

LESSON 3: “PLEASE DON’T CUT OFF MY LEG?”

INTENDED AUDIENCE

High-school students; first- or second-year undergraduates in history, social studies, or science

LEARNING OBJECTIVES

- Identify the tools employed during an amputation.
- Describe the procedures of an amputation.
- Describe how Civil War surgeons assessed the risks of performing an amputation.
- Outline the perspective or world view of the soldier who had a limb amputated, and the soldier’s expectations during the late 19th century.

TIME REQUIRED FOR LESSON

This lesson includes a role-play exercise and a class discussion which can be performed within a one-hour class. The debriefing question is intended as a supplementary exercise to provide broader context to the classroom discussion.

KEY TERMS/WORDS

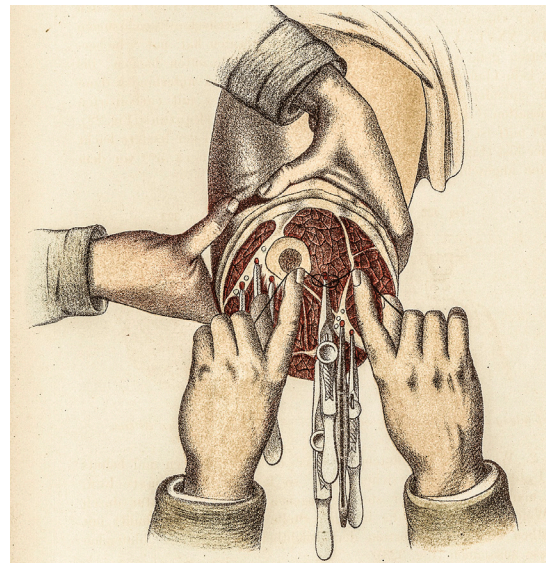
amputation, gangrene, shock, hemorrhage, resection, invalid, disabled

MATERIALS REQUIRED

Readings that accompany this lesson.

BACKGROUND QUESTION

Of all the enduring myths of the Civil War, the image of surgeons as drunken butchers sawing off the arms and legs of soldiers out of ignorance or callousness prevails today. In actuality doctors were extremely cautious and careful when it came to risking a patient’s life for such a radical treatment of gunshot wounds. In fact, most doctors, especially as the war progressed, preferred to extract damaged bone fragments or put the mangled limb in a splint rather than cutting it off. After the war, Union medical sources accounted for 29,980 amputations in Northern armies, and approximately 21,753 survived, an impressive statistic that speaks to the care and skill of professional medical men and their caregivers in the hospital.



Colored lithograph showing a thigh amputation procedure

Courtesy of Historical Medical Library of The College of Physicians of Philadelphia

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After reading the sources below, have students consider the following questions
(students can respond to these questions before the class scheduled for the following role play)

- *What were the questions that doctors asked themselves before deciding to amputate?
(Make a checklist of considerations in evaluating whether or not to amputate.)*
- *What did they see as the most serious risks for the patient?*

Both questions will allow you to reconstruct their philosophy about performing an amputation.

S. D. Gross, *A Manual of Military Surgery* (Philadelphia: J. B. Lippincott & Co.), 74-82.

Note that the complete manual may be found on-line at:

<http://jdc.jefferson.edu/milsurgusa/>

<https://archive.org/details/manualofmilitary01gros>

[Lesson 3 Attachment 1]

E. Andrews, *A Complete Record of the Surgery of the Battles: Fought Near Vicksburg*

(Chicago: George H. Fergus, Book and Job Printer, 1863), 41-45.

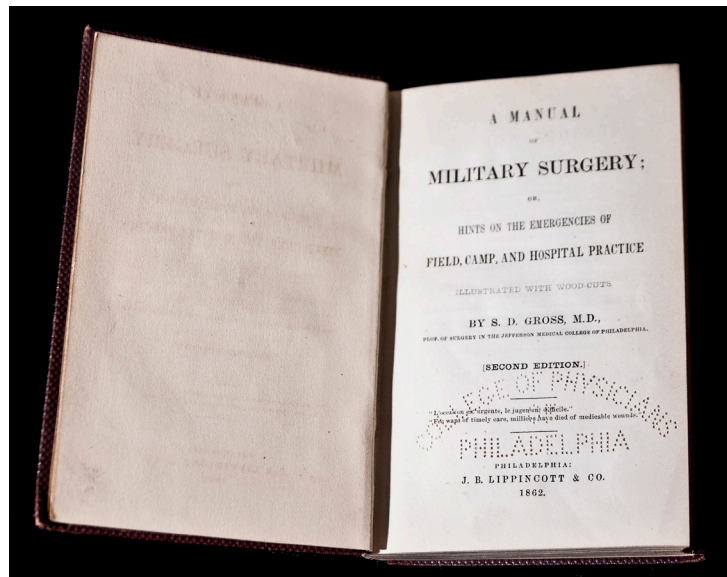
Complete text on-line at: <https://archive.org/details/2164035R.nlm.nih.gov>

[Lesson 3 Attachment 2]

John H. Packard, *A Manual of Minor Surgery* (Philadelphia: J. B. Lippincott, 1863), 2, 10-15.

Complete text on-line at: <https://archive.org/details/66850760R.nlm.nih.gov>

[Lesson 3 Attachment 3]

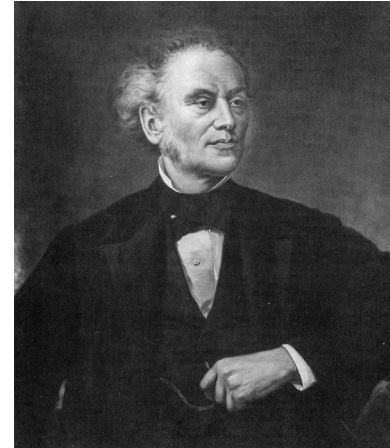


Samuel Gross, Manual of Military Surgery, Title page

Courtesy of Historical Medical Library of The College of Physicians of Philadelphia

ROLE-PLAY

Assign a student to be a senior surgeon (all military doctors were called surgeons) in the Army of the Potomac. If a large class, assign three students to be army surgeons, with one student as the senior surgeon. The rest of the class will make up the membership of a military board of doctors. The senior surgeon, on behalf of his fellow surgeons, presents to the class the case study of a man who is suffering complications from an amputation of his forearm. (Do not have students read from the attachment; the senior surgeon describes the case in his or her own words). The amputee is a colonel of a Union regiment and widely respected for his bravery. After his wound, his stump shakes violently. In evaluating the findings of the patient's doctor, please note the problems that have developed since the colonel's arm was amputated.



