



A nurse cleans the eyes of a gassed patient, France, 1918

Online Collections Database, 1926.28.157, www.theworldwar.org/research/database. National WWI Museum and Memorial. Online.

Fixing the Fallen: Medical Advances in WWI

Recommended Grade Levels: 9-12

Course/Content Area(s): World History, U.S. History

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LESSON OVERVIEW:	Students will work together to explore primary and secondary sources to learn about seven different advances in medicine during WWI. They will use this knowledge to write a case study of a fictional soldier and describe how they would treat his hypothetical injuries. The activities are designed to help students understand the extent of the innovation in medical technology and the root cause of the advancements; the innovations in weapon and military technology.
OBJECTIVES:	<i>Students will:</i>
	<ul style="list-style-type: none"> ● analyze source material ● incorporate analysis into a creative writing assignment
STANDARDS ALIGNMENT:	<p>National Council for the Social Studies (NCSS) C3 Framework Standards:</p> <p>D2.His.1.9-12. Evaluate how historical events and developments were shaped by unique circumstances of time and place as well as broader historical contexts.</p> <p>D2.His.2.9-12. Analyze change and continuity in historical eras.</p> <p>D2.His.3.9-12. Use questions generated about individuals and groups to assess how the significance of their actions changes over time and is shaped by the historical context.</p>
TIME NEEDED:	One 90-minute block
INTERDISCIPLINARY:	English Language Arts
PRIOR KNOWLEDGE:	<ul style="list-style-type: none"> ● Students should be aware of the origins of WWI ● Students should have some working knowledge of the way the war was fought
MATERIALS NEEDED:	<ul style="list-style-type: none"> ● WWI Medical Innovations Chart ● You're the Medic Handout ● Collection of Resources for Students (Appendix A) ● Manila folders (optional)

LESSON

INTRODUCTION/HOOK:

- Show students the following photo:
<https://collections.theworldwar.org/argus/final/Portal/Default.aspx?component=AAAS&record=010f8e66-52c7-4821-bd28-6d1cd71c027d>
- Ask them the following questions:
 - What do you see?
 - Where do you think this is taking place?
 - When do you think this is taking place?
 - What do you think is happening in this photo?
- Explain to students that this is a photograph of Anna Coleman Ladd at work in her studio in Paris. In this photo, Ladd is applying paint to a mask worn by a French WWI soldier to cover a disfigurement on his face. The destructive nature of military technologies used during the Great War led to medical innovations that are still referenced and used today.
- Explain to students that they will be exploring some of these medical advancements and then taking on the role of a doctor, teaching new doctors after the end of WWI.

DIRECTIONS:

Advance Teacher Preparation:

- Print all of the enclosed images. Depending on the size of your groups, you want two sets of items.
- Print or provide digital access to the essay for each innovation. Please note the warning (Appendix A); a few of the essay pages include graphic imagery that you may want to print to exclude from student access.
- Cut out the images and organize them into folders.
- Tape or paste each document and image into the inside of corresponding manila folders.
- Label the outside of the folder with the name of the innovation. (You don't have to put these in manila folders, but if you have time, it adds to the atmosphere of the lesson as it looks like a medical chart.)

Research and Learning:

1. Divide students into 7 different groups and give each student a copy of the "World War I Medical Innovations" chart.
2. Give each group one folder OR set up the folders at stations and assign groups to a certain area of the room.

3. Allow students 5-10 minutes to analyze the photographs and read the documents to determine how the innovation revolutionized the practice of medicine.
4. After time is up, students rotate the folders (or themselves).
5. Continue until every student has read each chart.

POST-ASSESSMENT:

Once students have gathered information from the sources, they will move on to the creative writing portion of the activity.

1. Give out a copy of *You're a Medic*.
2. Students will create a fictional soldier - they must provide details that will help them review earlier lessons on military technology.
3. Students will write a short story explaining how their soldier was injured and, using at least four of the seven innovations, systematically explain how to treat his wounds.

