

Larrey's Revolution

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July 14, 1789. “To arms!” echoed throughout Paris. The city was in a state of unrest and angry mobs roamed the streets. Spurred on by discontent with the monarchy and nobility, Parisians were seeking to gather large quantities of arms and ammunition. This ultimately culminated in the storming of the Bastille, an imposing fortress and a symbol of monarchical oppression. Its capture galvanized revolutionaries and helped justify their cause. The French Revolution was beginning.

The French Revolution and the following Napoleonic era transformed the social and political structure of Europe. In three years, France's long-standing monarchy was abolished. The aristocracy and clergy were stripped of authority as class distinctions were eliminated and democracy was established. Ideas of liberty, equality, and citizenship prevailed. The Revolution also marked the beginning of over two decades of war that consumed Europe. Revolutionary ideals resonated with people beyond France and well after the end of the Napoleonic Wars. This period of change and turmoil affected all aspects of human life worldwide, and medicine was no exception.

Indeed, the medical profession contributed to the Revolution and was forever changed by it. For Dominique Jean Larrey (1766–1842), the storming of the Bastille was a defining moment. On July 14, 1789, he led a contingent of 1500 medical students:

I put myself at the head of these young men... and we were the first to march against the tyrants... Everyone armed himself as best as he could and we marched through the night inciting the populace to rebellion. On the morning of the fourteenth we armed ourselves at the Invalides and turned our steps towards the Bastille. If we did not have the honour of mounting the first assault, it was only because the immense crowd before the gates prevented us, and not because we lacked either the enthusiasm or the courage.¹

Larrey would soon become a surgeon in the army of the French revolutionary government and later, surgeon-in-chief to Napoleon Bonaparte's Imperial Guard. He strongly believed in the values of the Revolution and was an idealist.^{1,2} While these characteristics created challenges in his military career, they fuelled his determination to provide compassionate and humanitarian care for the wounded. Today, he is considered the father of emergency medicine. Social revolution and years of war created the circumstances necessary for Larrey to implement and develop an unprecedented medical system.

PRE-REVOLUTION

Before the French Revolution, medical care was largely absent for wounded soldiers. Military operations and manoeuvres had absolute priority and military commanders believed the wounded simply interfered with their battle plans.^{1,3} Physicians and surgeons seldom belonged in

armies and responsibility for care fell to fellow soldiers, local inhabitants, and camp-followers.¹ Wagons were used to remove the wounded after a battle ended, but were required to wait four kilometres behind the army and never arrived in less than twenty-four to thirty-six hours.^{4,5} Regulations denied immediate treatment and evacuation,¹ and soldiers often died waiting. Compounding the problem was the status of medical officers employed to oversee collection of the wounded. The officers were often surgeons, poorly paid, and did not have military rank or authority.^{1,2,6} Surgeons overall belonged to the barber class, were seen as inferior to physicians, and lacked social and political power.⁷

REVOLUTION

The French Revolution had important social implications for surgeons. Traditionally trained through apprenticeships and removed from positions of privilege, they opposed the monarchy and its institutions. Revolutionary France saw a reorganization of universities and medical education, with surgeons at the forefront, emphasizing practical learning.⁷ Nonetheless, their newfound prominence in education and civilian life was not readily applied to the battlefield. For military medicine, it was a case of *plus ça change, plus c'est la même chose*.¹

Meanwhile, warfare at the beginning of the Revolution was becoming increasingly violent. Casualties were produced on a large scale as a result of military conscription, massive troop formations, and the use of concentrated artillery and accurate musketry.^{8,9} Furthermore, the rise of Napoleon ushered in a disregard for military conventions dictating the conclusion of battles and procedures for surrender. Instead, armies were to be annihilated. The conditions of war created a greater need for medicine to be present, but without a change in the culture of military medicine, the wounded would continue to be overlooked. Military medicine required an individual to take initiative and challenge military authority.

Dominique Jean Larrey was moved by the unnecessary deaths he witnessed on the battlefield in 1792^{1,5} and resolved to change the military mindset. He once reflected that “the misfortune of others affect me strongly. Serious disasters afflict my soul and plunge me into the deepest grief; I often think I can do something to help, and even attempt to remedy the situation.”² Fortunately, his conviction, driven by Revolutionary ideals, was aided by the Revolution itself. The Reign of Terror was underway and stipulated that anyone caught opposing the Revolution would be sentenced to death. It enforced Revolutionary values, of which equality for all citizens was paramount. Military generals were compelled to accept Larrey's proposals and give him permission and authority to implement his ideas.¹

INNOVATION

Larrey wanted to deliver prompt treatment and evacuation to casualties on the battlefield. He recognized that delaying treatment complicated

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patient cases, and lead to hemorrhage, increased pain, infection, and death.⁸ In particular, he went against the predominant practice of waiting as long as twenty days to amputate and advocated for surgery within the first few hours after injury.^{2,3,10} Inspired by the quickness and mobility of flying artillery, cannons attached to horse-drawn carriages, Larrey created the *ambulances volantes*, or flying ambulances.

The concept of flying ambulances was first tested in 1793¹⁰ and approved in 1794.⁵ There would be two types. A two-wheel model could carry two soldiers and was suited for use on flat terrain, while a four-wheel model could carry four lying casualties and travel across mountains.^{4,5} In addition to providing transport, they were equipped for on-the-spot surgery and medical treatment.¹¹ The flying ambulances became the core of Larrey's system of medical care.

Each ambulance unit consisted of a surgeon-in-chief and three divisions of 113 people and 12 flying ambulances.^{4,10} Larrey was careful to include military officers and soldiers in his ambulance teams, since medical officers alone did not have any authority on the battlefield.¹ Whether the situation demanded immediate treatment or evacuation, the ambulances would eventually converge at dressing stations or hospitals set up at the rear.

Unfortunately, due to political opposition to Larrey's plans, his system did not debut until 1797 in the presence of Napoleon Bonaparte. Napoleon was impressed and praised Larrey: "Your work is one of the greatest conceptions of our age. It alone will suffice to ensure your reputation."¹ The future French emperor's admiration and support of Larrey's work helped the flying ambulance system achieve success. The presence of flying ambulances in the military boosted the morale and confidence of French soldiers.¹⁰ Unsurprisingly, they adored Larrey and called him "The Saviour."^{4,10}

The implementation of flying ambulances was accompanied with the conception and development of systems of triage. The multitude of casualties, the range of injury severities, and limited resources created a necessity for the sorting of patients.⁵ First and foremost, Larrey explicitly instructed his medical officers to "always start with the most dangerously injured, without regard to rank or distinction."¹ This applied to both treatment and evacuation. Larrey was also known for providing the same quality of care to enemy wounded.^{3,6,12} On resource management and military rank, Larrey noted, "The slightly wounded can go to the hospital in the first and second line, especially officers because the officers have horses."¹⁰ With triage, Larrey created a complete, efficient, and organized medical system for those wounded in battle when there was none to begin with.

EMERGENCY MEDICINE

Larrey's unprecedented medical system was established through his determination, and through the circumstances created by the French Revolution and its subsequent wars. His flying ambulances are precursors to the modern ambulance. The basic concepts of triage have remained unchanged¹³ and are integral to modern emergency rooms, disaster management, and military medicine. His system reflected the fundamental principles of emergency medicine by providing immediate response, transport to care stations, care en route, and medical and surgical treatment. Dominique Jean Larrey introduced emergency medicine to the world and, with it, revolutionized the way warfare was perceived. The wounded were no longer ignored and humanity prevailed despite the inhumanities of war.

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