

we make, hemorrhage may be so profuse as to become alarming in a few minutes after the operation has been begun.

We have heard nothing to-day of the two-stage feature of cranial operations, and I take it that it has been very largely abandoned, and, I think, properly so. By means of blood-pressure observations we can determine with reasonable accuracy the condition of the patient, and there is no reason why, once the tumor or lesion has been exposed, we should not at once proceed to its removal. The dangers of infection from reopening the wound and of a second anesthetization are so great as to make the two-stage operation absolutely unjustifiable. The decompressive operation has become so popular of late that there is a danger of its adoption in cases in which an exploratory operation is clearly indicated. Although decompression entails less risk to the patient, it is less difficult and requires less experience. When there is the least suspicion of the presence and location of a lesion, it is the surgeon's duty first to explore the region under suspicion; failing to find it, he may then conclude the operation with the removal of as much of the dura and bone as may be necessary to effect decompression. If this course is not adopted, many operable lesions will be overlooked and the percentage of absolute recoveries proportionately decreased.

DR. C. G. COAKLEY, New York: I did not go into the matter of deaths following operation at all. I merely spoke of the cases of sinus disease which in the last few years were almost invariably fatal because no operation was done; but the tendency now is to operate and a certain proportion of these patients will recover that would have died.

## DECAPSULATION OF THE KIDNEYS FOR CHRONIC BRIGHT'S DISEASE

WITH A REPORT OF THE RESULTS, IMMEDIATE AND  
REMOTE, OBTAINED IN 102 CASES THUS TREATED \*

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When, in 1901, I suggested treating chronic Bright's disease by decapsulation of the kidneys, I placed myself under a moral obligation to report the results after a sufficient length of time had elapsed. In fulfilment of this obligation the present report is submitted:

The working theory on which I based my procedure of renal decapsulation for chronic Bright's disease was that by the removal of the impervious capsule an opportunity was created for the formation of new vascular connections between the blood vessels supplying the secreting structures of the kidney on the one hand and the blood vessels and tissues surrounding the kidney on the other. An additional blood supply is thus created for the kidney. The increased blood supply and activity of circulation are depended on to improve the working coefficient and gradually to restore the health of the kidney.

My observations on the kidneys of some of my patients who have died months and years after decapsulation, or whose kidneys I have decapsulated a second—and in one instance a third—time, have invariably demonstrated the formation of a more or less abundant new blood supply as the result of operation. While the creation of a new blood supply to the kidney readily explains the clinically established fact of continued and lasting improvement in the work of a diseased kidney after decapsulation, it fails to explain fully

and satisfactorily the immediate beneficial effects so often witnessed. I have never in any of my operations for chronic Bright's disease found the capsule tightly stretched and compressing the kidney. Generally it fits the kidney, and sometimes the kidney even appears to be somewhat shrivelled or contracted within the loosely fitting capsule. Even in far-advanced chronic interstitial nephritis with greatly thickened capsule, the reduction in size of the kidney appears to be due rather to contraction of the new fibrous interstitial tissue of the kidney itself than to compression of the capsule. I believe that the immediate good effects of decapsulation can be explained by the necessary manipulation, amounting in reality to a massage of the kidney, during operation. The immediate stimulation of the existing blood supply of the kidney thus effected, supplemented by the relief to congestion afforded by the direct abstraction of more or less blood from the organ during operation, suffices for the immediate needs of the kidney and carries it along until its supplementary new circulation becomes established. If we can cure chronic Bright's disease by renal decapsulation we can well afford to wait until time and further observation bring the explanation of the exact physiologic effects of the operation.

One invariable effect of renal decapsulation is the formation of a new capsule. This becomes distinctly organized in from three weeks to three months, is sometimes thicker, sometimes thinner, but always more succulent and vascular than the original. It has been suggested that this new capsule must inevitably contract and lead to injurious compression of the kidney with a return of the symptoms. This argument is not based on actual observation, nor is it in harmony with the results of animal experimentation, or with the clinical facts. I now give but little thought to the question of possible danger of contraction of the new capsule. The immediate effect of decapsulation is to increase the daily output of urea and cause the disappearance or lessening of uremic manifestations. I have known a daily excretion of 6 grams or less of urea, prior to operation, to be increased to a steady output of 30 to 35 grams within a month after operation.

Renal decapsulation enables any given kidney to do the best work which it is possible for that particular kidney to do. I now decapsulate every kidney operated on for any purpose, and believe that the other kidney should be explored and decapsulated before completing a nephrectomy. For the purposes of this report the diseases of the kidney are classified as: first, interstitial nephritis, those cases in which the gross evidences of inflammation of the connective tissue of the kidney predominate; second, parenchymatous nephritis, those in which the involvement of the secretory apparatus forms the salient feature; and, third, diffuse nephritis, those inflammations of the kidney characterized by implication in fairly equal degree of both the parenchyma and the connective tissue of the organ.