MODIFICATIONS/ACCOMMODATIONS

- Teachers should use their best judgment using some of the photos to determine their appropriateness for their particular students.
- The creative writing portion can be done for homework and the stories shared at the beginning of class the next day. My students have written more thorough treatment plans when they had time at home to think a little more, but they can still write something in class that demonstrates their learning if you're pressed for time.

Appendix A:

Collection of Resources for Students

Each page below includes a series of images and a link to an information page about the specific innovation. Provide students with access to both the essay (digitally or **printed – see warning below**) and the images (printed and placed into a folder for examination).

Note: Some of the webpages provided include graphic primary source images. It is recommended to print only the text and use the provided images on these pages if you do not want students to view the images on the webpage. If the page includes graphic imagery, a warning is included under the title. Please preview before linking to students.

Triage

Link: <https://www.kumc.edu/school-of-medicine/academics/departments/history-and-philosophy-of-medicine/archives/wwi/essays/military-medical-operations/triage-field-hospital-section.html>



Original Caption: WITH OUR FIGHTING FORCES ON THE WESTERN FRONT. / Our photo shows the Ambulance Corps of the U. S. Marines loading American wounded on board a Hospital train somewhere in France to be rushed to Base Hospitals.



Original Caption: The "triage" near Glorieux the morning of Aug. 21st. This was formerly a girls school and was used as a clearing house for the wounded in this attack. As the available space in the building had been utilized it was necessary to put the blesses temporarily in the court yard. They were cleared from there to the field hospitals and rail head.



Original Caption:
Wounded being
treated by the 110th
Sanitary Train, 4th
Ambulance Corps, 1st
Division in an old
church. Neuville,
Meuse, France,
September 20, 1918.



Original Caption:
Gassed patients of
82nd and 89th
Divisions. The 326th
field hospital was not
large enough to
accomodate the
enormous number of
patients. North of
Royauimeix, France,
August 8, 1918.

Blood Transfusion

Link: <https://www.kumc.edu/school-of-medicine/academics/departments/history-and-philosophy-of-medicine/archives/wwi/essays/medicine/blood-transfusion.html>

I. PREPARATION OF GUM-SALT SOLUTION:

Prepared solution of gum-salt for intravenous infusion in cases of hemorrhage and shock will be limited to Field, Mobile, Evacuation and Advanced Base Hospitals really functioning as Evacuation Hospitals, where, during active periods, blood transfusion may be impossible of accomplishment. Such hospitals may obtain gum-salt solution from the nearest Army Medical Dump or from the Central Medical Department Laboratory. The solution is issued in 500 c.c. automatic stoppered bottles 12 bottles to a case. Both cases and bottles are obtained with great difficulty and empty bottles and cases must be returned in order to receive replenishments.

In Base Hospitals, generally, blood transfusion should be the procedure of election and intravenous infusion of gum-salt solution resorted to only in emergency. The small stock of gum-salt solution necessary to meet those emergencies should be prepared locally, by each Base Hospital for its own use. Directions for the preparation of the solution may be obtained from the Director of Laboratories, A.P.O. 721.

In order that all the acacia that is available may be conserved for use in the preparation of gum-salt solution, its issue from Supply Depots for dispensary use, is interdicted.

Requisitions for acacia in small quantities, not to exceed 5 pounds in the instance of Base Hospitals, will be honored, provided the notation: 'for preparation of gum-salt solution' is entered opposite this item in the column of remarks.

II. TRANSFUSION SETS.

On several occasions requisitions for transfusion sets have been received from Base Hospitals with the explanation that the transfusion set formerly on hand had been taken to an advanced Field, Evacuation or Mobile Hospital by some member of the staff on detached service with a 'shock team.'

