Past Medical History
Paramedics in the United States

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Introduction

The practice of medicine dates back to the dawn of humanity. “The first illnesses, the first accidents, literally cried out for the first cures.” But pre-hospital medical care was virtually non-existent until a French military surgeon changed the perspective in which prompt medical care was delivered. As chief battlefield surgeon to Napoleon, Baron Dominique Larrey routinely operated on wounded soldiers on the battlefield and in the midst of intense fire. To get to these soldiers, Larrey employed use of his “flying ambulance.” This special nineteenth-century, horse-drawn vehicle would be a prelude to the advanced American model of pre-hospital care.

Forty years ago, you couldn’t stand up in an ambulance. And the term “ambulance” had somewhat of a fluid definition, as equipment and personnel training differed from one area of the United States to another. Although modern emergency medical services (EMS) came about due to a 1966 publication by the National Academy of Sciences, paramedic-level care came about due to concerns over coronary care.

In the late 1960s, coronary artery disease was the country’s number one cause of death, claiming approximately 400,000 lives per year. Roughly 70 percent of those deaths occurred in the pre-hospital setting. Physicians across the nation, from Pittsburgh and Columbus to Seattle and Los Angeles, recognized that lives could be saved using a pre-hospital medical care system. But those administering advanced cardiac care would have to be highly trained and have the ability to mobilize within minutes.

Luckily, programs in Europe had been established and reported on. Physicians in the
United States used Dr. Pantridge’s work in Belfast\textsuperscript{5}, and similar programs in Moscow\textsuperscript{6} as starting points. But American doctors found that the European model of physician-staffed ambulances didn’t suit the American landscape. And, by 1970, numerous programs had been instituted to train non-physicians to provide advanced medical care. These new health care professionals would become known as paramedics.

**Federal Legislation, 1966-1980**

Modern EMS came about in 1966 due to heavy involvement of the federal government and a monumental publication. The National Academy of Sciences’ National Research Council produced a 37 page paper entitled *Accidental Death and Disability: the Neglected Diseases of Modern Society*, commonly referred to as the “White Paper.”

Between 1963 and 1966, The National Academy of Sciences, officially incorporated in 1863 by President Lincoln, instructed its Committees on Trauma, Shock, and Anesthesia, along with special task forces of the Division of Medical Services to comprehensively review the status of emergency medical services accessible to victims of accidents. The committees reviewed everything to do with emergency care at the time, from ambulance services and communication systems, to emergency departments and intensive care facilities.

Once done, the National Research Council reported that, in 1965, 52 million accidental injuries occurred in the United States, killing 107,000 and disabling over 10 million\textsuperscript{7}. The Council went on to report numerous factors that would require early and timely intervention,
including:

1. The general public is insensitive to the magnitude of the problem of accidental death and injury.
2. Millions lack instruction in basic first aid.
3. Few are adequately trained in the advance techniques of cardiopulmonary resuscitation, childbirth, or other lifesaving measures, yet every ambulance and rescue squad attendant, policeman, firefighter, paramedical worker and worker in high-risk industry should be trained.
4. Local political authorities have neglected their responsibility to provide optimal emergency medical services.
5. Research on trauma has not been supported or identified at the National Institutes of Health on a level consistent with its importance as the fourth leading cause of death and the primary cause of disability.
6. Potentials of the U.S. Public Health Service programs in accident prevention and emergency medical services have not been fully exploited.
7. Data are lacking on which to determine the number of individuals whose lives are lost or injuries are compounded by misguided attempts at rescue or first aid, absence of physicians at the scene of injury, unsuitable ambulances with inadequate equipment and untrained attendants, lack of traffic control, or the lack of voice communication facilities.
8. Helicopter ambulances have not been adapted to civilian peacetime needs.
9. Emergency departments of hospitals are overcrowded, some are archaic, and there are no systematic surveys on which to base requirements for space, equipment, or staffing for present, let alone future, needs.
10. Fundamental research in shock and trauma is inadequately supported.
11. Medical and health-related organizations have failed to join forces to apply knowledge already available to advance the treatment of trauma, or to educate the public and inform the Congress.

At the same time, the President’s Commission on Highway Safety was formed and issued their report *Health, Medical Care, and Transportation of the Injured*. The report focused solely on the growing problem of highway-related accidental injury and, “…established 18 standards for improving highway safety.”

The United States Congress responded quickly to these two reports. The National Highway Safety Act of 1966 (Public Law 89-564) would provide $48 million between 1966
and 1973 through the Department of Transportation. Additionally, federal programs through the Department of Health, Education, and Welfare, and the Division of Emergency Medical Services, would provide over $73 million for various emergency medical service projects.

In November of 1973, after overriding a presidential veto of the bill, federal funding for EMS was expanded with the passage of the Emergency Medical Services Systems Act of 1973 (Public Law 93-154). The EMS Systems Act authorized the Department of Health, Education, and Welfare to award Regional Medical Program (RMP) grants for:

1. The establishment and initial operation of emergency medical services systems.
2. Projects for the expansion and improvement of emergency medical services systems.
3. Support of research in emergency medical techniques, methods, devices and delivery.

The EMS Systems Act authorized funds of $30 million for 1974, $60 million for 1975, and $70 million for 1976. The act also stipulated that an Interagency Committee on Emergency Medical Services be established in order to fully evaluate the sufficiency of governmental activities. An EMS system could be several counties in size, and would be managed by a single public or non-profit agency. In addition, fifteen components of an emergency medical services system were defined:

1. Manpower
2. Training
3. Communications
4. Transportation
5. Facilities
6. Critical Care Units
7. Public Safety Agencies
8. Community Participation
9. Accessibility to Care
10. Transfer of Patients
The Health Services Administration of the Department of Health, Education, and Welfare also provided funds for the planning and expansions of EMS systems. In the years of 1974 and 1975, over 200 grants were awarded through this legislation.

Initial funding provided by the EMS Systems Act of 1973 ended in 1976. Legislation was then immediately introduced to amend and extend the federal funding. Due to the proposed extension of the act, the General Accounting Office and the Comptroller General of the United States issued a report in June of 1975 to the U.S. Congress. This report reviewed the emergency medical services system program and stated that, “…although the progress is being made in the development of regional systems, the continued viability of such systems is not assured when Federal funding terminates.”

Therefore, in October of 1976, the EMS Systems Act of 1973 was revised and amended as Public Law 94-573. The extended act authorized, “…the appropriation of specified sums for purposes of making EMS grants and contracts in fiscal years 1976 through 1979.” These amendments later led, in 1978, to the creation of 304 EMS regions in the United States.

In 1978, the National Academy of Sciences’ Committee of Emergency Medical Services published a paper entitled *Emergency Medical Services at Midpassage*. As a
retrospective review of advancements made in EMS over the preceding twelve years, the paper stated that, “the availability of developmental funds… has resulted in significant improvement in many communities.” But, while highlighting the improvement pre-hospital care, the paper also called attention to the possibility of federal funding coming to a sudden end.

By 1979, it was apparent that the majority of EMS systems established and sustained with federal grants were failing to plan for self-sufficiency. One provision of the 1976 amended EMS Systems Act was that EMS systems across the nation must plan their own financial futures. This meant that systems receiving large amounts of federal funds now had to seek financial commitments from local governments or nonprofit agencies in order to maintain their regional operations. Because of the careless nature of the majority of EMS systems across the country, large amounts of money would have to be secured in a very short period of time, as federal assistance would soon come to an abrupt end in the 1980s.

**Early Advocacy**

While senators were battling in Washington D.C., James Page was paving his own road of pre-hospital advocacy and advancement. The former Los Angeles County Battalion Chief had already help set up North Carolina’s statewide EMS system and was now set up in Buffalo, New York managing a federally funded EMS project encompassing an eight county area of western New York. Using his resources to their full potential, Page prepared the first national paramedic survey.
Questionnaires were sent to EMS directors and personnel in all fifty states. Within five months, every state had been accounted for and data analysis had begun. Results showed that, by 1975, paramedics were operational in 46 states\textsuperscript{13}.

Based on Page’s research, and using funds from the Lakes Area Regional Medical Programs, *The National Study of Paramedic Law and Policy* was published. The report stated that, “…more than half the paramedic programs then in existence had begun without clear-cut authorizing legislation from their respective state legislatures.”\textsuperscript{14} And, between 1969 and 1976, paramedic services had been established without legal authority in 25 states\textsuperscript{13}. Also disclosed within Page’s report was that no less than fifteen different titles were being used throughout the country when referring to paramedics. This led the newly formed National Association of EMTs, in 1976, to adopt an official name for advanced-level pre-hospital medical providers, emergency medical technician – paramedic, or EMT-P.

The report garnered national notice. After being distributed to over 150,000 health care workers, within two years, only two states were still without paramedic legislation. Page also teamed up with the Department of Transportation to create the Model State Emergency Medical Services Statute.

Also published in 1976, a national survey of paramedics dug a little deeper than Page’s. The survey distributed by Dr. Elliott Salenger, medical director of the Emergency Medical Services Division of Los Angeles County’s Department of Health, and Joe Slotkin, student at the University of California at Los Angeles, made an effort to geographically locate every
paramedic service in the country. They found that 214 paramedic services were operational in the United States\textsuperscript{14}. Although, due to the fluid definition of “paramedic” at the time, the results of the study were deemed inconclusive.

As data was being received and analyzed for the Page and Salenger-Slotkin studies, the Department of Transportation named the University of Pittsburgh’s Department of Anesthesia and Critical Care Medicine as the recipient of the federal contract to develop the first national paramedic training course. As chairman of the university’s department, Dr. Peter Safar would delegate responsibility to Dr. Nancy Caroline, former medical director for Pittsburgh’s Freedom House paramedics.

Dr. Caroline surveyed thirty paramedic programs across the country and soon found enormous discrepancies. She found that training programs ranged from 100 to 1,200 hours in length and either covered medical and trauma topics comprehensively, or focused solely on cardiac care\textsuperscript{14}.

Dr. Caroline also found large inconsistencies in regards to training in patient assessment and medical terminology. A few training programs covered these topics fully, while most paid little to no attention to them. And, while arrhythmia recognition/therapy and intravenous fluid therapy were nearly complete in coverage, respiratory emergencies were included in only one-third of programs\textsuperscript{14}.

Clinical training also differed greatly from one program to another. Caroline found that, “Clinical experience in a hospital setting ranged from 16 to 800 hours. Field internships involving
actual performance under the supervision of trained paramedics ranged from 24 to 480 hours in
length.”  

Perhaps the most surprising finding was that less than 10% of paramedic training programs met the recommended standards set by the National Academy of Sciences’ National Research Council.

In September of 1975, the University of Pittsburgh’s report of findings, critiques, and recommendations was ready. The report was reviewed extensively by the Department of Transportation, the Interagency Committee on Emergency Medical Services, and a special technical subcommittee. In March of 1976, after months of scrutiny, the Department of Transportation contracted with Georgetown University Medical Center and the University of Kansas Medical Center to create a standardized student text and instructor lesson plans.

**Paramedic Programs**

**West**

As with most paramedic programs across the country, Seattle’s program was born as a result of Pantridge’s work in Belfast. Dr. Leonard Cobb, director of the Division of Cardiology at Harborview Medical Center and professor of medicine at the University of Washington, saw merit in the concept of pre-hospital cardiac care and became determined to make it a reality in his city. Cobb teamed up with Gordon Vickery, Chief of the Seattle Fire Department, to cross-train firefighters to handle cardiac emergencies. Using the financial assistance provided by a Washington Regional Medical Programs (RMP) grant, Dr. Cobb and Chief Vickery
“…designed a citywide system for handling out-of-hospital cardiac emergencies.”\textsuperscript{14}

In 1969, nine Seattle firefighters began their paramedical training, while all firefighters received basic CPR and first-aid training. The Medic I training program consisted of 150 classroom hours, followed by 10 months of physician-supervised experience on the ambulance. By 1970, they were ready to hit the streets in Medic I. The large motor-home, “affectionately referred to as ‘Mobey Pig’ by the paramedics,”\textsuperscript{14} responded to all cardiac emergencies throughout the city from its base at Harborview Medical Center.