*Portrait of Samuel D. Gross
by T. Dimino, Rome 1909*

Courtesy of The College of Physicians
of Philadelphia

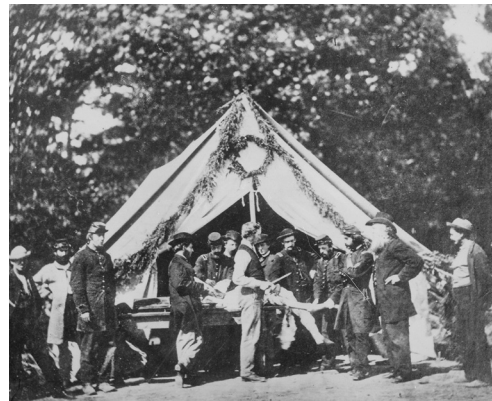
After performing the role play, ask the entire class:

- *What were the various treatments that were given the colonel? Do any of them surprise you?*
- *What questions should have been asked of the colonel during his recovery?*
- *Does the surgeon have any insights into the colonel's mental state? Why or why not?*
- *Was the patient spared any unnecessary suffering? If not, could suffering have been prevented or limited?*

Austin Flint, ed. *Contributions Relating to the Causation and Prevention of Disease* (New York: Hurd and Houghton, 1867), 415-17. Complete text available on-line at:

<https://archive.org/details/contributionsrel00finuoft>

[Lesson 3 Attachment 4]



Amputation tent in Gettysburg, 1863

Courtesy of Library of Congress Prints and
Photographs Division Washington, D.C.

DEBRIEFING QUESTION

For those soldiers who suffered an amputation, they received minimal support for medical rehabilitation or assistance from the national government in transitioning back to civilian life.

- *From the documents below, describe the new roles for these veteran soldiers. How do you think their identities as men were challenged once they were unable to carry a musket in the ranks?*
- *From the concerns expressed about caring for those perceived as “invalid,” what were the challenges facing those soldiers disabled by the war?*

“Health of the Army,” in *Medical and Surgical Reporter*, (1863) Vol. 10: 462.

[Lesson 3 Attachment 5]

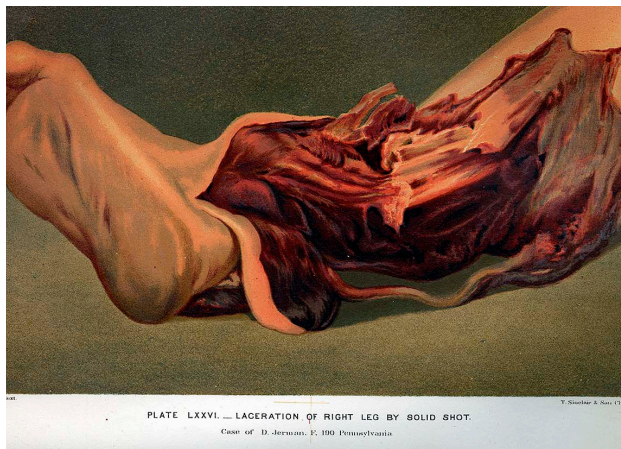
“Circular 3 from Assistant Surgeon-General’s Office” in *Medical and Surgical Reporter*, Vol. 11: 215

[Lesson 3 Attachment 6]

Selection from *The Sanitary Commission of the United States Army: A Succinct Narrative of its Works and Purposes* (New York: Published by the Benefit of the United States Sanitary Commission, 1864), 232-33. Complete text on-line at:

<https://archive.org/details/sanitarycommiss01commgoog>

[Lesson 3 Attachment 7]



Colored lithograph showing dry gangrene of the leg

Courtesy of Historical Medical Library of The College of Physicians of Philadelphia

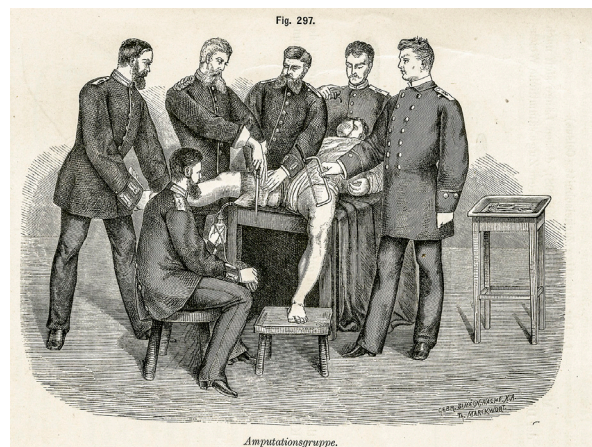


Illustration of a group of military surgeons performing a leg amputation

Courtesy of Historical Medical Library of The College of Physicians of Philadelphia

BIBLIOGRAPHY

Alfred Jay Bollet, *Civil War Medicine: Challenges and Triumphs* (Tucson: Galen Press, 2002). On-line at: http://books.google.com/books/about/Civil_War_medicine.html?id=IFJqAAAAMAAJ

Frances M. Clarke, *War Stories: Suffering and Sacrifice in the Civil War North* (Chicago: The University of Chicago Press, 2011).