The diagnosis of chronic nephritis on the living subject is easy after some experience, the pathologic changes being more appreciable with the blood circulating through the kidney than they are after death. It is easy to recognize in the adherent capsule, nodulation, granular condition of the subcapsular surface, shrinking, unequal contraction, and occasional cyst formation, a chronic interstitial nephritis; or by the enlargement, cloudy swelling, mottling, and discolorations due to

\* Owing to the illness of the late Dr. Edebohls, which prevented his attendance at the Section on Surgery and Anatomy of the American Medical Association, Fifty-ninth Annual Session, Chicago, June, 1908, this paper was read by Dr. Samuel Lloyd. Because of lack of space, the article is here abbreviated by the omission of the elaborate bibliography which appears in the Transactions of the Section and in the author's reprints.

circulatory and degenerative changes, a chronic parenchymatous nephritis; or by the thickening, general or localized, of the capsule, and the secondary inflammatory changes in the perirenal fat common to both varieties, a chronic diffuse nephritis. The variations in density and hardness, quite frequently varying widely in different parts of the same organ, are also readily appreciated. I now find no difficulty in promptly determining at operation whether or not a kidney is affected with chronic Bright's disease.

I now advise renal decapsulation for every sufferer who consults me for chronic Bright's disease, and who has a reasonable expectation of not less than a month of life without operation. The three conditions which lead me to advise renal decapsulation are: First, the clear and unequivocal establishment of the diagnosis of chronic Bright's disease; second, the absence in a given case of absolute contraindications to any operation; third, the possibility of securing the services of a surgeon practically familiar with the surgery of the kidney.

As soon as a nephritis has become chronic it is an absolute indication for decapsulation. The earlier in the course of chronic nephritis an operation is performed the better will be the patient's chances of a perfect cure. Renal decapsulation is indicated in all varieties of chronic nephritis. I no longer advise against operation on account of advanced age, provided the patient be otherwise in reasonably fair condition. It must be borne in mind that all patients with chronic Bright's disease have more or less hypertrophy of the heart. As long as the enlargement is mainly hypertrophic and not due to dilatation, and as long as the hypertrophy is concentric, an anesthetic may be administered with a reasonable degree of safety. It is only when dilatation of the heart predominates over the hypertrophy that the danger of sudden death from acute dilatation is ever present, and no general anesthetic should be administered to such a patient. In my opinion the most ominous auscultatory sign of predominant dilatation of the heart and danger of sudden death is insufficiency of the aortic valves, as denoted by an intermittent aortic regurgitant murmur occurring every third, fourth, or fifth beat, and even less frequently. When this condition is clearly present and can not be removed by suitable medication, the patient is very near the end of life and I advise against operation. During the course of recent years I have had the unexpected pleasure a number of times, on examining patients at periods remote from operation, of finding that very pronounced cardiac hypertrophies and derangements had become totally insignificant, and in some cases had even entirely disappeared, as the health of the kidneys was gradually regained. These changes for the better in the condition of the heart I have come to regard as the surest indication that the health of the kidneys is improving.

Retinitis albuminurica demands careful consideration in determining for or against renal decapsulation. Edema or dropsy of the retina must be differentiated from true retinitis with hemorrhage or exudates. The former may disappear, the same as a dropsy in any other part of the body. The importance of true retinitis albuminurica in relation to renal decapsulation lies in the fact that it is one of the late manifestations of chronic Bright's disease. Its occurrence signifies that the general changes produced throughout the body by the disease are so far advanced that they will cause

death, even though the function and health of the kidneys can be restored by operation. It also indicates such widespread disease of the vascular system that the danger of rupture of blood vessels in any part of the body is always imminent. Among the first 72 patients, 9 had retinitis albuminurica at the time of operation. The unfavorable outcome in these cases has led me for the past three years to decline to operate on patients who had well-marked albuminuric retinitis. The only point that requires emphasis in the operation is the necessity of securing union by first intention.

The changes in the patient's condition and general health after decapsulation are nearly always impressive, and in some cases simply marvellous. The improvement is progressive, continuing and increasing even after the patient has resumed his usual avocation. This is due to the improved work of the kidneys, as denoted especially by the increased daily urea output.

My own experience with renal redecapsulation has thus far not been very encouraging. Were it not for the impression created by the case of Peabody, I should feel opposed to further trial of a second decapsulation in cases in which the first operation failed to initiate the cure. The only indication for a second decapsulation that would appeal to me would be in the case of a patient acquiring a new chronic nephritis after having been entirely cured of a first chronic nephritis by the first decapsulation.

Renal decapsulation for puerperal convulsions of renal origin are really renal decapsulations for subacute or chronic nephritis, at least that has been my experience.

Whatever merit may be claimed for or accorded this report of the result of my renal decapsulations for chronic Bright's disease must be based entirely on the fidelity and persistence of purpose with which the histories and postoperative fortunes of my patients have been followed and recorded. This report embraces all my operations performed on the kidneys with the hope of curing or improving existing chronic Bright's disease up to the end of May, 1906, the patients numbering 102 all told. Nearly fifteen years have elapsed since the first operation, and fifteen months represent the shortest period of observation after operating in any of the surviving cases—an average of five years for each of the 102 cases has elapsed since operation. All but 3 of the 102 patients are fully accounted for; the 3 cases unaccounted for were lost sight of years ago.