In its first year, the Medic I program was met with enormous public support. Physician-supervised ambulance runs were also being phased out, as the training program evolved by, “…expanding the scope and duration of the hospital training period and providing for a carefully supervised period of responsibility and evaluation through field internship.”\textsuperscript{14}

Although public support could not have been greater, governmental assistance was about to end. Newly elected President Nixon pushed for the ending of the Regional Medical Programs. Dr. Cobb and Chief Vickery learned that the Medic I program would not receive funding enough to progress to its second year of operation. But, due to the efforts of Jerry Montgomery, a reporter for the \textit{Seattle Times}, and Seattle’s Downtown Rotary Club, “…the plight of Medic I quickly became a community issue.”\textsuperscript{14} Fund-raising drives proved to be extremely successful, and thanks to the donations of private citizens, the Rotary Club, and the Washington State Heart Association, the Medic I program survived and the Medic II program was initiated.
Begun in the fall of 1971, the Medic II program set out to train 100,000 Seattle citizens in CPR. The program broke away from the traditional way of teaching CPR throughout the United States. While in other parts of the country CPR training required a lengthy class, Seattle offered a three hour course to its citizens. The course’s curriculum consisted of a lecture, a film, and a manikin practice and discussion session. Headed by Dr. Hernan Alvarez, Medic II had successfully trained 40,000 people within 18 months, using Seattle Fire Department Medic I paramedics as instructors. In spite of profound opposition from medical leaders concerning the program’s three hour course, Seattle collected hard evidence of the effects. In 1973, less than two years after the initiation of Medic II, Dr. Alvarez reported that bystanders at the scene of emergencies initiated 20% of the resuscitations then carried out by Seattle paramedic units, leading to a 44% survival rate for patients in ventricular fibrillation upon arrival of paramedics\textsuperscript{14}.

With the success of the Medic I and Medic II programs, Seattle continued to improve its emergency medical response system. The city expanded its public education beyond CPR training, and established 9-1-1 as the emergency telephone number. Seattle also instituted a tiered response system for medical emergencies, dispatching a fire department unit to back up the paramedic ambulance.

Throughout the country, when patients were treated, paramedics were required to compile only simple reports, if the call was reported on paper at all. However, medical control physicians in Seattle demanded excellence in patient reports. The city’s comprehensive reporting system established uniform accountability as, “partial reports [got] kicked back to the
respective paramedic team with a gentle scolding from medical officials.” 14 The system also created a wealth of data for researchers. Through the University of Washington, Seattle’s paramedic system gained national and international honor while proving, unequivocally, that urban ALS worked.

There was great reason for the immense attention received by Seattle. For cardiac emergencies, “the number of people saved who had been found clinically dead for the 1971-1977 period was a total of 804.” 14 In 1976, CBS’s 60 Minutes produced a feature on the city’s program, which was later turned into a public education film. And just over a year later, London’s Sunday Telegraph published a feature article in January of 1978.

As Seattle’s system matured, Dr. Michael Copass, a neurologist, took over medical control as Dr. Alvarez left for Wyoming. Dr. Copass tightened the already stringent reporting system. For a number of years after his appointment to medical director, “…Dr. Copass reviewed virtually every report compiled by the paramedics within 24 hours of the event.” 14 The tiered-response system was also tightened by Fire Chief Frank Hansen. BLS-trained first response units now had the authority to triage patients to determine the need for ALS. This, in turn, created a system in which patients received paramedic care only when needed. The tiered-response system also lessened the physical and emotional stress due to non-stop responses of paramedics.

Seattle’s Medic I program was later expanded in 1977 to encompass the entirety of King County, Washington. Today, there are five Medic I programs in operation throughout the
county, South King County, Seattle Fire, Evergreen, Bellevue Fire, and Shoreline Fire. Medic I paramedics are still subjected to a training program provided through the combined efforts of Harborview Medical Center, the University of Washington, and the Seattle Fire Department. Because of early innovation in system design and research, Seattle is still a prime area for pre-hospital medical research, and it will remain so far into the future.

Meanwhile, 1,200 miles to the south, similar programs were underway in Los Angeles. However, unlike Seattle’s paramedic program, Los Angeles was the site of two such programs. One would become the country’s largest ALS system and spawn a hit television show. The other program would languish into the pages of history. But each project would be equally important in bringing paramedic level medical care to a population of over 3 million.

At Daniel Freeman Hospital, Dr. Walter F. Graf, a cardiologist, spearheaded a project that would train paramedics and cover the Los Angeles suburb of Inglewood, with a population of over 700,000. Dr. Graf’s three year program would include the cooperation of two other community hospitals, neither of which employed resident physicians. Supported by the Los Angeles County Heart Association, the L.A. County Coronary Ambulance/Paramedic Program officially started on August 1, 1969.

Dr. Graf’s project, popularly known as the Daniel Freeman Program, used, “…a specially designed and equipped coronary ambulance--a large converted step-van truck…” and employed Coronary Care Unit (CCU) nurses as part of its response team. During the first year of operation, after a physician-initiated dispatch, the ambulance would travel to the nearest
of the three hospitals, pick up a CCU nurse, and then drive to the scene. Later, the CCU nurses were phased out and by the third year, only paramedics responded to emergencies.

At the same time, in the suburban community of Torrance, Dr. J. Michael Criley, a cardiologist, and Dr. A. James Lewis began their paramedic training program at Harbor General Hospital. The hospital was a 700-bed teaching facility and campus for the UCLA Medical School, of which Dr. Criley served as professor of medicine and radiology. Harbor General’s ALS program differed from its counterpart by “…utilizing existing rescue personnel, vehicles and dispatch systems.”

There had been no significant changes to medical care in Los Angeles County since 1960, when its Fire Chief, Keith Klinger, proudly announced that all of his vehicles were equipped with resuscitator/inhalator units. Dr. Criley set out to change pre-hospital care in Los Angeles in a large way. Paramedic trainees were taken from the ranks of both the Los Angeles City and Los Angeles County Fire Departments. A total of 18 firefighters began their training at Harbor General Hospital on September 12, 1969.

Of these 18 trainees, 12 came from the county’s department and 6 from the city’s. All together, they had an average of two year’s fire experience with no medical training beyond first-aid. They endured 180 hours of instruction under the guidance of Carol Bebout, an experienced CCU nurse. 18-hour days were not uncommon, and by December of 1969, Criley’s paramedics were ready to serve the public.

Although Los Angeles’s paramedics were ready, there was no such legislation in
California that would let them operate autonomously. For legal reasons, a CCU nurse was added to each two-person paramedic team and Los Angeles’s first ALS units, Squad 59 and Rescue Ambulance 53 became operational.

Seeing the need for legalizing the utilization of pre-hospital paramedic care, Dr. Graf took his issues to Kenneth Hahn, a prominent and powerful Los Angeles area politician. Hahn carried the proposed legislation to Sacramento, State Senator James Wedworth and State Assemblyman Larry Townsend. The proposed bill was introduced to the state government in March of 1970 and signed into law by Governor Ronald Regan on July 14, 1970 as the Wedworth-Townsend Paramedic Act.

The Act provisioned that, “A county…may conduct a pilot program utilizing mobile intensive care paramedics for the delivery of emergency medical care to the sick and injured…” It also stipulated the scope of practice under the orders of a physician or nurse, “Administer intravenous saline or glucose solutions, perform gastric suction by intubation, administer parenteral injections of any of the following classes of drugs: Antiarrhythmic agents, Vagolytic agents, Chronotropic agents, Analgesic agents, Alkalinizing agents, Vasopressor agents.” Harbor General paramedics began to work free of CCU nurses the day the act became law. In 1973, a three-year evaluation of Los Angeles’s paramedic program stated that, “the increased utilization of the paramedic and his ability to render effective treatment was demonstrated.”

“Among the positive and progressive fire department EMS programs, Phoenix, Arizona,
was to be a stand-out.”

The population of Phoenix is protected by a fire department of nearly 800 members. As with most metropolitan fire departments, Phoenix’s department has provided some sort of first aid since its early years. In 1971, 16% of all calls were medical in nature. By 1973, that number had jumped to 54%, pushing department officials to plan for increased medical training of their personnel. The Phoenix Fire Department began by training its rescue personnel to the BLS level, awaiting Arizona legislature that would permit paramedics. And by 1974, every firefighter in the department was a certified emergency medical technician (EMT).

Anticipating legislation, nine Phoenix firefighters began their paramedical training through a local hospital. Within days of Arizona’s paramedic act, Phoenix’s paramedics had finished their training and were ready to test for state certification.

In 1978, Alan Brunacini rose to become chief of the Phoenix Fire Department. His progressive and pioneering spirit helped Phoenix become a marvel in pre-hospital care. Under Brunacini, the paramedic training regimen became an intensive 900-hour course, “…followed by written, performance and oral exams, 30 hours of refresher training each year and annual re-certification—all for non-stop duty shifts and a 5% increase in salary.”

By integrating paramedics into the fire department seamlessly, city officials saw response times for medical calls decrease to just over three minutes. Also, to avoid system overload, Phoenix Fire paramedics rarely transported patients in their ambulances. Private services took on the responsibility of patient transport in most cases in order to leave Phoenix’s paramedics available for true emergencies.
Ever the innovator, Chief Brunacini decided that the caller should receive assistance immediately. He stated that the three minute gap between the received call and the first unit on-scene was an unacceptable gap. To fill this void, Phoenix began staffing its medical dispatch consoles with certified paramedics. As well as dispatching ambulances and coordinating radio contact between units and hospitals, these paramedic dispatchers were responsible for issuing medical instructions to the caller. This system, the first of its kind in the nation, was named Lifeline. And in its first week of operation, “…a one-year-old drowning victim’s grandparents revived the child (following the medic’s instructions for CPR over the phone) prior to the arrival of the fire department units.”

In 1985, unhappy with private ambulance services, the city permitted the fire department to enter into the bidding process for the medical transport rights. The department was chosen to be the sole emergency medical provider for the city and in November of 1985, the Phoenix Fire Department Emergency Transportation Services began operations. Today, Phoenix boasts response times of under ten minutes 92% of the time, with the majority of responses arriving in under five minutes. Still innovative, Phoenix is looking into the future by planning a citizen CPR program similar to Seattle’s Medic II and providing computerized medical records to paramedics in the field. Phoenix looks to stay a national leader in fire-based emergency medical services through its innovative spirit and impressive leadership.

Prior to 1970, emergency medical care in San Diego was the responsibility of the San Diego City Police Department. In addition to their law enforcement duties, police officers were
expected to respond to medical emergencies in converted station wagons, using only basic medical supplies. Then, in 1972, The U.S. Department of Health, Education, and Welfare established the EMS Special Projects Office to allocate $8 million between five EMS demonstration projects. San Diego County and a three county area of Southern California were included in the project along with the city of Jacksonville and seven county area of northeastern Florida, the state if Illinois, a seven county region of southeastern Ohio, and the state of Arkansas.

These demonstration projects were established to, “…test the result of large amounts of federal monies concentrated within multi-county regions or states.”¹⁴ Large scale EMS systems were also implemented in these areas in order to prove their efficacy. Over the next five years, San Diego County instituted EMT training programs at local community colleges and developed a regional trauma center at the University of California – San Diego Medical Center.

In 1975, the San Diego Fire Department volunteered to take on the responsibility of providing paramedic-level pre-hospital care for its citizens. But, in order to provide this service, the fire chief asked for increased funding to provide for extra workforce and additional equipment. Being a city fire department, the increase in funding would translate into an increased public tax. But, upon voting on whether or not to implement a paramedic service, the citizens of San Diego, “…turned down the proposition by a two-to-one margin.”¹⁴

However, once paramedic programs began to spring up in surrounding communities, the citizens of San Diego decided to take another vote on the issue. And in November of 1977,
Proposition C passed nearly two-to-one. Due to the tumultuous Southern California political climate, a committee was formed in order to determine which type of paramedical service would most benefit the city. After evaluating various ALS systems, the San Diego Union reported that the committee had recommended Medevac Inc., a private ambulance service. Less than a week later, the newspaper ran an article reporting that a majority of the committee actually favored a fire-based paramedic system. Months and years would pass before the issue would be settled.

In 1979, it was decided that the city fire department would provide first responder services to all medical calls, while private paramedic ambulance services, such as Medevac, provided patient transport services. One year later, the San Diego Fire Department began a two-year program to train all of its firefighters to the EMT level.

