

# Civil War Surgery Simulation

## Lesson Cover Page

**Grade Level:** 7-12

**Subject/ Topic Area(s):** United States History

**Designed By:** Nathan L. McAlister

**Time Frame:** 1-2 Class Periods depending on prep and lesson option

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### **Brief Summary of Lesson:**

One area of the Civil War that is rarely taught or discussed in any form other than a lecture is medicine and the treatment of soldier's wounds. Within this lesson students will examine, (through primary sources readings and photographs, academic readings, live demonstration, and artifacts; both reproduced and authentic), the personal side of this under studied area of Civil War history. This lesson works well as an introduction to future lessons on the Civil War and primary source analysis.

### **List of Materials:**

1. Surgical gloves (I know they do not fit with the time period, but they are needed in today's world.)
2. One large tarp approximately to cover your classroom floor.
3. One white apron and one white shirt. (Though both are not essential to the lesson they will aid in the authenticity of said lesson)
4. One bone saw. (Although a Civil War replica may be obtained it is unnecessary for the lesson. A run-of-the-mill modern bone saw will suffice)
5. Civil War period Minnie Balls. (Authentic Civil War Minnie Balls can be purchased through many sources. Precautions must be taken however. Do not let students handle the lead Minnie Balls. Instead put them in or on some sort of container that will allow the students to examine the Minnie Balls. Conversely, replica Minnie Balls may be purchased as an alternative.)
6. Processed cow legs, as needed. (Most local meat lockers will readily give these legs (minus the hoof) free of charge. Simply call them up let them know what they are for and how many you will need. Storage may be an issue. Make sure you have enough freezer space to store the legs until the day of the lesson. A good friend is always helpful.)
7. One Sledge Hammer. (10-12 lbs.)
8. One piece of plywood or other wood dimensions approximately 2x3 ft.
9. One sturdy 8-foot table, a typical school table works very well. A preferred option is a 4x8 piece of ½ inch plywood—with a hole cut-out for a leg—and saw horses.
10. Willing volunteers, as needed. Many of these volunteers will be readers of the narration or eyewitness accounts. One will act as the photograph manager.
11. Narrative and Eyewitness dialogue sheets one per volunteer and one complete for the photo manager
12. A display option for the photographs, electronic or otherwise.

## Lesson Procedure #1:

### Step 1:

Before you begin the lesson have the surgical area set up (**make certain to protect the floor with tarp**), the desks arranged so that all may see, the display, for photographs, set up in a convenient viewing area, and all materials on hand.

### Step 2:

Begin the lesson by showing the students all of the simulation materials the cow leg, sledgehammer, the bone saw, etc. Tell students that the cow leg will represent a human leg or if you wish to be truly evil, tell the students it is a human leg. Tell students that the sledgehammer will simulate the Civil War *Minnie Bullet* and the impact of the bullet on the human body. Finally, tell students that the bone saw represents an actual bone saw from the Civil War period.

### Step 3:

Hand out the dialogue sheets to the student reader volunteers. Tell student volunteers to read when the corresponding photo on their dialogue sheet appears on the overhead. Give an entire set of the dialogue sheets to the photo manager. The photo manager will switch from one photo to the next on the overhead projector. This is the cue to the readers when to read.

### Step 4:

Ask for and select the wounded soldier volunteer, for the simulation. Tell him/her that they will simply lie on the table and hang one leg off the edge of the table from the knee down or place their leg through the hole of the plywood from the knee down.

### Step 5:

Begin the simulation by displaying the first photo while the first reader volunteer reads their dialogue aloud to the class. Have the photo manager continue switching photos and the readers reading, (Make sure they do not read too incredibly fast or slow), until they get to photo and dialogue #6. Upon reaching dialogue #6 place your plywood on the floor, to protect the floor. Place one cow leg on the plywood and strike the cow leg using the sledgehammer.

**\*This may take a considerable blow or several tries if you're a bad shot.\***

Make sure students are sitting at a safe distance so that nothing splatters on them, yuck. When you have obtained proper breakage show the students the broken leg and explain the similarity to the damage created by the Civil War Minnie Ball. Pass around your replica or authentic Minnie Ball bullets or display the photo provided.

