History of Paramedicine (Part 1)

Early history

Throughout the evolution of what we now call paramedicine, there has been an ongoing association with military conflict. One of the first indications of a formal process for managing injured people dates from the Imperial Legions of Rome, where aging Centurions, no longer able to fight, were tasked with organizing the removal of the wounded from the battlefield and providing some form of care. Such individuals, although not physicians, were probably among the world’s earliest surgeons, suturing wounds, completing amputations, and not through training, but by default. This trend would continue throughout the Crusades with the Knights Hospitallers of the Order of St. John of Jerusalem, known throughout the British Commonwealth today as St. John Ambulance, filling a similar function.

The first vehicle that was specifically designed as an ambulance was created during the Napoleonic War, and called the ambulance volante. Created by Napoleon's Chief Surgeon, Baron Dominique Jean Larrey, this new horse-drawn contrivance was intended to transport the wounded rapidly to surgeons, waiting at the rear. Such vehicles were seen by the military as a general resource, and care of the wounded was not given much priority; it was not uncommon for such vehicles to be tasked with carrying fresh ammunition to the battlefield, before they transported the wounded back. The basic design of such vehicles remained unchanged for nearly 100 years.

Early civilian ambulance services

While communities had organized to deal with the care and transportation of the sick and dying as far back as the plague in London, England (1598, 1665), such arrangements were typically temporary. In time, however, such arrangements began to formalize and become permanent. During the American Civil War Jonathan Letterman had devised a system of forward first aid stations at the regimental level, where principles of triage were first instituted. Letterman, with the rank of major, served as the medical director of the Army of the Potomac. He established mobile field hospital. Letterman, with the rank of major, served as the medical director of the Army of the Potomac. He established mobile field hospitals to be located at division and corps headquarters. The United States Army had reeled from inefficient treatment of casualties, in part because of the adoption of new firearm technology such as breech-loading rifles and Minié ball systems. Letterman established
mobile field hospitals to be located at division and corps headquarters. This was all connected by an efficient ambulance corps, established by Letterman in August 1862, under the control of medical staff instead of the Quartermaster Department. Letterman also arranged an efficient system for the distribution of medical supplies. His system was adopted by other Union armies and was eventually officially established as the medical procedure for the entirety of the United States’ armies by an Act of Congress in March 1864. Following the American Civil War, some veterans began to attempt to apply what had they had seen on the battlefield to their own communities, through the creation of volunteer life-saving squads and ambulance corps. This translation to civilian use did not occur in the same way everywhere; in Britain, early civilian ambulances were often operated by the local hospital or the police, while in some parts of Canada, it was common for the local undertaker (having the only transport in town in which one could lie down) to operate both the local furniture store (making coffins as a sideline) and the local ambulance service. In larger centers in various countries, such services might fall to the local Health Department, the Police, the Fire Department, or some combination of all of the above. Once again, the civilian model followed the lead of the military; although there were a handful of motorized ambulances just prior to the First World War (1914-1918), the concept of motorized ambulances was proven first on the battlefield, and spread rapidly to civilian systems immediately following the war.

There is some debate as to when the first formal training of "ambulance attendants" began. The generally accepted belief is that this occurred in the United States, at Roanoke, Virginia, with the Roanoke Life Saving and First Aid Crew, under Julian Stanley Wise, in 1928. While this may have been true of the U.S., Canadian records indicate the members of the Toronto Police Ambulance Service received a mandatory five days of training, conducted by St. John, as early as 1889, and well developed printed manuals, clearly beyond the scope of simple first aid, were present in England even earlier. In terms of advanced skills, it is known that, once again, the military led the way. During the Second World War (1939-1945) and the Korean Conflict, battlefield 'medics' were administering painkilling narcotics by injection, as emergency procedures, and 'pharmacists' mates' on warships without physicians were permitted to do even more. Korea also marked the first widespread use of helicopters to evacuate the wounded from forward positions to medical units, coining the phrase 'medevac'. These innovations would not find their way into the civilian sphere for nearly twenty more years.

**Pre-hospital medicine**

By the early 1960s experiments in improving care had begun in some civilian centers. The first such experiment involved the provision of pre-hospital cardiac care by physicians in Belfast, Northern Ireland, in 1966. This was repeated in Toronto, Canada in 1968, using a single ambulance called Cardiac One, staffed by a regular ambulance crew, plus a hospital intern, who was tasked with performing the advanced procedures. While both of these experiments had certain levels of success, technology had not yet reached the required level (the Toronto 'portable' defibrillator/heart monitor was powered by lead-acid car batteries and weighed nearly 100 lbs.). The required telemetry and
miniaturization technologies already existed in the military, and particularly in the space program, but it would take several more years before they found their way to civilian applications. In North America, physicians were judged to be too expensive to be used in the pre-hospital setting, although such initiatives were implemented, and in some cases still operate, in the United Kingdom, Europe, and Latin America.