WEB LINKS

Civil War surgical tools, illustrations of surgery, photographs

<http://www.dailymail.co.uk/news/article-2021188/Civil-war-surgery-The-grisly-photos-wounded-soldiers-treated.html>

On-line exhibit about amputations and prosthetic limbs, Life and Limb: the Toll of the American Civil War

<http://www.nlm.nih.gov/exhibition/lifeandlimb/exhibition.html>

Story of an amputee

<http://opinionator.blogs.nytimes.com/2013/05/29/napoleon-perkins-loses-his-leg/>

The amputation of Confederate Major General Richard S. Ewell's leg

<http://opinionator.blogs.nytimes.com/2012/11/17/under-the-knife/>

Museum of the Confederacy video, Amputations and Artificial Limbs in the Civil War

http://www.youtube.com/watch?v=3T5v_QbFZDU

“The Civil War and the Birth of Prosthetics Industry,” American Society of Mechanical Engineers website

<https://www.asme.org/engineering-topics/articles/bioengineering/the-civil-war-and-birth-of-us-prosthetics-industry>

Photo gallery of Civil War hospitals and surgeons

<http://www.civilwarphotogallery.com/thumbnails.php?album=26>

Pennsylvania Education Standards

(see <http://www.pdesas.org/standard/views>)

PA Core History and Social Studies standards

11TH GRADE

1.2.11.A-E; 1.6.11.A-B; 8.1.U.A-B; 8.3.U.A-D

12TH GRADE

1.2.11.A; 1.2.12.B-D; 1.6.12.A-B; 8.1.12.A-B; 8.1.U.A-B; 8.3.12.A-D

COMMON CORE 11TH-12TH GRADES

CC.1.2.11-12.A, B, I; CC.1.4.11-12.A, H, I; CC.1.5.11-12.A, D, G; CC.8.5.11-12.A-C, F, H; CC.8.6.11-12.H



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Carmichael has appeared in a number of media outlets surrounding the 150th anniversary of the
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AMPUTATIONS AND RESECTIONS

In endeavoring to decide so important a question as the loss of a limb, various circumstances are to be considered, as the age, habits and previous health of the patient, the kinds of injury, and the number, nature, and importance of the tissues involved. In military practice amputation must often be performed in cases where in civil practice it might be avoided.

It may be assumed, as a rule, that young adults bear up under severe accidents and operations, other things being equal, much better than children and elderly subjects; the strong than the feeble; the temperate than the intemperate; the residents of the country than the inhabitants of the crowded city.

The following circumstances may be enumerated as justifying, if not imperatively demanding, amputation in cases of wounds, whatever may be their nature:

- 1st. When a limb has been struck by a cannonball or run over by a railroad car, fracturing the bones, and tearing open the soft parts, amputation should, as a general rule, be performed, even when the injury done to the skin and vessels is apparently very slight, experience having shown that such accidents seldom do well, if an attempt is made to save the limb, the patient soon dying of gangrene, pyemia, or typhoid irritation. The danger of an unfavorable termination in such a case is always greater when the lesion affects the lower extremity than when it involves the superior.*
- 2d. No attempt should be made to save a limb when, in addition to serious injury done to the integuments, muscles, or bones, its principal artery, vein, or nerve has been extensively lacerated, or violently contused, as the result will be likely to be gangrene, followed by death.*
- 3d. A lacerated or gunshot wound penetrating a large joint, as that of the knee or ankle, and accompanied by comminuted fracture, or extensive laceration of the ligaments of the articulation, will, if left to itself, be very prone to terminate in mortification, and is therefore a proper case for early amputation.*
- 4th. Gunshot wounds attended with severe comminution of the bones, the fragments being sent widely around among the soft parts, lacerating and bruising them severely, generally require amputation, especially in naval and military practice.*
- 5th. Extensive laceration, contusion, and stripping of the integuments, conjoined with fracture, dislocation, or compression and pulpification of the muscles, will, in general, be a proper cause for the removal of a limb.*

Amputation is not to be performed, in any case, until sufficient reaction has taken place to enable the patient to bear the additional shock and loss of blood. As long as he is deadly pale, the pulse small and thready, the surface cold, and the thirst, restlessness, and jactitation excessive, it is obvious that recourse to the knife must be wholly out of the question. The proper treatment is recumbency, with mild stimulants, sinapisms [mustard plasters] to the extremities, and other means calculated to re-excite the action of the heart and brain. Power being restored, the operation, if deemed necessary, is proceeded with, due regard being had to the prevention of shock and hemorrhage, the two things now mainly to be dreaded.

One of the great obstacles about immediate amputation is the difficulty which the surgeon so often experiences in respect to the cases demanding the operation, and the uncertainty that none of the internal organs have sustained fatal injury; a circumstance which would, of course, contra-indicate the propriety of such interference.

Cases occur, although rarely, where, notwithstanding the most violent injury, or perhaps, even the loss of a limb, there is hardly any appreciable shock, and, in such an event, the operation should be performed on the spot.

The results of the military surgery in the Crimea show that the success of amputations was very fair when performed early, but most unfortunate when they were put off for any length of time. This was the case, it would seem, both in the English and French armies.

Should amputation ever be performed in spreading gangrene? The answer to this question must depend upon circumstances. We may give our sanction when the disease, although rapid, is still limited, and when the patient, comparatively stout and robust, has a good pulse, with no serious lesion of a vital organ and no despair of his recovery, but a, cheerful, buoyant mind, hopeful of a favorable issue. No operation is to be done when the reverse is the case; if it be, the patient will either perish on the table, from shock and hemorrhage, or from a recurrence of mortification in the stump.

Lacerated, contused, and gunshot wounds are often of so frightful a nature as to render it perfectly certain, even at a glance, that the limb will be obliged to be sacrificed in order that a better chance may be afforded for preserving the patient's life. At other times, the injury, although severe, may yet, apparently, not be so desperate as to preclude, in the opinion of the practitioner, the possibility of saving the parts, or, at all events, the propriety of making an attempt to that effect. The cases which may reasonably require and those which may not require interference with the knife are not always so clearly and distinctly defined as not to give rise, in very many instances, to the most serious and unpleasant apprehension, lest we should be guilty, on the one hand; of the sin of commission, and, on the other, of that of omission; or, in other and more comprehensive terms, that, while the surgeon endeavors to avoid Scylla, he may not unwittingly run into Charybdis, mutilating a limb that might have been saved, and endangering life by the retention of one that should have been promptly amputated. It is not every man, however large his skill and experience, that is always able to satisfy himself, even after the most profound deliberation, what line of conduct should be pursued in these trying circumstances; hence the safest plan for him generally is to procure the best counsel that the emergencies of the case may admit of. But in doing this, he must be careful to guard against procrastination; the case must be met promptly and courageously; delay even of a few hours may be fatal, or, at all events, place limb and life in imminent jeopardy. Above all, let proper caution

be used if the patient is obliged to be transported to some hospital, or to a distant home, that he may not be subjected to unnecessary pain, exposed to loss of blood, or carried in a position incompatible with his exhausted condition. Vast injury is often done in this way, by ignorant persons having charge of the case, and occasionally even by practitioners whose education and common sense should be a sufficient guarantee against such conduct.