As time progressed and information was gathered, the city of San Diego recognized certain areas that were, geographically, difficult to help. These areas displayed a history of producing long ambulance response times. And, in 1991, the decision was made to staff certain fire engines in these communities with dual-role firefighter/paramedics.

EMS history was to be made in San Diego during 1997. Due to constant financial struggles of private ambulance services, and their subsequent inconsistent performance, the city of San Diego conferred with a private consultant to redesign the city’s EMS system. The system that ensued was both ingenious and radical. San Diego was to be the home of the first public-private EMS organization in the country. Dual-role firefighter/paramedics were placed,
“…at each of the City's 44 fire stations.” The San Diego Fire Department then partnered with the Rural/Metro Corporation and Rural/Metro of San Diego to form San Diego Medical Services Enterprise. Both sectors of the venture were to operate under the same medical protocols, using the same equipment.

To date, San Diego Medical Services Enterprise has been an enormous success. Not only does the public benefit from improved response times, but taxes have been lowered due to the financial nature of the public-private venture. San Diego has also become a prime area for EMS research. A myriad of research data has been obtained from the area, including a three-year prospective study verifying the efficacy of rapid sequence intubation (RSI) in an urban setting.

Composed of eight main islands, the state of Hawaii’s 1.2 million permanent residents are surrounded by pristine sandy beaches, tropical mountainous peaks, and the world’s rainiest spot at Wai’ale’ale. It would seem a contradiction for any person to fall ill in such a romanticized locale. But 1972 saw 1,395 Hawaiians die from ischemic heart disease, and 146 from trauma arising from automotive collisions.

In 1969, just ten years after obtaining statehood, Hawaii became the new home of four young southern Californians, Bryan Peterson, John Yates, David Buckland, and Bob Sewell. Bryan Peterson soon found employment as a taxi driver and began taking a hard look at Honolulu’s ambulance service. The four men undertook an initiative to improve emergency medical services in Honolulu. For purposes of aesthetics, the men formed a nonprofit
corporation, American Paramedical Institute Inc. (API). “Its objective: an evaluation of
emergency care in Honolulu.”¹⁴

In dire need of financial assistance, the four associates of API were granted permission
to hold a benefit concert using the crater of Diamond Head Volcano. 30,000 people were in
attendance on August 2, 1969 for the Crater Festival to Benefit the American Paramedical
Institute. Peterson and company, being totally responsible for costs, were completely reliant on
donations from the crowd. After taking the stage to explain the objectives of API,
“…Peterson's call for donations produced an avalanche of money flowing through the crowd to
the bandstand.”¹⁴ By the end of the day, the Crater Festival had netted API over $7,000.

Due to under-planning, none of the four men had thought to hire a waste management
service. This left the entire staff (four) of the American Paramedical Institute to clean up the
debris of 30,000 people.

Using the money generated from the benefit concert, API began a nine month evaluation
of Honolulu’s EMS system. Needing a guide for evaluation, the men used *Medical
Requirements for Ambulance Design and Equipment*²⁰, originally prepared for the U.S.
Department of Health, Education, and Welfare by the National Academy of Sciences National
Research Council in 1968. From this document, 179 criteria items were established.
Throughout the nine months, the four men looked at ambulances and equipment, rode as
observers, and talked to anyone associated with EMS.

The report that was published stated that Honolulu EMS failed to meet more than half
of the established criteria. The report itself was highly critical of the current EMS system. API recommended a structured tiered-response system, improved ambulance design, and better paramedic training. Using contacts in the local media, the report went public and produced huge amounts of interest from the media. Honolulu government and EMS officials were not so welcoming of the report:

“The backlash was quick and severe. Mayor Frank Fasi is said to have flung the report clear across his office in anger. Peterson and friends were invited to a meeting with some of the senior members of the Honolulu ambulance service. ‘What was said and the way it was said gave us good reason to believe that our lives were in jeopardy,’ Peterson reported later.”

Despite initial condemnation of the report, encouraging decisions were made concerning the future of medical care in Honolulu. Lifeguards were trained in emergency care by the growing membership of API. And, by 1971, all Honolulu police officers had been trained as first-responders. Peterson and company were also busy writing grant proposals in order to improve first-responder training throughout the island.

The members of API were soon overwhelmed by work. It was finally decided that the organization would close its doors after one last event. They planned this event to be an international EMS conference. Letters of invitation for the First International Symposium on EMS were sent to health officials in the United States, Russia, Great Britain, Hungary, Italy,
New Zealand, Portugal, France, Australia, South Africa, Israel, Germany, Egypt, and China.

Letters of acceptance began to pour in. API soon realized that they were financially unprepared for an international event, not to mention inexperienced with foreign policy. “Should Arabs and Israelis be seated at the same banquet table? Should the Russians or the Chinese get top billing on the program?”14 Peterson hoped for the best and carried on to the best of his abilities.

Two days before the conference was to begin, API received word that the Russians were to send two representatives to Hawaii. Natasha Vorobieva, the International Secretary of the Soviet Medical Workers Union, and Eugene Lushnikov, a high-level Russian scientist, were to be in attendance. The State Department also caught wind of the Russians’ visit and ordered Peterson to keep a sharp eye.

As delegates began to arrive, the four men of API still did not own neckties. Peterson quickly mandated that neckties would not be allowed at the conference. “Only two [delegates] seemed bothered (from England and Australia), but they came around eventually.”14

Numerous invitations had been sent to local ambulance services within the state. But, in spite of international support, the Hawaii Medical Association (HMA) boycotted the conference. In addition, the governor of Hawaii had been invited to give the opening remarks. Due to scheduling conflicts, he was unable to attend and offered the lieutenant governor. As the conference drew near, the lieutenant governor was forced to cancel, and in his place he appointed the state health director to give the opening remarks. Unaware of the immense irony,
the international representatives listened to Hawaii’s top physician give his speech, while being forced to break his own boycott.

By the end of the symposium, “…there were no strangers among the attendees--nor did anyone seem to be a foreigner.”¹⁴ Natasha Vorobieva closed the proceedings with a tear-filled emotional, improvised, speech that warranted a standing ovation from all in attendance.

The First International Symposium on EMS marked the end of the American Paramedical Institute. Despite enormous support from the international delegates, Peterson, Sewell, Buckland, and Yates had neither the time nor the inclination to manage the growing organization. 1974 saw Peterson and Yates invest $14,000 to create their own ambulance service in Honolulu, Pacific Ambulance Company. With their uncanny ability to breed success, the company operated six vehicles with a staff of thirty within six months.

Hawaiian EMS, however, was not brought about single-handedly by four impoverished Southern Californians. The Honolulu Police Department had established an ambulance service in 1916. Ambulance attendants were little more than just drivers, and due to overwhelming demand, control was relinquished to the city’s Department of Health in 1931.

Governmental support had already been present upon the Californians’ arrival to the island. The state of Hawaii received a $56,000 grant from the Department of Transportation in 1971 to better the island’s EMS system.

The Hawaii Medical Association’s boycott of the First International Symposium on EMS was not unfounded. The HMA had already instituted a program that would improve
Hawaii’s paramedical services. A number of phases had been established for the HMA’s program. Each phase was to be tested in Honolulu and the island of Oahu. When each phase was proven successful on Oahu, it would then be implemented throughout neighboring islands.

In 1971, the HMA sought, “…improved equipment for ambulances and emergency rooms, training of ambulance and hospital personnel, as well as categorization of hospital emergency facilities.” Also, ambulance personnel working in the city and county of Honolulu were to be trained at the paramedic level. Prior to 1971, a job requirement to become an ambulance attendant in Honolulu included the possession of a chauffeur’s license. EMT training was also improved to consist of 200 hours didactic and 200 hours of clinical training, far exceeding the typical 81 hour course mandated by the Department of Transportation. Satisfied with the progress, the Department of Transportation provided additional funding during 1972.

Dr. Livingston Wong was named the project director that same year. Dr. Wong was instrumental in obtaining extra funds for the HMA’s program. Between 1972 and 1974, $1.5 million poured in from grants provided by the Chamber of Commerce of Hawaii, the Regional Medical Program, in addition to the extra Department of Transportation money. 1974 also saw Honolulu coordinate medical care with the U.S. Army 68th Medical Detachment to provide a helicopter MEDIVAC service. This service, beginning in November of that year, became known as MAST (Military Assistance Safety and Traffic) and is still functional to date.

Under Dr. Wong’s leadership, Reta Pozzi was recruited to serve as the paramedic instructor. A registered nurse, and native of Canada transplanted to the warmer climes of the
islands, Pozzi demanded perfection from her students. Working through the laid-back Polynesian attitudes, her students learned the assertiveness that she deemed necessary for emergency medical care. Pozzi’s first paramedic program consisted of 400 hours didactic, 175 hours clinical time, and a 640 hour internship.

At the conclusion of Hawaii’s first paramedic class, Pozzi was sent to Los Angeles to compare the city’s EMS operations and training program to that of Hawaii’s. After a week of conversations with EMS officials and numerous tours of equipment and facilities, Pozzi concluded that, “…the Hawaiian paramedic training program was as good as any.” She returned to the islands and continued her training regimens. Through the years, ambulance personnel from the state’s other islands were flying to Honolulu to learn from Pozzi, even Bryan Peterson returned to become one of her students.

The Honolulu Fire Department began to provide first-responder services in 1976, bringing medical care to its residents in the shortest period of time possible. At this time, the city was operating 15 ambulances in conjunction with the fire engines. Also, sea rescues began to be coordinated between EMS and the U.S. Coast Guard. In 1978, the Honolulu Star Bulletin reported that Oahu’s EMS program had caught the attention of the U.S. Department of Health, Education, and Welfare and recognized as a program of excellence.

In the 1980s, the paramedic training program was transferred from the Hawaii Medical Association to the University of Hawaii/Kapiolani Community College. And today, the county of Honolulu continues to provide emergency medical services for the city of Honolulu and the
entire island of Oahu. The islands of Maui and Kauai are served by privately contracted ambulance companies while the Hawaii Fire Department provides services on the big island of Hawai‘i.

Tucked in between the Wasatch Mountains and the shores of Great Salt Lake, the 900,000 residents of Salt Lake County and Salt Lake City saw their EMS system arise from near tragedy. In 1968, a Boeing 727 crashed at Salt Lake City International Airport, resulting in numerous injuries. Due to nonexistent planning, local hospitals were inundated and overburdened with patients.

Recognizing that, “…morticians ran an estimated 85% of the ambulance companies in the state.”¹⁴ the Salt Lake Medical Society formed an EMS Committee to prevent a similar scenario from playing out. Over the next two years, several disaster and mass-casualty drills took place around the state. As disaster planning came to the forefront, Gene Moffitt, owner of a private ambulance company in Salt Lake City, approached local physicians to help improve ambulance attendant training.

In 1969, Dr. John Henry, an orthopedic surgeon, took on the responsibility of obtaining funds from the Intermountain Regional Medical Program (IRMP) to provide local CPR classes and an ambulance attendant course. Utah’s State Medical Association’s EMS Council also named Dr. Andy Ruoff as its chairman. As Utah’s medical emphasis shifted away from disaster planning and towards everyday emergency medical care, funds were obtained from the Department of Transportation to advance EMS in the state.

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¹⁴ Morticians ran an estimated 85% of the ambulance companies in the state.
Utah’s first EMT programs commenced in 1971, with extra funds coming from the Intermountain Regional Medical Program and its EMS coordinator, Lionel Drage. In addition to an initial half-million dollar grant from the IRMP, the state received an extra $270,000 from the IRMP as the Department of Health, Education, and Welfare began phasing out Regional Medical Programs across the country.

In October of 1973, Dr. Henry traveled to Los Angeles to examine the EMS program. He returned to Salt Lake City amazed and concluded that such a program would thrive in his city. With the loss of federal funding looming on the horizon, the decision was made that Salt Lake City’s 23 paramedic trainees would be sent to Los Angeles for a six week training program.