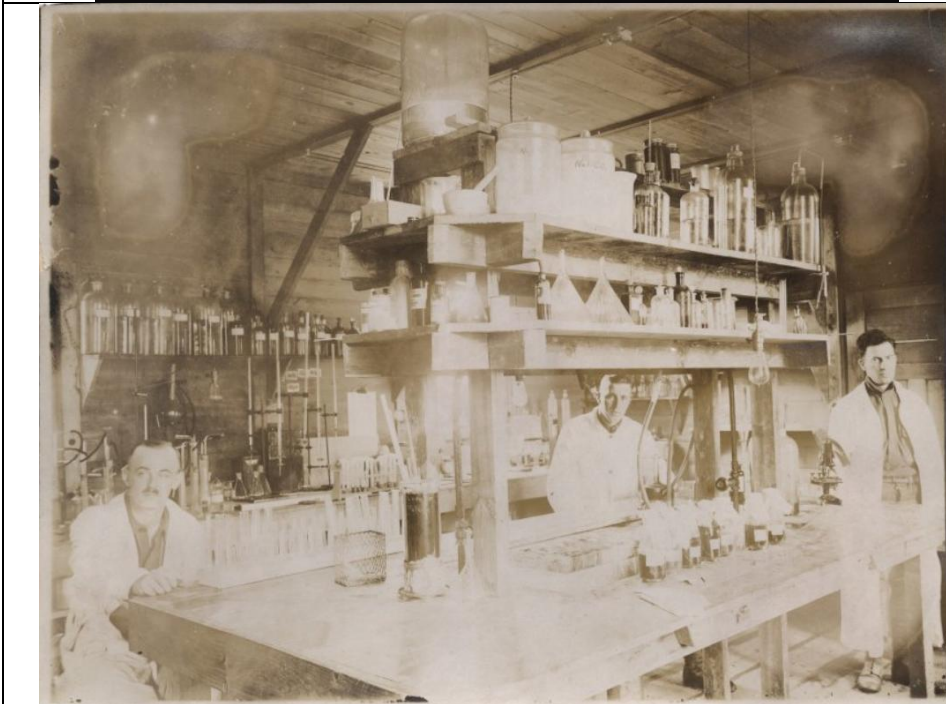
The impression has been gathered, apparently, that transfusion sets issued to individuals, upon completing the course in resuscitation at the Central Medical Department Laboratory, were for their personal use. This impression is erroneous as each set was destined for use in the hospital to which the individual returned and should have been turned over to the Supply Officer of the hospital.

All transfusion sets now in the possession of individuals will be turned in to the Supply Officer of the hospital to which they are permanently attached. Transfusion sets have been issued to advanced hospitals and reserve supplies have been placed in Army Medical Dumps. These supplies are adequate for the use of 'shock teams' serving temporarily at advanced hospitals.

Type-written copies of a series of circulars sent from the Office of the Surgeon General to Hospital Train No. 58. Dated November 1917 – June 16, 1919.



Blood transfusion kit (Canadian War Museum)



Laboratories like this one at Base Hospital 28 would have been used to add anti-coagulation chemicals to blood taken from soldiers who could spare it.

X-rays

Link: <https://www.kumc.edu/school-of-medicine/academics/departments/history-and-philosophy-of-medicine/archives/wwi/base-hospital-28/clinical-services/radiology.html>



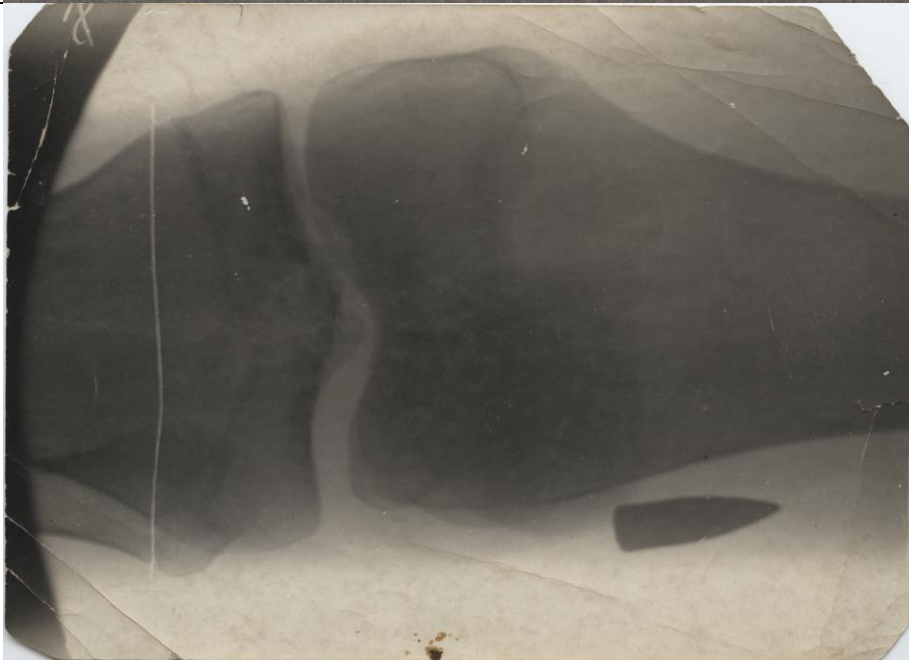
X-ray being done on an injured soldier's head at an American base hospital