Little need be said here about the methods of amputation. In cases of emergency, where time is precious, and the number of surgeons inadequate, the flap operation deserves, in my opinion, a decided preference over the circular, and, in fact, over every other. The rapidity with which it may be executed, the abundant covering which it affords for the bone, and the facility with which the parts unite are qualities which strongly recommend it to the judgment of the military surgeon. The flaps should be long and well shaped, and care taken to cut the larger nerves on a level with the bone, in order to guard against the occurrence of neuralgia after the wound is healed. Whatever method be adopted, a long stump should be aimed at, that it may afford a good leverage for the artificial substitute. No blood should be lost during or after the operation, and hence the main artery of the limb should always be thoroughly compressed by a tourniquet, not by the fingers of assistants, who are seldom, if ever, trustworthy on such occasions.

Anaesthetics should be given only in the event of thorough reaction; so long as the vital powers are depressed and the mind is bewildered by shock, or loss of blood, their administration will hardly be safe, unless the greatest vigilance be employed, and this is not always possible on the field of battle, or even in the hospital. Moreover, it is astonishing what little suffering the patient generally experiences, when in this condition, even from a severe wound or operation.

In the war in the Crimea, the British used chloroform almost universally in their operations; the French also exhibited it very extensively, and Baudens, one of their leading military surgical authorities, declares that they did not meet with one fatal accident from it, although it was given by them, during the Eastern campaign, thirty thousand times at least. The administration of chloroform is stated by Macleod to have contributed immensely to the success of primary amputations.

The dressings should be applied according to the principles laid down under the head of wounds. The sutures, made with silver wire or fine silk, should not be too numerous, and the adhesive strips must be so arranged as to admit of thorough drainage. A bandage should be applied from above downward, to control muscular action and afford support to the vessels; the stump rest upon a pillow covered with oil-cloth, and the waterdressing be used if there is danger of overaction. Pain and spasm are allayed by anodynes; traumatic fever, by mild diaphoretics. Copious purging is avoided; the drink is cooling; and the diet must be in strict conformity with the condition of the patient's system. The first dressings are removed about the end of the third day; after that once or even twice a day, according to the nature and quantity of the discharges, accumulation and bagging being faithfully guarded against.

SOURCE

S. D. Gross, A Manual of Military Surgery (Philadelphia: J. B. Lippincott & Co. 1861), 74-82.

AMPUTATIONS OF THE ARM

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These should only be performed when there is no possibility of preserving the limb. Amputations for bad fractures of the humerus, or for shattered elbows, while there is still a good pulse at the wrist, are no longer justified by any respectable authority. It is often astonishing to inexperienced surgeons to see from what terrific injuries a wounded arm will recover itself. If the bone is shattered, the artery cut, and the anastomotic vessels also so extensively destroyed, that circulation in the limb ceases, amputation should be immediately resorted to. If, however, circulation continues in some measure below the injury, the loose fragments of bone should be picked out, and the limb dressed as for other compound fractures.

The mortality after amputations of the arm is but slight: of 11 cases in my tables, not one died. Of 72 cases mentioned by Guthrie, only 17 died. Combining these statistics, we have the following results.

Amputation of the arm:

TOTAL NUMBER	83
RECOVERED	66
DIED	17
PERCENT OF DEATHS	20.5

AMPUTATIONS IN THE FORE-ARM AND HAND

As we recede from the body, both operations and injuries become less fatal. All the cases of amputation of the fore-arm and hand, of which I could obtain the results, recovered. The few who die, succumb not to the operation, but to the secondary effects of the deadly air of overcrowded hospitals. In every case where required, the amputation may be resorted to without fear; but it should be borne in mind that the fore-arm and hand recover from the most frightful looking wounds with surprising ease, and that every inch which can be preserved is of priceless value to the patient. In a mangled hand, almost every part which is not torn off, may be preserved, and should be, generally, retained. I make these remarks, because I have observed that inexperienced surgeons will often be moved by the ghastly appearance of a fractured and lacerated hand, to undertake very unjustifiable amputations.

AMPUTATIONS AT THE HIP-JOINT

No case of this fell under my notice, as we all adopted the principle, that it was an operation which can scarcely ever be justified.

AMPUTATIONS OF THE HIP-JOINT

In this part of the body, we reverse the rules applied to the superior extremity. Instead of going all lengths to save the member, we incline more decidedly to prompt and resolute amputation on the field. Secondary amputations of the thigh are usually fatal, therefore, the decision of the surgeon must be made up on the spot, from the appearance of the case, and resolutely carried out. My records show 20 amputations of the thigh, of which, 9 died, 10 recovered, and 1 remained doubtful, being a mortality of about 45 per cent. It is of the utmost importance here to observe the difference of mortality between the upper and lower parts of the thigh, because, on this difference are based life and death decisions. The following table illustrates it:

Amputated upper 3rd of thigh

TOTAL CASES	5
RECOVERED	1
DIED	4
PER CENT OF DEATHS	80

Amputated middle 3rd of thigh

TOTAL CASES	4
RECOVERED	2
DIED	2
PER CENT OF DEATHS	50

Amputated lower 3rd of thigh

TOTAL CASES	11
RECOVERED	7
DIED	3
DOUBTFUL	1
PER CENT OF DEATHS	27

Showing plainly that “every inch by which this operation approaches the body, increases its danger.”

