



## Acute pain management in the Roman Army

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### ABSTRACT

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Ancient warfare involved hostilities between, among or within city-states, clans, tribes, chieftaincies, ethnic groups, empires, or with other organized collectives, by means of armed force. Periodic warfare is universal in time and place. Its causes are many and complex, but unquestionably involve microcosmic and macrocosmic factors. Organized violence causes pain, suffering and death among combatants. The Romans forged a medical system that surpassed the medical systems of most of the enemies that the Romans fought. The Roman military staff employed rapid medical treatment of wounds on the battlefield and at field hospitals, including analgesics to increase the speed of recovery. This treatment acted as a force multiplier to give an advantage in war. The alleviation of pain through the use of analgesics was a major factor in allowing minimally and moderately wounded soldiers to return to the battlefield as soon as possible.

**Key words:** analgesic, immediate medical care, combat medicine.

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### INTRODUCTION

“Excellent herbs had our fathers of Old-Excellent herbs to ease their pain. -Rudyard Kipling, *Our Fathers of Old*. (27 BCE- 476CE)

War is a military conflict conducted by armed forces between or among city-states or empires, within city-states or empires or involving ethnic or asymmetric groups. The ultimate purpose of warfare is to inflict unacceptable casualties upon to secure a victory, armistice or truce. Many military personnel suffer traumatic injuries of various kinds through the use of weapons by the combatants. These injuries require immediate medical treatment including the use of analgesics and opiates. Analgesics are drugs that relieve pain. Opiates are strong analgesics derived from opium.

The main purpose of this article is to demonstrate that the early treatment of traumatic injuries through the use of medical corpsmen and field hospitals by the Roman army facilitated the return of wounded soldiers to the battlefield as quickly as possible. The use of analgesics was an important element of this treatment. The key question being addressed is the

efficiency of Roman medical care, including the use of analgesics in reviving minimally or moderately wounded legionnaires for reentry into military conflict. Critical source information is extracted from Greek and Roman historians, physicians, Roman artifacts, monuments, paintings, archaeological discoveries, and attention to modern secondary sources. The main inference is that Roman combat medicine and use of analgesics was superior to the combat medicine and use of analgesics practiced by many Roman enemies. Some armies, particularly Greek and Egyptian, developed techniques for use in combat medicine, and field medics and field hospitals or clinics were important *modus operandi* employed by the Roman legions.

The key concepts to understand in this article are “immediate medical care,” “military medicine” and “analgesics.” “Immediate medical care” means care rendered soon after a wartime injury by caregivers and hospitals located near the battlefield.<sup>1</sup> “Military medicine” means medical assistance rendered to a wounded soldier with a “primary goal of reducing manpower losses caused by an enemy.”<sup>2</sup> “Analgesic” is a drug that relieves pain.<sup>3</sup> The main assumption

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is that without the role of excellent trauma care, the Roman army could not have forged and maintained an empire which encompassed two million square miles, 44 provinces and 40 million people. Following this line of reasoning, the implications are a better understanding of Roman successes in warfare. Failure to take this line of reasoning seriously, leads to a lesser understanding of Roman military successes in warfare. The main point of view presented in this article is that the use of analgesics by medical personnel in the field and field hospitals was an important aspect of providing immediate care to legionnaires soon after a wartime injury.

### PRIMARY SOURCES

Aulus Cornelius Celsus (first century AD) who wrote a study of medical techniques and medicines, Pedanius Dioscorides (AD 40-80) who compiled an extensive materia medica of drugs and other substances used in medicine, Claudius Galenus (AD 129-ca.205) compiled a systematic approach to medical procedure, and Flavius Renatus Vegetius (4<sup>th</sup> century AD) who discussed sanitation and hygiene at military encampments and preserving the health of soldiers. Theodorus Priscianus (4<sup>th</sup> century AD) wrote a study about skin diseases and wounds and Quintus Gargilius Martialis (3<sup>rd</sup> century AD) specialized in dietetics, including foods useful to helping wounds heal and those possessing analgesic properties. Pliny the Elder (AD 23-79) recorded on science, agriculture and medicine.<sup>4,5,6,7,8,9</sup>