Around 1966 in a published report entitled "Accidental Death and Disability: The Neglected Disease of Modern Society" (known in EMS trade as the White Paper), medical researchers began to reveal, to their astonishment, that soldiers who were seriously wounded on the battlefields of Vietnam had a better survival rate than those individuals who were seriously injured in motor vehicle accidents on California freeways. Early research attributed these differences in outcome to a number of factors, including comprehensive trauma care, rapid transport to designated trauma facilities, and a new type of medical corpsman, one who was trained to perform certain critical advanced medical procedures such as fluid replacement and airway management, which allowed the victim to survive the journey to definitive care. As a result, a series of grand experiments began in the United States. Almost simultaneously, and completely independent from one another, experimental programs began in three U.S. centers; Miami, Florida; Seattle, Washington; and Los Angeles, California, the first of these to go from being an experiment to being a working unit was in Los Angeles, with the passage of the Wedsworth-Townsend Act. Other states would soon push their own Paramedic bills through, and soon, every fire department in every major city in the country had their own paramedic squads. Each was aimed at determining the effectiveness of using firefighters to perform many of these same advanced medical skills in the pre-hospital setting in the civilian world. Many in the senior administration of the Fire Departments were initially quite opposed to this concept of 'firemen giving needles', and actively resisted and attempted to cancel pilot programs more than once.

The public discovers paramedicine

In a curious example of 'life imitating art,' television producer Robert A. Cinader, working for producer Jack Webb of Dragnet and Adam-12 fame, happened to be in Los Angeles' UCLA Harbor Medical Center, doing background research for a proposed new TV show about doctors, when he happened to encounter these 'firemen who spoke like doctors and worked with them'. This novel idea would eventually evolve into the Emergency! television series, which ran from 1972-1977, portraying the exploits of a new group called 'paramedics'. The show captured the imagination of emergency services personnel, the medical community, and the general public. When the show first aired in 1972, there were exactly 6 paramedic units operating in 3 pilot programs in the whole of the United States. No one had ever heard the term 'paramedic'; indeed, it is reported that one of the show's actors was initially concerned that the 'para' part of the term might involve jumping out of airplanes! By the time the program ended production in 1977, there were paramedics operating in every state. The show's technical advisor was a pioneer of paramedicine, James O. Page, then a Battalion Chief responsible for the 'paramedic' program, but who would go on to help establish other paramedic programs in the U.S., and to become the founding publisher of the Journal of Emergency Medical Services (JEMS).
**Evolution and growth**

Throughout the 1970s and 80s, the field continued to evolve, although in large measure, on a local level. In the broader scheme of things the term 'ambulance service' was replaced by 'emergency medical service' in order to reflect the change from a transportation system to a system which provided actual medical care. The training, knowledge base, and skill sets of both Paramedics and Emergency Medical Technicians (both competed for the job title, and 'EMT-Paramedic' was a common compromise) were typically determined by what local medical directors were comfortable with, what it was felt that the community needed, and what could actually be afforded. There were also tremendous local differences in the amount and type of training required, and how it would be provided. This ranged from in service training in local systems, through community colleges, and ultimately even to universities. In the U.S. the community college training model remains the most common, although university-based paramedic education models continue to evolve. These variations in both educational approaches and standards led to tremendous differences from one location to another, and at its worst, created a situation in which a group of people with 120 hours of training, and another group (in another jurisdiction) with university degrees, were both calling themselves 'paramedics'. There were some efforts made to resolve these discrepancies. The National Association of Emergency Medical Technicians (NAEMT) along with National Registry of Emergency Medical Technicians (NREMT) attempted to create a national standard by means of a common licensing examination, but to this day, this has never been universally accepted by U.S. States, and issues of licensing reciprocity for paramedics continue, although if a EMT obtains certification through NREMT (NREMT-P, NREMT-I, NREMT-B), this is accepted by 40 of the 50 states in the United States. This confusion was further complicated by the introduction of complex systems of gradation of certification, reflecting levels of training and skill, but these too were, for the most part, purely local. The only truly common trend that would evolve was the relatively universal acceptance of the term 'Emergency Medical Technician' being used to denote a lower lever of training and skill than a 'Paramedic'.

During the evolution of paramedicine, a great deal of both curriculum and skill set was in a state of constant flux. Permissible skills evolved in many cases at the local level, and were based upon the preferences of physician advisers and medical directors. Treatments would go in and out of fashion, and sometimes, back in again. The use of certain drugs, Bretylium for example, illustrates this. In some respects, the development seemed almost faddish. Technologies also evolved and changed, and as medical equipment manufacturers quickly learned, the pre-hospital environment was not the same as the hospital environment; equipment standards which worked fine in hospitals could not cope well with the less controlled pre-hospital environment. Physicians began to take more interest in Paramedics from a research perspective as well. By about 1990, most of the 'trendiness' in pre-hospital emergency care had begun to disappear, and was replaced by outcome-based research; the gold standard for the rest of medicine. This research began to drive the evolution of the practice of both paramedics and the emergency physicians who oversaw their work; changes to procedures and protocols began to occur only after significant outcome-based research demonstrated their need. Such changes affected everything from simple procedures, such as
CPR, to changes in drug protocols. As the profession of paramedic grew, some of its members actually went on to become not just research participants, but researchers in their own right, with their own projects and journal publications.

