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# The Use of Medicine During and After World War I

Following her time working as a surgeon during World War I, Mary Merritt Crawford stated that "A war benefits medicine more than it benefits anybody else. It's terrible, of course, but it does." Her observation refers to the progress made in medicine as a result of the vast numbers of injuries and deaths that stemmed from technological advancements in weaponry. The War was an unprecedented event in world history, and as the death count rose, doctors had to keep up by advancing medicine to combat the tragedy brought on by the mechanization of warfare. Because of this, medicine was able to make significant advancements, such as the invention of the ambulance to transport wounded soldiers, greater use of anesthesia to reduce pain during surgery, and new operating methods that would prevent amputations as the only solution to injuries or infections. The great irony of revolutionary progress resulting from unthinkable destruction defines the evolution of medicine throughout World War I, where the immense number of casualties drove medical research and launched a new era in healthcare.

Before World War I, the world had never experienced the extent of death and destruction that occurred between 1914 and 1918. An estimated 40 million casualties were inflicted between soldiers and civilians, with around half resulting in death. These numbers can be attributed to the invention of weapons like machine guns and artillery, along with the nightmarish conditions soldiers faced in the trenches. Machine guns could fire hundreds of rounds per minute and easily

kill or severely wound dozens of soldiers before they could even begin to approach their enemy. Artillery was one of the most deadly new weapons due to its improved range, technical evolution, and the more sophisticated high explosive shells fired. Combined with unsanitary conditions of living in dirt trenches with hundreds of other men, injuries were prone to infection that would usually result in amputation of a limb or death. As the number of fatalities continued to rise, doctors and scientists heard their call to action and began to research how to prevent these deaths by improving medical procedures, pharmaceuticals, and the reach of field hospitals.

At the beginning of the war, when a soldier was wounded, they would be transported to a hospital by a horse-drawn wagon where they would most likely undergo a painful amputation surgery, after which recovery wasn't guaranteed. Most of the time a soldier's injury would become infected due to the filthy condition of the trenches, and the infection alone could kill the soldier before they could be treated in a hospital. One of the first responses to this issue was a greater use of motorized ambulances to quickly transport wounded soldiers in order to prevent the development of an infection. By the end of the first year of battle, the American Ambulance Field Service had grown to over 100 ambulances, and volunteers began driving to help injured soldiers get to a hospital.

While ambulances allowed for fast transportation to hospitals, doctors needed to come up with ways to save patients from injuries and infections. Doctors didn't have effective antiseptics to kill bacteria before it spread and infected a wound, so the most common procedure to try and save a soldier was amputation of the infected area. Amputative surgeries were painful and the loss of a limb would alter soldier's lives and challenge them forever. To solve this problem, Alexis Carrel, a French Physician, and Henry Dakin, a British biochemist, worked together to put

Dakin's solution of sodium hypochlorite to use in surgeries. The solution would kill bacteria without burning the patient's skin, and Carrel would use it by opening wounds and cleaning them out with the solution. The technique was named the "Carrel-Dakin Method," and doctors across Europe began to use it to effectively treat their patients.

With the advancement in surgery, there was a need for anesthesia to make procedures as painless as possible, and again doctors responded. George Crile, a volunteer physician from Cleveland, developed a new form of anesthesia with the help of nurse Agatha Hodgins that would put patients to sleep without putting them into shock. He used a mix of nitrous oxide-oxygen and gave demonstrations using the new anesthetic to doctors like Carrel and Dakin. Crile's new form of anesthesia, combined with the Carrel-Dakin surgical method and motor ambulances, along with efforts by doctors around the world, lead to more effective medical care for soldiers and future generations.

It can take tragedy for important progress to be made. World War I was the deadliest conflict in history at its time, with 20 million fatalities and 20 million more injuries, but it led to some of the most significant medical advancements in history. The work of doctors and nurses during that time period made developments that altered the course of medicine forever. Without the war, it would likely have taken decades more to develop an effective antiseptic for surgeries, or to find a way to put patients to sleep without sending them into shock. Going back to the words of Mary Merritt Crawford, war benefits medicine, it leads to a path of invention that will ultimately help future generations of both soldiers and civilians: "It's terrible, of course, but it does."