According to LONGMORE’S statistics, a similar percentage was observable in the Crimean Campaign, as is shown by the following table:

Amputation, upper 3rd in Crimean War

PER CENT OF DEATHS **87**

Amputation, middle 3rd, in Crimean War

PER CENT OF DEATHS **60**

Amputation, lower 3rd, in Crimean War

PER CENT OF DEATHS **57**

These figures show a more favorable result in our army than in the British, by an average of about 20 per cent. Combining the two tables, we have approximately the following:

Mortality of amputation at upper 3rd

PER CENT OF DEATHS **83.5**

Mortality of amputation at middle 3rd

PER CENT OF DEATHS **55**

Mortality of amputation at lower 3rd

PER CENT OF DEATHS **42**

The obvious deduction of which, is that the amputation should be made as far from the body as the nature of the injury will possibly permit. Such being the frightful mortality of amputations of the thigh, I tried in two cases to produce a better result, by resecting the ragged ends of the broken femur, and then treating it as for compound fracture. Both these cases died within the fifth day. The same experiment was tried on the Potomac, by Eastern surgeons, and also in the Crimea, and always with the same result,—every case proving fatal.

Still, other experiments have been made, by treating the case simply as a fracture, without any other operation than an incision to evacuate the pus. STROMEYER quotes 4 cases of recovery. My tables show 8 cases treated in this manner, of which, 2 recovered, and 6 died. These cases were mostly fractures above the middle; hence the mortality of 75 per cent is not greater than would have followed amputation in the same place. In Europe, after the battle of Toulouse, this mode was tried on 43 of the most favorable cases, with a mortality of about 60 per cent, which, on the whole, is not much worse than the result: of amputation, which, in nearly all fractures of the femur. must be as high as the middle, and has a mortality of 55 per cent.

A careful, and very deliberate examination of this whole matter, has settled in my mind the following conclusions:

- 1st *A very large portion of the cases with badly comminuted femurs, will die within five days,-- under all treatments, alike. There is no perfect reaction.*
- 2d *Shots through the spongy tissue of the trochanter and neck of the femur, are less fatal than those through the compact tissue of the shaft. This is contrary to STROMEYER'S opinion; but it is nevertheless true. The splintering of the bone, and consequent injury of soft parts, is far less in this spongy part than in the ivory-like shaft below. These cases of fractured neck require neither amputation nor resection of the head of the femur; a large part of them will recover with simple extension-splints, and in some cases, incisions to evacuate pus; whereas, amputations and military excisions at the hip-joint may be practically said to be ail fatal. I know of 2 cases of this fracture which recovered without difficulty in straight splints.*
- 3d *Amputations above the middle of the femur should only be resorted to in desperate circumstances, where the limb below is either torn off, or is, so injured that it has but little prospect of escaping mortification. If the circulation and innervation are good below, a free incision should be made down to the comminuted bone, and the limb be dressed with a straight splint and adhesive-strap extension-bands. The case is a desperate one, but I am confident that this treatment will save more lives than amputation above the middle.*
- 4th *If amputation can be made below the middle of the thigh, it should be promptly performed, for all severe compound fractures of the lower half of the shaft of the femur, and all, gun-shot fractures of the knee-joint. By this treatment. About 75 percent of the patients may be saved; but if attempts are made to save the limb, almost every man will die. At the battle of Shiloh, a large number of cases were treated with this false conservatism, and many lives sacrificed in consequence. If any young surgeon feels reluctant to sacrifice a fair and plump thigh, for a mere little bullet hole of very harmless appearance in the knee, I advise him first to amputate, and afterwards to dissect the limb; he will find within the joint a horrible disorganization, such as no man can reasonably hope to survive, without operative assistance.*

AMPUTATIONS OF THE LEG

These may be resorted to whenever a useful limb cannot be preserved, as the operation is not excessively dangerous. If, however, the circulation in the foot continues, and a chance of future usefulness of the member presents itself, conservative surgery should be practiced; because the danger of postponing or omitting amputation is not great, even though the foot should mortify. One hint may serve to guard young surgeons against a natural error: when a bullet traverses through the tibia from before, backwards, the front opening in the skin is small; but the fragments of the bone are driven back among the tissues of the calf, producing more danger of mortification than the first glance indicates. On the other hand, if the ball has traversed from behind, forwards, it drives all the splinters outward through the skin in front, doing less real injury than in the former case, but still tearing open the skin, and everting the flesh over an area of two or three inches in diameter. The wound looks so hideous, that it is not uncommon for the inexperienced operator to be moved by it to cut off the better limb and save the worse.

AMPUTATION OF THE FOOT

These may be decided upon and executed by the same rules as in civil surgery.

RESECTIONS

RESECTION OF THE SHOULDER-JOINT

The grounds of choice between this and amputation have already been discussed under the head of "Amputations at the shoulder." It is to be preferred, in proper cases, both for its superior safety, and because it saves a most important limb.

SOURCE

E. Andrews, A Complete Record of the Surgery of the Battles: Fought Near Vicksburg (Chicago: George H. Fergus, Book and Job Printer, 1863), 41-45.

THE POCKET CASE

CASES MATERIALS USED IN DRESSINGS, ETC.

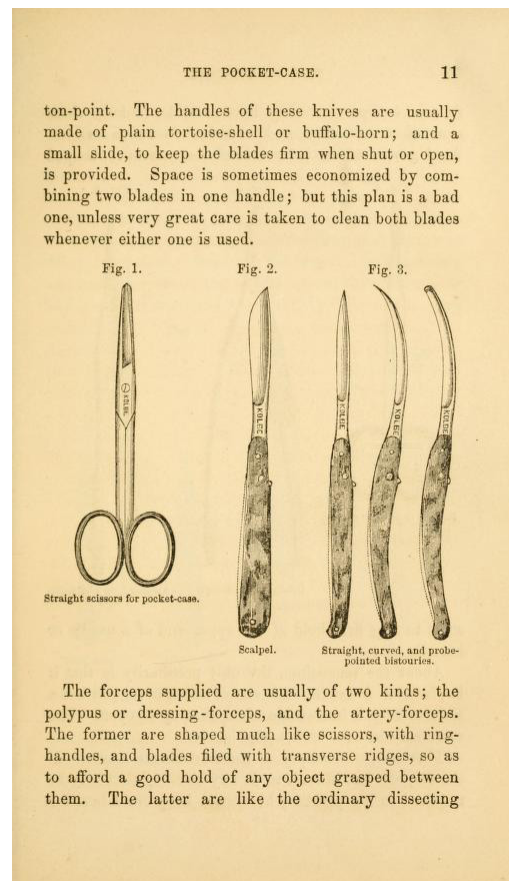
Before proceeding to the performance of even the slightest operation in surgery, everything that can possibly be required should be placed in readiness. Whether the wound is to be dressed, or a limb amputated, the surgeon should run over in his mind all the appliances he will need, all the exigencies that may arise; sponges, towels, dressings, ligatures, needles, instruments, all so arranged as to be at hand when called for. This is absolutely essential to the proper performance of every capital operation, and adds greatly to the comfort of all parties concerned in lesser surgical procedures.

