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EDUCATION

BARON DOMINIQUE JEAN LARREY 1766 – 1842

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ABSTRACT

Dominique Jean Larrey was a French military surgeon during the Napoleonic times. A man of great compassion and devotion to his patients, Larrey espoused values and commitment to his profession which are still reflected by health care professionals today. His practical and innovative thinking led to great improvements and change in patient care – in his development of the first purpose built ambulances and invention of the triage system. Larrey was a man who employed practical research in his every day thinking and observations, without realizing that the outcomes of his innovative ideas would have a lasting and positive impact on today's society.

INTRODUCTION

As the French Revolutionary and Napoleonic Wars raged across Europe for over twenty years at the turn of the 18th and 19th centuries, great armies resplendent in their colorful uniforms and precision maneuvers fought pitched battles with weaponry which cut swathes through the military ranks, and leaving their enemies either dead, or in agony and permanently scarred in the open battle fields. Military commanders ignored the plight of the wounded and often abandoned them as useless cripples, their contribution to the war machine at an end.

It was the extraordinary courage and devotion of one French military surgeon in his personal duty towards the victims of war, who brought about reforms to improve patient care. A man of great courage, ingenuity and virtue in an age where surgeons were despised for their perceived butchery, he was respected by all who were treated by him, from the military elite to the common soldier. His name was Dominique Jean Larrey, who was often described by Napoleon as “The most virtuous man that I have known”!

EARLY LIFE

The son of a shoemaker, Larrey was born on the 8th July 1766 in the French village of Beauden, in the Pyrenean Mountains. He left home at the tender age of thirteen to study medicine in the city of Toulouse. Six years later, Larrey traveled to Paris to continue his studies, and later, enlisted as a ship's surgeon in the French Navy.

In 1789 Larrey, who passionately believed in human rights joined forces with the masses, as they revolted against King Louis XVI and the aristocracy, in a fight for a republic. On the 14th July, Larrey was in the crowd of people who stormed the prison in Paris known as the *Bastille* - an event which marked the beginning of the French Revolution.

Larrey developed many of his ideas on treating the injured from the violence, which prevailed during the Revolution. These included wound debridement and the immediate amputation of severely traumatised limbs as a life saving measure. Most surgeons believed that postponement of amputation, even for as long as twenty days, allowed the patient to recover from the shock of their wounds while becoming reconciled to the inevitable loss of the affected limb. However in his observations, Larrey discovered that the incidence of mortality was much higher in delayed amputation, and at the very least, a long and painful recovery was suffered by those who did survive the wait.

THE REVOLUTIONARY WARS

In 1792, when France was at war with most of the major European powers, Larrey enlisted as a regimental surgeon-major with the French Army. During combat, Larrey was forced to remain three miles behind the front line in order to receive the wounded. Soldiers were either carried by comrades, or left to find their own way to the hospitals. As most of the medical resources were reserved exclusively for officers, soldiers would often have to wait for days or go without treatment.

Those soldiers who survived the day's fighting were often too exhausted to search for signs of life in the corpse strewn battlefields, or respond to the pitiful calls for help from their incapacitated comrades. The wounded were forced to lay in agony until after the battle, before medical teams could reach them in huge cumbersome wagons called *Fourgons*. These slow moving vehicles could take up to three days to reach the battlefields, often becoming bogged as they negotiated churned up roads where other military traffic held priority. Such delays meant that the injured often succumbed to their wounds, or would become victims of bandits who would loot the battlefield, killing and robbing the weak and vulnerable.

When the army retreated, the badly wounded were packed into whatever spare transport was available. As fourgons had no suspension, the horrendous suffering inflicted upon the wounded during transportation further exacerbated their trauma and sometimes resulted in death as a consequence. Such was the fate of many wounded soldiers in wars across Europe at that time, as it had been for centuries before. In empathy for those soldiers beyond the threshold of tolerance and existence, it was not uncommon for their comrades in an act of humane intervention to carry out acts of what we now perhaps term as euthanasia.

