get well in that time, operate.

Any ulcer of the stomach that cannot be found by palpation alone when the abdomen is opened does not need gastrojejunostomy for its cure.

"Most chronic gastric ulcers are now known to be in the duodenum."—Mayo.

A simple gastrojejunostomy is no longer the vogue in treating duodenal ulcer—the duodenum is now excluded as well.

Bear in mind that it is too late to expect permanent cure if you can palpate the tumor through the abdominal wall in cancer of the stomach.

The posterior no-loop method is the one of choice for gastrojejunostomy.

If there must be a loop, the two limbs should be anastomosed.

Never do a simple gastroenterostomy alone in treating chronic ulcer of the pyloric region. Remove the ulcer and then do the gastrojejunostomy.

Do not waste valuable time in vain attempts to decide whether you have to deal with pyloric, duodenal, or bile-tract disease. Decide whether it is medical or surgical, and then operate if surgical.

Very few persons use the Murphy button in doing a gastroenterostomy nowadays. It is *infra dignita-*

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any hollow viscus. They are sure to cut through if you do.

If you should happen to spill gastric or intestinal contents into the cavity, do not irrigate afterward; gentle mopping with gauze is better. The free use of towels or gauze pads as dams will prevent wide dissemination.

A posterior gastrojejunostomy will be difficult and may be quite impossible in case of ulcer on the posterior wall when visceral and parietal peritoneum are grown together—remember that drainage of the stomach at the lowest point is always the rule, and do the best you can.

Do not try to resect the ulcer when operating for perforated gastric or duodenal ulcer—whip the perforation over, and drain. Quite likely you will not get the case before stomach or duodenal contents have been spread widely through the cavity. Don't increase the shock or prolong the anesthesia, or you will lower your patient's resistance so that he cannot combat his infection.

Always change your gloves and clean up after finishing the through-and-through sewing of any hollow viscus.

Never forget to fasten either stomach or bowel to the edges of the wound in the mesocolon, and so prevent a later "hernia into the lesser sac."

Remember that a gastrostomy may be done under a local analgesic with very slight pain to the patient.

Always aim to secure a fistula with valvular action when making a gastrostomy. Witzel's, Marwedel's, and Frank's are the types.

Never forget your "stay-sutures" in closing the abdomen.

Bear in mind that a great liability to slow healing exists after operations on the stomach.

Do not allow distention of the stomach to occur after stomach operations; always hasten to use the stomach tube when signs of distention supervene.

Do not forget the increased danger of pneumonia after operations on the stomach, or in the upper abdomen generally, and try to prevent it both during and after operation. But think of it beforehand, and get the patient's mouth clean some days in advance, and keep it so.

CHAPTER XVI.

LIVER AND BILE-TRACT.

Always remember that many a case of gallstone disease is hidden under a diagnosis of "nervous dyspepsia."

You should no more have to wait for "colic" or "jaundice" to enable you to make a diagnosis of "gallstones" than have to wait for autopsy to make a diagnosis of cancer of the stomach.

Watch the patient who "belches an hour or so after eating," and who has done so many years. Notice the person who always has a "spell of indigestion" after eating certain articles of diet. Observe the one who has "often a sharp pain under the ribs," or examine the case complaining of "soreness" over the lower ribs and upper abdomen. If you do, and make investigation, you will get other evidence of gallstones.

If you find a distended gall-bladder without jaundice, look for obstruction in the cystic duct, and bear in mind that other things than stones can cause such obstruction.

Never fail to warm your hands before you try to feel anything through the abdominal wall.

der is contraindicated in the presence of inflammation of the bile-ducts.

Never fail to look for stones in the cystic and in the common duct before you begin to deal with the gall-bladder.

It is often of advantage to incise the peritoneum along the right side of the descending limb of the duodenum in removing a stone from the common duct.

Never attempt to crush stones by pressure exerted outside of the walls of bladder or duct.

Always probe up and down the duct after you have removed a stone from the duct—there may be others.

Do not make a hasty diagnosis of cancer of the pancreas when you feel the head of that organ hard and firm and large in operating for gallstone—it may be a chronic pancreatitis that your operation will cure.

Do not fail to drain the common duct after removal of gallstones therefrom.

The most likely place for a stone to lodge in the common duct is in its intraduodenal portion.

When opening a gall-bladder, remember that if you incise it too close to where it is attached to the liver you can never invaginate it around a tube, or sew it properly to the peritoneum either.

See to it that your drainage tube is not pushed too far into the gall-bladder or duct, as the case may be, or the end will abut against the opposite wall and be occluded.

Remember that, when you invaginate the fundus of the gall-bladder with the tube, your tube end approaches the opposite wall.

Remember that you cannot invaginate a thickened or an acutely inflamed gall-bladder around a drainage tube, and make a good job of it.

Do not forget that your drain may become loose with the subsequent vomiting, etc.

Always bear in mind that if you tie your stitches too tightly they will cut out at once.

Never fail to drain the kidney-pouch if you have soiled the peritoneum—a stab wound well back, but look out for colon, kidney, and diaphragm.

Always be sure that your tube will not be kinked when the parts are returned to their normal positions.

Do not get the habit of whacking out every gall-bladder that is not blue, just because you are able to do it. The operation does give the onlooker a thrill, but it is ordinarily not difficult to remove a normal gall-bladder.

Remember that the gall-bladder may have a function to perform, although you who are so omniscient do not know it. The best surgeons are more conservative nowadays about the gall-bladder.

Always remember that if for any reason you cannot remedy an occlusion of the common duct the best and easiest thing to do is to anastomose the gall-bladder with the duodenum.

When you have difficulty in working on the com-

mon duct, try rotation of the liver, after the plan of Moynihan.

If a mucous fistula persist after your operation on the gall-bladder, there is still occlusion of the cystic duct.

Remember that no bile may come from your tube in the gall-bladder for a few days after the operation, and yet everything be well done.

Bear in mind that if bile comes through your tube from the gall-bladder in large amount from the beginning there probably exists an overlooked stone in the common duct.

If bile constantly flow from a gall-bladder fistula, it will never get well without surgical intervention.

After all operations on liver and bile-tract give urotropin and plenty of water.

Always be on the watch for syphilitic cirrhosis, when you feel a tumor on the liver surface.

Don't forget that a "Riedel's" lobe has often been mistaken for tumor. Should you ever find one, make a thorough search for gallstones.

Surgery has not yet been very successful in the removal of large growths from the liver. Small growths near the surface can be easily removed, but a lock-chain stitch is used to encircle the area to be excised before making any incision.

The danger is from hemorrhage. The larger veins may be tied by dissecting the liver substance back a short distance from their cut ends.

Never operate for cancer of the liver unless it be

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The earliest and most constant symptoms are those of hemorrhage.

Whenever you find the pulse going up after an injury to the abdomen, operate *at once*.

One can almost always control the bleeding from a ruptured liver by gauze packing; if this fails, or cannot be used, try the chain stitch, or the cautery at low reddish heat.

CHAPTER XVII.

APPENDICITIS.

ACUTE.

Any physician who allows the most favorable time for operation to slip by should be held responsible if death occur—unless he be not able to secure a skilled surgeon.

If the favorable time has passed by, the question of operation is one on which none can be dogmatic; each case is decided on the evidence presented.

It has never seemed rational therapy to me to administer a purge to cure appendicitis.—C.

Nothing by mouth, the ice bag to the affected region, and rest do the least harm while you are waiting.

Do not forget that appendicitis is the most frequent cause of acute general peritonitis and that it *never can* cause peritonitis if treated early by a *real* surgeon.

There is no excuse for losing a single case of appendicitis.

The best time to operate is in the first twenty-four hours, the earlier the better.

Of those operated by *real* surgeons in proper sur-

roundings in the first forty-eight hours, practically all get well.

Do not fail to impress on the patient and his friends the danger of giving food and medicine by the mouth in acute intestinal inflammations—especially in appendicitis.

The expectant treatment in appendicitis leads to *apparent* cure in about eighty per cent of the acute cases, and to certain death or chronic invalidism in the remainder—if persisted in.

Late "forced operation" in the twenty per cent not recovering under expectant treatment will probably be followed by cure in five out of twenty, but only after a long and serious illness, with the prospect of ventral hernia, adhesions, etc., afterward. The remaining fifteen will die.

Expectant treatment never *cured* a case of appendicitis.

The idea—that in case an abscess of the appendix breaks into the bowel the patient will never have another attack—is not based on pathological findings later, or on clinical data.

It does happen sometimes that the disease is so severe as to entirely destroy the appendix and that another attack cannot occur, but no one living can tell that this has happened without actually seeing the appendix—often not then.

The only way to be certain that another attack will not occur is to allow this attack to kill the pa-

Do not forget the possibility of typhoid fever—it can and does simulate appendicitis. The blood picture is different.