1. THE POCKET-CASE.

Some articles the surgeon should always carry with him, ready for use. They are put up in what is called the pocket case; and are generally as follows: Scissors, a scalpel, bistouries, forceps, tenaculum, lancet, gum-lancet, needles, ligatures, porte-caustic, director, probes, and male and female catheter. Other instruments may be added, to any extent that the surgeon's fancy, or the peculiar demands of his practice, may dictate; but these are the commonly recognised essentials.¹

A good pair of scissors is indispensable; some surgeons carry several, of different shapes, straight, curved on the flat, or bent at an angle at the joint. The best form is that last named, since it is never inconvenient, and sometimes answers when a plain straight pair would not. But they must be in good order; nothing looks so awkward as for the surgeon to have to chew a ligature or a suture-thread in two with dull scissors.

The scalpel is merely a knife with a convex cutting edge, that of a bistoury being always either straight or concave. A probe-pointed scalpel is of use in some operations. The bistouries are usually four in number, two curved and two straight; one of each pair being sharp pointed, and the ending in a probe or button-point.



¹The instruments contained, according to the Army Regulations, (supply table last issued,) in the pocket-cases furnished to army medical officers, are as follows:

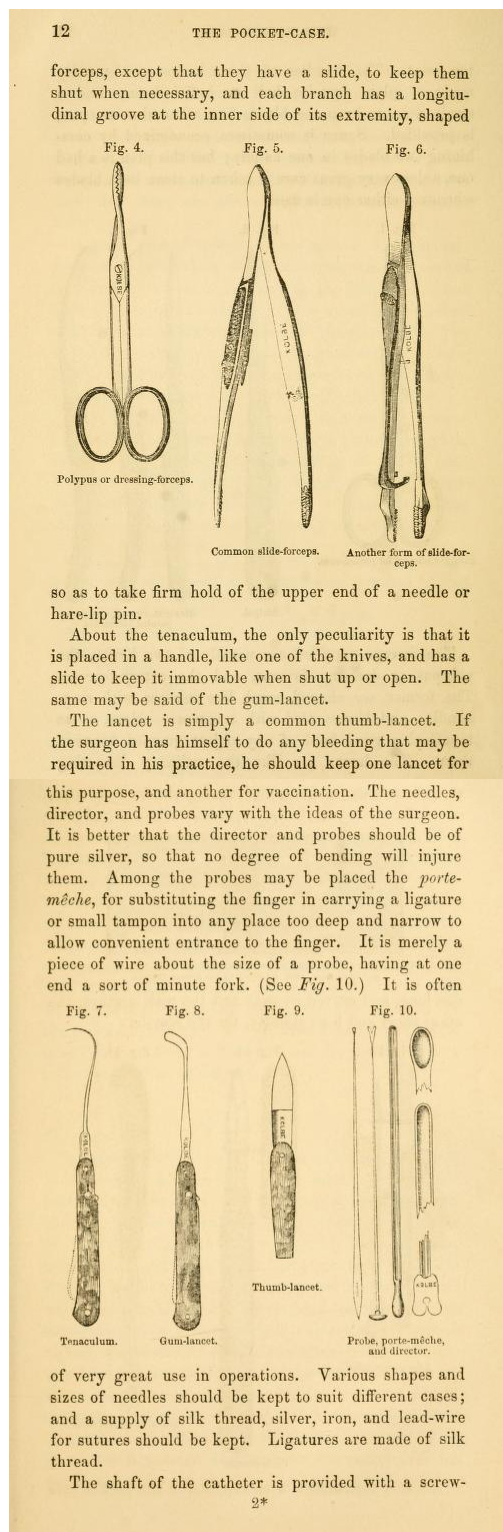
One scalpel	One tenaculum	Three bistouries	One scissors
One tenotome	One director	One gum-lancet	Three probes
Two thumb-lancets	One caustic-holder	One razor, small	One silver catheter, compound
One artery-forceps	Six yards suture-wire, iron	One dressing-forceps	¼ ounce ligature-silk
One artery-needle	½ ounce wax	Six surgeon's needles.	

The handles of these knives are usually made of plain tortoise shell or buffalo-horn; and a small slide, to keep the blades firm when shut or open is provided. Space is sometimes economized by combining two blades in one handle; but this plan is a bad one, unless very great care is taken to clean both blades whenever either on is used.

The forceps supplied are usually of two kinds, the palypus or dressing-forceps, and the artery-forceps. The former are shaped much like scissors with ring handles, and blades filed with transverse ridges, so as to afford a good hold of any object grasped between them. The latter are like the ordinary dissecting forceps, except that they have a slide, to keep them shut when necessary, and each branch has a longitudinal groove at the inner side of its extremity, shaped so as to take firm hold of the upper end of a needle or hare-lip pin.

About the tenaculum, the only peculiarity is that it is placed in a handle, like one of the knives, and has a slide to keep it immovable when shut up or open. The same may be said of the thumb-lancet.

The lancet is simply a common thumb-lancet. If the surgeon has himself to do any bleeding that may be required in his practice, he should keep one lancet for this purpose, and another for vaccination. The needles, director, and probes vary with the ideas of the surgeon. It is better that the director and probes should be of pure silver, so that no degree of bending will injure them. Among the probes may be placed the *portemèche* for substituting the finger in carrying a ligature or small tampon in any place too deep and narrow to allow convenient entrance to the finger. It is merely a piece of wire about the size of a probe, having at one end a sort of minute fork. (See Fig. 10) It is often of very great use in operations. Various shapes and sizes of needles should be kept to suit different cases; and a supply of all silk thread, silver, iron, and lead-wire for sutures should be kept. Ligatures are made of silk thread.



The shaft of the catheter is provided with a screw thread towards its lower end, fitting either of two tips, one long and curved so as to suit the male urethra, the other short and bent slightly, for the female.