### Step 6:

Proceed to photo and dialogue #7. Have the volunteer read his/her dialogue sheet while you prepare the wounded volunteer and the cow leg. Make sure that his/her leg is hanging off the table or through the hole at the knee and put the cow leg in place of the volunteer's own leg. As you begin the amputation have the volunteers display the photos and read the dialogues #8, #9, and #10.

**\*You may ask for a volunteer surgical assistant to help steady the cow leg during amputation.\***

### Step #7:

When you have may several cuts with the saw or have finished the amputation show the students and read your dialogue sheet. Next, have your last student volunteer read the last dialogue sheet.

### Step 8:

Debrief the simulation. Have students share their feelings and questions about the experience via a brief discussion.

### **Lesson Procedure #2/Performance Assessment:**

(Rather than have the teacher perform the simulation for the class you may wish to have the students run the entire simulation. If this is your choice—and it is a fun choice—make certain to use one class period for the students to prepare for the simulation.) Place students into groups of 3 to 4, using the following roles: Surgeon, Surgeons Assistant, Soldier, Narrator. Student may combine the role of soldier and narrator.

**\*You may wish to have students read the attached pdf entitled *This Tide of Wounded*, for context.\***

#### **Teacher:**

Before you begin the lesson have the surgical area set up (**make certain to protect the floor with tarp**), the desks arranged so that all may see, the display, for photographs, set up in a convenient viewing area, and all materials on hand.

#### **Students:**

Have students show and explain all of the simulation materials the cow leg, sledgehammer, the bone saw, etc. Students should explain that the cow leg will represent a human leg. Students should explain that the sledgehammer will simulate the Civil War *Minnie Bullet* and the impact of the bullet on the human body. Finally, Students should explain that the bone saw represents an actual bone saw from the Civil War period.

#### **Students:**

Have students use the prepared dialogue sheets and distribute amongst their group, modify as needed. Have students create their version of the simulation using the dialogue sheets and photographs as needed. Give an entire set of the dialogue sheets to the student group.

#### **Students:**

The wounded soldier volunteer, for the simulation, should also have a role in the simulation. Although, they will lie on the table and hang one leg off the edge of the table from the knee down or place their leg through the hole of the plywood from the knee down, they still have a job. They can discuss some of the mythology surrounding Civil War surgeries, such as the use of chloroform.

#### **Students:**

This will vary depending on the student's creativity, but it should roughly follow the steps below.

1. Discuss the procedures leading up to the surgery using dialogue sheets 1-6 as a guide.
2. Upon reaching dialogue #6 place your plywood on the floor, to protect the floor. Place one cow leg on the plywood and strike the cow leg using the sledgehammer.

**\*This may take a considerable blow or several tries if you're a bad shot.\***

Make sure students are sitting at a safe distance so that nothing splatters on them, yuck. When proper breakage has been obtained have a student show other students the broken leg and explain the similarity to the damage created by the Civil War Minnie Ball. Pass around your replica or authentic Minnie Ball bullets or display the photo provided.

#### **Step 6:**

Proceed to photo and dialogue #7. Have the students read his/her dialogue sheet while they prepare the wounded volunteer and the cow leg. Make sure that his/her leg is hanging off the table or through the hole at the knee and put the cow leg in place of the volunteer's own leg. As you begin the amputation have the volunteers display the photos and read the dialogues #8, #9, and #10.

**\*Students may ask for have the volunteer surgical assistant to help steady the cow leg during amputation.\***

**Step #7:**

When students have made several cuts with the saw or have finished the amputation, they should show other students and read the corresponding dialogue sheet. Have the last student volunteer read the last dialogue sheet.

**Step 8:**

Debrief the simulation. Have students share their feelings and questions about the experience via a brief discussion.

