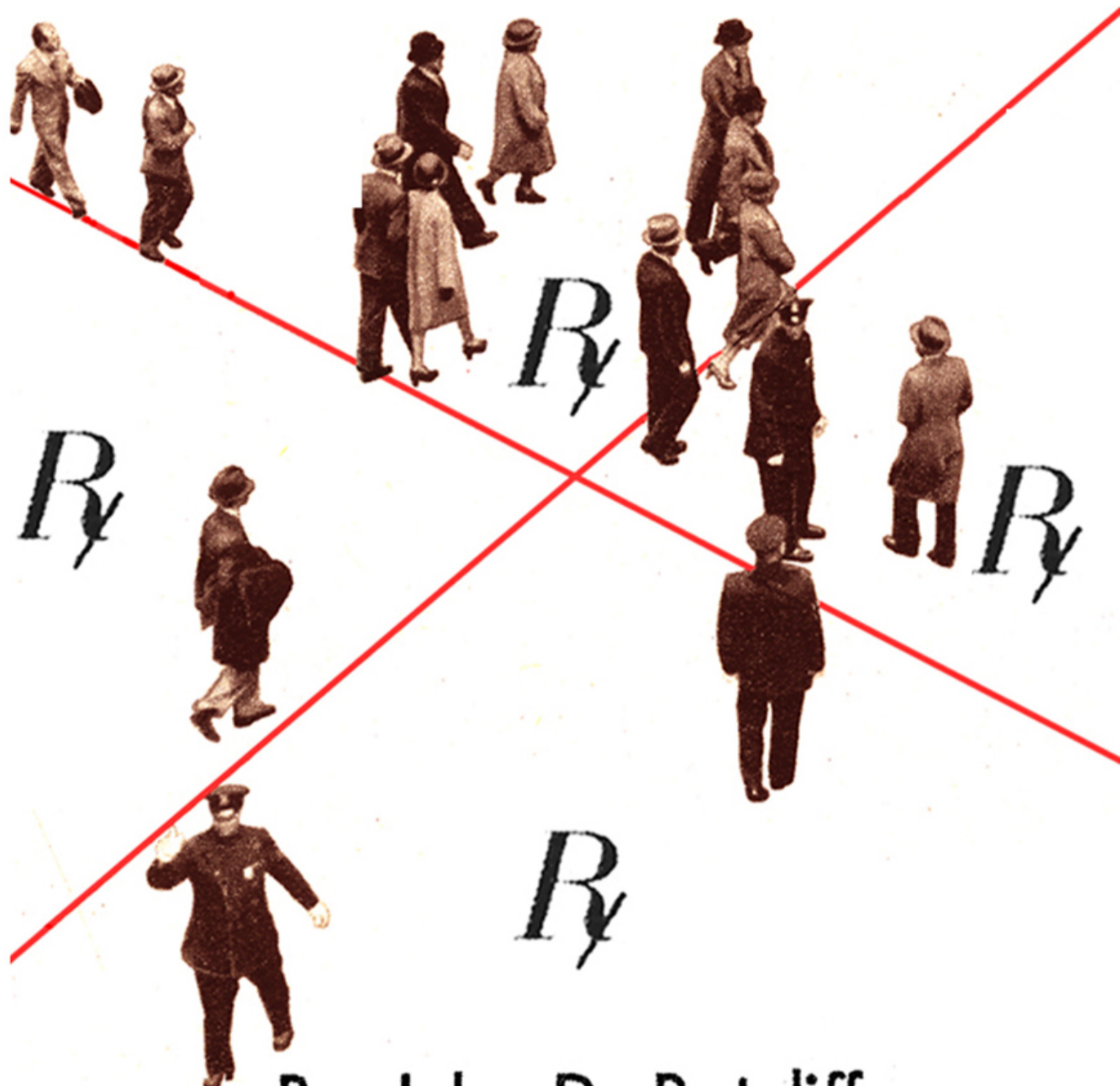


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## War Dividend: Better Health for Everyone

*From the Clash  
of Battle has Come  
Vast Medical Progress*



By John D. Ratcliff

One thing, at least, may be said in war's favor: it quickens the tempo of medical research—to man's everlasting benefit.