Another instrument often supplied in the pocket-case is the grooved exploring needle, with a handle made to serve as a sheath when the needle is not in use. Cases rarely occur, however, in which the employment of this instrument is necessary or even proper; and much harm may be done with it.

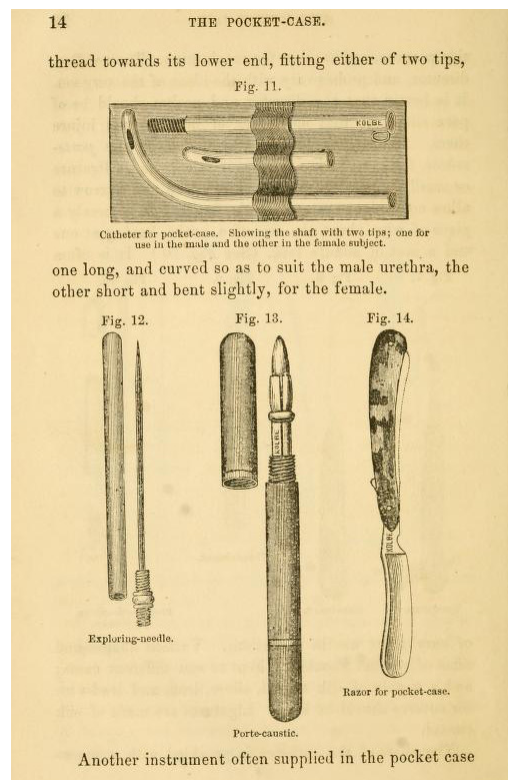
The porte-caustic is made of silver, ebony, or hard rubber. Its tip, which grasps the caustic, should be composed of platinum, so as to undergo no chemical change; and the instrument is generally arranged so that by screwing one of its parts upon another it may be very much lengthened, for the purpose of touching the os uteri, pharynx, etc. A razor kept in the pocket case will sometimes be found of use, in shaving a part to be operated on or dressed.

2. THE DRESSING BOX

It is essential to order and comfort in hospital surgery. It is simply a wooden box: with a handle, like a large knife tray, in which is kept a supply of bandages, lint, charpie, ligatures, sponges, strips of adhesive plaster of various widths, towels, a pair of large scissors, a well furnished pin-cushion, and whatever else the surgeon is likely to need as he makes his rounds. It ought to be divided into compartments, and kept always in order and well replenished. Besides the articles already mentioned, it should contain a few gum-catheters and bougies, with some oil or lard for anointing them; some cerate and a spatula; a bottle or cup of common whiskey and another of spirit of turpentine. Another instrument which will sometimes be of use is a large double probe, commonly called a gunshot probe.

SOURCE

John H. Packard, A Manual of Minor Surgery (Philadelphia: J. B. Lippincott, 1863), 2, 10-15.



GUNSHOT WOUND OF RIGHT WRIST

CASE I. Gunshot Wound of Right Wrist: Immediate Amputation; Choreal Affection of Muscles of Right Fore-arm (stump) and Shoulder. — Col. J. G. P., age

41, 139th Pennsylvania Volunteers, an officer of high character, in good health up to the date of wound, was shot, June 3d, 1864, through the right wrist with a slug. He became at once singularly excited, and felt as if he was crazed. Under the sudden influence of these sensations, he ran along the line of his regiment, only half conscious, until he fell senseless, having gone about fifty feet. Within a few minutes he revived, and was assisted to a hospital near by, where Dr. Chapin, surgeon of the regiment, amputated his fore-arm at the junction of the lower and middle third.

Col. P. never remained in bed, but continued in active service while the wound healed. This process was over about September 20th, 1864. At this date, someone remarked to him that his stump shook a good deal. This first attracted his attention. Within a month the quivering extended to all the muscles of the fore-arm, except the extensor group, and at the close of the second month it attacked the biceps, triceps, and deltoid. In November a seton [a kind of suture that creates a cinch] was carried through the skin of the stump. For a day or two the limb was much more quiet, but again became worse. Tincture of aconite was used locally without relief. A firm bandage applied to the whole limb, produced no good result, the movements getting constantly worse. At length a large part of the cicatrix of the stump was dissected out. For a few days he did better, and then relapsed as after the use of other remedies.

March 1, 1865.—The fore-arm is incessantly in motion, the muscles quivering in a singular manner, night and day, whether asleep or awake. Every twenty seconds, or oftener, the fore-arm is suddenly flexed, and more rarely the arm is thrown across the chest by the pectoral group, or upwards and outwards by the deltoid. These movements are beginning to involve the trunk and neck muscles of the right side. They are increased if attention be drawn to them, but they allow him to make voluntary movements with the aid of the muscles in question, and do not seem to interfere with or disturb this volitional control, as happens in the chorea [involuntary spasms] of children. The moment his will ceases to act, the spasms recur, but he does not feel any fatigue from this endless muscular action. All the muscles move readily under induced electric currents. The stump is not unusually tender, and there is no soreness in the nerve tracks when tested by heat or pressure.

Col. P.'s general health is suffering somewhat, but at no time except during the few days of leave, which he sought in order to consult me, has he failed to do full duty in the field. On one occasion only is he aware that the arm ceased to move. This occurred at the battle of Cedar Mountain, when, his regiment having been cut off, he was in grave danger of capture. He fought his way out, and saved his command. During the two or three hours of suspense, and while constantly under fire, his men observed that his arm ceased to move, and hung limber at his side.

I felt strongly disposed to consider these motions as caused by some nerve lesion originally confined to the stump, and occasioning an excitation of the centres which gave rise reflectively to the spasms. To test this, I proposed to inject a paralyzing agent into the neighborhood of the main nerve trunks, and failing thus to check the conveyance of irritations to the centres, I should have wished to divide the chief nerves in the arm, removing half an inch. This, of course, would have paralyzed the muscles below. If, then, it were still found that the deltoid and pectoralis twitched, I should have concluded that the nerves were diseased above the point of section. Of this, some judgement could have been formed by examining with the microscope the section of nerve removed but the knife. After this there would have been no surgical remedy, excepting section of the brachial plexus in the neck, an operation which I presume, might offer some embarrassments.