# *This Tide of Wounded...*

Civil War Battlefield Medicine: An Intro to the Medical Middle Ages



## Medicine in the Civil War

**Warning: This site contains graphic images and descriptions of war. Viewer discretion is advised.**

This page contains a description (warning to those easily disturbed by such: in graphic language) of the most common Civil War surgery, the amputation. A few words about why there were so many amputations may be appropriate here. Many people have construed the Civil War surgeon to be a heartless individual or who was somehow incompetent and that was the reason for the great number of amputations performed. This is false. The medical director of the Army of the Potomac, Dr. Jonathan Letterman, wrote in his report after the battle of Antietam,

*The surgery of these battle-fields has been pronounced butchery. Gross misrepresentations of the conduct of medical officers have been made and scattered broadcast over the country, causing deep and heart-rending anxiety to those who had friends or relatives in the army, who might at any moment require the services of a surgeon.*

*It is not to be supposed that there were no incompetent surgeons in the army. It is certainly true that there were; but these sweeping denunciations against a class of men who will favorably compare with the military surgeons of any country, because of the incompetency and short-comings of a few, are wrong, and do injustice to a body of men who have labored faithfully and well.*



*It is easy to magnify an existing evil until it is beyond the bounds of truth. It is equally easy to pass by the good that has been done on the other side. Some medical officers lost their lives in their devotion to duty in the battle of Antietam, and others sickened from excessive labor which they conscientiously and skillfully performed. If any objection could be urged against the surgery of those fields, it would be the efforts on the part of surgeons to practice "conservative surgery" to too great an extent.*

*Jonathan Letterman, medical director of the Army of the Potomac and father of modern battlefield medicine.*

Still the Civil War surgeon suffers from being called a butcher or some other derisive term. The slow-moving Minie bullet used during the American Civil War caused catastrophic injuries. The two minie bullets, for example, that struck John Bell Hood's leg at Chickamauga destroyed 5 inches of his upper thigh bone. This left surgeons no choice but to amputate shattered limbs.

Hood's leg was removed only 4 and 1/2 inches away from his body. Hip amputations, like Hood's, had mortality rates of around 83%. The closer to the body the amputation was done, the more the increase in the wound being mortal. An upper arm amputation, as was done on Stonewall Jackson or General Oliver O. Howard (who lost his arm at Fair Oaks in 1862) had a mortality rate of about 24%.

This site is, basically, devoted to medicine of the battlefield. Other topics are of course covered, but here you will see a description of a common battlefield amputation. Missing arms and legs were permanent, very visible reminders of the War. Amputees ranged from the highest ranking officers, like John B. Hood, Stonewall Jackson, and Oliver O. Howard, all the way down to the enlisted men, such as Corporal C.N. Lapham of the 1st Vermont Cavalry who lost both of his legs to a cannon ball. Hood, Jackson, Howard, and Lapham were certainly not alone in their loss, as 3 out of 4 wounds were to the extremities... in the Federal Army this led to 30,000 amputations.

### An Example Case

The wait for treatment could be a day, maybe two and that was not out of the ordinary. And when treatment was finally done on the poor soldier, it was not done antiseptically. It would only be in post-1865 that Joseph Lister embarked upon the era of antiseptic surgery. Careful hand washing by the surgeon of the Civil War was not even done. The doctors wore blood splattered clothes. When something was dropped, it was simply rinsed in cool, often bloody water. They used sponges that had been used in previous cases and simply dipped in cold water before using them again on the next person.



A surgeon recalled: "We operated in old blood-stained and often pus-stained coats, we used undisinfected instruments from undisinfected plush lined cases. If a sponge (if they had sponges) or instrument fell on the floor it was washed and squeezed in a basin of water and used as if it was clean" The injuries to be dealt with were dreadful and the fault of the soft lead Minie Ball.

*Limbs un-made by War.*

With the capability to kill at over 1,000 yards, this soft lead bullet caused large, gaping holes, splintered bones, and destroyed muscles, arteries and tissues beyond any possible repair.

Those shot with them through the body, or the head, would not be expected to live. Almost all wounds were caused by the bullet, with canister, cannonballs, shells, and edged weapons next down on the list.

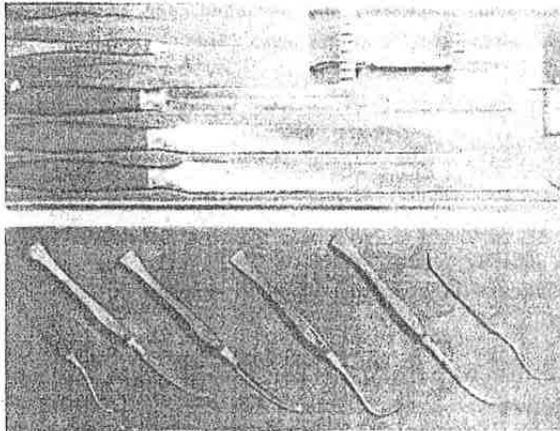
The weapons (particularly the rifle) of the 1860s were far ahead of the tactics; i.e. the generals still thought to take a position you needed to go at it with the bayonet. The cylindrical lead bullet, the Minie ball, was rather large and heavy (.58 caliber usually). When it hit bone, it tended to expand.