With 99 of my 102 patients I have managed to keep in touch continuously from the day of operation until either the date of their death or the present day. In the case of those who died, I have succeeded in obtaining the exact date as well as the cause of death in each instance. The vast majority of my cases were private: scarcely half a dozen belong to the class of hospital-ward cases. This has been of material assistance in following the after history of these patients. The patients themselves have freely and voluntarily cooperated in the attempt to solve the question of the curability of chronic Bright's disease. Whenever I have failed to hear from a patient for a period of six months I have made inquiry either of the patient or of the attending physician. I consider myself exceptionally fortunate in having succeeded in obtaining from all but one or two a twenty-four-hour specimen of urine at fairly regular intervals of time since the operation. The last specimen of urine from all but three of the survivors has been obtained within the past few months.

## SUMMARY OF CASES

Since the publication of my book in 1904 I have continued to follow and record the further histories and fortunes of my surviving patients, as well as of those operated on in 1904, 1905, and the first half of 1906. I have thus managed to keep together this entire clinical material as a compact whole. I fully realize that in order to obtain recognition and acceptance by the profession at large for the surgical treatment of Bright's disease a sufficiently large number of cases of chronic nephritis observed for a sufficient length of time after renal decapsulation was an absolute essential. I believe that this report will show that this purpose has now been fulfilled. This report will probably be my final one,<sup>1</sup> and it is hoped that it will be received and accepted by the profession in full and complete discharge of the moral obligation assumed by myself when I first proposed to treat chronic Bright's disease, as such, by surgical measures.

## SEX

Of my 102 patients 50 were male and 52 female.

## AGE

The youngest patient was 4½ years, the oldest 67 years of age. The average age of the 102 patients at the time of operation was 39 years and 8 months.

## OCCUPATION

Notes concerning the occupation of patients were rarely made, the matter not being deemed of sufficient practical interest. Fourteen of my patients were themselves physicians, and five were immediate members of physicians' families.

## HISTORY PRIOR TO OPERATION

The majority of the patients at and before the time of operation presented either all or the most serious of the well-known clinical features of the disease. Some suffered in one way or another without having such a pointed history as unmistakably to indicate chronic Bright's disease. A few were absolutely unaware of any serious impairment of health until the occurrence of paralysis, of retinitis albuminurica, of uremic convulsions, or the discovery of albumin and casts in the urine on application for life insurance brought them suddenly face to face with the fact that they were affected with a fatal malady. It is a well-known fact that chronic Bright's disease frequently develops and progresses in an insidious manner, so that the advanced and final stages of the malady are often reached before the patient is aware that there is anything greatly wrong.

## PHYSICAL CONDITION AT TIME OF OPERATION

Equally great with the differences in the symptoms produced by the disease were the physical manifestations and objective signs presented by the various patients on examination prior to operation. In comparatively few there were absolutely no manifestations of chronic nephritis except such as examination of the urine revealed. Others, again, suffered from all conceivable ravages of the disease in distant parts of the body—the brain, the visual organs, the heart and lungs, the digestive system, etc. Between the two extremes mentioned all shades of variation were encountered.

## LENGTH OF EXISTENCE OF CHRONIC BRIGHT'S DISEASE PRIOR TO OPERATION

One of the most difficult things to determine is the exact date of the beginning of chronic nephritis. Perhaps the only time when this can be done with absolute exactness is when the chronic nephritis is the outcome or the continuation of an acute nephritis occurring either as a primary affection or as a complication of other diseases: influenza, scarlatina, typhoid

fever, diphtheria and other general infections in which the kidneys are liable to become involved. Even then our conclusion that the nephritis dates from such an event may not be correct. The patient may have had chronic nephritis prior to the occurrence of the infectious disease, and the acute nephritis supposedly induced by the infection may in reality have been only an acute exacerbation of an already existing nephritis. Uncertainty in this respect pertains even to those cases of nephritis which the history indicates as having originated during a pregnancy.

Subject to the restrictions and limitations just stated, an attempt has been made to determine the probable duration of the chronic nephritis prior to operation in each patient from the length of time that the symptoms have existed. Judged by this admittedly defective standard, the average duration of chronic Bright's disease prior to operation in my 102 cases was four years. That the average duration, as thus estimated, falls far within the real limits is very certain.

In 85 of the 102 patients the period of time prior to operation at which examination of the urine first revealed the presence of chronic Bright's disease could be accurately determined. In these 85 patients the duration of chronic Bright's disease prior to operation, as known from urinalysis averaged 2 years and 11 months.

## DATE OF OPERATION

The first of my 102 patients was operated on Nov. 29, 1892; the last on May 31, 1906. Nearly fifteen years have passed since the first operation, and fifteen months have elapsed between the last operation and the date of this report.