X-ray being taken of an injured soldier's hand at an Austro-Hungarian hospital.



Mobile X-ray units were invented by Marie Curie during the war. The first outfitted ambulances were funded by donors Curie found and operated by women that Curie trained. This image shows one being used on a soldier at a field hospital..



Bullet wound X-ray from a soldier's leg, 1915.

Wound Treatment

WARNING: GRAPHIC IMAGERY ON THIS WEBPAGE! PLEASE PREVIEW BEFORE LINKING DIRECTLY TO STUDENTS

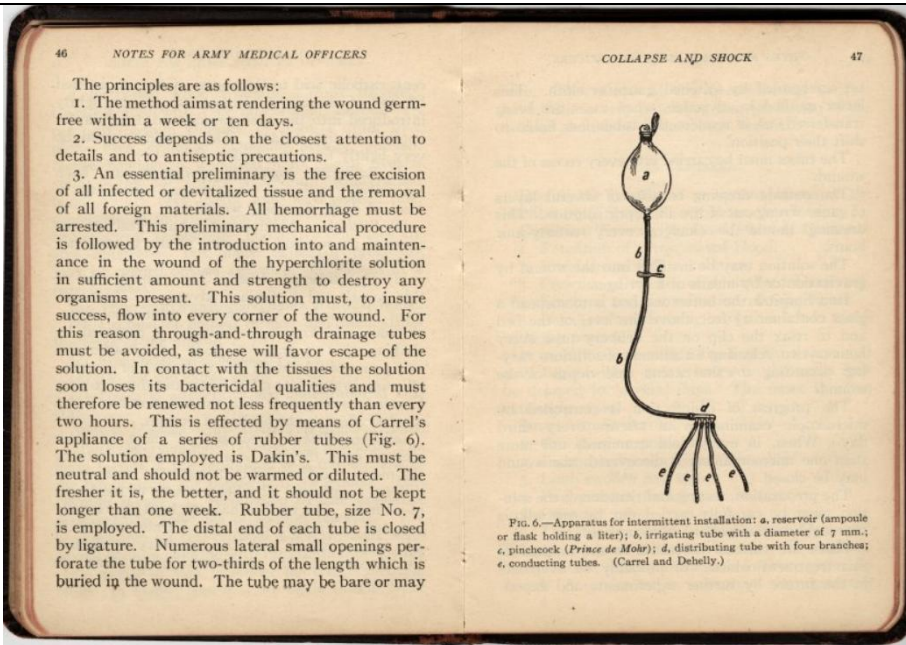
Link: <https://www.kumc.edu/school-of-medicine/academics/departments/history-and-philosophy-of-medicine/archives/wwi/essays/medicine/dakins-solution.html>



A small, handheld medical needle sterilizer.