*Skull of a Maryland soldier, killed at Gettysburg by a minie ball to the head.*



When it hit "guts" (i.e. the intestines or other soft tissue) it tended to tear them in ways the old smoothbore musket ball didn't do. The wounds from a minie bullet were ugly. Since they crushed and smashed bone so badly, the doctors didn't have much choice but to amputate a limb. Wounds to the stomach were almost always a death sentence.

Civil War doctors were woefully ill-prepared: of 11,000 Northern physicians, 500 had performed surgery. In the Confederacy of 3,000, only 27. Many docs got their first introduction to surgery on the b'field. Doctors usually didn't specialize.



Medical school, for many, was just 2 years (some less, few more) of study. Surgeons reacted to these conditions by adapting. Many had to learn to do surgery on the job in the most hellish conditions that can be imagined. While most Civil War surgeons were competent, many doctors were no more than political appointments there were no licensing boards in the 1860s... Army exam boards often even let in quacks.

*A Civil War surgeon's kit.*

Of the wounds recorded in the Civil War, 70%+ were to the extremities. And so, the amputation was the common operation of the Civil War surgeon.

The field hospital was hell on earth. The surgeon would stand over the operating table for hours without a let up. Men screamed in delirium, calling for loved ones, while others laid pale and quiet with the effect of shock. Only the division's best surgeons did the operating and they were called "operators".

Already, they were performing a crude system of triage. The ones wounded through the head, belly, or chest were left to one side because they would most likely die. This may sound somewhat cruel or heartless, but it allowed the doctors to not waste precious time and to save those that could be saved with prompt attention. This meant that common battlefield surgery was the amputation.

The surgeon would wash out the wound with a cloth (in the Southern Army sponges were long exhausted) and probe the wound with his finger (the finger being usually used), or a probe perhaps, looking for bits of cloth, bone, or the bullet. If the bone was broken or a major blood vessel torn, he would often decide on amputation. Later in the War, surgeons would sometimes experiment with resection, but far more common was amputation.

Deciding upon an amputation, the surgeon would administer chloroform to the patient. What is portrayed in

"Hollywood" and in much "modern" conception of what surgery in the War was like during the war is false; anesthesia was in common and widespread use during the war.... it would make more complicated and longer operations possible as the era of antiseptic surgery was embarked upon (but too late for the poor Civil War soldier).



He would make incisions both above and below, leaving a flap of skin on one side. Taking his bonesaw (hence Civil War slang for a doctor is a "Sawbones") he would saw through the bone until it was severed. With the patient insensible, the surgeon would take his scapel and make an incision through the muscle and skin down to the bone.

*Surgery at Camp Letterman at Gettysburg.*

He would then toss it into the growing pile of limbs. The operator would then tie off the arteries with either horsehair, silk, or cotton threads. The surgeon would scrape the end and edges of the bone smooth, so that they would not work back through the skin. The flap of skin left by the surgeon would be pulled across and sewed close, leaving a drainage hole. The stump would be covered perhaps with isinglass plaster, and bandaged, and the soldier set aside where he would wake up thirsty and in pain, the "Sawbones" already well onto his next case.

A good surgeon could amputate a limb in under 10 minutes

If the soldier was lucky, he would recover without one of the horrible so-called "Surgical Fevers", i.e. deadly pyemia or gangrene.

15 years after the War, surgeon George Otis cited the five principal advances of Civil War surgery: the surgeons had learned "something" about head injuries, how to deal with awful "ghastly wounds" without dismay, they had learned how to ligate arteries, information on injuries to spine and vertebrae had been "augmented", and "theory and practice" in chest wounds had been forwarded.