Do not forget to wash out the stomach before starting the anesthetic if the condition be accompanied by vomiting.

Always remember that the appendix abscess is very prone to spread into the pelvis—be sure to examine *per rectum* or *per vaginam*.

Do not forget that the abscess from an appendix lying to the outer side of the cecum extends up into the loin, sometimes even to the diaphragm.

Many a "perinephric abscess" began as acute appendicitis.

Never make a diagnosis of appendicitis because of pain at McBurney's point—get the other evidence: e. g., first diffuse, then local, pain, continuous or spasmodic; tenderness and rigidity, then nausea and vomiting; bowel most often constipated, or constipated after one or two stools; the temperature up; the pulse usually accelerated and hard.

It is very important in bad abdominal cases to get in quick and get out quick.

Never use the muscle-splitting method if you are going to open and drain an abscess.

If you are expecting to drain an abscess, go in over the abscess.

Remember the liability to hernia afterward, but make your incision big enough.

If you get in alongside a mass, the first thing to

do is to gently but securely wall off the general cavity with gauze.

If you inadvertently open the abscess before your gauze wall is in place, quickly turn the patient so as not to let the pus flow over the unprotected peritoneum.

It is wonderful what quantities of foreign material can be "taken care of" by the peritoneum, but that is no excuse for slovenly work.

If you irrigate, never irrigate over a wider area than has been soiled, and *do not use antiseptics.*

Always remember that we *pack* with gauze, but we *drain* with rubber.

Never forget to fasten your drain in place—worse to have it slip in, than to come out!

Try to get your drains to the farthest recesses of the abscess cavity, and use enough of them.

Always remember that hard drains, or drains left too long in one position, often make holes in the bowel.

There is great improvement in results since surgeons began to take advantage of gravity in drainage.

Never put your patient in the "half-sitting position" if the heart is weak and pressure low, without remembering the danger of it.

Never give your preoperative purge the day of the operation. Give it the second day before, and give foods that leave little residue the day before.

Always have the enema given—if you give one at

all on operation day—at least three hours before the patient is brought to the operating-room.

Whenever you have trouble in beginning at the tip to loosen the appendix and to tie off its mesentery, do not hesitate to reverse the usual procedure and begin at the base, amputating the appendix and closing the bowel wound first.

CHRONIC.

A chronic appendicitis is often "gallstones" or duodenal ulcer in disguise. You should never close an abdomen after removing a chronic appendix without a complete search for Jackson's membrane, and also take time to examine the gall-bladder and duodenum, and the right tube and ovary in women.

You cannot properly examine for other conditions when you go in through "the gridiron incision."

The best incision for a chronic appendix is through the sheath of the rectus.

Never fail to conserve motor nerves and muscle when you can.

Do not split the rectus—the part to the inner side of your incision will atrophy.

Do not forget that, though you remove a chronic appendix, you will not cure the symptoms, if you leave strong fibrous bands constricting the cecum and ascending colon.

Always look for kinking of the small intestine near where it joins the cecum when you operate for chronic appendicitis.

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Always think more of the condition of the patient than of the pathological condition found.

Bear in mind that making an artificial anus or doing a lateral anastomosis may save the patient's life, while a complete operation may kill him.

Never be too anxious to do all at once; the idea is to save the life even if you have to do four operations instead of one.

Never try to reduce the intussusception by pulling —it is dangerous. Grasp the bowel in one hand just opposite the lower end of the invaginated part and gently squeeze so that the bowel wall is pulled down and the invaginated part pushed up (milking action). At the same time pull gently on the bowel just above the invagination ring.

PERITONITIS.

Remember that absorption is slowest in the lower part of the cavity.

Do not give medicine for vomiting, withhold all food and drink, and wash out the stomach.

Never forget that the patient must have plenty of water. Give it by the drop method *per rectum*, or subcutaneously.

Pay no attention to the temperature in intra-abdominal conditions, but watch the pulse.

Remember that some cases of diffuse peritonitis are quite hopeless when a surgeon is called. You cannot save all by operating.

Do not forget, however, that even the best sur-

geons have refused to operate in seeming hopeless cases, and yet have seen their patients get well.

You can sometimes save a life by *not* operating.

Be sure to frequently wash out the stomach of the patient with fecal vomiting.

While waiting for a surgeon to deal with a case of peritonitis, raise the patient's thorax and upper abdomen if the trouble began below—and keep the patient quiet.

Always remember that the anesthetic may lessen your patient's chance for recovery—lowers resistance to infection and causes yellow atrophy of liver.

Chloroform is the anesthetic that is most dangerous in that regard, but ether is not without danger.

Gas and oxygen is least harmful.

Never fail to wash out the stomach before you begin your anesthetic.

Always bear in mind that the cause of death is heart failure, due to the action of the toxins on the heart muscle.

Therefore don't give an anesthetic that has a deleterious effect on a weakened heart.

While you may wish to operate with the patient's thorax and upper abdomen elevated, do not forget that sudden death on opening the cavity may occur if you do.

When you open an abdomen for obscure diffuse peritonitis, look first to the appendix region, unless you at once see the cause of the trouble elsewhere.

Always proceed methodically, appendix, gall-bladder, duodenum and pylorus, transverse colon, the sigmoid, the pelvic viscera, and the small intestine.

Always remember that the odor or lack of it may give you an idea where to look for the cause in perforative peritonitis.

When you find on opening that the peritonitis does not involve the whole cavity, put the patient in such a position that the involved part is lowest before you begin to look for the cause.

Never forget that the thing of most importance, next to relieving the condition in bad cases, is speed—in quick, and out quick.

Do not fail to relieve the distended bowel—"No operation for peritonitis is complete unless the distention of the bowel has been relieved."—Moynihan.

Do not irrigate in diffuse peritonitis.

If you have time and can do so without roughness, dry sponge the dependent portions of the cavity—the renal fossæ and the pelvis.

Never allow the intestines to escape from the cavity, if you can prevent them from doing so.

If coils of bowel do escape, be sure to keep them covered with hot saline cloths.

Do not forget the liability to internal or intraperitoneal hernia, and look in the most likely places for them.

The duodenojejunal, the ileocecal, the intersigmoid, and inguinal fossæ are the most common sites for internal hernia.

ways bear in mind that you can never get rid of all of the infectious material. You could not clean even one inch of infected bowel, with all the time and antiseptics in the world at your disposal, without doing at the same time the peritoneal coat more harm than good.

You can not *completely* drain the peritoneal cavity by any known non-injurious means.

You do *not* operate *to remove all* of the infectious material.

You do *not* drain to remove *all poison* through your tubes.

Always remember, however, that at operation, or after it, you must *remove the excess* of poison, and if you do, the patient will take care of the rest.

Never forget that just as soon as a drain is placed in the normal peritoneal cavity Nature begins to build a wall around it.

A tube placed in a normal peritoneal cavity is completely walled off in from ten to twenty hours.

If your tubes placed to drain a diffuse peritonitis are discharging much fluid on the third day, the fluid is likely coming only from the tissue touching the tubes.

Do not leave tubes in place long enough to wear holes in the bowel.

We do not hear so much as formerly about draining with gauze. Gauze does not act as a drain for very long. It also hastens the formation of adhesions. Do not use it. Rubber-tubing is better.

Always remember that the peritoneum is doing all it can to counteract the infection; do not injure it.

If you relieve the condition and empty the distended bowel and remove the excess of the infectious material and do this with the minimum of injury to the patient, you are doing all that the best operator ever aims to do.

Always be sure to maintain the body heat while on the table. Take all the precautions you can to diminish shock both during and after operation.

Raise the head of the bed and put pillows under the loins and lower thorax.

Remember the weak heart and low pressure and do not raise such a patient to half-sitting posture, unless a nurse is constantly at the bedside.

Never forget that the patient must have plenty of water; give normal saline *per rectum* or subcutaneously.

Wash the stomach again and again if need be.

Give nothing by mouth while there's nausea.

Saline *per rectum* by the drop method must be delivered into the rectum not colder than 100° F., or hotter than 105° F.

In prescribing proctoclysis, do not forget that it is possible to give a patient too much salt or too much water. The one injures the kidneys, and the other causes general edema, showing the worst effects in the usual places.

If the saline is for some reason not retained, try plain sterile water.

Bear in mind the importance of prolonging life in these bad cases—keep the patient living, and he will successfully combat his infection.

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If the fluid accumulates in the flanks, there will be bulging of these as the patient lies on his back.

Do not believe that "there is always a resonant area about the umbilicus as the patient lies supine" —this is not true. If the intestinal coils be matted together, they do not float, and then the abdomen is dull all over.

Aspirate as soon as breathing becomes difficult.

Be sure to have the patient empty the bladder before you do a paracentesis abdominis.

Always have the patient either sitting or half-reclining.