### THE ROMAN MILITARY SYSTEM AND ITS WEAPONS

During the reign of Emperor Gaius Octavian Augustus (27 BCE-CE 14), the Roman army consisted of 25-28 legions. A legate commanded a legion of 5,000 men, cavalry and auxiliaries. He was assisted by six tribunes, 60 centurions and a number of noncommissioned officers. A "castra" (camp) or "castellum" fort offered protection to the legionnaires. The legion had a number of support personnel including medical personnel. Medical personnel were excused from regular fatigue duties, except in emergencies. Between 27 B.C. and AD 476 Roman military medicine reached its zenith.<sup>10</sup> Roman soldiers and their enemies employed a wide variety of weapons designed to kill or injure enemy forces. Among the most lethal weapons were swords, javelins, spears, arrows, slings, onagers and catapults. Incendiary arrows, and incendiary missiles fired from onagers were especially deadly.<sup>11</sup> Many of Rome's enemies used heavy clubs, rocks, slings and other weapons instruments capable to producing traumatic

brain injury and blunt force injuries.<sup>12</sup>

Roman battle dress uniforms were designed to protect soldiers from wounds and other traumatic injuries. They wore metal helmets, segmented armor, greaves, and carried a large, rectangular shield ("scutum"). Legionnaires also fought in close formations for mutual defense in hand-to-hand combat. In spite of these defensive measures lacerated wounds and traumata were common on the battlefield.<sup>13</sup>

### WOUND CARE AT BATTLEFIELD

In an era when wounds the most common in firmament encountered on a battlefield, it was critical that medical personnel be proficient in treating all types of wounds." Capsarii" (medical corpsmen) received training to render advanced first aid to wounded legionnaires. They carried first aid kits containing dried aloe for use as an anti-hemorrhagic, "acetum" (vinegar) for use as an antiseptic, and henbane seeds (*Hyoscyamus niger*) in an ointment prepared with wool fat (lanolin) for pain. They also carried bandages made of linen and wool. ("absus")<sup>14</sup> If the wound was mild and the fighting intense, the soldier would return to the battle. If the wound was serious the "capsarii" could suppress the bleeding with a tourniquet and evacuate the soldier by stretcher or wagon pulled by horses to the field hospital ("valetudinarium"). Although "valetudinarium" is usually translated from the Latin as hospital, it could also represent a medical clinic established at temporary camps installed by legions on campaigns.

### WOUND CARE IN MILITARY HOSPITALS

Triage was practiced by the Romans and it took place at the entrance of the field hospital erected in every camp or fort.<sup>15</sup> Camps and forts occupied an area of about five acres, in addition to the fortified ditches, stockades and other defensive devices that surrounded them.<sup>16</sup> The average hospital occupied an area of 6,000 square feet and could accommodate between 250-500 patients. In the event of mass casualties, ward tents could be set up near the hospitals. Every hospital had wards, a surgical suite, corridors, administrative offices, dining hall and drainage system. There were lavatories, kitchens, baths, and storage rooms for medical instruments and medical herbs. The bath area was also used as an exercise area. Medical herbs were grown outside the hospital in a garden area reserved for that purpose. Every hospital had a number of physicians, including specialists, nurses, orderlies and other staff. Pain medicines and other forms of medication were prepared by

“seplasiarius” (a pharmacist specializing in the preparation of administered drugs). The “medicus primus” (chief medical officer) reported directly to the “praefectus castrorum” (prefect of the camp or fort) who was second in command of a legion. The “optio valetudinarius” (hospital executive officer) and “optio convalescentium” (physician’s assistant in charge of convalescence) were subordinate to the “medicus primus” in all medical decisions.<sup>17</sup>

### **NON-PHARMACOLOGICAL TREATMENTS FOR PAIN**

The “Optio Convalescentium” employed a number of techniques for soldiers suffering from mild to moderate pain. Ice packs (when available) or frigid water would decrease swelling and pain. Hot baths could also decrease pain and muscle spasms. Massage and exercises of gradually increasing intensity could help restore the use of injured joints and muscles. Certain foods contain alkaloids with pain reducing capabilities. The “optio convalescentium” in consultation with a “medicus” ordered meals from the kitchen for wounded soldiers depending on their overall physical conditions. The first priority was to serve sufficient calories from a balanced diet of nutritious foods. Diets usually included protein, fruits, vegetables, dairy products and grains. Beverages included water, fruit juices and tea. The “medici” knew from experience that some foods helped to relieve pain. Examples are cherries (*Prunus cerasus*) mint (*Mentha spicata*), and other herbs had this ability.<sup>18,19</sup>