Due to the immense popularity of Los Angeles County’s paramedic program at Harbor General Hospital, “…there was no room for outsiders…”[14] The Salt Lake City trainees were instead sent to Dr. Graf and his training program at Daniel Freeman Hospital. And, on February 18, 1974, the 23 Utahans began their training at the Inglewood, California hospital. Nineteen of the students were from the Salt Lake City and County fire departments. However, due to the insistence of Gene Moffitt, four of the trainees were selected from the ranks of his private ambulance service.

After six weeks of didactic training at Daniel Freeman Hospital, the 23 returned to Utah for six weeks of clinical training in local hospitals. Their clinical training was followed by another trip out to the Pacific coast, where they completed an eight week internship with the paramedic
units of the Los Angeles County Fire Department. Following the passage the Utah’s Mobile Paramedic Act of 1974, Salt Lake City’s new paramedics were ready to hit the streets in July of 1974. Acknowledging that the current long-distance training program was unacceptable, the Utah State Health Department began its own paramedic training program at Weber State College and employed Evelyn Draper, RN, to head the program.

Working through early conflict between the city and county fire departments concerning paramedic units, paramedical care soon became an integral service of fire departments throughout the city and county. Money soon started flowing into the system for extra equipment and personnel. And, in 1977, Salt Lake City was subjected to an extensive examination by the School of Public Health at the University of Pittsburgh\textsuperscript{21}. Although some negative areas were exposed, Utah’s EMS system and programs fared well when compared with the rest of the nation.

Today, EMS is still strong in Northern Utah. Salt Lake City is currently served by Southwest Ambulance, a subsidiary of the private ambulance service Rural/Metro Corporation. In addition, Salt Lake County Fire Department continues to provide paramedic services to all areas outside the city’s limits. As a result of increased demand and need for extra personnel, the fire department has instituted its own accredited paramedic school.

**South**

Popularly credited with establishing the first paramedic program and paramedic service
in the United States, the Miami story centers solely around Dr. Eugene Nagel. During 1964, Dr. Nagel joined the faculty at the University of Miami School of Medicine, while practicing anesthesiology at Jackson Memorial Hospital.

Dr. Nagel’s interests were eclectic. In addition to his practice as an anesthesiologist, Nagel immersed himself in the disciplines of cardiac care, CPR, and aquatic studies. Through his penchant for CPR, Dr. Nagel was invited to speak at the International First Aid and Rescue Association meeting in January of 1964. The meeting was held in Miami Beach, and Nagel was considered to be the local expert on the topic. Shortly after the meeting, Nagel went to Miami Fire Station Number One and offered to teach their firefighters CPR. Soon, all Miami firefighters were performing CPR in the field.

The Miami Fire Department had an extensive rescue service that included heavy physical rescue and extrication as well as a team of rescue divers. Nagel soon found that the department’s emergency medical training consisted of basic first-aid training. “Nagel was convinced that the only way to save cardiac arrest victims was to have firefighters defibrillate at the scene…”

He recognized the rescue firefighters’ skills and abilities with CPR and began to formulate a training program that would train them as "physician extenders". But first, Nagel would have to convince Miami Fire Department’s chief that his men could provide advanced medical care. This would prove to be a challenge. Dr. Nagel had cultivated a good relationship with the firefighters and rescue personnel, but his rapport with the chief was less than cordial. As he later recounted, “I told the fire chief that I wanted to train the guys in defibrillation…He said,
‘This is a fire department, not a hospital; these are firemen and not doctors. I do not want you to forget that.’”

By 1967, Dr. Nagel had caught wind of Pantridge’s work in Belfast. He was impressed with the outcomes and assumed that a similar system could work in Miami. Having to progress slowly due to the chief’s objections, Nagel started with providing pre-hospital telemetry. Treatment of the patient in the field would center on a portable telemetry unit that would transmit the electrocardiograms (EKG) over existing radio frequencies to the hospital. Chief Kenney agreed to the telemetry units as they, “…seemed unlikely to hurt the patient or embarrass the department.” Nagel received $3,000 from the Florida Heart Association to develop a telemetry unit his specially trained firefighters could use.

The only problem was that no such unit existed. Telemetry devices that were available at the time were able to transmit over phone lines only. Nagel and the Miami Fire Department needed a unit that transmitted over the radio. The company Biocom created a sufficient device for the department. Housed in a wooden milk crate, “The radio unit was a 28-pound Motorola Business Dispatcher. The Gulton nickel-cadmium battery weighed 11 pounds. The final design featured a modulator, radio and battery shock-mounted in an aluminum waterproof case to bring the whole unit to a backbreaking 54 pounds.” And by March of 1967, Miami’s “paramedics” were serving the public and transmitting EKGs to Jackson Memorial Hospital. Nagel and company would go on to report extensively on the efficacy of telemetry and mobile physician medical direction.
At first, the firefighters were not permitted to do anything besides transmit EKGs. But as Dr. Nagel slowly made progress with department officials, field personnel were soon permitted to start IVs and administer certain drugs on standing orders. And, in 1969, the Miami Rescue Unit expanded to three vehicles, while annual rescue calls rose from 8,000 to 15,000.

The next step in the Miami paramedic evolution was the initiation of field intubation. Nagel, being an anesthesiologist, saw this as obvious. Chief Kenney, however, was a tougher sell. Despite the chief’s reluctance, Dr. Nagel trained nine paramedics in the technique, using both practice dummies and cadavers. After he was confident with the paramedics’ intubation skills, he set up a demonstration for Chief Kenney and department officials. As Nagel recalled the event,

“I enlisted one of our residents, Harry Heinitsch. We sprayed each other with topical anesthetic. I then intubated Harry, awake, demonstrating the technique. All nine paramedics then intubated Harry successfully. Harry then intubated me and the paramedics followed his lead…Neither Harry nor I reported even so much as a sore throat.”

The next morning, Nagel had permission to let his paramedics intubate in the field.

Dr. Nagel later went on to become chair of the anesthesiology department at Harbor General Hospital in Los Angeles, California. He continued to advocate for EMS throughout his
career, including a six year period in which he authored a column for the trade magazine *Emergency Medical Services*. Also, from 1972 – 1980 Dr. Nagel served as chair of the medical advisory committee to the International Association of Fire Chiefs.

Today, the Miami Fire-Rescue Department employs nearly 300 paramedics, who answer over 65,000 calls annually. The Emergency Medical Services sector is within the Emergency Response Division of the department and staffs a total of 23 paramedic-staffed ambulances.

The Gulf coast of Florida was also home to a progressive fire department that was committed to EMS advancement. The Tampa Fire Department put its first rescue unit, car Number 16, into service in 1941. By 1965, the department operated five such units throughout the city. News of Miami’s success soon came to the attention of Tampa’s officials. The fire department’s rescue personnel were chosen to undergo paramedic training.

The first batch of paramedic trainees entered Tampa’s program in 1971. By July of 1972, Tampa Fire Department paramedics were practicing in the field. Telemetry units, similar to those being utilized in Miami, were placed on Tampa’s ambulances soon after. In 1975, the fire department added its sixth rescue unit, while also upgrading all rescue units to brand new modular ambulances.

Tampa’s EMS system differed from other parts of the country. The Tampa Fire Rescue Division was headed by Deputy Chief Earl Goff. All paramedics worked under the guidance of three medical directors and a ten-person committee of medical advisors. In addition, each
rescue unit was staffed with a three-person crew, including a captain trained to the paramedic level.

As with most of the nation, Tampa saw its call volume increase dramatically through the 1960s and 1970s. In 1955, the Tampa Fire Rescue Division received only 296 emergency calls for assistance. By 1977, that number had risen to nearly 13,000.

Tampa was an early home for pre-hospital research. In addition to studying the efficacy of the esophageal obturator airway and pneumatic anti-shock trousers, “Tampa paramedics conducted controlled studies of nitrous oxide as a field analgesic.” Continuing their public education efforts, Fire-Rescue paramedics set out to train nearly 300 Tampa teachers in CPR.

Seeing that Tampa’s progressive ALS paramedical services were confined to the city’s limits, Hillsborough County elected to implement its own EMS system. In 1974, the county began BLS services throughout its jurisdiction. Hillsborough County recruited thirteen physicians to act as medical control; each carrying a portable radio at all times to direct the field paramedics. Soon, a set of medical protocols had been established to regulate medical care in the field.

Anticipating disdain and opposition from local physicians, John Parker, a licensed physician’s assistant and Hillsborough County chief of paramedical services, mailed out a personal letter to every practicing physician in the county. The three-page letter included the county’s ALS system design, as well as descriptions of paramedic training, medical control procedures, and paramedic drugs and equipment. “The simple step of communicating with
doctors before problems occurred seems to have accomplished its purposes…”

John Parker also implemented important data collection procedures throughout the county. After working through a tight budget and proving that large amounts of data could be effectively analyzed using simple, primitive computer systems, Parker was invited to give a presentation at the First World Conference on Pre-Hospital Care in Anaheim, California.

Despite impressive cooperation between Hillsborough County and the Tampa Fire Department, collaboration broke down in 1978 due to jurisdictional quarrels. Today, the Rescue Division of the Tampa Fire-Rescue Department is staffed by over 100 paramedics, operating from twelve ALS ambulances and one paramedic unit at the Tampa International Airport. Hillsborough County has also expanded its workforce, combining the efforts of 750 paid staff and 175 volunteer fire-rescue personnel. Hillsborough paramedics answer 72,000 calls annually and benefit from a budget of over $74 million.

While boundary disputes raged in Florida, Texas was working its way to the forefront of EMS. As with other parts of the country, medical emergencies in Dallas were being attended to by private ambulance companies. After years of substandard medical care, the city hired a private consulting firm. It was suggested that a city-wide EMS system be established through the Dallas Fire Department.

To build this system, the services of Bill Roberts, a division fire chief, were enlisted. Not knowing where to begin, Roberts began touring various EMS systems through the state. He returned with of number of ideas on how Dallas’s new system should operate.
Dallas was to be a totally advanced life support system. But first, Roberts set out to build a solid foundation of BLS service throughout the city before advancing. And on November 1, 1972, 204 EMT-trained firefighters began working on sixteen Dallas Fire Department ambulances and as dispatchers in Dallas’s call center. Jumping into innovation, Dallas began using a computer-simulation program in order to determine where to locate each of their sixteen ambulances. These same computers also provided Roberts with reams of information concerning the enormous success of his new system, as he tracked progress and found areas that needed improvement.

The city had also made a major commitment. The Dallas Fire Department ambulances were to be “emergency only.” While private ambulance services were to serve the city in a non-emergency role. This left field personnel with a great deal of responsibility as, “The fire department's EMTs (later paramedics) were authorized…to refuse emergency transport and to refer the individual to other means of transportation.”

Before advancing to paramedic services, legal authority had to be established. In other states, legislation had been proposed after ambulance personnel had fully committed to paramedical training. In Texas, however, the issue would be resolved before it could become a problem.

These concerns were taken directly to the state’s attorney general by the president of the Texas State Board of Medical Examiners. And on April 12, 1973, the following opinion was issued: “Ambulance attendants not in the physical presence of a licensed physician who provide
emergency care within the scope of nursing, acting under the control or supervision or at the
instruction of a licensed physician by telephonic or radio communications are not engaged in the
unlawful practice of medicine.”

With legal concerns abated, paramedic training in Dallas began. Southwestern Medical
School took on the responsibility of providing the didactic portion of training, while the majority
of clinical training was to take place at Parkland Hospital. Medical control was also established,
as Dr. James Atkins, associate professor of internal medicine, and Dr. Irwin Thal, associate
professor of surgery, shared medical direction of field personnel. And, in January of 1974, the
Dallas EMT/firefighters began 650 hours of paramedical training.

Within five years of the system’s implementation, the Dallas Fire Department saw
emergency medical calls double. The department’s patient screening process also created the
prospect of lawsuits. As the first lawsuit in American history concerning paramedics was taken
to an appellate court, Dallas’s legal authorities faced the problem head-on. The city, and its
paramedics, came away unharmed, as no fault was established.

Through the years, the Dallas EMS system has only improved, while growing even
larger. Today, the Dallas Fire-Rescue Department has expanded to nearly 40
paramedic-staffed ambulances and has earned its place as a progressive EMS system as, “…in
the world of EMS, Dallas has arrived as the system to see on your way home from Seattle.”