Bear in mind that even so small an operation has caused death, primarily by shock or anemia of the brain, and also secondarily by peritonitis.

Never plunge the trochar through the skin—always incise first.

The bowel most often floats, but coils may be adherent in the pelvis, and so be punctured.

Never continue to aspirate if the patient show signs of weakness.

Do not forget that a wet peritoneum is less resistant to infection than a normal one.

Do not fail to centrifuge some of the obtained fluid, and to examine it microscopically and chemically.

The only operative procedure so far popular for ascites is that of "Talma," or some of its modifications.

If you are going to advise an operation, do not

wait till the patient is *in extremis*. Such cases do badly, but cases taken early do seem to live longer with, than without, omentopexy.

Also remember that at operation you may find a cause for the ascites that you will be able to remove, and thus cure the patient.

CHAPTER XX.

HERNIA.

GENERAL.

Never employ taxis in strangulated hernia. Realize that taxis is responsible for many deaths. It is astonishing to notice, even in recent works on surgery by men high in the profession, from one to three pages devoted to directions for the application of taxis.

Taxis is *dangerous and unnecessary*—never employ it.

Remember that hernia may occur even at birth.

In infants, as in adults, inguinal hernia is the most common variety.

Do not forget that many of the herniæ present at birth or developing in early infancy get well without operation—some even without the wearing of a truss.

Be on the watch for umbilical hernia—hernia into the umbilical cord—when delivering a baby. The peritoneal cavity has been opened and a loop of bowel incised, in the act of cutting the cord, when hernia into the cord was present.

Remember that the congenital umbilical hernia

scended in males—if not, your truss is far less likely to cure the hernia.

Always examine the patient for hernia before you prescribe for a case of vomiting.

Explore the abdomen as soon as possible if you find a lump of uncertain nature at any of the hernial sites in a case of vomiting of unknown cause.

Never expect to get "impulse on coughing" over a strangulated or incarcerated hernia—you *may* get it, but not as a rule. The same is true of hernia containing omentum only.

Always remember that some herniæ are "inoperable" when they come to the surgeon, and do not be guilty of operating on an "inoperable" case.

Bear in mind that the more room in the hernial sac the less room there is in the abdominal cavity.

You may be able to return the sac contents and close the abdomen; but if the tension be too great, either the patient will die, or the wound will break open.

VENTRAL AND UMBILICAL.

Do not forget that the coverings of an umbilical or of a postoperative hernia are very thin and that the viscera are nearly always adherent to the sac.

Never try to dissect the "sac" free from the structures covering it in umbilical or ventral hernia.

Also remember that the peritoneum is quite adherent to the posterior sheath of the rectus in the neighborhood of the ring in umbilical hernia.

The contents of a large umbilical hernia have a habit of becoming inflamed and sticking together and are often tender, and a truss that causes pressure cannot be worn—a "cup" or "bag" truss may be used in such cases.

Unless the case is urgent, never operate on large herniæ without preparation for weeks beforehand.

Put a patient with a large hernia in bed, and keep him there if possible for some days before operation—reduce the hernia if possible, and keep it reduced in order that the abdominal cavity may accommodate itself to the presence of the sac contents. Thus you will be able to close with less tension.

Always be on the watch for herniæ of the linea alba. They occur more often above the navel. Even very small ones may cause symptoms. Operation is the only treatment for them.

An adult umbilical or any postoperative hernia should be operated at the beginning of its course. They are dangerous later. The best operative procedure for umbilical hernia is that of closure by overlapping from above downward, as described by W. H. Mayo.

If possible repair postoperative herniæ by overlapping.

Never use buried silver-wire sutures; they do no good after healing is complete, but often act as a foreign body, and have to be removed later.

After repairing a large hernia do not allow the patient to get up before twenty-one days.

Do not advise the patient to "wear a truss for a while" after an operation for the cure of hernia; it weakens rather than strengthens the scar.

INGUINAL.

It is becoming more and more the belief of surgeons that the occurrence of a hernia does not depend on the weakness of muscles, but on the presence of depressions on the internal surface of the peritoneum.

Almost all inguinal herniæ are oblique.

The old idea that the testicle descended into "a test-tube-shaped process of peritoneum drawn down by the gubernaculum" is no longer fashionable. A "test-tube-shaped process of peritoneum" is drawn down, however, and the testicle should be drawn down behind it. The incomplete obliteration of this "process" is responsible for the occurrence of oblique inguinal hernia.

Always examine the scrotum to note the absence of a testicle therefrom—hernia often complicates undescended testicle.

Do not forget the frequency of hydrocele of the cord.

In operating on a hydrocele of the cord, never fail to examine above for a strand or cord connecting with the peritoneum.

Examine the upper end of this cord closely, and if the peritoneum bulges, you have to deal with an un-

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face of the peritoneum, so that not even the slightest dimple remains at that site on the inner surface.

Remember that if stitches through muscle are drawn too tightly they soon cut out.

If there be any inguinal canal at all, there is no sense in "transplanting the cord"—don't do it.

Unless you are operating also for the cure of a varicocele, let the veins of the pampinniform plexus alone. If they are dilated, that dilatation depended on the presence of the hernia very likely, and, the cause being removed, the condition will need no treatment.

Never forget the accidents in operating, cutting the bowel, cutting the bladder, cutting the vas or its vessels, and constriction of the cord, and some have wounded the great vessels!

Always first clean Poupart's ligament from muscle attachment to spine of pubis after opening the canal.

Next, clean the margin of internal oblique and the conjoined tendon from Poupart's ligament to their insertion.

Always isolate the sac first at its neck.

Never open the sac until you have separated it from surrounding structures.

Bear in mind that you must not ligate omentum *en masse*.

Be careful lest you ligate omentum too close to the large bowel and include a portion of the bowel in your ligature.

A similar accident happens in tying off adhesions. Watch for it.

Always be on the watch for the bladder when freeing the sac and when ligating the pedicle.

Be always sure to pass your finger into the abdomen through the ring and palpate the parietes within reach.

Bear in mind the liability to herniæ of the cecum and sigmoid—they require special measures.

If the external ring admits the tip of your little finger alongside the cord, you have not closed it too tightly; if not, you have.

FEMORAL.

Be on your guard lest you mistake a varix of the upper end of the saphenous vein for a hernia—*it also* gives an impulse on coughing.

A psoas abscess is another source of error—look for the other signs.

Always remove the masses of fat that protrude into the thigh ahead of the sac in femoral hernia.

In femoral as in inguinal hernia no procedure is likely to be successful unless the sac is entirely obliterated.

While closing the peritoneal orifice in femoral hernia, the bladder is in even more danger than it is while doing the same in inguinal hernia.

Sewing Poupart's ligament to the fascia pectinealis, close to the attachment of the latter to the os pubis, is the method of choice.

Always use suture material which will last a month —fascia is slower than muscle in healing.

Always keep an operated femoral hernia in bed longer than you would a case of inguinal hernia.

Be sure to warn anyone who has had an operation for the cure of any hernia as to the liability of its recurrence under strain during the first year after operation.

Never fail to look for stricture of the urethra or rectum and for enlarged prostate as causes of hernia—always remove the cause if you can.

Chronic bronchitis may cause a recurrence if you operate on such a case in the fall.

STRANGULATION.

Bear in mind that the rings—more often the internal—are the sites of the strangulation.

No man living can tell the time required for strangulation to produce gangrene of the sac contents. But it can hardly occur under six hours.

Never let a patient with a hernia leave your office without telling him what to do immediately if strangulation should occur in his case.

Do not forget that hydrocele of the cord can become a cause of strangulation in a hernia, cord, or testis by being forced from the external ring alongside a hernia or the cord, and then by retraction shutting off the return circulation in these.

Remember that "torsion of the cord" gives the symptoms of strangulated hernia.

much, to go a foot away from where constriction occurred.

No case of strangulated hernia should ever be lost—deaths from that cause are like those from septicemia, due to carelessness or incompetence.

There is hardly a place in the civilized world today where a competent surgeon may not be had within six hours. While waiting for him, don't do any harm.

The vomiting in strangulated hernia may be like that in low obstruction, only a very late symptom.

Always keep the stomach washed if vomiting be present.

About the height of absurdity is the giving of food and medicine by mouth to patients with obstruction and vomiting.

If a late operation be done, never lessen the patient's chance by using a general anesthetic or by waiting to resect—relieve the constriction, and make an artificial anus.

Don't fail to empty the bowel if there be very much distention.

CHAPTER XXI.

GYNECOLOGIC SURGERY.

Have your patient prepared both for abdominal and vaginal work in all operations in the pelvis.

The vaginal route for doing pelvic surgery has still its advocates, and is sometimes of advantage, but if you like to see what you are doing and need room to work, go in from above.

Remember, when you pull down a uterus for any reason, that if an old salpingitis exist it may recrudesce, or adhesions may tear, and peritonitis ensue.