Medicine Case complete with five hard rubber bottles and original contents. Bottles in the original positions from left to right are: plain bottle, no contents; "Mistura Glycyrrhizae" (Mistura glycyrrhizae composition) with contents; "Pilulae Catharticae Comp." with contents; "Pulv. Ipecac. et opii, 324 mgm" with contents; "quinine Sulphas 200 MGM", with contents



46 NOTES FOR ARMY MEDICAL OFFICERS

The principles are as follows:

1. The method aims at rendering the wound germ-free within a week or ten days.
2. Success depends on the closest attention to details and to antiseptic precautions.
3. An essential preliminary is the free excision of all infected or devitalized tissue and the removal of all foreign materials. All hemorrhage must be arrested. This preliminary mechanical procedure is followed by the introduction into and maintenance in the wound of the hyperchlorite solution in sufficient amount and strength to destroy any organisms present. This solution must, to insure success, flow into every corner of the wound. For this reason through-and-through drainage tubes must be avoided, as these will favor escape of the solution. In contact with the tissues the solution soon loses its bactericidal qualities and must therefore be renewed not less frequently than every two hours. This is effected by means of Carrel's appliance of a series of rubber tubes (Fig. 6). The solution employed is Dakin's. This must be neutral and should not be warmed or diluted. The fresher it is, the better, and it should not be kept longer than one week. Rubber tube, size No. 7, is employed. The distal end of each tube is closed by ligature. Numerous lateral small openings perforate the tube for two-thirds of the length which is buried in the wound. The tube may be bare or may

47 COLLAPSE AND SHOCK

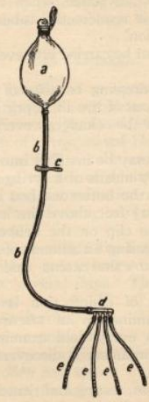


FIG. 6.—Apparatus for intermittent installation: a, reservoir (ampoule or flask holding a liter); b, irrigating tube with a diameter of 7 mm.; c, pinchcock (*Pinzette de Mole*); d, distributing tube with four branches; e, conducting tubes. (Carrel and Dehelly.)

Introductory note by Surgeon General William C. Gorgas; medical war manual no. 2. Figure 6: Carrel-Dakin Treatment apparatus for intermittent installation



Operating scene in an operating room. Female nurse and another male assisting doctor while averting eyes away from patient.





A U.S. operating equipment case made of khaki canvas. Case interior is printed with outlines for 22 instruments and has a metal scalpel container at left end.

Plastic Surgery

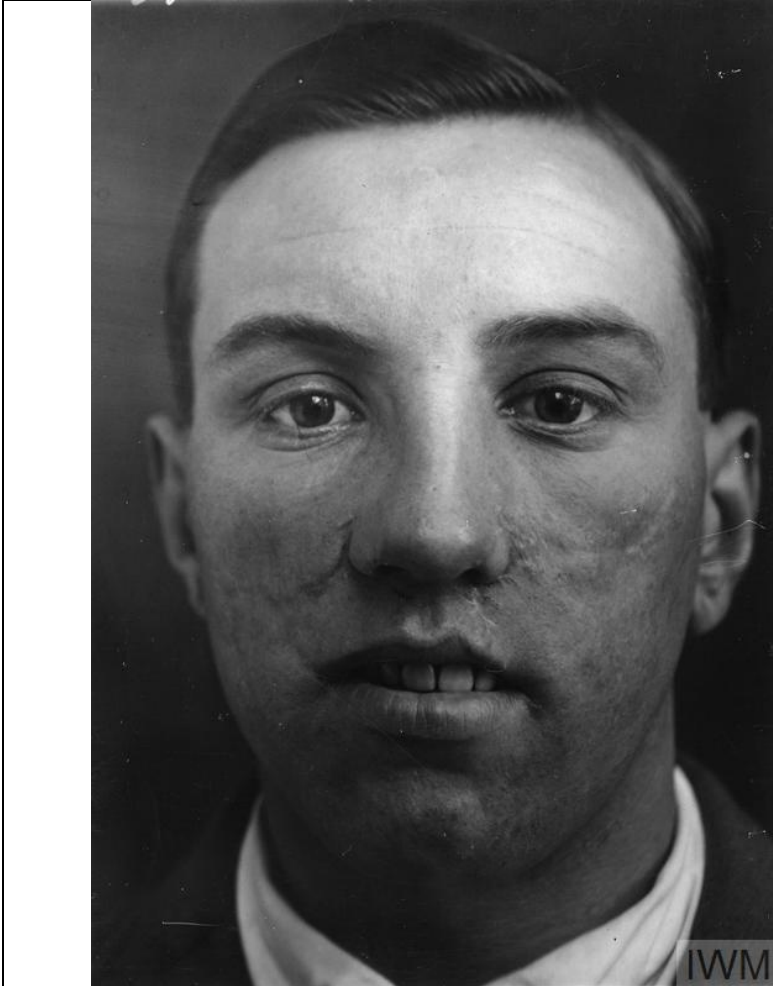
WARNING: GRAPHIC IMAGERY ON THIS WEBPAGE! PLEASE PREVIEW BEFORE LINKING DIRECTLY TO STUDENTS