Frustrated by the regulations which kept him behind the front line, Larrey responded by riding into the battlefield, braving enemy fire in an attempt to treat the wounded directly. With several other surgeons and a loyal band of infirmiers (medical orderlies), he would operate on the wounded either where they fell, or have them carried by infirmiers to a sheltered spot nearby. Despite his efforts, Larrey could see that it was an impossible task to evacuate all of the wounded to proper surgical

stations in the rear and in an effort to find a solution to the problem, he came up with the idea of using a light transport vehicle to reduce response time and increase survival. Larrey decided that what he needed was a horse drawn carriage that would be light, swift and robust so that it could rapidly attend and evacuate casualties from the battlefield. It would also have sufficient suspension and padding to ensure a comfortable ride for the patient.

Larrey eventually came up with the design for an ambulance vehicle which he called a "Flying Ambulance" or *Ambulance Volante*. The vehicle's design comprised of a two-wheeled carriage of light construction with an elongated cube shaped compartment on the chassis, capable of carrying two patients lying at full length. To assist in patient comfort, the ambulance had suspension on the axle and further suspension between the compartment and the chassis, as well as horsehair mattresses covered with leather on the floor, and padding on the walls. The floor of the compartment was set on detachable rollers which acted as stretchers. However, with no room inside the compartment to treat the wounded in transit, two infirmiers had to sit on the mounted horses which drew the carriage. The exterior sides of the ambulance were equipped with pockets to hold medical equipment, and a fold down ramp at the rear which served as a rudimentary operating table. The concept was approved and several of these vehicles were completed and rushed into service.

Larrey and his fellow medics faced the inherent dangers of enemy fire on the battlefield and did not receive any special exemption by the enemy despite the fact that they were on a humane mission - the Red Cross insignia and Geneva Convention had not yet been developed at that time. Larrey had horses shot from beneath him as he rode, was wounded on several occasions and many of his colleagues and infirmiers were killed. On many occasions as a military surgeon, Larrey was often forced to engage in direct combat, armed only with a light sabre and pistol to defend himself and his patients. This bravado earned Larrey and his men great admiration and celebrity status from the patients.

During these early battles Larrey adopted a new paradigm in treating the wounded. Previously he would have treated the officers according to their class - upper class being treated first, followed by the lower ranks, and enemy prisoners last. With the Revolution abolishing the privileged class and decreeing that all were equal, Larrey dispensed with the old ways and started treating the most seriously wounded first, regardless of rank and nationality. Larrey was a humane man who was totally devoted to his patients, even if they wore an enemy uniform.

Larrey knew that those with critical injuries would stand a good chance of survival if they were operated on within the first hour of their trauma occurring. Those with minor injuries were made to wait, while the more seriously injured were attended to. Those deemed to be mortally wounded were put aside, often with alcohol to comfort them until they passed away, whilst resources were concentrated on those who could survive. This process of systematic evaluation became known as "Triage", a French word meaning "to sort". No one dared to question Larrey's triage system for fear of being deemed aristocratic - a status that would almost certainly attract the attention of the dreaded Committee of Public Safety, the ruling council in Paris.

In February 1794 Larrey returned to Paris where he married his twenty one year old sweetheart, Charlotte Elisabeth Laville. Larrey was a devoted husband and father and wrote letters to Charlotte and their two children constantly while he was away.

After service in Southern France and Spain for almost two years, Larrey returned to Paris to teach at the Val de Grace School of Military Medicine. He was then ordered to Italy to serve under Napoleon Bonaparte who commanded the French army there.

In Italy, Larrey was able to organize more efficient emergency medical units referred to as an *Ambulance* with a chief surgeon in command. Each unit consisted of three Ambulance divisions, utilizing fifteen surgeons and one hundred soldiers who were equipped with twelve flying ambulances and four fourgons which acted as mobile depots. Larrey wrote: "*The function of the organization is to rescue the wounded on the field of battle and, having given first aid, to transport them to the first line of hospitals*".