## PLACE OF OPERATION

One hundred and nine operations were performed on the kidney or kidneys of my 102 patients, 7 of the patients having two kidney operations. The 109 operations were performed in the following places:

My private hospital.....	40
New York Postgraduate Hospital.....	37
Home of the patient.....	15
St. Francis Hospital, New York.....	14
Galt General Hospital, Galt, Ontario, Canada.....	1
Dr. H. D. Fry's private hospital, Washington, D. C.....	1
Virginia Hospital, Richmond, Va.....	1

## NATURE OF OPERATIONS PERFORMED ON THE KIDNEYS.

	Sittings.	Patients.	Operations.
Decapsulation of both kidneys....	1	69	69
Redecapsulation of both kidneys..	1	..	4
Decapsulation and fixation of both kidneys.....	1	17	17
Decapsulation and fixation of both kidneys.....	2	2	4
Decapsulation of both kidneys and fixation of right kidney.....	1	4	4
Decapsulation of one kidney and removal of the other.....	1	2	2
Decapsulation of one kidney and removal of the other.....	2	1	2
Decapsulation and fixation of right kidney.....	..	7	7

It will be noted that in 7 cases only one kidney, always the right, was operated on; while in 95 cases both kidneys were submitted to operation. Ninety-two of the 95 bilateral operations were performed at one sitting; in three instances the right and left kidneys were operated on at two separate sittings. Both kidneys of two patients were decapsulated twice, and both kidneys of one patient three times.

## ANESTHETIC

The following list shows the number of operations in which each of several anesthetics was employed, alone or in combination:

Nitrous oxid and ether.....	63
Ether.....	19
Chloroform.....	11
Chloroform and ether.....	4
Chloroform and oxygen.....	1
Nitrous oxid and chloroform.....	1
Nitrous oxid, ether and chloroform.....	1
Nitrous oxid, oxygen, ether and chloroform.....	1
Nitrous oxid and oxygen.....	8

I have had the good fortune in the majority of these 109 operations to have at my command the services of specialists

1. EDITOR'S NOTE: Dr. Edebohl died Aug. 8, 1908.

and acknowledged experts in the administration of anesthetics, and when such was the case the choice of anesthetic was left with the anesthetist. I can see no good reason, however, why any surgeon should not use in his kidney operations the same anesthetic to which he is accustomed in his operative work generally. To this broad rule there are exceptions, special reasons for the preference of a particular anesthetic being now and then given by the predominance of particular complications, especially those affecting the heart, lungs and vascular system. Under these conditions the choice of anesthetic must be made on generally understood and accepted principles; and it should always be borne in mind that in operations on the kidneys of patients suffering from chronic nephritis the danger is, broadly speaking, greater from the anesthesia than from the operation.

#### ADDITIONAL OPERATIONS

A number of operations additional to the kidney operations were performed by me on a certain proportion of the 102 patients. The additional operations, although many of them were of a severe character, were attended with no mortality. In some instances the kidney and the additional operation or operations were performed at the same sitting; in some the additional operation or operations either antedated or followed operation on the kidneys.

#### VARIETY OF NEPHRITIS AS ESTABLISHED AT OPERATION

Right and left chronic interstitial.....	31
Left chronic interstitial, right kidney normal.....	4
Right chronic interstitial, left kidney normal.....	1
Right and left chronic diffuse.....	34
Left chronic diffuse, right kidney normal.....	3
Right chronic interstitial, left chronic diffuse.....	6
Right and left chronic parenchymatous.....	16
Right chronic diffuse, left kidney not operated on.....	1
Right chronic interstitial, left kidney not operated on.....	6

The only difficulty in the classification of the variety of nephritis that presented itself was in the cases of three patients whose kidneys were decapsulated for the cure of puerperal convulsions. In these three cases a subacute parenchymatous nephritis was encountered. As there was much evidence, however, both from the condition of the kidneys and in one case from the history of the patient, that the subacute nephritis encountered at operation was but an exacerbation of a previously existing chronic nephritis, these cases have been classified under the head of chronic parenchymatous nephritis.

From the above classification it will be seen that one variety of nephritis may affect one kidney, and a second variety the other kidney of the same individual—right chronic interstitial and left chronic diffuse nephritis having been observed no less than six times.

#### UNILATERAL NEPHRITIS

Chronic nephritis affecting one kidney only was noted in a strikingly large proportion of the 102 cases. In 8 patients, in whom both kidneys were exposed at operation, one kidney was found healthy and the other diseased, the unilateral chronic nephritis being of the interstitial variety in 5, and of the diffuse variety in 3 cases. Of 7 patients in whom only one kidney was operated on, 4 were completely cured of their former chronic interstitial nephritis and have remained cured for periods of time varying between five and fourteen years; therefore, these 4 patients must either be regarded as having had a healthy kidney on the side not operated on, or, if it be assumed that the second kidney also was diseased at the time of operation, the decapsulation of one of a pair of diseased kidneys must be credited not alone with restoring the health of the kidney operated on, but of that of its fellow kidney as well. I incline to the former of these two explanations as the more probable. In 8 of the 102 cases, therefore, the chronic nephritis was proved beyond a reasonable doubt to be confined to one kidney, and that such was the case in at least 4 other patients the final outcome makes extremely probable. These observations I am compelled to interpret as establishing beyond controversy the fact that chronic nephritis may be encountered as a unilateral affection in a hitherto unsuspected proportion of cases.