As Colonel P. was obliged to return to duty at once, I contented myself with ordering him to have two setons through the stump, and to take ten grains of bromide of potassium thrice daily. April 17th, I heard from him. He had been again severely wounded in the side, March 25th, and lay insensible for some time although the limb all the while twitched as usual. He recovered readily, and at the date of April 17, wrote, "that the limb had ceased to jump as it did, but is never still. It quivers all the time."

I saw Colonel P. September 29, 1865. The arm at this time, rarely executed any violent or wide movements; but the fore-arm was much as his letter described it to have been in April. A greater gain was visible in the chest, neck and trunk, the muscles of which no longer twitched. His general health was better, and he had become robust and well. I desired him to renew the treatment as soon as he was at rest in any one place, and hoped to persuade him at a future period, to allow of some such operation as I have alluded to above.

SOURCE

Austin Flint, ed. Contributions Relating to the Causation and Prevention of Disease (New York: Hurd and Houghton, 1867), 415-17.

HEALTH OF THE ARMY

The following extract comprises all that is said in the report of the Secretary of War to Congress, of the Medical Department of the Army:

By the report of the acting Surgeon-General, the department is informed that the latest reports received give one hundred and eighty-two general hospitals, with a capacity of 34,472 beds. The number of patients remaining in general hospitals June 30, 1863 was 9.1 per cent; and in the field 4-4 per cent of the entire mean strength of the army, of whom 11 per cent were sick, and 2.5 per cent wounded. The corps of medical inspectors, by the system of inspections established, has added materially to the efficiency of the medical and hospital service, and a marked improvement in all matters of sanitary precaution and police is exhibited. Companies of the second battalion, invalid corps, have in many instances been advantageously substituted for contract nurses, attendants and cooks in the general hospitals. Appropriations are asked for the payment of washing in those hospitals and on transports, where a sufficient number of matrons cannot be employed; for the collection and preservation of pathological specimens in the army medical museum; and for the preparation and examination of drugs, in connection with the purveying depots. The health of the troops has been good, and the mortality less than the preceding year.

SOURCE

“Health of the Army,” in Medical and Surgical Reporter, (1863) Vol. 10: 462.

CIRCULAR 3
FROM ASSISTANT SURGEON GENERAL'S OFFICE

Assistant Surgeon-General's Office

Louisville, KY, March 15, 1864

1. *The practice of employing soldiers whether of the Invalid Corps, acting as nurses, or enlisted men detailed as such, or men on the sick report, as private servants, cooks or hostlers [people responsible for horses] is strictly prohibited in the General Hospitals of the Western Medical Department.*
2. *Medical Inspectors and Directors will promptly report any deviation from these instructions, and surgeons in charge of General Hospitals will be held strictly accountable for their execution.*

B. C. Wood, Ass't Surgeon-General, U.S.A.

SOURCE

“Circular 3 from Assistant Surgeon-General’s Office” in Medical and Surgical Reporter, Vol. 11: 215, 1864

SELECTIONS FROM THE SANITARY COMMISSION

DISABLED SOLDIERS

The Commission's concern for our disabled soldiers, wherever they may be found in need of sanitary care or friendly aid, cannot be essentially diminished at any point during the war; and several questions are now assuming great importance respecting the more permanent wants of the disabled classes. To these questions the Commission must give increasing attention.

At an early period of the war the Commission's methods of Special Relief brought to light important facts relating to the present system of *invalidating* and *pensions*. Indeed, the whole subject of the sanitary and social welfare of the permanently *invalid* class pressed itself upon the attention of the Commission, and in the month of August, 1862, the special inquiries upon this subject took shape, and have been pursued with increasing interest until the present time. An associate member of distinguished ability then undertook, without cost to the Board, the work of personal inspection and inquiry respecting the military invalid systems of Europe, and he has since reported very fully upon the subject. Other associate members have been giving continued attention to the study of the subject in its various aspects at home, until conclusions well based and highly important to the welfare of the invalid class, as well as to the economical and social interests of the nation, have been reached.

That these inquiries were originally undertaken in the full belief that the absorbing capacity and tendencies of our social state and the patriotic spirit of each community, would render great national Asylums or "Hôtels des Invalides" unnecessary and unsuited to our wants, is evident from the following passage which we quote from a Document of the Commission, published in the autumn of 1862 (Document No. 49, Sanitary Commission):

"The Sanitary Commission are much exercised with the subject of the future of the disabled soldiers of this war. They calculate that, if it continue a year longer, not less than a hundred thousand men, of impaired vigor, maimed, or broken in body and spirit, will be thrown on the country. Add to this a tide of another hundred thousand men, demoralized for civil life by military habits, and it is easy to see what a trial to the order, industry, and security of society, and what burden to its already strained resources, there is in store for us. It is, in our judgment to the last degree important, to begin now, to create a public opinion which shall conduce to, or compel the adoption of, the wisest policy on the part of our municipal and town governments, in respect of disabled soldiers—so as to discourage all favor to mendacity.

"We don't want a vast network of soldiers' poor-houses scattered through the land, in which these brave fellows will languish away dull and wretched lives. Nor do we want petty State asylums, to be quarrelled about and made the subject of party politics. We want to economize our battered heroes, and take care of them in such a way as to maintain the military spirit and the national pride; to nurse the memories of the war, and to keep in the eye of the Nation the price of its liberties."

After much experience and observation in connection with the Special Relief work—in the matter of discharged soldiers, invalids partial and permanent, back-pay, pensions, etc., as provided for by that branch of the Commission’s service—it was finally resolved, at a recent session of the Commission, to give authority to a sub-committee of the Board to establish *experimental Sanitaria* for certain classes of disabled soldiers.ⁱ

SOURCE

Selection from The Sanitary Commission of the United States Army: A Succinct Narrative of its Works and Purposes (New York: Published by the Benefit of the United States Sanitary Commission, 1864), 232-33.

ⁱThe following were the resolutions adopted at that meeting, [March 10th, 1864], upon the subject of the Invalid Class:

“Resolved, That a Committee of four be appointed by the Chair, to consider the subject of the organization, location, and final establishment of National Sanitaria for disabled soldiers, to report at their earliest convenience....”