As Dallas was implementing its BLS services, Birmingham, Alabama was joining the
paramedical movement. In 1972, Dr. Alan Dimick, associate professor of surgery and director
of emergency medical programs at the University of Alabama, took his concerns on the pre-hospital care in Birmingham to the State Health Department and the state’s medical society. With the receipt of a Regional Medical Program grant, Jefferson County and the four-city area of the Birmingham metropolitan area began designing a paramedic training program. It was decided that the new paramedic trainees would be taken from the ranks of the cities’ respective fire departments.

The training program was a tremendous success. The paramedic program, and subsequent EMS system, produced virtually no staff turnover, as 33 of the original 34 paramedic trainees remained four years later. Birmingham also accomplished a feat that very few communities throughout the country were unable to do. When the Regional Medical Programs came to an end in 1976, the Birmingham area EMS system flourished. The cessation of governmental support did not translate into financial troubles. The University of Alabama picked up financial support where the federal government had left off. And, six years after the initiation of the program, the city of Birmingham grew from operating one paramedic rescue unit to operating six units with 73 paramedics within the city limits.

By 1976, there were 30 paramedic units operating throughout Jefferson County, making it one of the largest EMS systems in the nation. Birmingham also had a very influential advocate on its side. John Swindle, chief of the Birmingham Fire Department, supported the paramedic program from the beginning and provided vital liaison services, therefore reducing internal conflict within the city. In 1977, Swindle became the president of the International Association
of Fire Chiefs (IAFC). He soon made EMS a top priority of the organization. Swindle strongly urged fire departments throughout the country to support the new IAFC/International Association of Fire Fighters EMT Apprenticeship Program. In just a matter of months, “…several of the most traditional single-purpose fire departments were making studious inquiries about the fire-EMS marriage.”

Through the years, Alabama has led the way in EMS legislation. Through innovative regulations and revisions, Alabama first introduced the EMT-Intermediate. This deviated from the traditional two-level, EMT and paramedic arrangement, and created a three-level pre-hospital care system. Today, the counties of Jefferson, Blount, Chilton, St. Clair, Shelby, and Walker are directed by the Birmingham Regional Emergency Medical Services System (BREMSS). Coordinated through the University of Alabama, BREMSS is, “…responsible for overall coordination of and improvements in the pre-hospital emergency medical care system.”

This regional service directs the operations of 174 ambulance services, 17 hospitals, and 2000 field personnel.

Two years after Miami firefighters began transmitting EKGs, another Pantridge-inspired paramedic program was underway. The Great Smoky Mountains of North Carolina seemed to be an odd backdrop for such an innovative pre-hospital initiative. The Haywood Rescue Squad of Haywood County would provide the first all-volunteer paramedic service in the county.

Dr. Ralph Feichter, an internist native to the area, saw no reason why Pantridge’s concepts couldn’t benefit his community. In 1969, Feichter, already credited with “…bringing
specialized medicine to Haywood County.”27, gathered 40 Haywood Rescue Squad volunteers
to undergo twelve weeks of training in cardiac pathophysiology, electrocardiography,
arrhythmia recognition, pharmacology, and CPR. Using a North Carolina Regional Medical
Program grant, Feichter equipped two coronary care ambulances to operate out of the towns of
Waynesville and Canton.

Due to the mountainous nature of the county, plans for rescue personnel to first drive to
the hospital and pick up a physician or nurse were soon deemed unacceptable, as emergency
responses were delayed significantly. Dr. Feichter decided that the rescue personnel needed a
way to operate autonomously. After conferring with the Haywood County Medical Society, a
set of standing orders was implemented and the Haywood paramedics began to function on
their own. On a visit from Jim Page of the Los Angeles County Fire Department, he commented
that his, “…California cockiness had been badly shaken”28 by thoroughness of the rescue
squad’s program.

The fact that there would be no legal authority for paramedical care in North Carolina
until 1974 did not deter Dr. Feichter or the volunteers of the Haywood County Rescue Squad.
Their paramedic program and services were unknown to virtually all outside the mountains of
western North Carolina for years. And, on April 9, 1976, nineteen of the original paramedic
volunteers became official North Carolina Mobile Intensive Care Technicians.

Northeast
Like the improbable Haywood County, Pittsburgh would be the home to an unexpected advance in pre-hospital care. But unlike the volunteers in North Carolina, of Pittsburgh’s new ambulance attendants-in-training “…half of the trainees had not completed high school and all were without any prospect of steady employment.”

Freedom House Enterprises was founded as a nonprofit organization to encourage African American-owned businesses in the Hill District and Oakland District of Pittsburgh. In 1967, after seeing moderate amounts of success, Philip Hallen, director of the Maurice Falk Medical Fund, decided to start a commercial ambulance service to transport residents to the hospital for emergency care and also for routine appointments. He brought his ideas to Dr. Ed Noroian and Dr. Peter Safar at Presbyterian-University Hospital. The idea was to take unemployed African Americans in the Freedom House area, subject them to intensive medical training, and then let them provide sophisticated pre-hospital medical care. Gerald Esposito, who had already developed a small EMS system in western Pennsylvania, was recruited to act as project director.

Forty-four individuals, aged from 18 to 60, began their medical training in October of 1967. After 300 hours of didactic instruction and nine months of clinical training aboard ambulances and various hospital units, the Freedom House ambulances went into service in the summer of 1968.

But Freedom House was thwarted everywhere it turned. The city of Pittsburgh refused to expand their contract to include a larger section of the city. The organization also relied
heavily on grants and financial donations. And, from month to month, financial stability was an uncertainty. In addition, Freedom House was having jurisdictional and racial battles with the Pittsburgh Police Department, which also ran an ambulance service as, “Freedom House began racing police ambulances to the scene.”

The scene started to change slowly in the 1970s. Starting with a study conducted in 1971, it was shown that 62% of patients received improper medical care from the police, while only 11% received improper care from Freedom House. Soon, residents in need of an ambulance began to call Freedom House dispatchers instead of the police.

In 1970, Dr. Safar left on sabbatical, leaving Dr. Don Benson in his place. Benson soon left to serve with the U.S. Air Force and Freedom House fell on hard times without any consistent medical control. Then, in 1974 with the help of Dr. Safar, Dr. Nancy Caroline took over as medical director of the service. Caroline was an extremely dedicated physician who kept a constant eye on her ambulance personnel as she accompanied them on ambulance runs, even after working long shifts at the hospital.

At an international symposium on critical care medicine in 1975, Freedom House paramedics presented a disaster drill and were, “…judged among the most sophisticated and skilled in the nation.” It was in that same year that Pittsburgh ended its contract with Freedom House. The city was instituting its own EMS system, which continues to this day. The Freedom House ambulance service dissolved and over a dozen Freedom House paramedics went to work for the city. As for the rest of the original 44 trainees, “Many pursued advanced degrees
and careers in health services… some became unemployed or drifted back to unskilled work.”

But Dr. Caroline’s paramedical exploits were not over. The University of Pittsburgh soon learned that it would receive the U.S. Department of Transportation contract to develop the first national paramedic training course. The contract went to the University Medical School’s Department of Anesthesiology, and Dr. Safar, head of that department, delegated responsibility to Dr. Caroline. Caroline also went on to author *Emergency Care in the Streets* in 1979, the first, and for years, only paramedic textbook. Dr. Nancy Caroline later emigrated to Israel to become medical director of Magen David Adom, Israel’s equivalent of the Red Cross, which provides ambulance service throughout the country.

The City of Pittsburgh EMS created its Ambulance Division in 1975 and consisted of 40 paramedics staffing four ALS ambulances. Pittsburgh’s services were expanded in 1977 with the creation of the Rescue Division. To date, six specialty units are specifically equipped to handle heavy-rescues, confined space rescues, mass casualty incidents, river rescue, and hazardous materials emergencies. Today, Pittsburgh Emergency Medical Services employs over 200 field personnel, staffing thirteen ALS ambulances and three paramedic motorcycles, and responding to over 55,000 calls each year. Also, Warner Brothers Pictures is currently working on a feature film on the story of the Freedom House paramedics.

Montgomery County, Maryland (on the northern edge of Washington D.C.) was home to another volunteer movement. Prior to the 1970s, the entirety of the county was covered by
two volunteer ambulance rescue squads. Then, in 1970, the Montgomery County chapter of the American Heart Association provided money to fund a mobile coronary care project. The program would be similar to other pre-hospital cardiac care programs throughout the nation. Montgomery County’s MCCU would be “A large step-van truck was equipped as a rolling emergency room…”\textsuperscript{14}, staffed by coronary care nurses, and driven by local volunteer rescue squad personnel.

Mary Beth Michos, head nurse of the program, began to recognize merit in the idea of the volunteers providing care, instead of the nurses. And, with the project was still ongoing, she began to train them in advanced life support procedures. Michos had laid the groundwork for Montgomery County’s first paramedic program.

Members of the Bethesda-Chevy Chase and Wheaton Rescue Squads were chosen as the first paramedic trainees. Due to the enormous success of the pilot program, paramedic training was made available to all fire department personnel in the county. In 1972, the MCCU program ended, leaving the county without pre-hospital coronary care. It was decided by county officials that a county-wide EMS system was to be established.

The Department of Fire and Rescue was established to coordinate services between fire and rescue squads throughout the county. Mary Beth Michos was hired to implement the county’s plans. In 1973, the first paid paramedics began working in Montgomery County. This created a unique combination of paid and volunteer personnel. Due to the original emphasis on cardiac care, the first paramedics, “…were actually classed as cardiac rescue technicians.”\textsuperscript{14}
By 1977, seven ALS ambulances, staffed with 135 paramedics, were in service throughout the county. 1982 saw seven ALS ambulances put into service, bringing the county total to seventeen paramedic-staffed MICUs. After years of cardiac rescue technician training, the county offered its first Department of Transportation EMT-Paramedic training course in 1984. Since then, Montgomery County has gone on to expand its services to included 44 ambulances serving a population of nearly 900,000.

Midwest

Pre-hospital medical care in Columbus, Ohio dates back to 1931, when a Lyons pulmotor was donated to the Columbus Fire Department. It was carried in the chief’s vehicle and used to aid firefighters overcome by smoke. In 1934, the fruitless, but widely publicized, rescue attempts of an electrocution victim led to Columbus residents calling on the fire department for medical aid. An H and H Inhalator was then placed on a hose wagon to serve the public’s medical needs.

In the 1960s, the newly formed Columbus Fire Department Emergency Squad, “…arrived at the scene on an average of four minutes after a call for help….yet, nationally, medical teams arrived at an average response time of over 40 minutes…” Cardiac care came to the forefront of the medical community in the 1960s. Due to the new advances in coronary care, research into the concept of a mobile coronary care unit began in 1966.

The concept for the famed Columbus Heartmobile began in an unlikely place, the first
annual Student Design Program sponsored by the Armco Steel Corporation. A student team from the University of Cincinnati trained their creative minds on the traditional ambulance design. Their winning design would become the basis for one of the most recognizable vehicles in the Midwest.

In 1968, Dr. James V. Warren, chairman of Department of Medicine at Ohio State University, obtained an Ohio Regional Medical Program grant to establish a pre-hospital coronary service not unlike Pantridge’s service in Belfast. Based on the student design, the Heartmobile was, “…built within a Clark Cortez motor home and offered abundant working and storage areas.” The Heartmobile went into service on April 9, 1969, staffed by one cardiologist and three off-duty Columbus firefighters.

The vehicle was housed at the Ohio State University Medical Center in a building adjacent to the Emergency Department. Upon receipt of a call that was determined to be cardiac in nature, a physician would be paged from the eleventh floor and respond with the firefighters.

When, in 1971, the Regional Medical Program grant ended, the city of Columbus picked up funding for the project. The firefighters that had originally staffed the Heartmobile were then subjected to intensive medical training and took to the streets as paramedics on July 1, 1971. The Columbus Fire Department took over management of the Heartmobile, renamed Medic, and the newly trained firefighters began treating patients without direct physician supervision. Later studies proved the efficacy of Columbus’s paramedics, stating that, “there
were no significant differences in the results of cardiac resuscitation between the physicians and advanced EMT-Ps”\(^{31}\) and that, “EMT-Ps can perform as effectively as physicians in a mobile emergency care system.”\(^{31}\)

By 1975, “Fifty-five percent of all heart attacks within the City of Columbus [were] first seen by medics.”\(^{30}\) and the nearly one million residents of the Columbus area were being served by thirteen paramedic units. In conjunction with its unparalleled medical success, the Heartmobile won four design awards between 1969 and 1971.