Also bear in mind that after doing anything in the pelvis that necessitates the cutting and tying of vessels, if you pull down the uterus to curette, you may loosen ligatures and cause your patient to bleed to death.

Therefore, if you must pull a uterus down, under the circumstances named in the preceding paragraphs, always do it before you open the abdomen, and not after you have closed it.

A curettage is such a simple thing, that almost every graduate thinks very lightly of it and feels that he must undertake it on the slightest provocation.

Do not forget that there is real danger of perforation of the uterus when curetting, and this has happened in introducing a sound. If you fear that you have perforated a uterus, open the abdomen above at once, and repair any damage done. Don't sit around waiting for symptoms of peritonitis to develop. I do not believe that one should do a curettement unless he is ready to do abdominal surgery.—C.

Remember that no operation for cystocele will be successful unless the torn perineum is repaired at the same time.

The reason for so many poor results after operation for the repair of torn perineum is that many are improperly done. Bear in mind that the structures torn apart must be sutured together each to its fellow, fascia to fascia, and muscle to muscle, and so held without strain or tension till union is firm.

You must know the anatomy of the part and the pathology of the condition, or you will never have lasting success—in these cases.

Be sure to make extra good hemostasis in operations on the perineum. A blood-clot here almost always becomes infected with putrefactive bacteria.

Never attempt to completely remove a suppurating Bartholin's gland—incise freely, scrape and pack, and keep packed till healed.

For chronic inflammation of the gland, nothing less than complete removal of the whole mass is indicated.

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Always remember when operating for the above named conditions that there must be no tension on your sutures, and that silkworm gut or silver wire is the best suture material.

Never allow a nurse inexperienced in such cases to give a vaginal douche, after such operations.

Be sure to prevent distention of the bladder after closing a vesicovaginal fistula. This is best done by a retention catheter, or by turning the patient on her face and properly using a catheter every four hours till healing is well advanced.

Always take precaution to prevent cystitis after operations on the bladder.

Be certain of your hemostasis in operations on the bladder; otherwise you may find that viscus over-distended with clotted blood.

Do not forget that the ureters have been cut or included in the sutures in the operation for cystocele, as well as in that for vesicovaginal fistula.

Never merely amputate a cervix for carcinoma.

Remember that a foul-smelling vaginal discharge is always a sign of serious disease.

Beware of "erosion of the cervix" in women at or beyond the menopause.

Always remember that cancer of the womb, like cancer elsewhere, soon invades the lymphatics, and any operation that removes only the primary growth cannot hope to cure the disease.

In opening abscess in the cul-de-sac, have good light and have an assistant draw the cervix forward;

draw down the vaginal wall with a tenaculum and snip with a scissors close to the uterus—after that use blunt dissection. *Fasten* your rubber drains in place. Use long instruments.

Never leave the end of a drain sticking out of the vagina.

Never make a long incision in the middle line, and never make even a short one through or close to the umbilicus in a vertical direction. A long incision is often necessary; as a rule, incisions are too short.

When for any reason you do not wish to have the whole length of an incision through the middle line, make the upper part of it through the sheath of the rectus, and the lower through the median line.

Never cut through the rectus muscle or split its fibers—the part of the muscle lying to the inner side of the incision atrophies.

Before making an abdominal incision, let it be your practice to ask "Has she been catheterized?"

It is not always easy to tell just on which side of the median line you have opened a rectal sheath—the direction of the pyramidalis will tell you (if it be present).

Always open the peritoneum first at the upper end of the wound.

Bear in mind that inflamed tissues are friable; find the planes of cleavage, and follow them.

Never use force in separating adhesions.

Should you tear a viscus, always repair the damage at once.

If you fear that your handling or separation of adhesions has thinned or injured a bowel coat, take care to repair the damage at once.

Never divide or ligate adhesions while under tension.

The Trendelenburg position is of great advantage, but it is overworked. Never call for it before the peritoneum is opened, and always change to the horizontal before you begin to close.

Always lower from the Trendelenburg position at once if you rupture an abscess or cyst. Pus may get through your dam and reach the diaphragm.

Do not believe that the pus from tubo-ovarian abscess or pyosalpinx is sterile. Always treat it as though you knew it to be virulent, and you will lose very few patients from peritonitis.

Should you find that a papillomatous cyst of the ovary has ruptured and that the peritoneum is studded with papillomata, remove the cyst anyway.

One would naturally suppose that after spilling pus in the pelvis drainage were always indicated, but as a matter of fact, most cases do very nicely without it.

Make it a rule, from which you never deviate, never to even allow a small sponge in sight from the time the peritoneum is opened till after it is closed.

Always use forceps and clamps at least seven inches long for abdominal work.

Always begin in the middle line to separate ad-

Remember that while a patient lies on her back the bottom of the cul-de-sac is at a lower level than the vaginal outlet.

Before you attribute a backache to "female trouble," take another look at the gait and station, and be sure to exclude feet and shoes as a possible cause of the trouble.

Do not believe that you can cure all of a woman's ills, real or fancied, by fixing forward a retroverted uterus.

Always remember that an elongated or hypertrophied cervix should be removed before you try to fix a uterus forward.

Be very careful that you do not draw peritoneum or bowel with the round ligament through the abdominal wall.

It requires a little more knowledge and a little greater skill to bring the round ligaments out along their normal route than to draw a loop of each through the rectus, but the results are better.—C.

Never attempt to "shorten the round ligaments" without opening the abdomen.

Remember that stitches soon cut through if subjected to tension.

Do not remove a normal appendix when doing a pelvic operation if in so doing you increase the patient's risk from shock or infection; otherwise always get it.

If you drain, use rubber, and never change drains.

Remember that in ten or twelve hours Nature will have built a wall about your drain.

In closing, when peritoneum is too thin and friable and under such tension that your stitches will not hold, remember that the rule is to take it with the next layer in the same stitch.

Never close an abdomen with absorbable sutures without putting in "retention sutures" of non-absorbable material. No one can tell when "20-day" catgut may be absorbed in four.

Do not tie a long roll of gauze under your "stay" sutures. Put a pad of gauze under each stay stitch if you like, but always leave your wound so that you may loosen a stitch or remove a clip that is causing trouble without disturbing the whole wound.

Always remember that catheterized female patients develop cystitis more easily than do men—take precautions.

If you find a stitch that is causing trouble, loosen or remove it, and apply gauze soaked in alcohol for a few hours.

CHAPTER XXII.

GENITOURINARY SURGERY.

GONORRHEA.

Do not forget that there is such a thing as simple urethritis—and it can very closely simulate gonorrhea. Use the microscope.

Always be sure to warn the patient about infecting his eyes.

Never fail to instil a few drops of silver nitrate solution, 1 per cent, or argyrol, 10 per cent, in the eyes of the new-born babe, if you know or suspect the mother (or father) of having had gonorrhea.

Be very careful not to make a quick diagnosis of gonorrhea when you see a discharge from the preputial orifice in phimosis.

Do not provide a patient in the acute stage with that weapon of destruction—a syringe. Keep the patient as quiet as possible (in bed if you can), prescribe bland diet—no alcoholics, plenty of water. Keep the bowel free and do not upset the stomach with many drugs; and interdict sexual excitation. With this line of treatment there is no "chronic gonorrhea" or "gleet."

Never forget that as long as your patient has

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Bear in mind that the balsams cause "rash" very often.

Always be sure the prepuce is not adherent before making a "dorsal slit."

Never "pull the foreskin well forward," as is sometimes advised in doing a circumcision—without remembering that you may cut it too short, much to the later discomfort of the patient.

Never try a local anesthetic in circumcising children.

You *must not* pass a sound in an acutely inflamed uretha.

After instrumentation (with a stranger) always mention the possibility of a chill.

"Always remember that the introduction of an instrument is an evil never to be resorted to unless in the hope of relieving a greater evil."—Sir H. Thompson.

Do not forget that a false passage is very easily made. Never hurry, and never use force in passing instruments. The insensitive urethra is the most dangerous.

Always feel the prostate if the catheter does not readily enter the bladder after passing the triangular ligament.

Do not fail to have a special prostatic catheter in your outfit.

Do not forget to keep your unboilable catheters continually in antiseptic solution.

Always feel the prostate before passing a sound.

Never pass a sound during an attack of acute cystitis.

Never sound for a stone unless stone symptoms have been present.

Never sound an elderly patient for stone without having him in bed, and keep him there at least twelve hours afterward.

Beware of saying any stricture is impassable. You may work for several hours with "filiforms" and then be successful—or some colleague may be successful.

Always remember that a larger sound will often pass where a small one will not.

Never forget that plastic surgery can do great things for a tortuous stricture—or obliterated urethra.

Never pass a jointed instrument into the urethra without making sure that all joints are safe.