#### RENAL AND PERIRENAL CONDITIONS COMPLICATING THE CHRONIC NEPHRITIS

Polycystic degeneration of left kidney.....	3
Polycystic degeneration of right kidney.....	1
Bilateral pyelonephritis, with miliary abscesses.....	2
Unilateral pyelonephritis, with miliary abscesses.....	1
Left acute suppurative perinephritis.....	1
Right chronic perinephritis.....	5
Right and left chronic perinephritis.....	14

#### WOUND HEALING

Of the 205 lumbar incisions made in the 109 operations on these 102 patients, 200 healed by primary union throughout. The failure to obtain primary union in the remaining five incisions was due to the following causes:

One intractable patient infected both wounds by repeatedly tearing off all dressings.....	2
Breaking down of an acute perinephritis antedating operation.....	1
Suppuration of a deep perirenal hematoma.....	1
Slight leakage of urine from surface of kidney.....	1

In not a single case was the breaking down of the wound the result of infection introduced at operation.

#### ANALYSIS OF RESULTS

Of the 102 patients 10 died within two weeks following operation, 39 died at periods of time more or less remote from operation, 3 disappeared from observation after leaving the hospital, and 50 are known to be living.

#### OPERATIVE MORTALITY

The operative mortality may be stated as 9.8 per cent. In reality, however, as 7 patients were operated on twice, 109 operations were performed on one or both kidneys. One of these patients died after a second decapsulation. Figured in this way, there were 11 deaths in 109 renal decapsulations for chronic Bright's disease, an operative mortality of 10.1 per cent. In round numbers, therefore, my operative mortality was 10 per cent.

This 10 per cent. mortality is fairly attributable to the disease itself and to its complications rather than to the operation. Bilateral renal decapsulation could be performed by an expert in renal surgery on 100 perfectly healthy human beings without losing a single life. In judging my own mortality, the fact must be taken into consideration that for one reason or another I accepted for operation cases in which the fatal outcome was almost a foregone conclusion. Patients, as well as their physicians (the two sometimes represented in the same person), insisted that they were entitled to the benefit of the doubt, and requested or even demanded operation.

Six of the operative deaths occurred in the first 40, 5 in the last 69 operations. All of the 10 patients who died within fifteen days following operation were males. The average age of the 10 patients was 45 years and 6 months.

The average duration of chronic nephritis prior to operation in these 10 patients, as indicated by the symptoms, was 4 years 11.6 months; as known from urinalysis, 3 years 1.7 months.

Decapsulation of both kidneys at one sitting was performed on each of these 10 patients.

Of the 10 patients, 7 suffered from chronic interstitial nephritis, 2 from chronic diffuse nephritis, and one from chronic parenchymatous nephritis, the disease in every instance being bilateral.

The cause of death was acute dilatation of the heart in 4 cases, uremia in 3, cerebral hemorrhage and uremia in 1, acute dilatation of the heart and edema of the lungs in 1, and acute lobar pneumonia in 1.

#### LATER DEATHS

Thirty-nine patients died at periods of time more or less remote from operation and from causes in no wise connected with the operation; of these 26 were males and 13 females.

The average age of the 39 patients at the time of operation was 41 years and 10 months.

The average duration of chronic nephritis prior to operation in these 39 patients, as indicated by the symptoms, was 4

years 7.3 months; as known by urinalysis, 2 years 7 months.

Decapsulation of both kidneys was performed on 24 of these patients; decapsulation and fixation of both kidneys on 2; decapsulation of both kidneys with fixation of the right on 1; decapsulation and fixation of the right kidney on 1; decapsulation of the right kidney and removal of the left on 1.

Of the 39 patients, 17 suffered from right and left chronic interstitial nephritis; 1 from right chronic interstitial nephritis; 3 from right chronic interstitial and left chronic diffuse nephritis; 8 from right and left chronic diffuse nephritis; 2 from left chronic diffuse nephritis; 1 from right chronic diffuse nephritis, and 7 from right and left chronic parenchymatous nephritis.

Wound healing was by primary union throughout in each of the 77 incisions made on these 39 patients.

Of the 39 patients, 1 died as the result of abdominal hysterectomy eight years after her kidney operation; 1 died of an operation for ruptured tubal pregnancy one year after operation on her kidneys; 1 died of septic pneumonia due to suppurative coxitis; 1 died of chronic pleuropneumonia; 1 died of gangrene of the tonsils and palate following grip; 1 died of cerebral embolism in the course of grip; 1 died of heart failure and uremia in the course of grip; 3 died of cerebral hemorrhage; 1 died of suppurative pyelonephritis; 4 died of edema of the lungs; 1 died of endocarditis; 2 died of valvular disease of the heart; 4 died of acute dilatation of the heart; 1 died of diabetic gangrene of the lower extremities, and 16 died of uremia.

Of these 39 later deaths, 10 were due to causes that stood in no direct relation to chronic nephritis—2, for instance, died of diabetes. Three other patients succumbed to grip. Including these last 3 cases, 29 of the 39 later deaths may fairly be ascribed to chronic nephritis and to its sequelæ and complications.

The longest period of time between operation and death was eight years; the shortest, fifteen days. The average duration of life after operation was 1 year 4 months and 20 days.

In these 39 patients, 11 received no benefit from the operation; in 1, the possible benefit from operation was prevented by suppurative coxitis; the complications of the advanced stages of chronic Bright's disease nullified the benefits of operation in the remaining 10.