“Dr. Warren’s project provided significant stimulus for development of the pre-hospital advanced medical care now provided by EMS in America.”\(^{32}\) The original Heartmobile has since fallen into disrepair. Efforts are currently being taken to restore the vehicle to its original glory by the Central Ohio Fire Museum.

On October 12 of 1971, Dr. James Warren of Columbus was a guest on NBC’s *Today* show. By this point, his Heartmobile had been serving Columbus for over two years, and was now functioning solely with paramedic personnel. He explained to a national audience that mobile coronary care units were not only efficacious, but also relatively inexpensive.

From her home in Inverness, Illinois, Janet Schwettman listened intently to what Dr. Warren was presenting. Two months prior, her husband had suffered a massive heart attack. She called on an ambulance, but none came. She finally got him into the family car, where he died before reaching the emergency room.

Soon after Dr. Warren’s interview aired on NBC, Mrs. Schwettman began researching
the possibility of an advanced ambulance service for her suburban community, just outside of Chicago. For the next three months, she made endless inquiries to local physicians, local ambulance services, the American Heart Association, and the American Medical Association. She spent a large amount of her time at Northwest Community Hospital in the nearby suburb, Arlington Heights. It was also in Arlington Heights that she discovered fire captain Jack Benson had also been pushing for more advanced pre-hospital care.

But Mrs. Schwettman’s inquiries were not limited to local resources. She was soon contacting many of the paramedic programs that were beginning around the country. As she began to compare the systems from across the nation to the resources her community possessed, it was determined that a multi-community EMS system would work best for the northwest suburbs of Chicago.

Two months after first seeing Dr. Warren’s interview, Janet Schwettman was presenting her own mobile coronary care unit proposal to the Inverness Village Board. On January 4, 1972, local newspapers ran an editorial, “…[urging] that the mobile coronary care concept be seriously considered for 15 communities in the area.” Soon, Mrs. Schwettman’s mailbox was being filled with articles, letters of encouragement, and private donations to her cause.

On January 12, Schwettman first met with Dr. Stanley Zydlo, who shared her zealous pursuit of a MCCU. Dr. Zydlo would prove to be invaluable in the position of liaison between Schwettman and the hospital’s administrators and physicians. Over the next two months, Mrs. Schwettman made similar presentations to six other nearby towns. The city of Rolling Meadows
even responded by immediately instituting the program with the instant authorization of funds.

In spite of the city board’s fervor on the issue, Rolling Meadows Fire Chief Thomas Fogarty favored a five-year plan for implementation of pre-hospital advanced life support. In August of 1973, Fogarty suffered a cardiac arrest in his home. His life was quickly and deftly saved by Rolling Meadows paramedics. After rehabilitation, Fogarty reversed his position on the swift implementation of the program and went on to advocate for ALS programs.

In the town of Hoffman Estates, doubt on the issue was introduced by a board member while debates were raging on whether or not to institute a mobile coronary care program. The hesitation arose from Janet Schwettman having no medical background. After voting, the issue was turned down by a seven to five count.

However, before the meeting was drawn to a close, the board member who had originally cast doubt on the issue began to complain of chest pain. He was driven to the local hospital where he was diagnosed with simple indigestion. Conversing with his doctor, he attempted to find reason for his illness,

“He explained the probable source to his doctor. ‘Some damn fool woman is running around getting people to vote village money for some mobile heart thing,’ he told the physician. ‘How did you vote?’ asked the doctor. ‘I voted no!’ replied the trustee adamantly. The doctor sighed before replying. ‘My friend, what you voted against might have been needed to save your life. Let me
explain a few things to you.” 14

The board member then called his associates before the meeting ended and changed his vote to yes, tying the issue six votes to six. With the board members unable to reach a decision, the mayor of Hoffman Estates stepped in and the issue passed.

But despite approval and cooperation from town boards, physicians at Northwest Community Hospital were less than enthused with the idea of advanced pre-hospital care. On February 21, 1972, the Department of Internal Medicine at Northwest Community voted not to participate in the mobile intensive care program. Two days later, Dr. Zydlo took a leave of absence from his practice to fully commit himself to designing a paramedic training program. Due to Zydlo’s adamant support, the medical staff at Northwest Community Hospital reversed their opinion a week later and agreed to the program.

Janet Schwettman’s cause had garnered national notice. She was soon receiving personal phone calls and advice from Dr. William Grace of New York and Dr. Eugene Nagel of Miami, while also being invited as a guest to the annual meeting of the American College of Cardiology. The project moved ahead as Northwest Community Hospital committed itself to serve as the training center, and Dr. Zydlo was named director of training for the program.

On March 24, 1972, letters were sent to local fire departments and private ambulance services concerning the paramedic training program and asking that the hospital be contacted with the names of personnel to be in attendance. “Within days, 218 trainees from seventeen communities had committed to the program.” 14
April 3, 1972, six months after Schwettman’s crusade began, saw the first 64 paramedic trainees arrive for class at the Arlington Heights fire station. With the program well underway, Schwettman and company ran into legal problems. A local newspaper pointed out that the Illinois Medical Practice Act did not authorize paramedics to administer medications or operate defibrillators. Many of the fire departments threatened to full their men out of the program if legal authority was not established.

After contacting both Governor Richard Ogilvie and Senator John Graham, Mrs. Schwettman learned that she would need the unanimous support of, “…the Illinois State Medical Society, the Illinois Nurses Association, the State Hospital Association, the Chicago Board of Health, and the Illinois Department of Public Health.” After quickly receiving backing from each group, it was decided that Illinois’s legislation would be modeled after California’s Wedworth-Townsend Act.

But the Illinois Nurses Association soon rescinded their support for such legislation. And, on May 30, 1972, both Schwettman and Zydlo were present in Springfield, Illinois to testify on behalf of their cause. Senate Bill 1571 passed with a 35 to 2 majority. After months of planning and preparation by the State Department of Public Health, which now had the responsibility of certifying and testing paramedic candidates, the northwest suburbs of Chicago saw paramedic-level pre-hospital services go live on December 1, 1972. Studies would conclusively show that the paramedical systems in place in the Chicago suburbs were extremely successful. It was shown that, in specific communities, the mortality rate from heart attacks
dropped from 41 percent to just 23 percent\textsuperscript{33}.

Grand Rapids, Michigan would prove to be an unlikely site for a unique paramedical program. Dr. C. Mark Vasu, a cardiologist with several years of CPR instruction experience, set into action a program that would take paramedics out of the realm of fire departments and rescue squads.

Vasu was committed to advancing the skills of ambulance personnel for both trauma and medical care. But, instead of approaching the ambulance services, he went straight to Bill Johnson, Chief of the Grand Rapids Police Department.

Without first asking area physicians, Dr. Vasu proposed that physicians would ride on a police “ambulance” (little more than a converted station wagon) on a volunteer basis. These volunteer physicians would be available twelve hours a night for two weeks straight.

After approval from the chief, Vasu set out to find the volunteers he had promised. Luckily, 35 physicians offered their assistance. Soon, physicians were equipping their personal vehicles and labeling themselves as the “crash squad.” These doctors were, “…available for free-of-charge medical duty at the scene of emergencies.”\textsuperscript{14} at a moments notice.

It soon became apparent that the physicians could not do everything themselves. They soon recruited police officers to enter into a training program to learn basic medical skills. And, by 1971, it was agreed upon to officially train these new personnel, known as “medi-cops”, to the paramedic level.

But Grand Rapids was not the only area of the country employing police officers as
Paramedics. In Louisville, Kentucky, Mayor Harvey Sloan, also a physician, had brought EMS to the forefront of public concern. In 1973, Jefferson County was awarded a federally-funded ambulance, which was put into service through the police department as a dual-role patrol/ambulance unit.

Due to the tremendous success of the first unit, “eleven additional modular ambulances were ordered, [and] 48 police officers were trained as EMTs.”¹⁴ Soon, the Jefferson County Police Department’s patrol ambulances were serving the entirety of the county and the County Police Emergency Medical Squad had been formed.

By the mid-1970s, there were nearly 150 EMT-trained police officers and a dozen officers at the paramedic level. The paramedic officers were issued personal squad cars that were specially equipped for their dual-role duties. And by 1977, the County Police Emergency Medical Squad was answering more than 14,000 calls annually and employed nine EMT-trained dispatchers in conjunction with their field personnel.

Due to immense growth of the city and county, medical calls increased, and the Jefferson County Police Department could no longer provide paramedic services for Louisville. So, instead of attempting to force the Louisville Fire Department to implement an EMS system for the city, Mayor Sloan created an entirely new agency. This new municipal agency would be solely responsible for paramedic-level pre-hospital service to the city of Louisville. The city also contracted with the University of Louisville to conduct paramedic for the new department.

Today, the Louisville Metro Emergency Medical Service provides paramedic service...
throughout the Louisville metro area. Working closely with other county and city agencies, Louisville EMS has proven itself an impressive system.

**1980s**

By 1980, there were as many as 30,000 certified paramedics operating throughout the nation. EMS systems had been receiving large amounts of federal funding to institute paramedical programs in their coverage areas and numerous studies had proven their efficacy in the pre-hospital setting. One study stated that when operating under established protocols in the field, independent paramedics were able to, “…perform as well as physician counterparts.” But, despite positive reviews from both the academic community and the public, the federal government would not be a part of paramedical care for long.

The same man who signed California’s Wedworth-Townsend Act into law was now president. When President Ronald Regan, who would later need advanced medical support due to a failed assignation attempt, signed the Omnibus Budget Reconciliation Act of 1981 (Public Law 97-35), he essentially terminated the funding first provided by the EMS Systems Act of 1973. EMS and paramedical funding would now be available in the form of state preventative health and health services block grants. Paramedic programs would now have to compete with rat control and fluoridation programs for federal money.

This act significantly changed the pathway in which federal funds would be administered. Many federal programs, and their subsequent funds, were consolidated into several block
grants. Also, these grants would now be the responsibility of the states, shifting the duty away from national government. This not only substantially diminished the available funds for paramedic programs, but also destroyed the unity in service between states. Individual states now had opportunity to create their own policies and services while determining where funds would be allocated. Of the nine available block grants, only four related to health services and the act would only, “[Authorize] appropriations through fiscal year 1984.”

While there was widespread panic that advanced life support programs would not survive past the termination of federal funding, “…the funds were never intended to pay for the direct delivery of emergency care or transportation.” Federal funds had been dispersed in order to establish paramedical programs. Continued funding to cover operational costs had been the responsibility of local entities from the start. By 1986, there were nearly 16,000 ambulance services operating throughout the country. Some areas were better served than others, as Washington D.C. embarrassingly had one ambulance for every 20,000 people of its population, while similarly urbanized states like New York boasted one per every 5,000.

When the Department of Health, Education, and Welfare became the Department of Health and Human Services, the Division of Emergency Medical Services was dissolved. The Department of Transportation’s National Highway Traffic and Safety Administration however, “…would not lose its monies for highway and traffic safety, and regained its role as the federal government’s lead agency for EMS [system] development.” With its reclaimed authority, NHTSA contracted with a nonprofit organization in 1984 to institute nationwide standards for
paramedical pre-hospital care. Although the American Society for Testing and Materials established several voluntary standards, widespread acceptance was never obtained, and the project proved to be futile.

As requested by the Department of Transportation and U.S. Congress, the National Academy of Sciences published *Injury in America: A Continuing Public Health Problem* in 1985. The report was to be an analysis of the progress made in the twenty years since their 1966 study *Accidental Death and Disability: the Neglected Diseases of Modern Society*. The report submitted by the Academy posed a serious question for pre-hospital providers, “…should paramedics be trained to intubate a patient, start intravenous fluids, and give medications?”

Later, in 1986, Senators Alan Cranston and Edward Kennedy requested that a study be done to determine the effectiveness of transition of paramedical systems from federal to state leadership. The General Accounting Office’s report *States Assume Leadership Role in Providing Emergency Medical Services* found that the transition had been less than desirable and that, “certain federal actions…could help enhance state and local leadership efforts.”