Do not catheterize an old man with morning nausea, incontinence, pale urine of low specific gravity, and marked thirst, without telling the friends of the gravity of the case.

Never roughly pull out a retention catheter—the incrustation injures the urethra.

Never pass a sound on a patient with nocturnal frequency without remembering that you may infect a tubercular bladder or kidney in so doing.

Always suspect ruptured urethra if blood comes from the meatus, after an accident.

Yes; the female urethra *is* dilatable, but never

forget that it *can* be overstretched and *remain* paralyzed.

Never forget that urinary extravasation means rupture of the urethra and that you should operate at once.

Every time you feel a hard nodule in the prostate, think of cancer, but never make the diagnosis of cancer without excluding calculus of the prostate.

If you make a diagnosis of prostatic abscess, it is your duty to open it from the perineum and not wait for it to break into rectum, urethra, or bladder.

Bear in mind that if a fistula persist after external urethrotomy there is most likely an obstruction anterior to it, and that any fistula that does not heal after the passage is opened widely in front is either "healed over" (from mucous membrane to skin) or is tubercular.

TESTES.

Always examine the scrotum of the baby to note whether both testicles are descended at birth or not.

A testicle may be undescended and yet come down later—one has been known to descend late in life—but in the child past the age of five, it is not likely to descend spontaneously.

The success of the operation for undescended testicle varies. It can undoubtedly be retained in the scrotum after having been placed there. The organ is generally much atrophied when observed a few years later.

same, and both give general symptoms not unlike those of strangulated hernia.

The best treatment for acute orchitis and epididymitis of pyogenic origin is early incision and drainage.

In removing a testicle for tuberculosis get all the cord and follow the vas as far as you can.

In all chronic swellings of the testicle try for "normal testicular sensation" on pressure; its absence means loss of function.

Do not forget that gumma of the testes may be followed by fungus or hernia of the testes.

Never make a diagnosis of sarcoma of the testicle without first excluding syphilis.

Do not *tell* a man he is sterile because he has had a bilateral gonorrheal epididymitis—his wife may conceive.

An undescended testicle rarely develops any external secretion, though its power of internal secretion seems unimpaired.

Do not always tell a patient that his undescended testis will never come down of its own accord—they sometimes do.

Never forget that your operation for varicocele may be followed by chronic hydrocele or enlargement of the testicle—beware of cutting out too many veins.

Do not disturb the cord or bother about its veins when operating for inguinal hernia—unless you are operating for a varicocele at the same time.

In all operations about the scrotum take special care to make a good hemostasis—hematomata form here most readily, and they nearly always suppurate.

Always remember that the glands draining lymph from the scrotum are the inguinal, while lymphatics of the testicle go first to the lumbar glands.

Never forget that sarcoma of the testes, as well as carcinoma, spreads through the lymph-channels—no operation for either is complete without regional gland removal.

Do not fail to examine the prostate and vesicles in every chronic disease of the testicles.

No instrument except a catheter to relieve retention should ever be passed during acute inflammation of a testicle.

BLADDER.

Never tap a bladder that you cannot feel.

Beware of making a diagnosis of "incontinence of urine" and letting it go at that—find out why.

Always remember that a bladder may be sacculated and your sound may miss a stone in a "pocket," and a "fasciculated" bladder may have "incrustations" on its walls and feel much like stone.

Find the stone with the cystoscope, or the x-ray.

Do not forget that cutting for stone, when done as it should be, is just as safe as and far more certain than litholapaxy.

If when operating on inguinal or femoral hernia you find a vascular structure to which the sac is adherent, be very careful—it may be bladder.

Always remember that a bladder overdistended for any length of time may remain paralyzed.

Never make a diagnosis of hysterical retention and refuse to catheterize—your refusal may cause the patient to be catheterized for the rest of her life.

Always try to avoid causing a cystitis. Whenever you expect to repeat catheterization more than once, inject two drams of argyrol (5 per cent) just before withdrawing the catheter, and keep the patient on urotropin.

Never fail to closely watch the bladder in all injuries to the spine—and in all delirious or unconscious patients.

Do not forget that the bladder is sometimes ruptured by very slight external violence—more often in drunken men.

The best way to test for ruptured bladder is first to catheterize and empty the bladder—then inject a measured quantity of boric acid solution, and try to recover it.

Remember that there is one thing that always makes tuberculous or malignant disease of the bladder very much worse, and that is pyogenic infection.

Always suspect tuberculosis in some other part of the genitourinary tract when you find a tuberculous ulcer in the bladder.

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ptosis will never cure the patient suffering from Glénard's disease.

Never use turpentine, mercury, potassium iodid, or cantharides on nephritic patients without knowing that you may suddenly cause complete anuria and death by so doing.

When you find albuminuria without other signs of nephritis, look for stone in the kidney.

Pain in the region of the kidney is more often due to other conditions than to calculus.

Never think that because a patient looks well he cannot have renal or vesical tuberculosis or cancer of the bladder—the cachexia comes late in them.

Any rapidly growing tumor in the abdomen of a child is more likely to be a renal sarcoma than anything else.

Never catheterize a ureter in the presence of acute infection lower down.

Always remember that blood in the urine obtained by ureteral catheterization may be due to trauma from the catheter.

Bear in mind that nocturnal frequency is often an early sign of renal tuberculosis.

A kinked ureter with uronephrosis can often be completely relieved by inverting the patient for a few minutes.

Never fail to examine the other kidney before advising any renal operation.

Never be slow about opening a perinephric abscess.

Do not forget that a perinephric abscess often begins at the appendix—be suspicious of the appendix as a cause if a sinus persist.

Always remember that ordinarily the pleura near the spine comes down some distance lower than the last rib.

Beware of trying to deliver the kidney before you have cut through all of the perirenal fat and fascia—divide everything right to the tunica propria before trying to pass your finger around the kidney; this separates it from its "fatty capsule" very easily; there is no bleeding, and delivery is easier.

When operating for stones which cast small shadows, be sure to x-ray shortly before operation—the stone may have passed into the bladder since last examination.

Never forget that phosphaturia and uric acid may cause attacks of renal colic.

Do not make a diagnosis of renal colic without excluding gall-bladder, appendix, and ovarian disease.

Never hesitate to enlarge your incision downward or forward just as soon as you decide you are hampered for lack of room.

The abdominal route is better when a renal tumor is very large and fixed.

Do not forget to first feel the other kidney once the abdomen is opened—and don't mistake pancreas for kidney.

Be careful lest the kidney have more than one artery.

Never fail to inflate the colon as a help in diagnosticating renal tumor.

Remember that stones lodge in the ureter most often "at the end (upper or lower) and at the bend (brim of true pelvis)."

Never forget that a calculus may be present, although the x-ray be negative.

Never try to remove the gall-bladder or to operate on the bile-ducts through the lumbar incision when operating a supposed renal tumor—attack in front.

Never aspirate a renal tumor from front or side.

Be sure to use absorbable material for suturing rents in kidney or its pelvis.

Remember that it is possible for postoperative hemorrhage from the kidney to cause death—most often by lowering resistance to infection.

If the ureter be distended with urine of recent accumulation, it looks like a large vein—use the hypodermic needle.

Never fail when x-raying a kidney for stone to radiograph the whole ureter as well, and be sure to do the same on the other side.

Methods of ureteral implantation are many, and none are ideal. The best results are those in which it was possible to transplant a portion of the bladder wall, as in the operation for extrophy of the bladder.

After all accidents and injuries have the patient try to pass water, or catheterize and examine for blood.

Do not forget that *small*, *recent*, simple ulcers and fissures get well readily after dilatation of the sphincter without cutting.

Much harm has been done by forcible dilatation of the sphincter, incontinence ensuing.

Never stretch the sphincter forcibly or rapidly. Take your time, and stretch while gently using a massaging movement. Great dilatation is seldom necessary.

Cutting the sphincter causes incontinence if you cut the muscle obliquely, or if you cut it on both sides at the same "sitting." Learn the direction of the fibers and see that one side is completely healed before you completely divide the other.

Never operate on inflamed hemorrhoids.

Do not allow the patient to immediately walk about after any operation on the rectum.

In operating for piles be sure to cut off the "skin tags," or the patient will think the job is unfinished.

Never use that instrument of torture, "a dressed tube," after operations on the rectum. A strip of vaselinized gauze does just as well, and is so much more comfortable.

Do not forget that a fissure, an ulcer, or a fistula may be a beginning cancer.

Never fail to examine for tuberculosis of the lungs in every case of anal fistula, ulcer, or fissure, and remember that, though the patient may be otherwise apparently healthy, such rectal trouble may still be tubercular.

Many a sinus called "blind external fistula" leads down to diseased bone or joint.

Remember that blind fistula often means blind surgeon.

Burrowing sinuses and fistulæ can be far more easily followed at operation if the Mayo method of injecting methylene blue be adopted.