How much did our physicians learn in World War II? One statement answers that question. This was the first war in history in which bullets have been more deadly than microbes. Figures of astonishing portent are on hand. In the European campaign, disease took only 1,500 American lives!

A large part of this progress, of course, is traceable to penicillin and the sulfa drugs. Their story has been told often. But there are dozens of other heartening stories of medical advances.

**DISEASE:** When war started, typhus—not to be confused with typhoid fever—hung like a dark threat over Europe. This louse-spread wrath, handmaiden of war, preys on ill-fed, ill-clothed populations. After the last war it killed 3,000,000 Russians.

Just as the war started, American research men devised a new vaccine to protect against typhus.

Millions of doses were made and used with brilliant result. Not one American died of this sickness.

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Another superb weapon against typhus came out of Swiss laboratories and was mass-produced by American industry. It was the miracle insect killer, DDT. When a man is dusted with DDT the lice on him die instantly. He is no longer a potential spreader, or potential victim, of typhus.

DDT played a similarly heroic role in the No. 1 disease problem of the Pacific—malaria. Planes dusted DDT on swamps, killing both mosquitoes and mosquito larvae. Pest holes like Guadalcanal became healthful. Army malaria rates declined 75 per cent.

Meningitis has been a problem in every war. In World War I, it killed 40 percent of the men who contracted it. Thanks to penicillin and sulfa, only a tenth this many died in World War II. Similarly with pneumonia—which claimed the lives of 24 per cent of its victims in the first World War and of 4 per cent in the second.

Using the same technique used to prepare typhus vaccine—microbes of the disease are grown in fertile eggs—research men have prepared a vaccine against influenza. It has had no widespread trials, for there has been no flu outbreak. But it promises to break the back of any epidemic such as the one which killed 20,000,000 human beings after World War I.

**SURGERY:** Advances in surgery during World War II were spectacular. A soldier who reached a hospital was twice as apt to walk out alive as he was during the first World War. Note some sample figures. Abdominal wounds killed 70 per cent in the first World War, only 20 per cent in the second; chest wounds 30 per cent versus 15 per cent; head wounds 50 per cent versus 15 per cent.

There are several reasons for this. For one thing, in World War II, the wounds were handled with speed unmatched previously. Men wounded in France on D-Day morning were evacuated by plane to England by afternoon. As a rule medical assistance reached a man within minutes of the time he was wounded. Thus, surgical intervention came during the "golden period"—within six hours.

The two great soldier-killers are hemorrhage and shock. In World War II, great strides were taken

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in controlling both. Shock is complete collapse of all vital body functions, with subnormal temperature, shallow breathing, falling blood pressure. Blood vessels collapse. Fluid leaks into tissue. Weapons against shock were plasma and whole blood—sometimes in enormous doses.

One of the dramatic advances was in treatment of compound fractures—where bones pierce skin. Such wounds are open invitation to infection. During the Civil War, eight out of ten men with compound fractures died. During World War I, it was one in six. In World War II, only a negligible number died.

Wounds were cleaned and dusted with penicillin or sulfa powder. Then the leg or arm bones were nailed together with stainless steel nails and the whole limb cased in plaster. Men with such injuries were often hobbling about on crutches a few days after being injured. Wounds so treated heal in a few weeks, instead of making a man an invalid for months.

Penicillin opened the way for another great surgical advance. Surgeons had feared to close deep wounds in soft tissue. There was always the grim chance that bacteria might be sealed in the wound, paving the way for gangrene and death. Such wounds took months to heal by granulation—formation of scar tissue on the wound crater.

New procedures changed all this. A wound was left open a day or so for observation. All dead tissue was cut away, the patient was treated with penicillin and on the third or fourth day the wound was closed. As a rule, wounds were 90 per cent healed in ten days.

Both brain surgery and plastic surgery were born of the first World War. They grew up in the second. At one time a penetrating wound of the brain was a verdict of death. The surgeons of World War I became skilled enough to save half the men thus injured. Those of the second World War saved all but 15 per cent.