Changes in procedures also included the manner in which the work of paramedics was overseen and managed. In the earliest days of the field, medical control and oversight was direct and immediate, with paramedics calling into a local hospital and receiving orders for every individual procedure or drug. This still occurs in some jurisdictions, but is becoming very rare. As physicians began to build a bond of trust with paramedics, and experience in working with them, their confidence levels also rose. Increasingly, in many jurisdictions day to day operations moved from direct and immediate medical control to pre-written protocols or 'standing orders', with the paramedic typically only calling in for direction after the options in the standing orders had been exhausted. Medical oversight became driven more by chart review or rounds, than by step by step control during each call.

**Evolution in other jurisdictions**

In other places, the evolution of paramedicine occurred somewhat differently. In Canada, for example, there was an early, but unsuccessful attempt to introduce paramedicine. In 1972, a pilot paramedic training program occurred at Queen's University, located in Kingston, Ontario. The program, intended to upgrade the mandatory 160 hours of training then required for 'ambulance attendants', was found to be too costly and premature. While the program operated for two years and produced a number of graduates, it would be more than a decade before the legislative authority for them to practice was put into place. The program then moved in another direction, providing 1,400 hours of training at the community college level, prior to commencing employment. This change was made mandatory in 1977, with formal certification examinations being introduced for the first time in 1978. Similar, but not identical, programs occurred at roughly the same time in the Province of Alberta, and in British Columbia, through its Justice Institute. Other Canadian provinces gradually followed, but with their own education and certification requirements. Advanced Care Paramedics were not introduced until 1984, when Toronto trained its' first group internally, and the process continued to spread across the country. The current model in Ontario calls for a two year community college based program, including both hospital and field clinical components, prior to designation as an Advanced Care Paramedic, although this is gradually evolving in the direction of a university degree-based program. Some services, such as Toronto EMS, continue to train paramedics internally (indeed, Toronto EMS is accredited in its own right by the Canadian Medical Association as an Advance Care Paramedic training academy).

In the United Kingdom, ambulance services became largely municipal services, with some exceptions, shortly after the end of World War Two. Training was frequently conducted internally, although national levels of coordination led to better standardization of staff training. All public ambulance services are currently operated by regional entities, most often 'trusts', under the authority of the National Health Service. Tremendous standardization of training and permitted skills has also occurred. The English model
utilizes two levels of ambulance staff. The first of these is 'Ambulance Technician'. This role is not a paramedic, but more closely corresponds to the EMT role in the United States. Most services train these individuals internally, using a common curriculum. The second role is that of 'Paramedic'. These are practitioners of advanced life support skills, similar to U.S. paramedics. Initially, many of these individuals were trained internally by the services that employed them, with the step to Paramedic being a logical career path progression for an experienced Ambulance Technician. Increasingly, this trend has moved toward training in the University system, with the entry level for Paramedics being an Honours Bachelor of Science degree in Pre-Hospital or Paramedic Care. Some British Paramedics have been further elevated, into the role of Paramedic Practitioner, a role that practices independently in the pre-hospital environment, in a capacity similar to that of a nurse practitioner, but with more of an acute care orientation. Some Paramedic Practitioners in the U.K. hold M.Sc. degrees.

The growth of a new profession

Today, the field of paramedicine continues to grow and evolve into a formal profession in its' own right, complete with its own standards and body of knowledge. What began as a concept of simple 'technicians' with a couple of weeks of training, performing procedures that they didn't fully understand, has evolved into a career that in many cases (U.K., Australia, increasingly U.S. and Canada) requires a university education, and which is, in some locations actually evolving into a second tier medical practitioner. In many places, the practice of paramedics began as an extension of the supervising physician's license to practice medicine. As such, they were absolutely subject to every condition that the physician placed on their practice. More recently, however, paramedics in both the U.K. and some Canadian provinces have been granted the legal status of self-regulated health professions. When this occurs, the individual paramedics are certified and licensed by a College of Paramedicine, created by legislation but run by the paramedics themselves. This body sets standards, conducts licensing exams, deals with complaints regarding individual practitioners, and consults the government with respect to legislation, policy, and regulations. Paramedics are governing and regulating themselves; the true measure of a profession. In the U.S., paramedics are subject to regulation by individual states, and the degree and type of regulation, as well as paramedic participation in that process, varies from state to state.

http://www.absoluteastronomy.com/topics/Paramedic

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