Remember that if an ulcer, fissure, or fistula be tubercular the same rules apply here as in the treatment of surgical tuberculosis elsewhere.

You can never put a rectum *at rest* for a prolonged period without diverting the fecal stream.

Tuberculosis of the lungs is a contraindication to curative procedures in rectal tuberculosis, only when the chest condition is advanced beyond hope of cure.

It is far better surgery to pack the wound after dissecting out a fistula than to suture it, and keep it packed that it may heal from the bottom.

Do not think that because the stools are normal in appearance there can be no stricture of the rectum. The "ribbon-shaped" or "pipe-stem-shaped" stool is present only when the stricture is near the anus.

Remember that, though syphilis can cause a stricture, antisyphilitic treatment is no more likely to cure it than it is to cure tabes dorsalis—even salvarsan won't cure it.

Do not forget that the incision for *anal abscess* radiates, but for *ischiorectal abscess* it extends from before backward.

Be on the watch for cancer of the rectum—only

early is operation worth while. Remember that the bowel well above the apparent site is involved and also for a shorter distance below it. Any operation that does not remove the regional glands is worthless.

Never operate on cancer of the rectum—or on cancer anywhere else—if the liver be secondarily involved.

Do not hastily open a slow-growing swelling between the rectum and the coccyx. Cysts of the post-anal gut grow here and may become inflamed so as to be mistaken for abscess.

If one must make an artificial anus, the sigmoid is better brought out through the rectus—appliances are more easily kept in place over it.

Always examine the coccyx and sacrococcygeal joint in people who complain of pain behind the anus.

Never fail to explore the rectum in cases of fractured pelvis.

All wounds of the buttock received in falls should be examined for foreign bodies.

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drawn from books, is always suicidal, in fact, is silly and childish, and of no value beyond that of being an exercise for a schoolboy. A communication of that kind fools no one and only makes a laughing-stock of the author.

A contribution to a scientific journal should be properly constructed. By way of introduction it should show what is known on the subject up to the time of writing. The writer should accurately give the bibliographical references on what has been heretofore published about the matter in hand. For this purpose it is not necessary to refer to what text-books say about the question, because they can hardly ever be considered as depositories of scientific communications. They are in nearly all cases merely compilations. You will always refer only to original memoirs or monographs, giving the name of the author first, then the subject of his book or article, then the page to which you refer, then the name of the publisher and the year in which the publication occurred. If there has been more than one edition name the one quoted. Let these references follow each other in chronological order, and let them be accurate. Never quote a book or an article by any author to which you do not actually refer in your own contribution.

After this historical introduction in which you show what was known about the subject before you made your own investigation, you proceed to the main and most important part of your paper. This

will consist of a detailed account of your own labors, giving your observations and the methods by which you carried on your researches. Let this part of your paper be as long or as short as may be necessary to communicate every single fact which you have found—this part will contain the meat for your work. Let it be accurate, absolutely true to nature, and let it be illustrated, if figures or diagrams will add to the clearness of the description or to the lucidity of the demonstration. After having completed your scientific description and after having given your complete findings, the conclusions should follow.

These must be drawn from the premises or facts as you found them. You should then state in what your research differs from or corroborates the conclusions which were held by scientists in the past. If your work has been successful in advancing our knowledge a step forward you will have the duty and the pleasure of calling attention to it. Finally, it will be a gracious act on your part to express thanks to any teacher or fellow who may have rendered you assistance in your research. Be sure also to mention the institute or laboratory or hospital in which your work was done. If the work was done in your own laboratory or in your private practice be sure to state this to have been the case.

I desire to impress upon you that not the matter alone but the manner of its presentation will largely influence its appreciation by the profession. An

article or a book which is clumsily written, though it contain somewhat of scientific truth, may fall flat and be overlooked. An article which adds artistic and literary finish to its scientific nucleus will always be sure of attracting its full quota of notice from the scientific world and will receive very favorable notice from the critics and reviewers. You may be fortunate enough to have your paper, book, monograph, or whatever form your contribution may have taken, translated into a foreign language or reviewed by contemporary scientific or medical journals. These reviews, or translations, or perhaps quotations, will be gratifying to the author exactly in proportion to the standing of the scientist who quotes the work. And if the quotation be made, together with approving and confirming words in the text and by a writer personally unknown to the original contributor, the latter may justly be encouraged to further research.

Remember that to the artistic and literary merit of the contribution will be due a large part of its success. Therefore don't hurry. In giving the anamnesis of a case or a series of cases let all data be complete. Give facts; let the reader exercise judgment.

Do not, for instance, explain away deaths after hysterectomy or after pyosalpinx or after appendicitis operations by pneumonia, nephritis, or other pathological processes. The pneumonia or nephritis would probably not kill the patient if there were no

suspicion, and its author runs the risk of placing himself in an oblique light, be he ever so honest.

If an article is intended to reach only a limited number, of a special department, of course you will choose a special journal. But if the subject is of more general interest, I am giving good advice in recommending one of the large weeklies. Both the latter and some of the monthlies have been recently much improved in regard to value of scientific reports as well as of editorial work. American weeklies and monthlies will never equal the European until contributors are liberally paid for their work, a thing much to be desired by the entire medical world. The same is true of professors in medical colleges. These latter will always be of inferior quality until the teachers are paid good living salaries, so that the work of teaching in medical colleges becomes more important than the following of the practice of medicine and surgery. Then the professors will have the exalted scientific standing in our country that they now have in Germany and in France. There is also improvement in this direction noticeable within the last decade.

When once the immense wealth of such universities as Chicago and Harvard and the endowment of institutes and of laboratories for scientific research, as we see them starting up in Washington and New York, begin to show results, the United States will soon be at the head of the world in this respect also. Men will come to America, as we in the past have

gone to Europe, for the best opportunities to do original research. This will come to pass during the next twenty-five years, and our children will enjoy this American *Renaissance* of the twentieth century. These institutions will then furnish the highest class of archives, quarterlies, monthlies, or weekly bulletins, in which to publish the results of our investigations.

Before closing this chapter on the subject of scientific contributions to literature, I think some experiences of my own may be instructive and useful. My first two publications were embryological researches and were printed in the *Morphologisches Jahresbuch* of Leipzig and have been quoted by every author who has written a textbook on this subject in any language. This work was done in 1876. I must say that the prompt acceptation of these two memoirs was due to the fact that they emanated from the laboratory of Gegenbaur, who, together with Huxley and Haeckel, was the leading scientific investigator in the field of biology in 1876. After returning to America to practice surgery my contributions to its literature have been very numerous, and I will relate a few of my most curious experiences. Soon after my return I was consulted by a girl of seventeen years about a tumor in her tongue which was rapidly growing and completely filling the mouth. It bulged out upon the back of the tongue as large as a walnut and also bulged the floor of the mouth downward so as to make a round ball be-

low the chin and above the hyoid bone. I removed it through a median incision. It proved to be a genuine struma or goitre situated entirely within the tongue, extending from the pyramidal process of the thyroid gland to the foramen cecum on the back of the tongue. The literature of surgery, searched very thoroughly by me, spoke of no tumor originating in the thyrolingual duct. I think indeed that there were few if any surgeons then living who would have known what this duct was. I plainly expressed my opinion that this tumor (at least twenty similar ones have been described since) was developed from epithelial cells which were left in the track of the thyroid gland as it is developed from the primitive epithelium of the pharynx or head gut. It takes its descent between the two halves of the tongue before they grow completely around it and are joined together to form the tongue. This observation was published in the St. Louis *Medical and Surgical Journal*. It rested there; nothing was said about the rather interesting and rare tumor for a number of years. About six years after my publication Mr. J. Bland-Sutton, of London, chief surgeon of the Chelsea Hospital, in a very clever work on tumors quoted my paper, and agreed with my explanation of the origin of the growth. Since then this peculiar tumor, now called intralingual goitre, has been quite frequently seen and written about in all civilized countries. But an American surgeon must be credited with the neat little scientific discovery, for which

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achieved a restoration to health without the formation of a troublesome fistula. I plainly stated the indications for the ideal operation. It cannot be performed in every case; in fact, it can only be performed in carefully selected cases. But where it is indicated it gives ideal results. Kocher in the last edition of his operative surgery speaks of it as a most simple and safe operation!

At the end of this paper I drew conclusions, one of which related to the function of the bile. I set up the thesis that the bile must be considered an excretion and that it has little or no value as an aid to digestion; in fact, I believed that there was no reliable evidence upon which to base the theory that the bile was of any use to the economy. This conclusion was based upon observations of biliary fistulæ. I had seen several of months' and one of over twenty years' duration in which all the bile was discharged and the subjects of the fistula in perfect health.