The 1980s also saw federal focus change from local paramedical care to large-scale disaster planning by establishing the National Disaster Medical System. This system would ensure that paramedics, and other health care providers, were readily available in case of national disaster. Paramedical pre-hospital care had improved dramatically in the last twenty years, but, “emergency medical care systems in metropolitan areas can now handle
multiple-casualty incidents involving dozens of victims but are seldom prepared for larger numbers.” The National Disaster Medical System, however, planned for natural or accidental disaster such as, “an earthquake, a technologic disaster...or some other kind of public health emergency,” and not for the mass-casualty events that would be seen in the decades to come.

President Reagan began the development of the nationwide system on December 29, 1981 by establishing the Emergency Mobilization Preparedness Board. The Board coordinated efforts of twenty-two federal agencies, including the Department of Health and Human Services and the Federal Emergency Management Agency, and established three main objectives of the national system:

1. To provide assistance to a disaster area in the form of medical assistance teams, supplies, and equipment.
2. To evacuate patients who cannot be cared for in an affected area to designated locations elsewhere in the nation.
3. To provide hospitalization in a national network of hospitals that have agreed to accept patients in the event of a national emergency.

Paramedical care would fall under the system’s first objective and, under the provisions of the National Disaster Medical System, paramedics would provide field rescue, first aid, triage, medical stabilization, and temporary care. Due to these provisions, the first Disaster Medical Assistance Teams (DMATs) were formed.

But there was extensive criticism of National Disaster Medical System. It was noted that, “…with no single federal agency in charge, [the NDMS] would likely result in fragmented leadership and would not respond rapidly enough…” Also, the goal for deployment teams to
be on scene within twelve hours of notification, “…would be impossible to meet…due to inadequate federal resources being applied to teams.”45 But multiple system weaknesses would be addressed through trial and error. And, the system would be truly tested at the turn of the millennium.

Paramedics in the 1980s also were given a helping hand in the form of pre-arrival instructions. The Phoenix Fire Department had proven the effectiveness of EMT-trained dispatchers giving medical instructions over the phone to civilian callers. By the end of the decade, hundreds of pre-arrival instruction programs had been established. These new personnel, emergency medical dispatchers, were bridging the gap between the placement of the call, and the arrival of paramedical personnel. As more and more data streamed into research centers, it was stated that, “the provision of pre-arrival instructions is not only appropriate but necessary…”46

Subsequent studies unequivocally proved the benefits of emergency medical dispatch. In London, England, London Ambulance Service’s Advanced Medical Priority Dispatch System resulted in a, “…200% rise in the number of patients accurately identified as suffering from cardiac arrest.”47 Emergency medical dispatch also served a second purpose; triage. With the advent of medically trained dispatchers, paramedic units could now be saved for high-priority calls. Prospective studies proved the effectiveness of EMD as, “implementation of an EMD system significantly decreased inappropriate ALS dispatching…”48

Paramedics began taking to the sky as air ambulance services flourished in the 1980s.
Civilian aeromedical transport had begun in 1972 in Denver, Colorado. The city was bidding to host the 1976 Winter Olympics when it recognized a significant problem. While the Rocky Mountains provided a perfect venue for sporting events, the nature of the terrain prohibited timely access to a life-threatening event. To solve this problem, Saint Anthony’s Hospital in Denver established a medical helicopter program. Flight for Life began operations in late 1972. It was not only the first hospital-based helicopter program, but the nation’s first civilian aeromedical service. By 1994, there were 260 helicopter services throughout the country, answering nearly 25,000 calls annually.

The aeromedical industry would soon come under fire. Because aeronautical accidents are exponentially more visible to the public, and the media, than are ground vehicle accidents, questions began to be asked. Inquiries into the safety and actual need of air ambulances were nationally broadcast as the industry fought to defend itself.

1990s

The 1990s began with significant federal legislation. The Trauma Care Systems Planning and Developmental Act of 1990 (Public Law 101-590) was signed into law in order to improve trauma care and pre-hospital medical services. The act required that all states, “…adopt standards for the designation of trauma centers, and for triage, transfer, and transportation policies.”

Over the next three years, the act would provide over $60 million for the stipulated
advancements in emergency care. However, federal funding would once again come to an abrupt end in 1995 as Congress failed to reauthorize the act.

As funding for paramedical care continued to be the responsibility of state or local government, new taxes and support systems had been established. But the state of Virginia stood out in their statewide support of advanced life support programs. The state’s One for Life Program, “…added one dollar to its vehicle registration fee and earmarked the new revenue for EMS development.” Similar programs have been instituted in various states for the same purpose of continued support for pre-hospital medical care development.

By 1993, there were over 3,300 paramedic-level ambulance services functioning across the country. And, as in 1985, the National Academy of Sciences produced another analysis of injury-prevention progress in the United States. This 30-year analysis, Reducing the Burden of Injury: Advancing Prevention and Treatment, was published in 1999. The report focused heavily on trauma care systems throughout the nation and commented on the importance of early paramedical intervention, stating that, “prehospital care is the gateway to the trauma care system and a major determinant of patient outcome.”

As with the boom in air ambulance service throughout the country in the 1980s, paramedics took on a new role in the 1990s; they became armed. Tactical EMS had grown out of Los Angeles County Sheriff’s Department after Governor Reagan signed the Wedworth-Townsend Act into law. After training officers as paramedics, advanced life support was readily available on SWAT missions.
But, it wasn’t until 1989 that national attention would be paid to these “tactical paramedics” when the National Tactical Officers’ Association and the Los Angeles Sheriff’s Department co-hosted the first national tactical EMS conference. The conference was repeated a year later in Tucson, Arizona. It would be in Tucson that Joshua Vayer of the U.S. Department of Defense would unveil the new federally funded Counter Narcotics Tactical Operations Medical Support (CONTOMS) program.

The CONTOMS program would be housed in the Uniformed Services University of Health Sciences, the Department of Defense’s medical school. The program was presented with three distinct objectives in mind:

1. Establish a standardized tactical EMS curriculum and certification process that is consistent nationwide.
2. Collect and analyze data to ensure the curriculum is up to date, based on science and appropriate to the tactical environment.
3. Provide consultation to public safety agencies for operational and long-term planning.\(^5\)

The first CONTOMS class was conducted in New York City and attended by about 200 students. The course ran 58 hours and yielded an EMT-Tactical certification, good for three years. In addition to special medical training, the course covered various subjects as, “…the dangers of drug labs, mission planning, uses of air support, ballistics, team-member wellness, environmental issues like heat and cold, preventative medicine…[even] foot care and dental emergencies.”\(^5\)

The tactical paramedic would differ greatly from a regular paramedic. In addition to special medical training, their medical equipment would vary. The equipment would have to be lightweight and easily accessible as, “…tactical EMS personnel must be capable of moving in a
stealthy manner, using cover and concealment, or running at full speed…”54. With the expanding nature of tactical medicine, it has even been shown that physicians should be closely involved as, “physician-level medical support can be extremely effective…to the tactical setting.”55

The public’s first glimpses of tactical medicine and violence towards paramedics would come with two tragedies. The first would begin with California Highway Patrol officers pursuing a speeding vehicle on March 3, 1991. The subsequent arrest, caught on videotape, and acquittal of those involved led to widespread violence in south-central Los Angeles on April 29, 1992. The city’s police and fire departments would have to work closely with 411 paramedics to quell the disturbance.

As calls for emergency assistance increased, Los Angeles ambulances found that they required police escort to reach patients. Many patients, “…gave up and drove to the hospital themselves, either because they’d been unable to reach a dispatcher, or because no ambulance ever arrived.”56

Even before the riots got underway in Los Angeles, it was standard procedure for all paramedics to wear body armor when venturing into hostile neighborhoods. The civil unrest exacerbated tensions between the general public and emergency workers as, “there were more than 12 documented attempts to kill paramedics in just the first three hours of the riots.”56

In the following years, violence towards emergency workers came to be more widely recognized. Many larger EMS systems began, “…[issuing] ballistic vests and jackets.”57 The escalating violence would again become a national issue on April 20, 1999. It was on that day
that two students at Columbine High School in Littleton, Colorado, “…attacked their school using semiautomatic weapons and nearly 100 improvised incendiary and explosive devices.”

But, aggression towards their fellow students was not the only objective for the day. A majority of the explosive devices were intended to “inflict damage…on responding emergency personnel.” As paramedics arrived on scene before the termination of the attack, they were thrown into the heat of battle. The two assailants, “…fired out windows at paramedics who were attempting to rescue victims lying just outside the cafeteria.”

September 11, 2001 would put the National Disaster Medical System, created nearly twenty years prior, to the test. As two commercial jet airplanes collided into the World Trade Center towers, New York City Fire Department (FDNY) paramedics responded instantly as, “the FDNY response began within five seconds of the crash.” And within minutes, U.S. Secretary of Health and Human Services Tommy Thompson had, “…ordered the first nationwide activation of the National Disaster Medical System.” This order put 80 Disaster Medical Assistance Teams (DMATs) on alert across the country.

Created with the National Disaster Medical System, these special teams consisted of paramedics, nurses, and other medical and support personnel. These personnel are trained to mobilize immediately upon activation. The first deployment consisted of five DMATs, consisting of 211 health care personnel.

While firefighters ascended flights of stairs to scout and determine the severity of the building fires, paramedics set up four triage areas around the perimeter of the towers, while
some “entered the lobby to respond to specific casualty reports.” These actions continued while New York City’s Police Department Aviation Unit advised that a rooftop rescue mission was not possible.

As 9-1-1 calls inundated city dispatch centers, communications broke down between emergency personnel as, “people watching on TV certainly had more knowledge of what was happening…” Emergency responses became scattered and unorganized and battalion chiefs were unable to communicate over their radios. To add to the confusion, New York City contracted out with St. Vincent’s Hospital to provide paramedic ambulance service to Lower Manhattan. St. Vincent’s service, along with other ambulance personnel could not communicate with FDNY officials. It was later stated that, “…there was no real central command…everyone was on their own.” and that the response, “…was necessarily improvised.”

Just before 10:00am, a FDNY paramedic, “…approached the FDNY Chief of Department and advised that an engineer…remarked that the Twin Towers in fact were in imminent danger of a total collapse.” The prophetic report was realized within minutes.

The response at the Pentagon was vastly different than that in New York City. Deemed as nearly perfect, the emergency response brought together many agencies and maintained a strong, identifiable central incident command. One reason for this lies in the fact that the agencies involved had a history of working and training together. In fact, most of the departments involved had recently completed public safety preparations for the annual meeting of the International Monetary Fund and the World Bank, to be held later that month.
Private Organizations

In conjunction with federal and local support, many private organizations contributed to the advancement of paramedicine throughout the nation. In 1970, several pharmaceutical companies joined forces to form a non-profit organization to, “…promote the national development of MCCU programs such as those in Miami, Columbus, and Seattle.” The organization would be called the ACT (Advanced Coronary Treatment) Foundation. This was to be the first national organization created solely to promote paramedic-level pre-hospital care.

The ACT Foundation’s first public education campaign was the production of the film A Life on the Line. The film highlighted the progress and achievements of paramedic programs in Los Angeles, Seattle, and Columbus. The film was offered on a free loan basis to schools, local governments, and community organizations. But soon, “…demand for the film outstripped supply…” A Life on the Line won its first award in an international film festival in 1972. The film was awarded the festival’s top award by the Council on International Nontheatrical Events.

The ACT Foundation also approached public education through printed materials. Their first booklet, entitled Let Us Do Something, echoed the information in A Life on the Line. With their successes well documented, the foundation produced a highly professional publication named Saving Lives with Emergency Coronary Care. The 68-page booklet was tremendously popular as, “more than 15,000 copies were distributed through the first and second editions.” Recognizing change in paramedical care throughout the country, the ACT
The Robert Wood Johnson Foundation, founded in 1972, was created at the request of Robert Wood Johnson, who had left $1.2 billion from Johnson & Johnson stock upon his death.

David Rogers, dean of Johns Hopkins University’s medical school, was named the first president of the foundation. Rogers sent out a national survey to determine what Americans thought was lacking in medical care. Upon return of the surveys, Rogers and the foundation saw that there was deep concern about receiving medical help when it was needed. It was then that the Robert Wood Johnson Foundation focused its attention on pre-hospital medical care.