Link: <https://www.nam.ac.uk/explore/birth-plastic-surgery>

	<p>Outcome of plastic surgery done to a soldier with a gunshot wound to the face.</p>
	<p>Outcome of plastic surgery done to a soldier with a gunshot wound to the face. This soldier's right eye and brow were completely lost; surgery done by Major Harold Gillies. This individual is also wearing a prosthetic face mask after reconstructive surgery. (IWM)</p> <p>Note: Image of injury pre-surgery here.</p>



WWI veteran Walter Yeo before (left) and after (right) skin flap surgery performed by Harold Gillies in 1917. (Public Domain)



A soldier's face after surgery that included skin grafting; surgery done by Major Harold Gillies. (IWM)

Prosthetics

Link: <https://www.theworldwar.org/learn/about-wwi/becoming-bespoke-when-one-size-prosthetic-does-not-fit-all>



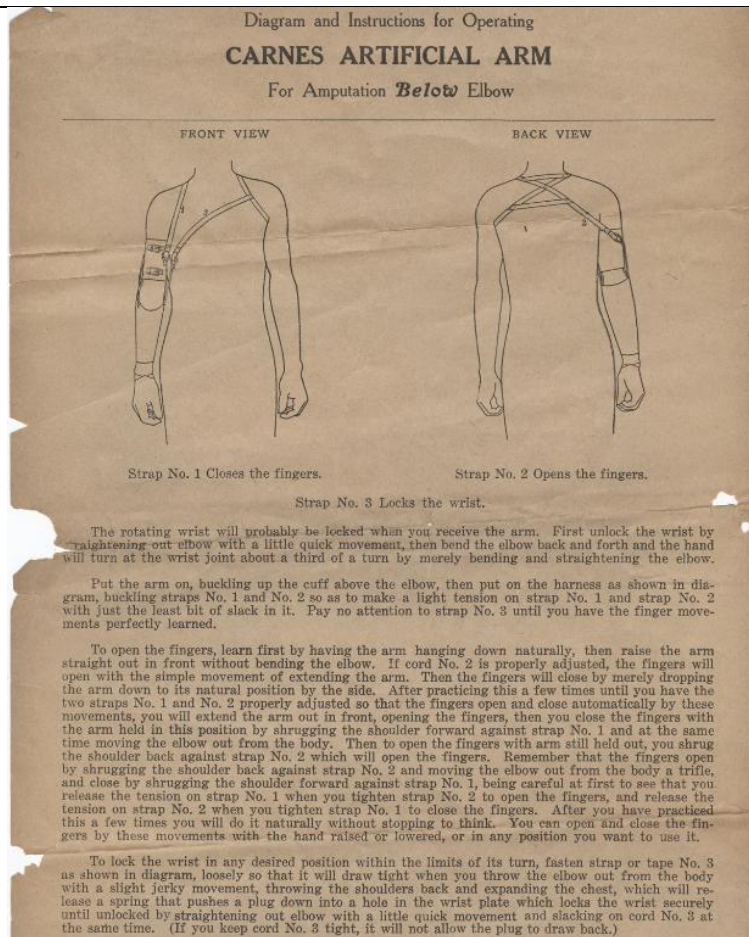
A German soldier working on shaving a piece of wood with a prosthetic limb for his left arm.