This publication was made in the St. Louis *Weekly Medical Review* about the year 1883. My doctrine went unnoticed in medical literature for about twenty years. Lately I have noticed several voices in Germany practically maintaining the same views about the bile that I published long ago. I am fully convinced of the correctness of my view and believe that it will prevail as soon as the question is properly and carefully investigated by a physiologist or a physiological chemist. That my doctrine had

passed unnoticed is probably due to the fact that it was published in a surgical memoir which was not read by physiologists. It has thus escaped being noticed for years, and the lesson which can be drawn from this experience is: do not hide or bury important physiological findings in medical or surgical contributions. You can thus see that the selection of the proper medium in which to publish your contributions may be of great importance.

My communications to surgical literature number over one hundred, some of the most important being in connection with the subject of appendicitis, the large majority however being case-reports and reports of operations suggested by me or done for the first time by me. If ever anyone should conceive the foolish idea of writing a geographical paper on "the progress of surgery west of the Mississippi River," the records would show that the first operations on the stomach, the extirpation of tumors of the brain, the liver, the kidney, the intestine, gall-bladder, etc., were done by me in this territory, and also that the first successful operation for gunshot wound of the abdominal viscera was done by me in this territory. There is only one operation which I was the first in the world to do successfully, and that was the Cesarean section in a case of placenta previa. I still believe that this operation has a future under certain circumstances, although I am aware that many obstetricians are not in favor of it. And still, I will say that, having to choose be-

tween a young well-trained surgeon and an old obstetrician to deliver a woman with central placenta previa, I would have the young trained surgeon do the classical Cesarean section in every instance. It must be said here that, soon after my arrival in St. Louis in 1877, the ablest and most useful and busiest surgeon, John T. Hodgen, told me that he had done sixteen laparotomies, and said he, pointing northward, "I have fifteen tombstones to show for them." Another surgeon (perhaps the next in prominence) in Missouri told me that laparotomies could not be done successfully in the Mississippi Valley, as he believed climatic conditions to be unfavorable. You will understand that in those times the technic of antisepsis was only poorly understood and asepsis was unknown. I was among the first to adopt and teach asepsis and wrote a paper on "The Best Method of Practical Antisepsis and Asepsis," which did much to popularize the method in the United States. We may assume that at the present day no surgical operation is done without an attempt to be as aseptic as is possible under the surrounding conditions. The time is not far away when no premeditated operation will be performed except in a properly equipped operating-room. In fact, I think this rule is now generally observed where such a place is not too distant or inaccessible. Operating-rooms which can be made clean, by sterilization in some of its forms, are springing up even in small country towns. There are no more doubting

CHAPTER XXV.

SCIENCE AND SURGERY.

About ten years ago, a new chancellor was called to a western university, and after residing in the city for a few months, during which time the reorganization of the medical department kept him busy, he publicly announced that many of the western physicians did not know what science meant. This statement caused discussion and some ill-feeling among physicians, but there is no doubt that the chancellor was right. In order to give medical students and physicians a clear idea of the meaning of science the following thoughts on the subject may be here expressed:

The definition of science found in most dictionaries is: "Science is knowledge," or "science is classified knowledge."[1] While these definitions are perhaps correct, they do not give a complete idea of what the term science means or of its scope.

Science is not only the grandest and most important thing on earth, but it deserves our reverence

[1] In this connection permit me to recommend to all physicians who desire to rank above the common herd, the study—yes, the intense and diligent consideration—of the small volume by Herbert Spencer called "*First Principles.*" It is the best introduction to science that I know of and can be mastered by any one having the qualifications necessary to become a useful surgeon.

and culture more than any god that mankind has ever worshiped or any idol deified in the past. A better definition than the two given is as follows: Science is the knowledge of the laws which govern this universe.

Science is still very incomplete because we do not know all the rules upon which Nature, or, if you like a plain English word better, upon which the world works. In fact, we know but a small part of the rules or laws of Nature, but we are learning more of them as science grows. Science is truth; anything which is proved untrue cannot be scientific. An author or a textbook may make certain statements, which are supposed to be true. The author of the textbook believes them to be true, but that does not make them true. Science is absolutely the opposite of belief; it takes nothing for truth on anyone's authority or statement. It requires proof by demonstration, and the proof and demonstration of a statement must be open and possible to anyone sufficiently skilled and educated to repeat the experiment or demonstration upon which the statement is based. When this has often been done and the demonstration is found flawless by different men independently of each other, then a statement or a finding or a discovery becomes a scientific fact. It does not then rest upon anyone's authority, but we say it is a fact scientifically established.

It is clear that science is unfinished as a whole, although some minor fields are pretty well worked

up. It is the opinion of scientific thinkers that science never can be completed so that no laws or rules upon which the universe works will be unknown. We may rejoice that this is true, because such a condition would put an end to scientific investigation. Research, and in fact mental effort of all kinds, would necessarily cease. On the other hand, if there were nothing left for belief and faith, if there were nothing left of the unknowable, there would be no room for religions or creeds. Such a condition will never come about; therefore it is idle to waste time on its consideration.

If the definition of science which I have given above be correct, then of course science is not only the most sublime thing, but also of the utmost practical importance and use to mankind. It is the only thing which can possibly lead to an understanding and to an explanation of the phenomena which we call life. Our hope of ever knowing exactly what life is and how it was developed on this planet lies in science.

There is one other point I wish to raise in this connection. A collector of beetles or butterflies may be a scientific man. The mere collecting of specimens and classifying them do not make him so. At best we may consider him a useful helper who is gathering valuable material upon which some scientific researcher may base scientific observations and reflections, which may lead to the discovery of

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we shall become more scientific physicians and surgeons, and our fight against disease will become more and more successful.

Remember that science is truth. Much of your life should be therefore devoted to the study of science. Remember that belief and superstition are the opposites of science and tend to keep mankind in darkness. Science is light and truth.

All science is the work of man, and it has been developed by the brain functions of man. The cultivation and expansion of the field of science is man's highest and noblest function. Let us remember, for instance, that the study of the most universal and highest questions and problems of humanity is Ethics, which also comes under the head of science. The clearest work on Ethics [2] is by Herbert Spencer. Remember then that the pursuit of scientific work is man's noblest occupation. Scientific workers more than all others deserve our sympathy and our aid. Let us accord to them honors and rewards without stint.—A. C. B.

[2] *The Data of Ethics.*

APPENDIX.[1]

PREOPERATIVE TREATMENT.

GENERAL.

(1) Unless otherwise ordered by the attending surgeon, all adult patients should receive a purgative on the evening of the second day before the operation. This should be either:

(a) Calomel, gr. ¼, with soda, grs. 3, hourly until six doses have been taken. To be followed next morning by a saline, such as magnesium sulphate, 1 oz., Pluto water, 2 oz., or (b) castor oil, 1 oz.

(2) The day preceding the operation the patient should receive, unless otherwise ordered by attending surgeon, only light or liquid diet.

(3) Three hours before the time set for operation the patient should receive a copious soapsuds enema.

(4) Patients to be operated on in the forenoon should receive no solid food or milk for at least six hours before the operation. Liquids, such as broths or light soups, may be allowed three and one-half hours before operation.

(5) Patients over twenty-one and under fifty shall be given three quarters of an hour before operation, ⅙ gr. of morphin and $\frac{1}{120}$ gr. of atropin (hypodermatically), unless otherwise ordered by the attending surgeon.

(6) For the twenty-four hours preceding operation patient shall be obliged to cleanse teeth and mouth and gargle throat with 1 per cent iodin solution, three times each day, except in goitre cases, in which liquor antisepticus alkalinus (U. S. P.), 1 part to 3 of water, shall be used.

The mouth and teeth shall be cleansed and the throat gargled with the same solution immediately before patient is placed on table.

(7) All patients to be operated on for brain, cord, bladder, kid-

[1] The appended rules are those in force in the author's service at St. Louis University (Rebekah) Hospital.

ney, or bile-tract troubles shall receive urotropin, grs. 5, every three hours for the twenty-four hours preceding operation.

(8) All patients to be operated on for chronic stomach disease shall have the stomach washed with 3 per cent boric acid solution until the solution returns clear. The stomach shall then be rinsed with saline solution. All this shall be done within two hours preceding operation.

(9) The urine of every patient should be examined on his entrance to the hospital. Unless this has been done within the three days previous to operation, the urine shall be examined the morning of the day of operation, and the urinalysis report shall be sent with the patient's record to the operating-room along with the patient.

(10) In all acute abdominal conditions with vomiting, the stomach shall be washed as soon as the patient enters the hospital, except in cases where the stomach itself is supposed to be the seat of disease.

(11) In all acute abdominal conditions, patient shall be given nothing whatever by mouth, unless by special order of the attending surgeon. All such patients shall be put on proctoclysis, normal saline solution, 45 drops per minute till one pint is given. It is then to be discontinued and after two hours again begun. The solution must be of a temperature of not less than 102° F., or more than 104° F., when it reaches the rectum.