Four experienced slight and temporary improvement only. A peculiar feature of this temporary improvement consisted in the fact that the patient's general health and well-being were decidedly improved, so much so that three of the four who were bedridden for months preceding operation were able to return to work and to remain at work until within a very short time before death. This improvement in general health, however, was not accompanied by any improvement in the condition of the kidneys. Albumin and casts continued in the same or even greater abundance than before operation. The daily output of urea, however, was always greater than before operation, and the consequent lessening of uremia probably explains the improvement in general health and well-being. In other words, the functional activity of the kidneys was temporarily improved by decapsulation, although the fatal organic changes continued unchecked.

Eight patients experienced moderate improvement, the average duration of such improvement amounting to 1 year and 10 months.

Sixteen patients experienced decided improvement, lasting in 3 cases until death from causes other than chronic nephritis. The average duration of decided improvement for these 16 cases was 1 year and 2 months.

#### THE SURVIVORS

There are 53 survivors. The youngest was 4 years and 7 months, and the oldest was 67 years of age at the time of operation. The average age of the 53 survivors at the time of operation was 38 years and 11 months. An average period of fully five years for each of the survivors has elapsed since operation, making the average age of the survivors at the present time (September, 1907) 43 years and 11 months.

The average duration of chronic nephritis in the 53 survivors, as judged from the history and symptoms, was 3 years

6.9 months. The average period before operation at which albumin and casts were first discovered in the urine was 3 years 1.2 months.

The following operations were performed on the 53 survivors:

Decapsulation of both kidneys.....	25
Decapsulation and fixation of both kidneys.....	17
Decapsulation of both kidneys and fixation of right kidney .....	3
Decapsulation and fixation of right kidney.....	6
Decapsulation of right kidney and left nephrectomy..	2

The 53 survivors had, and a number of them still have, the following varieties of nephritis:

Right and left chronic interstitial.....	7
Left chronic interstitial, right kidney normal.....	4
Right and left chronic diffuse.....	24
Left chronic diffuse, right kidney normal.....	1
Left chronic diffuse, right chronic interstitial.....	3
Right and left chronic parenchymatous.....	8
Right chronic interstitial, left kidney not operated on..	6

The first of the 53 was operated on 14 years and 10 months ago; and the last, 1 year and 3 months ago. The average length of time since operation is a little over five years for each.

The histories of these 53 patients have been followed in all but three instances since the time of operation. In the three cases alluded to the final result is unknown. The life history of each of the remaining 50 has been obtained and recorded, and the final results to date of the 53 patients may be stated in a general way as follows:

Final result unknown.....	3
Unimproved, or but little improved.....	6
Improved .....	11
Cured .....	33

Before proceeding to an analysis of this list, it is but fair to state that the results are in reality a little better than indicated by the above figures. Thus, of 2 patients who died after operations performed by other surgeons one year and eight years respectively, following renal decapsulation, there is reason to believe that one was cured, while the other was certainly improved. Both of these patients now figure in the list of later deaths, instead of appearing among the survivors. There is also very little doubt in my mind that the number of cured patients will in the near future be increased by a few accessions from those now classed as improved.

Of the 6 survivors recorded as unimproved, only 1 has really experienced no amelioration of any kind. The other 5 all experienced improvement in either general health or in the urine, or in both. All of the 5, however, are at present in better health than before the operation. In 2 of the 5 an associated pulmonary tuberculosis precludes all hope of further betterment.

Of the 11 cases classed as improved, both the general health and the condition of the urine show steady and progressive improvement, continuous from the date of operation to the present day; 3 of the 11 appear to be on the eve of restoration to complete health, their general condition being good and their urine almost normal.

Finally, 33 patients have been completely cured of their former chronic nephritis as a result of the operation performed on their kidneys. In every case the urine has become normal at varying periods of time following the operation and, with the exception of four patients whose urine was found normal for the first time within a few months of this report, has remained normal for a period of six months and upward. These patients, with the four exceptions mentioned, have, therefore, fully met the requirements necessary to entitle them to be regarded as cured. These requirements are: "The urine must remain free from albumin and casts, and the daily urea output be normal, or approximately so, for a period of at least six months following the verification of the disappearance of albumin and casts, and the patient must be free from the symptoms of chronic Bright's disease from which he or she formerly suffered."

It should be added that the vast majority of my patients received no further treatment of any kind for their chronic nephritis after operation; they were not even subjected to the

usual restrictions of diet. Whatever benefit they received, therefore, must be ascribed solely to the effects of renal decapsulation.

As already stated, the cure of chronic nephritis is only started by renal decapsulation, and the element of time is essential to obtain the full advantages of the operation. In some patients the health of the kidneys was restored in a few months after operation, while in others the same result was reached only after a period of three years.

