

Chloroform and the Civil War

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The advent of general inhalation anesthesia using sulfuric ether in 1846, and chloroform the following year, transformed military as well as civilian surgery. Its introduction in civilian life coincided with the Mexican-American war (1846-48), which saw ether used for the first time by American military surgeons under combat conditions. Initially, its employment by army doctors remained extremely limited; but by 1849 ether was officially issued by the U.S. Army. It was during the Civil War, however, that painless surgery on the battlefield became fully established. Interestingly, despite American doctors' extensive experience with ether by then, chloroform became the anesthetic agent of choice by both Union and Confederate army surgeons for the duration of the hostilities. This decision was grounded in the faster action of chloroform and the good record it had earned on the battlefields of the Crimean War. [1]

The ability of chloroform to induce insensibility for extended periods was first brought to professional notice by (later, Sir) James Young Simpson, a noted Edinburgh obstetrician. He and local medical colleagues sought an anesthetic agent that was superior to ether by inhaling numerous chemical compounds and then waiting to find out their effects. When he finally hit upon chloroform, Simpson believed he had discovered the ideal agent because of its effectiveness and its apparent patient safety. Other attributes included its non-flammability, its economy, and its relatively inoffensive odor. Its comparatively easy method of administration and speed of action also recommended it. Chloroform was slowly dropped onto a cone made out of a handkerchief or a piece of cotton that was placed over the patient's mouth and nose: when things went correctly, the

patient went into a deep, peaceful slumber and became placidly oblivious to the fact that a leg was being sawn off, for example. And things went correctly tens of thousands of times as major surgery was undertaken painlessly—as one Victorian surgeon expressed it, patients now had been “rendered unconscious of torture.” [2] Occasionally things turned out badly, however, when patients died in the first few minutes of having chloroform administered; these events were usually well-publicized in contemporary newspapers, coroners’ inquests, and medical journals. [3] As a result, even well into the Civil War era, some patients declined the use of anesthesia, choosing instead to endure surgery while awake.

With the onset of war in the early 1860s, notable surgeons from both the North and the South wrote surgical manuals for military use in the field. These works show a consensus about the use of chloroform. The critical factor for this agreement was the overwhelmingly successful experience of British and French army surgeons during the earlier Crimean War. But these American medical authors did not agree on everything. Samuel Gross of Jefferson Medical College in Philadelphia believed that anesthetics should not be used in all surgical cases, especially in instances where soldiers were so “bewildered with shock” for it was “astonishing what little suffering” they experienced. [4] Whereas J. Julian Chisolm of South Carolina’s Medical College believed chloroform to be “wonderful in mitigating the suffering of the wounded.” Chisolm decried those doctors brought up in pre-anesthetic days who “moralize upon the duty of suffering” and who “characterize the cries of the patient as music to the ear.” [5]

Most surgeons agreed, however, in not recommending mechanical inhalers, preferring the tried and true method of a hand crafted cone-shaped towel fitted lightly

over the patient's mouth and nose. (Although, Chisolm would later devise his own unique inhaler to help economize the South's use of chloroform as supplies began to run low.

[6] Dr. John Packard, a Visiting Surgeon at the West Philadelphia Military Hospital, also observed that chloroform worked best when administered in the open air. [7] Finally, these doctors maintained that the operating surgeon should not have the responsibility of administering the anesthetic, but should have the help of at least one assistant to do so.

The technique is illustrated in the photograph. But reflecting the reality of surgery on the battlefield, they realized that military surgery was not the same as its civilian counterpart.

In 1863, Edward Warren, former University of Maryland professor and then Surgeon General of North Carolina, admonished readers that all his directions applied only where a full complement of medical officers existed, a "rare circumstance...and a most unfortunate one, as the history of every camp and field attests." [8]

The true test of chloroform was its efficacy on the battlefield. Records and statistics kept by the Army Medical Museum (founded in 1862), used to compile the massive multi-volume *Medical and Surgical History of the War of the Rebellion* attest to the extent and utility of anesthesia in the Civil War. Over 174,000 shot wounds of the extremities were reported, the majority of which were treated without extensive surgery; however, 4,656 were treated by surgical excision and another 29,980 by amputation. Exactly how often anesthesia was employed during the war is not known, but Union army surgeons at the Museum believed that a good estimate was 80,000 cases. Certainly, detailed field notes amassed by the Museum showed that of 8,900 cases, in which anesthetics were definitely used, chloroform was the agent of choice-- 6,784 employed chloroform (76.2%), 1,305 employed ether (14.7%), and 811 employed a combination of

both chloroform and ether (9.1%). Supporting these statistics were the individual testimonies of field surgeons who noted that they “invariably,” “universally” “always,” “in every painful operation,” used chloroform. Only 37 deaths (5.4 deaths for every thousand cases) were attributed to chloroform, of the just under 7,000 instances in which it was the anesthetic used. [9] The experience with chloroform in the Civil War, along with other anesthetic agents, might help put to rest apocryphal stories of the purported widespread practice of soldiers biting on bullets, or being overdosed with whisky during surgery. But such stories linger on.

After the war, chloroform’s use declined again in favor of ether as time to induce anesthesia became less critical for army surgeons. (Battlefield experience showed that, on average, it took about nine minutes to induce anesthesia with chloroform, as compared with 16 minutes for ether.) During later wars in the nineteenth and early twentieth centuries chloroform regained its popularity on the battlefield, but would be supplanted by multiple gases delivered by more complicated mechanical anesthetic machines by World War I and after. [10]

CAPTION

A Union Army surgeon (right) and his assistant (left) stand in front of a Civil War medical wagon as they administer chloroform as an anesthetic to a soldier before amputating his leg. The assistant has placed a cone made of cloth over the patient’s mouth and nose preparatory to dripping the anesthetic on to it. On average, it took about nine minute for the chloroform to take effect. *Courtesy, Otis Historical Archives, National Museum of Health and Medicine, Armed Forces Institute of Pathology, OHA 75 Contributed Photographs, 1862-1918, CP 1563.*

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