On April 9, 1973, The foundation teamed up with Yale University and provided $15 million to create more advanced EMS and communication systems. The foundation would later provide 1,100 awards between 1972 and 1978, totaling $318.5 million. With such large amounts of money being freely dispersed, the foundation set strict guidelines and requirements to be instituted within a year of receipt of an award. These requirements were:

1. Central and immediate citizen access to the emergency medical system.
2. Central control of communications with a single regional institution assigned responsibility for dispatch and coordination of emergency medical vehicles and services and for collection of data necessary for effective internal management and monitoring of the system.
3. Prompt central medical dispatching of appropriate emergency care to the scene of the emergency and direction of patients to appropriate medical facilities.
4. Prompt and appropriate emergency system capacity, meaning 24-hour availability of properly designed and equipped vehicles staffed by trained emergency medical technicians, adequately staffed and equipped 24-hour hospital or clinic emergency department capability, with substantive progress toward regionalization and
categorization; adequate communications equipment for transmission of voice information between hospitals, ambulances and the central medical emergency dispatcher.

5. Access to adequate radio channels and telephone lines for a comprehensive emergency medical services systems.

6. Assurance that after the two years of support, the program would become self-sufficient, with its subsequent operational expenditures becoming part of the budgets of the applicant or other agencies.\(^{63}\)

The requirements set by the Robert Wood Johnson Foundation represented the first time that any organization, federal or private, had set a complete definition of what an EMS system should entail. In addition to providing free money, the foundation, “…sponsored workshops, offered low-cost technical assistance on communications issues, and provided guidance on dealing with the Federal Communications Commission.”\(^{64}\) Recipients of awards were also brought together on an annual basis to meet and discuss progress made.

The Robert Wood Johnson Foundation provided seed money for numerous advancements in paramedical care throughout the nation. Before the initiation of the foundation’s program, only 2 percent of ambulance services had radios in all their vehicles. When the program ended in 1978, 75 percent had radios in all their ambulances\(^ {64}\).

In the late months of 1969, working on the recommendations put forth by the President’s Committee on Highway Traffic Safety, the American Medical Association’ Commission on EMS created a task force to study the viability of a National Registry of EMTs. At the time, most states had no formal certification or licensure procedures. So, the new organization would fulfill the Committee’s advice to create a national certifying agency for pre-hospital providers across the nation. This new non-governmental agency would be
January 21, 1970 saw the task force call its first meeting. Invited to this meeting were several organizations involved in emergency medical services at the time. These participating organizations were:

- Ambulance Association of America
- International Association of Fire Chiefs
- International Rescue and First Aid Association
- National Ambulance and Medical Services Association
- National Forest Service
- National Funeral Directors Association
- National Park Service
- National Safety Council
- National Ski Patrol
- American Heart Association
- International Association of Chiefs of Police

On June 4, 1970, the first meeting of the Board of Directors of the National Registry of Emergency Medical Technicians (NREMT) was convened and named Roddy Brandes as Chairman. Rocco Morando was later named the first Executive Director in 1971. That same year, the first National Registry EMT-Ambulance exam was administered concurrently to 1,520 ambulance personnel at 51 separate test sites throughout the country.

The NREMT would later call together paramedical leaders from across the nation to help develop a set of guidelines for a national EMT-Paramedic curriculum. This led to paramedic written and practical examinations to be developed by the University of Kansas. And, in 1978, the first NREMT-Paramedic exam was successfully administered in Minneapolis, Minnesota.
The National Registry of EMTs only grew from there. Eventually setting up headquarters in Columbus, Ohio, the NREMT grew in power and influence. The U.S. Department of Defense would require that all EMTs in the military obtain National Registration. Continuing governmental cooperation, the organization collaborated with the U.S. Department of Transportation to revise key curricula in pre-hospital education. Today, NREMT exams are used by 46 U.S. states and territories as, “...the sole basis for certification at one or more levels.”

In 1975, Rocco Morando and the National Registry of EMTs called a meeting of the state EMT organizations of Massachusetts, Colorado, Florida, Oregon, North Carolina, New Hampshire, Maine, Tennessee and Illinois. The purpose of the meeting was to determine whether or not a national association representing EMTs was feasible.

The idea was deemed practical and Roger Fox, from the Oregon state EMS office, was named the first president of the National Association of EMTs (NAEMT). By the end on 1978, “...the organization had more than 15,500 paid members in 25 affiliated state EMT associations, 200 chapters and three national divisions.” The NAEMT worked in areas of EMS where the NREMT could not focus fully. The association began offering lectures and organizing special conferences. By 1980, single lectures were drawing up to 300 participants.

The NAEMT would go on to develop the popular Prehospital Trauma Life Support (PHTLS) training program, used extensively by U.S. military personnel. The association would also later offer the Advanced Medical Life Support (AMLS) and the Pediatric Prehospital Care
Educational Advances

Until the early 1970s, the American Red Cross’s Advanced First Aid course was the gold standard of ambulance personnel training. While many ambulance attendants were trained in first aid, many were not, as there was no set standard of training nationwide. It was also somewhat of a contradiction for ambulance personnel to be trained with the Red Cross’s manual. The manuals stated, “…what should be done ‘until the ambulance arrives’ yet these very manuals were the ones being used to train the ambulance personnel.”

The National Academy of Sciences’ publication Accidental Death and Disability: The Neglected Disease of Modern Society was the first to expose the shortcomings of current education and training of pre-hospital medical providers. This led to the publication of Training of Ambulance Personnel and Others Responsible for Emergency Care of the Sick and Injured at the Scene and During Transport in 1969. This report outlined specific topics that should be covered while training ambulance personnel and also recommended the creation of a national standard curriculum.

At the same time, the U.S. Department of Transportation developed a national training curriculum for emergency medical technicians. In 1970, the 81-hour course was adopted as the first EMT-Ambulance (the title was later changed to EMT-Basic) National Standard Curriculum. This laid the foundation for later EMT-Intermediate and EMT-Paramedic standard
curricula. Although the new training regimens were thought of as vast improvements in patient care, many officials saw it as, “…too complex and too long.” and vehemently resisted the new educational criteria.

In the 1980s, various organizations began identifying weaknesses in paramedical training programs. These recognized shortcomings would lead to several specialized training courses. The first such course to be established was administered through the American Heart Association and titled Advanced Cardiac Life Support. This was followed by Basic Trauma Life Support, Advanced Trauma Life Support, Prehospital Trauma Life Support, Pediatric Advanced Life Support, and Advanced Pediatric Life Support. All courses were, and still are, administered through differing agencies and organizations.

In 1990, the National Highway Traffic Safety Administration produced the National Emergency Medical Services Education and Practice Blueprint. The Blueprint distinguished four levels of pre-hospital provider: first responder, EMT-Basic, EMT-Intermediate, and EMT-Paramedic. It also identified sixteen elements common with all four levels: patient assessment, airway, breathing, circulation, musculoskeletal, OB/GYN, behavioral, medication administration, neurological, environmental, EMS systems, ethical/legal, communications, documentation, safety, and triage/transportation.

In addition to the Blueprint, the National EMS Core Content and the National EMS Scope of Practice were established to present a “…broad overview of what an EMS provider must know and be able to do.” The core content and the scope of practice together formed the
National EMS Education Standards. These education standards set the minimal competency objectives for students at the completion of their training at each provider level.

The American Medical Association (AMA) officially recognized “paramedic” as an allied health occupation in 1975. As the number of paramedic and EMT programs grew rapidly, the need arose for some form of accreditation. And, in 1976, the AMA formed the Joint Review Committee on Educational Programs for the EMT-Paramedic (JRCEMT-P). This would lead to the formation of the Committee on Accreditation of Emergency Medical Services Professions (CoAEMSP) in 2000. The CoAEMSP would also begin accrediting all EMS programs, not only paramedic-level courses.

As for paramedic education, higher level educational institutions had moved to the forefront of paramedic instruction. As educational standards increase, it has been shown that paramedic candidates who perform better in high school perform significantly better on certifying exams. While programs are still offered through hospitals and fire departments, associate’s degree and bachelor’s degree level education have become increasingly popular. And with, “…some states, such as Florida, paramedic education must take place at the community college level.” There are also fourteen universities and colleges now offering four-year, baccalaureate-level paramedic education.

Hollywood

May 11, 1971 marked the day in which national public perception of the paramedical
concept would change greatly. Dick Friend, the public information officer for the Los Angeles County Fire Department, received a phone call from a television producer, Robert Cinader.

Cinader, who was currently working with Jack Webb, informed Friend that NBC was interested in developing a program that would focus on rescue operations. Dick Friend referred Cinader to Captain Jim Page for technical research and consultation. Page was soon committed to creating numerous scenarios for review by Webb and Cinader. But, “there were only so many kinds of cave-ins, building collapses and similar calamities that could be depicted without encountering potentially boring similarities.”

It was at this time that Page was promoted to the rank of battalion chief and reassigned to the south Los Angeles area. This meant that Page would now have two of the three paramedic units operated by the county under his command. Facing the possibility of monotonous physical rescue scenarios on television week after week, Page recommended that the proposed program also focus on paramedics.

One week after the paramedic suggestion, Page received a phone call from Cinader. The purpose of the call was to inform Page that, “…serious consideration [was] being given to a one-hour program (the first 30 minutes involving [LA County] paramedics and the second 30 minutes involving action in the hospital).” Cinader also expressed great interest in riding with Los Angeles County paramedics in order to gain a deeper knowledge of their profession.

In August of 1971, NBC and Jack Webb entered into an agreement to produce a single two-hour television movie. Los Angeles County Fire Station 127 was chosen to become the
central building of the show, as the area was picturesque and the station fairly new. For the program, the station would be numbered 51. And Harbor General Hospital (now Harbor UCLA Medical Center) was chosen to become Rampart Hospital.

As the script for the two-hour movie premier was nearing completion, Jack Webb learned that he would be granted permission to follow the movie with six one-hour episodes. The cast was set with Julie London, Bobby Troup, Robert Fuller, Randolph Mantooth, and Kevin Tighe playing the primary characters.

During the development of the scripts, Page was very critical of numerous details. The Los Angeles County Fire Department had built itself an impressive reputation for professionalism and conduct. Anything that strayed from the department’s conduct procedures or protocols were taken from the script at the vehement request of Page. It was also decided that any fire vehicle driven in the program would be driven by actual Los Angeles County firefighters, while “dispatching” would be done by a real dispatcher.

While preparations were being made, both Mantooth and Tighe rode along with paramedics on Rescue Squad 36 to orient themselves to the tasks they would be performing. Filming progressed and Emergency! soon became a household name.

The show ran until 1977 and aired 132 one-hour episodes. Although the affect of the show can never be determined, “…paramedic-level services were first initiated in no less than 24 states during the 1973-1974 period.”

Looking Towards the Future
“Great medical breakthroughs were accomplished without the slightest idea of what was being broken through.” Like the conquest of scurvy and smallpox, paramedical care on a national scale was purely inadvertent. Numerous paramedic systems sprang up throughout the United States without the slightest bit of shared information. Drs. Nagel, Warren, and Cobb were all working with their paramedics without any knowledge of similar systems for a number of years.

Since the mid-1960s, the face of pre-hospital emergency medical care has changed dramatically. Advanced-level care became the domain of civilian ambulance personnel as they proved that sophisticated medical care could be, “…accomplished by non-physician personnel acting under medical guidance.” These new “paramedics” had proven themselves worthy. Ambulance defibrillation was demonstrated to be efficacious in numerous locales. The paramedic concept soon caught hold of the public’s attention and only grew from there.

As the paramedic scope of practice continues to expand, these advanced pre-hospital medical providers will find themselves practicing in new arenas of the medical profession. Paramedics are even being considered to conduct home visits to provide routine medical care. And, as educational requirements advance, the profession of paramedicine will only progress. Attention will be more focused on schooling and personal attributes.

Pre-hospital paramedical care has advanced far beyond the expectations of the early pioneers. Once limited to cardiac medical care, paramedic skills have been enhanced to manage virtually any emergency situation. Present day paramedics have become highly-trained health
care professionals dedicated to providing the best possible medical care in the worst situations.

And the country has benefited greatly from their passionate care.
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