A little about the "Surgical Fevers". These were infections arising from the septic state of Civil War surgery. As you should have been able to see, the Civil War surgeon was interested not so much in cleanliness, but speed. As such, and not knowing anything about antiseptic surgery, fevers arose. Of these, the most deadly was probably pyemia. Pyemia means, literally, pus in the blood. It is a form of blood poisoning. Nothing seemed to halt pyemia, and it had a mortality rate of over 90%. Other surgical diseases included tetanus (with a mortality rate of 87%), erysipelas, which struck John B. Gordon's arm after he was wounded at Antietam, and osteomyelitis which is an inflammation of the bone. Also, there was something called "Hospital Gangrene". A black spot, about the size of a dime or so, would appear on the wound. Before long, it would spread through, leaving the wound an evil smelling awful mess. The Hospital Gangrene of the Civil War is an extinct disease now.

Primary amputation mortality rate: 28%

Secondary amputation rate: 52%

Most of the information from this page came from Coco's "A Strange and Blighted Land" and Adam's "Doctors in Blue"

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Return to the This Tide of Wounded: An Intro to Civil War Medicine home-page.

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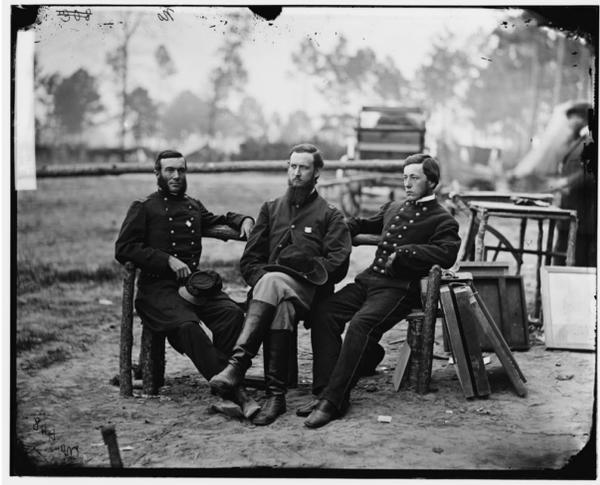
## Student Narrator Dialogues

**#1** The Civil War was fought, claimed the Union army surgeon general, "at the end of the medical Middle Ages." Little was known about what caused disease, how to stop it from spreading, or how to cure it. Surgical techniques ranged from the barbaric to the barely competent.



**#12** These fallen men were cared for by a woefully underqualified, understaffed, and undersupplied medical corps. Working against incredible odds, however, the medical corps increased in size, improved its techniques, and gained a greater understanding of medicine and disease every year the war was fought. Poet Walt Whitman, who served as a volunteer in Union army hospitals, had great respect for the hardworking physicians, claiming that “All but a few are excellent men...”

**#4** Although Civil War doctors were commonly referred to as "butchers" by their patients and the press, they managed to treat more than 10 million cases of injury and illness in just 48 months and most did it with as much compassion and competency as possible.



**#11 (Teacher Reads This)** Approximately 850,000 people died in the four-year conflict, a figure that tops the total fatalities of all other wars in which America has fought. Of these numbers, approximately 110,000 Union and 94,000 Confederate men died of wounds received in battle. Every effort was made to treat wounded men within 48 hours; most primary care was administered at field hospitals located far behind the front lines.

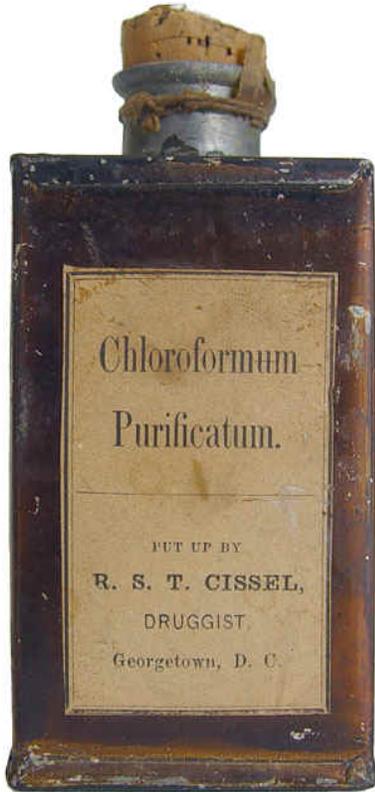
**#6** The most common Civil War small arms ammunition was the dreaded minnie ball, which tore an enormous wound on impact: it was so heavy that an abdominal or head wound was almost always fatal, and a hit to an extremity usually shattered any bone encountered. In addition, bullets carried dirt and germs into the wound that often-caused infection.