In May 1798 Larrey left Italy and continued with the French Army to Egypt, returning to Paris in January 1802 where he continued teaching at the Val de Grace. In May 1804, after taking political control of France, Napoleon crowned himself Emperor. He then instituted the *Legion d'Honneur* (Legion of Honour) medal, France's highest military award, of which Larrey was one of the first recipients in recognition of his outstanding service to military medicine. Larrey was then made an Inspector-General of the Army Medical Services and Chief Surgeon to the crack Imperial Guard, Napoleon's elite troops.

THE GRAND ARMY

In order to conquer Europe, Napoleon organized his forces into what was referred to as the Grand Army. Larrey and his ambulance divisions accompanied the army as the primary medical support. At the Battle of Eylau in Poland on the 8th February 1807, as they worked in a field hospital, Larrey and his own ambulance division came under direct attack from the Russian Army. Larrey ignored the advancing Russians and instead concentrated on the leg amputation he was performing. He told his medics that he would stay and die with his patients if he could not save them. His calm demeanor and courage under fire inspired his men and the lesser wounded, to stay and defend their hopeless position. Fortunately, the Imperial Guard Cavalry came charging to the rescue and saved Larrey and his medics from a terrible fate.

Larrey, like other surgeons at the time, worked without gloves, wearing only an apron to stop blood from splashing onto his fine cornflower blue uniform. He would hold a bloodied scalpel between his teeth as he tied off severed blood vessels with his bare hands. There were very few drugs to assist with pain relief during surgery, except for alcohol, which was used to induce intoxication prior to 'going under the knife'. This method was not entirely successful during surgery, as most patients were still conscious and had to be physically held down. A padded stick to bite on was the only means of comfort in helping patients cope with the pain. Adding to the trauma, there was always a grizzly pile of amputated limbs in the operating room, which increased as patients were brought in by the ambulances, while the dead could never be buried fast enough. It was a nightmarish scene with patients screaming, moaning and sobbing, surgeons shouting orders, unable to muffle the terrible sound of the bone saw at work, all this and the din of battle nearby. The floors were awash with blood and discarded human tissue, and in the warmer months flies swarmed everywhere. Soup, made from horsemeat cut from the carcasses littering the

battlefield, was boiled in the breastplates of dead cavalry troopers and fed to the patients after surgery to replace body fluids. Larrey was able to perform most amputations in less than 2 minutes, providing the bone was already shattered and didn't require sawing or if he could amputate cleanly through the joint.

In October 1809, Larrey was again honored for his contributions and was made Baron of the Imperial French Court. Later in 1812, Larrey went along with the Grand Army on its long and disastrous invasion of Russia where the French eventually captured Moscow.

At the battle of Borodino in Russia in September 1812 in which 80,000 men were killed, Larrey personally performed over 200 amputations in 24 hours and treated many other wounded soldiers in between. He continued to treat the sick and wounded during the long arduous retreat out of Russia, despite the appalling conditions from the cold winter and repeated attacks from the Russian army.

As the retreating Grand Army crossed two narrow bridges over the partly frozen Beresina River, one of the bridges collapsed under the weight, creating panic in those soldiers on the other side of the river who were under attack from the Russians. The remaining bridge soon became a bottleneck with soldiers, horses, carriages and cannons. Among those still waiting to cross the river to safety, was Larrey, who had recrossed the bridge several times to ensure that all the wounded were saved. Suddenly a voice cried out: "It's Monsieur Larrey. He must be saved!" The panic was arrested and the Russians were ignored as the soldiers realized that their hero was in danger. "Save him who has saved us" was the catch-cry as Larrey was bodily carried hand over hand above the heads of the French soldiers to the safety of the far bank of the river.