### **PHARMACOLOGICAL TREATMENTS FOR PAIN**

Pain can be classified as mild, moderate or severe. Mild pain is nagging, annoying and interferes little with activities of daily living. Soldiers with mild pain could be treated with non-pharmacological intervention and the use of a local anesthetic such as henbane seeds (*Hyoscyamus niger*) combined with opium in an ointment prepared in wool fat (*Lanolin*).<sup>20</sup> Broadleaf plantain (*Plantago major*) provided another form of local anesthetic.<sup>21</sup> The powdered bark from the white willow tree (*Salix alba*) could be used to treat inflammation and fever. The powdered inner bark of the slippery elm tree (*Ulmus glabra*) was used for coughs.<sup>22</sup> Moderate pain interferes significantly with the activities of daily living.<sup>23</sup> These patients require stronger medicine which might include a draught of mandrake (*Mandragora officinarum*).<sup>24</sup> The legionnaires would then be referred to a ward for convalescent care. Sick and wounded soldiers were kept in separate wards. The ancient Romans knew

nothing about microbiology, however they knew that diseases could be passed on from one patient to another. Severe pain is disabling and patients are unable to perform the activities of daily living. Most post-operative patients were in this category. They usually required a draught of opium (*Papaver somniferum*).<sup>25</sup>

### **SURGERY IN ARMY FIELD HOSPITALS**

The surgical suite and other parts of the valetudinarium was kept as sanitary as possible. Every night, while others slept, a detachment of soldiers performed HP (hospital police) duties. The “medicus tesserarius” (officer of the watch) monitored cleanliness, and a “medicus decanus” (noncommissioned officer) ordered the specific tasks of workers on the policing detail. All surgical instruments, lint, fibulae and bandages were boiled in water prior to use for every operation. During relatively peaceful periods the “medicus chirurgus” (surgeon) preferred that a patient receive adequate sleep prior to the surgery. The somnifacient of choice was withania somnifera (*somnifera*) (*ashwagandha*) (winter cherry). The herb contains somniferine, withanasomnine and withanolides which are hyonotics.<sup>26,27</sup> The patient could be given a draught of this medicine the evening before surgery. Unfortunately, the plant had to be imported from India via the Silk Road and was not always available. As an alternative Celsus recommends a mixture of mandrake, apium seed and seed of henbane mixed in wine as an alternative.<sup>28</sup>

During battles in which the hospital was overwhelmed with triaged patients, this initial step was not taken. Soldiers receiving surgery went through several phases of treatment. The first phase was the administration of an analgesic, either a draught containing opium or mandrake. The dosages depended upon the patient’s body mass, age, physical condition and the judgment of the medicus. Rain water was preferred for use in liquid medications. If rain water was not available spring water was the preferred source.<sup>29</sup> Soldiers too weak to receive these powerful analgesics could be administered a local anesthetic using henbane seeds.<sup>30</sup> The wounded area was then cleansed with water and Ammoniacum and sponged with vinegar.<sup>31,32</sup>

Missiles were extracted through the entry wound using a scalpel and cyathiscus. Surgical retractors were used for drawing back the flesh at the edge of an incision if necessary. Probes were used to move arteries, large veins and nerve fibers to protect them from punctures.<sup>33</sup> If, as in the case of arrows, the missile deeply penetrated

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the impact area, it could be extracted at a counter-opening at the opposite side of the entry point through the use of a scalpel, retractors and the cyathiscus.<sup>34,35</sup> Speed was important in all surgical procedures, and hemorrhaging was controlled by a variety of means: hemostatic tourniquets, arterial clamps, ligatures, cupping glasses, and the application of lint strips and gum of frankincense (*Boswellia carteri*)<sup>36</sup> Galen even developed the technique of trepanation in cases of traumatic brain injury.<sup>37</sup> After surgery the wound was sutured, sponged with ammoniacum water and vinegar, covered with a mixture of honey and aloe and bandaged with a linen bandage or barbarum plaster.<sup>38</sup> The patient was then transported to the convalescent ward.

## CONCLUSION

During the Roman Empire thousands of soldiers suffered traumatic injuries on the battlefield. The Romans forged a military medical system that surpassed the medical systems of many of their enemies. Under the principles of immediacy and expectancy, the Roman medical staff salvaged and returned to duty many wounded soldiers as rapidly as possible. Immediate medical care, including

the use of analgesics soon after a wartime injury emphasized that the timing of care after trauma is as important as the quality of care. The Romans employed medical corpsmen, field hospitals and triage. Other ancient armies such as the Greek city-states, Macedonians, Persians and Egyptians may have employed these techniques before the Romans, although there is insufficient evidence to demonstrate this. Long-standing, well-lead armies directed by stable governments likely had organized medical care for casualties. Nevertheless, the Roman efficacy in combat medicine may be one of the least appreciated aspects of the ability of the Roman army to create and maintain an empire. Perhaps modern medical corpsmen should receive enhanced training in the location and use of medicinal herbs for situations when combat units are isolated from normal logistical supplies. The U.S. Army Survival Manual gives extensive examples of edible foods and poisonous plants in different parts of the world, but offers virtually no examples of medicinal plants.<sup>39</sup>

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