*[Use the sledgehammer on the cow leg to show the damage inflicted by a Civil War Minnie Ball]*

*Hand around the Civil War Bullets for examination or use this photo:*



**#8** Contrary to popular myth, most amputees did not experience the surgery without anesthetic. Ample doses of chloroform were administered beforehand; the screams heard were usually from soldiers just informed that they would lose a limb or who were witnesses to the plight of other soldiers under the knife.



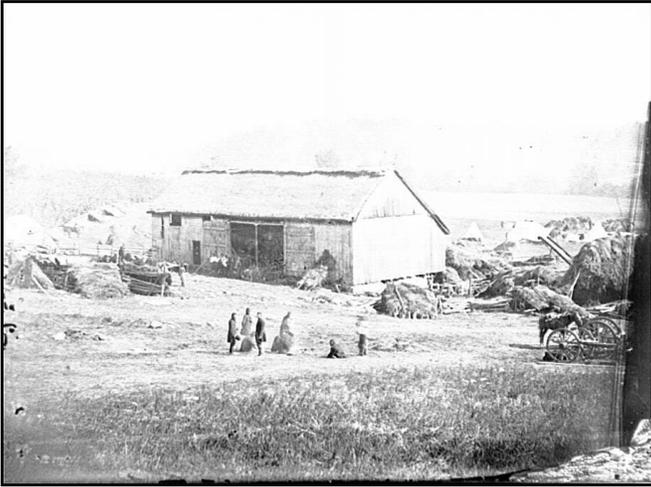
Go to **#9** as the amputation is winding down

**#9** Those who survived their wounds and surgeries had another hurdle to overcome, the high risk of infection. While most surgeons were aware of a relationship between cleanliness and low infection rates, they did not know how to sterilize their equipment. Due to a frequent shortage of water, surgeons often went days without washing their hands or instruments, thereby passing germs from one patient to another as he treated them. The resulting vicious infections, commonly known as "surgical fevers," are believed to have been caused largely by *Staphylococcus aureus* and *Streptococcus pyogenes*, bacterial cells, which generate pus, destroy tissue, and release deadly toxins into the bloodstream. Gangrene, the rotting away of flesh caused by the obstruction of blood flow, was also common after surgery. Despite these fearful odds, nearly 75 percent of the amputees survived.



## Student Eyewitness Dialogues

**#2** To look after the wounded of my command, I visited the places where the surgeons were at work. At Bull Run, I had seen, on a very small scale, what I was now to behold. At Gettysburg the wounded—many thousands of them—were carried to the farmsteads behind our lines.



**#3** The houses, the barns, the sheds, and the open barnyards were crowded with the moaning and waiting human beings, and still an unceasing procession of stretchers and ambulances came in from all sides to augment the number of the sufferers.



**#5** There stood the surgeons, their sleeves rolled up to the elbows, their bare arms as well as their linen aprons smeared with blood, their knives often held between their teeth, while they were helping a patient on or off the table, or had their hands otherwise occupied; around them pools of blood and amputated arms or legs in heaps.



**#7** As a wounded man was lifted on the table, often shrieking with pain as the attendants handled him, the surgeon quickly examined the wound and resolved to cut off the injured limb. Some chloroform was administered and the body put in position, for surgery. The surgeon snatched his knife, wiped it rapidly once or twice across his blood-stained apron, and the cutting began.

*[Begin your amputation of the cow leg as students look on in amazement.]*

Go to **#8** during the amputation somewhere in the middle. Keep cutting

**#10** And so it went on, hour after hour, while the number of expectant patients seemed hardly to diminish. Now and then one of the wounded men, would call attention to the fact that his neighbor lying on the ground had “given up the ghost” while waiting for his turn, and the dead body was then quietly removed. Or a surgeon, having been long at work, would put down his knife, exclaiming that his hand had grown unsteady, and that this was too much for human endurance-not seldom hysterical tears streaming down his face.