Of the 600,000 troops of the Grand Army who marched into Russia, barely 50,000 survived. France pulled out of the war, and in April 1814, Napoleon signed an armistice before abdicating and going into exile on the island of Elba. Larrey returned to Paris in 1815 to work at the Imperial Guards Hospital.

WATERLOO

Napoleon stayed on Elba for less than a year before he returned to France in March 1815, and retook political control. An immediate threat for Napoleon in the north was the combined British and Dutch army under the command of Arthur Wellesley, the Duke of Wellington, and a Prussian army under the command of Field Marshall Prince Gebhard von Blucher. Napoleon marshaled his army, including the Imperial Guard together with Larrey, and marched to meet up with the British and Prussian armies at the battle of Waterloo in Belgium on the 17th June 1815.

The French army was defeated and 52,000 soldiers from both sides were killed. During the battle, Wellington observed Larrey retrieving the wounded and, upon learning who he was, saluted him for his courage and directed his soldiers not to fire in Larrey's direction. While Wellington may have admired Larrey, he was not an advocate of medical services on the battlefield, providing little to no medical support for his own army.

Larrey was injured and captured by Prussian soldiers whilst covering the evacuation from the battlefield of the remaining wounded. Doomed to death before a firing squad, an officer who was about to blindfold Larrey recognized him as the surgeon who had delivered some lectures he had attended years before. The Prussian officer, a surgeon, immediately released Larrey and attended his wounds. He was taken before Prince Blucher who also knew of Larrey and had him repatriated. Almost two years previously, Blucher's son had been wounded and taken prisoner by the French and it was Larrey who had operated on him and saved his life.

When he finally returned to Paris, Larrey was fortunate to avoid arrest as the new government attempted to quickly round up Napoleon's supporters. Napoleon had surrendered to the British, abdicated again and was permanently exiled to the island of St Helena. Despite Larrey's dedication to the sick and injured, the new French government removed most of Larrey's professional awards. However he did retain his role as chief surgeon at the Guards' Hospital, where he continued to devote his efforts to the care of wounded veterans.

In 1830 yet another revolution swept through Paris as soldiers clashed with rebels in revolt against the King. Some six thousand rioters turned up to the Guards' Hospital threatening to kill the wounded soldiers and steal their weapons.

Incensed at this threat to his patients, Larrey stormed to the front gate and faced the impending rioters alone. He shouted scornfully at them "What do you want?" "My wounded?" "How dare you threaten them! Now clear off!"

There was a moment of stunned silence as the rebels recognized the irate man before them to be one of their most respected and admired heroes from Napoleonic campaigns in which a lot of them had taken part alongside Larrey. In no time at all, a great burst of cheering broke out in support of Larrey, who eventually agreed to provide the rioters with weapons, in exchange for the peace and safety of his patients. The crowd responded by dispersing from the hospital gates.

Larrey was later appointed by the new King Louis as medical director of a large veteran's hospital called the Hotel des Invalides, where he devoted the remainder of his life to the long term care of wounded veterans.

Larrey died on the 25th July 1842 aged 74.

CONCLUSION

Larrey's last wish was to be buried in the gardens of the Invalides, but this did not eventuate at the time of his death due to political dictum which stated that funeral honours in the Invalides grounds be reserved for military officers such as marshals, generals and other brave soldiers; not for mere surgeons. So, whilst his heart was entombed in the Chapel of the Val de Grace, Larrey was buried in a Paris cemetery where thousands of grieving mourners attended his funeral. In 1992 on the 150th anniversary of his death, Larrey's remains were exhumed and reburied in the grounds of the Invalides with full military honours.

During his life Larrey wrote many medical texts as well as his comprehensive memoirs. Most of the letters he wrote to Charlotte and their children survived.

However most of his work on improving the conditions of health services died with him and it was some time before others took up the challenge and overcame the odds.

He is best described in his own words: "*To perform a task as difficult as that of a military surgeon, I am convinced one must often sacrifice oneself, perhaps entirely, to others, must scorn fortune, and must maintain an absolute integrity*".

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