A soldier wearing a mask created by Anna Coleman Ladd at her Studio for Portrait Masks in Paris.



Openshaw wooden artificial hand. Designed by Thomas Openshaw, a surgeon at Queen Mary's Hospital, Roehampton, during World War I. A special feature of the hand is that the the ring and little fingers are held rigid, in a slightly flexed position, with steel reinforcement which extends into the palm. This allows bags and other objects to be carried. The thumb, index and middle fingers have a certain degree of articulation. Made by Anderson & Whitelaw, England c.1919.



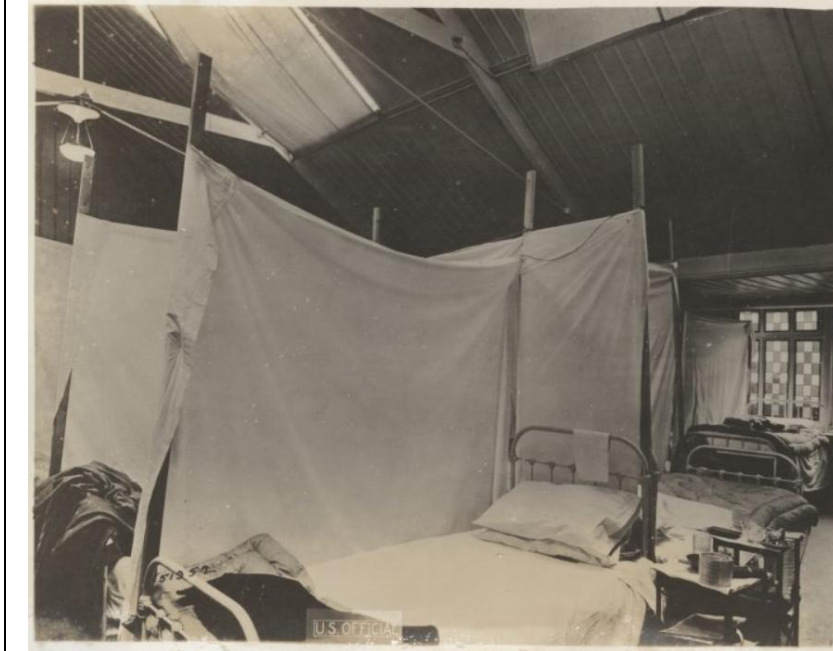
Instruction sheet titled "Diagram and Instructions for Operating Carnes Artificial Arm For Amputation Below Elbow," created by Carnes Artificial Limb Co. in Kanas City, Missouri.

Reducing Spread of Disease

Link: <https://www.theworldwar.org/learn/about-wwi/pandemic-then-and-now>



A doctor or a nurse wearing a white protective gown with a head wrap and face mask. The person stands outside of a tent with hospital beds inside and water basins and other medical equipment outside. Beau Desert, France.



The influenza ward at Base Hospital No. 3 in Paris, France.

The "Flu." Situation

The Medical Officer of the Battalion submits the following on the "flu." situation:

"The influenza is still with us. During December it sent nearly fifty men to the hospital. This disease seems to be of a diminished virulence as none of the cases sent so far is serious.

"There seems to be no sure method of preventing influenza, but there is no doubt that overcrowding in stuffy billets and promiscuous coughing and sneezing are two of the most important causes.

"Every man should see to it that he has his allotted floor space, plenty of ventilation and dry warm clothing. He should see to it that his mess kit is washed clean because the germs of "flu" are also spread in dirt. And lastly, when he gets ill he should see the medical officer so that if he should have to go to the hospital, he can be sent promptly and not risk exposing others by delay."

Clipping from newspaper, "The First Call; Dope Sheet of the First Battalion, 354th Infantry., Army of Occupation, A.E.F. Lunebach, Germany." Printed January 1919.



St. Louis Red Cross Motor Corps on duty Oct. 1918, during the Influenza epidemic. (Library of Congress)