To prove that cure or improvement of chronic nephritis after renal decapsulation is due to the operation, it must be shown: First, that cure or improvement follows operation with practical uniformity; second, that improvement obtained by operation is steadily progressive in the majority of cases; third, that a cure once obtained is, as a rule, lasting. The first of these conditions has been fulfilled in 81 of the 102 patients; the second in an equal number, 48 of the number progressing steadily up to a certain point, varying with each case, but falling short of complete cure. That some of the 48 will eventually reach complete health I am very confident. This confidence is based on further experience and developments in connection with the "survivors" of my report of 1904. Of the 53 survivors in this report, the 17 who were classed in 1904 as cured are all alive and perfectly well at the present day; while of the 20 patients who were classed as improved, 4 have attained perfect health and now appear in the list of cures.

The third condition, that a cure once obtained must, as a rule, be lasting, has thus far been fulfilled to the extent to be detailed later on by every one of the 33 patients.

Fifteen of the women on the cured list were married at the time of operation; 4 have married since operation; 2 women have given birth to one child each since operation; a third woman has gone through two pregnancies, giving birth to three children. The five children are alive and well. The mothers suffered no kidney disturbance of any kind during pregnancy or since, and are to-day in the enjoyment of perfect health.

#### SUMMARY OF DATA RELATING TO CURED PATIENTS

These number 33—4 men, 28 women and 1 female child. The youngest cured patient was 4½ years old at the time of operation; the oldest, 67 years. The average age of the cured at the time of operation was 33 years. Five years, on an average, having elapsed since operation, the present average age of the cured is 38 years.

The average duration of chronic nephritis before operation was 2 years and 8 months for each of the 33 patients; comparison with the average duration before operation of 4 years for the total number of 102 patients; 4 years 11.6 months for the 10 patients who died within two weeks following operation; 4 years 7.3 months for the 39 later deaths; and 3 years 6.9 months for the 53 survivors, speaks louder than words for early operation.

The varieties of chronic nephritis of which these 33 patients were cured were as follows:

Right and left interstitial.....	5
Right interstitial, left kidney not operated on.....	4
Left interstitial, right kidney normal.....	4
Right and left diffuse.....	11
Left diffuse, right kidney normal.....	1
Right and left parenchymatous.....	6
Right interstitial, left diffuse.....	2

In 13 cases, therefore, the chronic nephritis was interstitial; in 12 diffuse; in 6 parenchymatous, and in 2 interstitial on the right side and diffuse on the left.

The shortest time between operation and cure was one month; the longest, 3 years; 18 patients recovered full health in less than a year after operation; 10 required between 1 and 2 years; 4 did not attain full health until between 2 and 3 years after operation; and in one case fully 3 years elapsed between operation and cure. The average time after operation at which full health of the kidneys was reached was 11 months for each of the 33 patients.

Deducting 11 months, the average time after operation at which the urine became normal, from 5 years, the average time since operation, gives an average period of health of 4

years and 1 month thus far gained for each of the 33 patients.

In the 33 cured patients, the average duration of chronic nephritis was 1 year and 10 months for each of the 13 interstitial cases; 3 years and 5 months for the 12 diffuse cases; 1 year and 1 month for the 6 parenchymatous cases; and 2 years for the 2 right interstitial and left diffuse cases.

The average length of time after operation at which the urine became normal was 6 months for the interstitial cases; 1 year and 2 months for the parenchymatous cases; and 8 months for the right interstitial and left diffuse cases.

#### SUMMARY OF RESULTS AND REMARKS

The results obtained in my first 102 decapsulations of the kidneys for chronic Bright's disease have been detailed fully, frankly and without reservation.

In the first place, renal decapsulation for chronic Bright's disease may be charged with 10 deaths following the operation. Let us admit for the sake of argument that these 10 deaths were all due to operation—a matter by no means settled, as practically every one of the 10 patients was within a few weeks, if not days, of the natural termination of life by disease. These 10 deaths as a result of operation are fully offset by an equal or larger number of patients snatched from impending death by operation. At least 12 others of my patients, who were considered at death's door when I operated, have had months and years added to their lives by the operation, and a number of the 12 are alive and well to-day. The sum total of life added as a result of operation in these 12 cases very far exceeds the curtailment of life which the operation may have caused in the 10 patients who died soon after, as a result of operation. The added years of life, in addition, were for the greater part years of comparative health, comfort and usefulness, as compared with the days or weeks of suffering which, had operation not been performed, would have been the lot of the 10 unfortunates who died.

To put it another way: Of 22 sufferers from chronic nephritis who came to me for operation, and whose deaths were immediately imminent by virtue of the disease, 12 were saved by operation, while in 10 the attempt to save life failed.

Of the 39 remote deaths none were due to operation. Twenty-nine of the 39 patients ultimately died of chronic nephritis or its complications. Of these only 11 received no appreciable benefit from operation. The worst that can be charged against operation in these 11 cases is that the operation did no good; it certainly did no harm. Eighteen of the 29, as well as the 10 patients who finally died of causes other than chronic nephritis, were all more or less benefited by the operation, the duration of improvement experienced by these 28 patients amounting to a total of more than 33 years.

Of the surviving patients, even the 6 classed by me as unimproved have experienced such marked benefit in general health that, personally, each of the 6 is abundantly satisfied with the results of operation.

Next, of the 11 patients who have all experienced decided improvement in general health and in the condition of the urine as the result of operation, a number appear to be on the high road to complete health, and bid fair later on to augment the list of cures.