Nowadays there is hardly any human wreckage that reconstructive surgeons cannot repair. They use cartilage—even have “banks” to store this tissue, borrowing it from cadavers—to build new noses

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and ears. If new eyelids are needed, they are built out of tissue taken from the underarm or from the foreskin. Eyelashes and eyebrows are made of small strips of tissue taken from the scalp.

If skulls have been shattered and bone has been torn away, surgeons replace it with the miracle metal, tantalum. This is easily tolerated by the body and is soft enough to be hammered into shape in the operating room. Once the metal is in the skull, the scalp is drawn over the wound. From outward appearance, no one would know a chunk of skull was missing.

**ANESTHESIA:** Although war has developed few new anesthetics, it has familiarized physicians with many of them. The most valuable anesthetic of World War II was sodium pentothal, administered by hypodermic. Within three minutes of getting a painless jab in the arm, an injured soldier was in peaceful slumber, remaining unconscious for about half an hour. This was often long enough to permit surgical repair work. If not, ether or cyclopropane was used.

Avertin is another new anesthetic. This is administered by enema. It is particularly valuable in treating highly nervous patients. The physician will order an enema each morning for several days. When the patient is completely relaxed—and unsuspecting—avertin is added to induce sleep.

The Navy has familiarized thousands of surgeons with the use of spinal anesthesia. This knowledge will be valuable in civilian life, especially in treating surgical patients with bad lungs or hearts. Spinal anesthesia does not burden them as ether does.

**BURNS:** To a great extent World War II was a burn war. Gasoline, incendiaries, flame-throwers made it imperative that better techniques be developed to handle these ghastly wounds. Shock and infection are the twin enemies in burn cases. Surgeons had plasma to fight shock, sulfa and penicillin to fight infection. Skin dressings were developed for immediate grafts on burned areas.

The Padgett dermatome—invented by Dr. Earl Padgett of Kansas City—was a tremendous aid in

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this work. This rolling-pin device cut slices of skin of any desired thickness.. Thus, skin taken from a burned man's hip by the dermatome was used as a dressing on his burned chest. The skin was "glued" in place by thrombin, a component of blood. When securely anchored, the skin started growing immediately. In an astonishingly short time, no scars whatsoever showed for the ordeal.

**BLOOD:** Just before war started, the Russians pioneered with storing whole blood. American workers were chiefly responsible for developing plasma. Even at the outset of the plasma program one thing was apparent—enormous waste was involved. After plasma was extracted, red blood cells—nearly half the blood volume—were discarded.

Research men set about finding uses for this material. One was immediately apparent: red cells as a treatment for anemia. Spectacular results followed injection of red cells into anemic patients, who got an immediate sense of vigor.

Fibrin has been extracted from red cells. Sprayed on a body area, it makes a cellophane-like film. Such films have been used to replace injured brain membranes. This same fibrin, in the form of foam, is used to stop hemorrhage.

Thrombin, mentioned above, is also valuable in stopping hemorrhage. In as little as a second it will clot blood. In skin grafting, thrombin and fibrin play a double role. They stop bleeding from capillaries and act as a "glue" to hold skin grafts in place. Formerly, grafts had to be sewed or held in place by dressings.

Red cells make an excellent salve for wounds. This red paint somehow hastens healing. Exactly how, no one knows, but in many instances results have been surprising.

**VENEREAL DISEASES:** These have been the plague of every army. Penicillin has reduced early syphilis from a disease which required months or years for treatment to one requiring weeks. Gonorrhea can be cured in hours. As a result, a means is now at hand for complete eradication.

New methods of treating trouble-

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some ailments have appeared. Athlete's foot, for example: the Navy copperplates inflamed areas! An electrical contact is fastened to the ankle of a sufferer, and he puts his foot in a bath of copper sulphate. A tiny electric current is switched on and free copper is deposited in the pores of the inflamed areas. This kills the parasites.

To enumerate all the other medical advances of the war would require volumes. This new knowledge will be utilized for everyone.

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