(12) The patient's bladder should be emptied immediately before sending patient to the operating-room, and if catheter be used, the surgeon shall be informed of the fact before the operation begins.

(13) No morphin or atropin shall be given any patient under twenty-one or over fifty without special order of the surgeon attending.

REGIONAL.

Shaving.

(1) The operative field is to be shaved. In shaving, the razor is never to be drawn against the direction of the hair, but with it or across it.

FOR OPERATION ON THE TRUNK.

(a) In abdominal cases, shave the whole anterior surface of the body from the nipples to the middle of the thighs.

(b) For operations on the breast, shave the anterior and lateral surfaces of the affected side from the level of the ear to that of the

After having been well washed, the surface is rinsed with sterile water, and dry sterile dressing is applied.

(Note) The shaving and washing are to be done either the evening before or the morning of the operation, as convenient.

(Note) The above rules apply to adults. In the case of children or infants the attending surgeon shall be asked concerning the administration of urotropin, morphin, and atropin, or any other drug; and for special directions in regard to shaving.

(Note) In preparing patient, should any lesion be found on the skin, especially on the skin of the area to be prepared, the surgeon should be notified, and his directions asked.

POSTOPERATIVE TREATMENT.

Position of Patient.

In lifting and laying patient, the head is to be kept low, unless in case of abdominal or pelvic suppuration, when the chest and head are always to be kept at a higher level than the hips. The same shall apply when the patient is placed in bed. The body and limbs of the patient are to be kept well wrapped in woolen blankets, and the head to be surrounded by towel as the patient is transported from the operating-room to bed.

Treatment of Shock.

The patient should be put in bed between woolen blankets, and hot-water bottles to be applied. The temperature of the hot-water bottles must not be lower than 105° F., or higher than 120° F. They should be separated from the skin by woolen wrappings or woolen blankets, and the bottles are to be continuously in use until the patient reacts from shock. For shock, neutral camphorated oil, drops 30, may be given hypodermatically every half hour. The head must be kept low.

Proctoclysis.

Immediately on being put in bed, proctoclysis of normal saline, 45 drops per minute, is begun and continued for three hours; when it is discontinued for an hour, and again begun. In this manner proctoclysis is kept up, until ordered discontinued by the surgeon or until no longer tolerated by the patient. In brain, cord, bladder, kidney, and bile-tract operations, urotropin, 30 grs., is added to the first pint.

Sweating.

If severe sweating occur, give atropin sulphate, gr. $\frac{1}{120}$, hypodermatically. The skin should be rubbed with dry towels, taking great care not to uncover patient while this is being done.

Pain and Restlessness.

If patient be in great pain or over-restless, morphin sulphate, gr. $\frac{1}{6}$, may be given, hypodermatically.

Position of Body.

In all cases in which pus has been evacuated from the lower part of the abdomen, the pelvis and hips are to be kept lower than the chest and head. This is accomplished, either by raising the head of the bed at least two feet higher than the foot, or by raising the patient on the bed-rest to a half-sitting position. In either case, a bolster or sheet is utilized to prevent patient from sliding down. No patient is to be raised to the half-sitting position, or is the head of the bed to be elevated until the reaction from the shock has set in, and should the pulse go up or the patient become faint, the head must be lowered at once.

Liquids and Nourishment.

Nothing whatever is given by mouth for at least three hours. The mouth may be rinsed with water, or water and lemon juice, at the pleasure of the patient. After three hours hot water (at 120° F.) may be allowed in 1 oz. doses every half hour. If this is not borne, give the patient 8 oz. of hot water to encourage vomiting. Repeat this in one-half hour if there be any nausea. If nausea still continue, this is to be again repeated. Should patient refuse to drink water, the stomach may be washed until the solution returns clear and free from mucus. An hour after nausea has ceased, patient may be given water *ad libitum*.

No liquid nourishment of any kind is to be given for at least eight hours, then only if nausea have ceased. Patients on liquid diet are not to be given milk without special order.

(Note) In operating on the stomach or intestines, special orders with regard to the giving of water or liquid nourishment shall be given by the surgeon in charge.

Pulse.

Pulse should be watched and recorded every five minutes until reaction has set in. If the pulse should continue to rise, or should

a falling pulse rise again, the head of the bed should be lowered, and the surgeon should be notified at once.

Temperature.

The temperature should be recorded every three hours during the first three days, and every six hours thereafter until convalescence, or until ordered discontinued by the surgeon in charge. Should the temperature rise more than 2 degrees, the surgeon shall be notified thereof as soon as possible. Should patient's temperature be subnormal, hot bottles as described should be used.

Respiration.

Respirations should be recorded with the pulse. Should the rate rise to 40 or more per minute, 1/8 of a grain of morphin sulphate may be given hypodermatically, providing morphin has not already been administered within the past four hours; also the surgeon should be notified. Should the rate fall below normal or become irregular, 1/30 of a grain of strychnin sulphate may be given, hypodermatically, and the surgeon should be notified.

Dyspnea.

Should the patient have an attack of dyspnea, he may be set up in bed with back-rest, unless this cause faintness, and the surgeon should be notified at once.

Acute Dilatation of Stomach.

Should symptoms of acute dilatation of the stomach arise, as shown by belching, distention, nausea, and discomfort, notify the surgeon at once, wash out the stomach until the solution returns clear, and turn the patient on the abdomen.

Soiled Dressings.

In case blood should appear on the outer dressing or ooze from under the same, note the character of the pulse and appearance of the patient, and if these vary from the normal, notify the surgeon; if not, change the outer dressings at once.

Changing Position of Patient.

Ordinarily patients are placed in bed in a supine position with a small pillow under the loin and a large pillow under the knees; a small pillow to be placed under the head. After ordinary clean

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Talcum powder, in shaker.
Balsam of Peru.
Stick of lunar caustic.
Bandage scissors.
Wooden tongue depressors.
Wooden applicators.

The surgeon will so time his dressing as to not interfere with the meal time of the patient.

The nurse in charge of the patient, at the request of the surgeon, shall prepare to do the dressing. She shall ask what solution the surgeon wishes to use, and on being informed, shall place on the dressing-tray at least one quart of such solution. She shall sterilize and prepare the following instruments:

1 pair of surgical scissors.
2 pairs of dissecting forceps.
1 probe.
1 two-ounce glass irrigating syringe, and such other instruments as the surgeon may specify.

All shall be brought in sterile receptacle and placed on the dressing-tray. If it be necessary to place any of these articles on the small table by patient's side, the said table shall be first covered with sterile towels. Next, all windows or doors, through which drafts blow over the patient, must be closed before the dressing is commenced, and when necessary, a screen shall be placed about the bed or around the patient, as the case may be.

In the event of dressing having to be done at night, the nurse shall arrange the drop-light. When all is ready for the dressing, the nurse shall cut the bandages, and remove bandages and outer dressings. She shall then furnish the surgeon with sterile towels to place around the part to be dressed. When the dressing is concluded, unused gauze or cotton is to be sent to the sterilizing-room to be resterilized.

RECORDS.

A complete record shall be kept from the time of admission till the discharge of the patient. This record shall be kept by the nurse, in charge of the patient, who will be held responsible for the accuracy, cleanliness, and neatness of the record.

Night records are kept in red ink. Day records in blue or black ink.

Events are to be recorded as they occur, or as soon as possible thereafter, with the time of their occurrence.

The following are the chief items to be recorded, but any item of interest regarding the patient is to be recorded also:

(1) The hour of admission, the manner of admission (stretcher, chair, or walking). The complaints of the patient.

(2) Pulse, respiration, and temperature are to be recorded (in their proper columns) at the time of admission (before bath is given), and after at the hours of 8:00, 4:00, and 12:00, except when otherwise ordered by the surgeon in charge. Anything peculiar in character of pulse or respiration to be noted in column headed "Remarks."

(3) Record to be made of all food or liquid taken by patient, and the measured amount of liquid in cubic centimeters recorded.

(4) Record is made, in proper column, of the amount of urine voided or drawn per catheter, and in the column headed "Remarks" mention shall be made of its character and whether it was voided or obtained per catheter.

(5) Stool: record shall be made of the bowel movement, and in column headed "Remarks" description of stool shall be recorded.

(6) Record shall be made of surgeon's visits and of his orders, if any.

(7) Record shall be made of each dressing or treatment and by whom done or given; and the character of any discharge on dressings or elsewhere.

(8) A separate sheet shall be attached bearing a record of the urinalysis. A complete urinalysis shall be made within twenty-four hours after admission of the patient.

(9) A twenty-four-hour summary shall be made by the day nurse at the end of the night record, and therein shall be recorded:

(a) Highest pulse, temperature, and respiration.
(b) Lowest pulse, temperature, and respiration.
(c) The amount of liquid taken.
(d) The amount of liquid voided.
(e) Whether the bowel moved.

D

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