Finally we reach the 33 cures of chronic Bright's disease attained as a result of operation. These 33 cures alone would justify all the work that has been done, even if no benefit had accrued to the remainder of



my patients. The justification, in my opinion, will still hold good, even if some of the cases now classed as cured should relapse, or in the future become the victims of a new nephritis.

Of the entire 102 patients, therefore, 21 received no benefit from operation, while 81 patients experienced amelioration varying all the way from slight and temporary improvement to complete cure. In 12 cases the operation proved directly life-saving by rescuing the patient from impending death.

In judging the above results, the fact should be borne in mind that the immense majority of my patients came for operation only after all other measures and treatment had failed to arrest the progress of their chronic nephritis. A great number were on the very eve of dissolution, and the desperate character of my series of 102 cases will probably not be duplicated by any surgeon in the future. Better results than those recorded here will undoubtedly be obtained as soon as sufferers from chronic nephritis seek relief and cure in early operation.

In the meanwhile, these results, 33 cures among 99 patients whose ultimate fate is known—obtained in a hitherto incurable malady, and one which, according to the United States census of 1900, ranks sixth in the list of diseases causing death, not alone justify the surgical treatment of chronic Bright's disease, but establish that treatment as at present the main if not the only hope of a very large class of sufferers.

For the present, in view of the helplessness of medicine in the presence of established chronic Bright's disease, the advance in treatment represented by renal decapsulation should be welcomed by every physician called upon to treat chronic nephritis. Nor is the physician justified in taking the position that only after all other measures have failed will he resort to decapsulation. That is giving neither the operation nor his patient a fair chance, to which the latter at least is certainly entitled. For even at present I am able to affirm, as the result of experience, that renal decapsulation applied early in the course of a chronic nephritis, and in the absence of complications, is almost free from danger in expert hands, and is almost a certain cure.

That physicians are not unwilling on occasion to try in their own persons methods of treatment which promise more than those heretofore known to medical science, seems indicated by the fact that of my 102 patients no less than 14 were physicians, and 5 others were members of the immediate families of physicians. One physician and his wife were both operated on during the same afternoon.

Much of what has been said in this paper rests upon the assumption that the curability of chronic Bright's disease by decapsulation of the kidneys is a proved fact. Regarding it as such, I feel that my expectation and hopes of years ago have been in large measure realized, and that the promise of a yet fuller realization appears bright.

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**The Dark Ages of Tuberculosis to End.**—I have lived through many of the long, dark years of ignorance, hopelessness and apathy. . . . But I have lived also to see the dawn of the new knowledge, to see the fall of the death rate of tuberculosis, to see hundreds who have been rescued, to see whole communities growing up of men and women whose lives have been saved and who are engaged in saving the lives of others.—Dr. E. L. Trudeau.

## THE SUTURE: ITS PLACE IN SURGERY \*

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The history of the ligature and the suture is, in a measure, the exponent of the history of surgery. Surgery may also be accepted as a fair exponent of the rise, fall and progress of civilization.

### PREHISTORIC SURGERY

Always prominent in the very dim and shadowy past, two of the professions, with which the third is more or less intimately blended, come into bold relief. In the differentiation of duties, even in the tribal relations, there was set apart a liberal representation of the brighter intellects for determining the relation of man to his brother and to that which all men have believed more or less clearly, the possible after-life. The rules of living determined by these men assume more or less formal expression in the codes of laws of the state and the church. The physical needs of mankind became at once apparent, and these were ministered unto, in differentiation from either spiritual or political needs by the so-called medicine-men of the savage tribes and priests and soothsayers of the barbaric ages. The need for the care of wounds and injuries produced a class of those especially trained, who have been denominated surgeons.

### GREEK AND ROMAN SURGERY

Homer clearly portrays the active, beneficent service of the military surgeon. The fragmentary history of the Egyptian and Assyrian civilizations clearly teaches the honorable part assigned to his service. Pompeii, although a suburban city, has yielded abundant evidence of the surgeon's art in both war and peace. Pompeian frescoes portray his service. The instruments which he used are seen to-day in the great museum at Naples in considerable variety. This is as would be expected, since the mental processes act ever in the same accord, and a recognized need stimulates the meeting of the demand.

Roman civilization reached the climax of development in the early centuries of the Christian era, but, as in the case of Egypt, Assyria and Greece, unfortunately, many most important questions in regard to the development of the arts and sciences can at the best be only partially answered, since the storehouses of the most precious knowledge of the Romans were destroyed with the downfall of their civilization. We know, however, that even to-day we may learn much from the civil code and military regulations which dominated Rome's highest development. In both the civil and the military service the surgical profession was honored and the service rendered was of most signal value.

### ANCIENT USE OF THE LIGATURE

The ligature played an important part in the armamentarium of Roman surgeons.

Celsus, living in the first century, one of the most remarkable of the Roman surgeons, gives special directions as to the use of sutures in a great variety of surgical affections. In illustration may be cited the pene-

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\* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-ninth Annual Session, held at Chicago, June, 1908. Because of lack of space the article is here abbreviated by the omission of a history of sutures, but the complete article appears in the Transactions of the Section and in the author's reprints.