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Literature review

From stretcher bearer to practitioner: A brief narrative review of the history of the Anglo-American paramedic system

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ABSTRACT

Background: This narrative review presents a brief chronological history of the Anglo-American paramedic system, combining decades of stories from across ambulance services in western, English-speaking developed countries

Methods: Databases, including Embase, MEDLINE, Web of Science, CINAHL and Google Scholar were searched from the inception of the databases. A grey literature search strategy was conducted to identify non-indexed relevant literature along with forwards and backwards searching of citations and references of included studies. Two reviewers undertook title and abstract screening, followed by full-text screening. Included studies were summarised using narrative synthesis structured around the exploration of the history of the Anglo-American paramedic system.

Results: The research team structured the narrative in chronological order and used metaphorical models based on philosophical underpinnings to describe in detail each era of paramedicine. The narrative explores several key milestones including, industrial orientation, scope of practice, innovation, education and training, regulation as well as significant clinical and technological advancements in the delivery of traditional and non-traditional paramedic care to patients.

Conclusions: Paramedicine, like other allied health professions, has successfully navigated the pathway toward professionalisation in a considerably short period of time. From its noble beginnings as stretcher bearers in times of war, the profession has looked outwards to emulate the success of our healthcare colleagues in establishing its own unique body of knowledge supported by strong clinical governance, national registration, professional regulatory boards, self-regulation, and a move towards higher education supported by the development of entry-to-practice degrees. Whilst the profession has achieved many great milestones, their application across multiple jurisdictions within the Anglo-American paramedic system remains inconsistent, and more research is needed to explore why this is.

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Preface

This brief narrative review of the history of the Anglo-American paramedic system was the first step in a larger research series exploring the origin, present state, and modernisation of the Anglo-American paramedic system. Our research team acknowledges that as academics, we often play a role in shaping modern history and so the story of the birth of the Anglo-American paramedic system is expressed here as a vital step in the process of reimagining the future design of this system of care.

To understand where you are going, you must first know where you came from.

Introduction

Since 1960s, the model of scheduled and unscheduled health care delivery in the out of hospital environment evolved around two main systems of practice with distinct features. These are the Franco-German and Anglo-American models. The Franco-German model, largely found in Europe, is based on "delay and treat" model of care delivered by a combination of physicians, nurses and paramedics [1–3]. The Anglo-American paramedic system is predominantly found in English-speaking western nations [4,5], and staffed by paramedics as the primary level of care givers. Whilst this introduction provides a simplified description of each system, the story of the modern Anglo-American ambulance service is far more complex, interconnected and yet divided all at the same time.

Objectives

This narrative review presents a brief historical overview of the Anglo-American paramedic system including clinical, operational and educational developments, industrial orientation, scope of practice, the emergence of the autonomous practitioner and legislative oversight. The review was the first step in a wider research project that seeks to map and explore the Anglo-American paramedic system in significant depth in the hope of identifying new systems of practice that better reflect the progressive modernisation of this system of care over the past 70 years.

Methods

A narrative review was considered to be the most appropriate design to address the objectives of this study as the authors did not seek to answer a specific hypothesis. Rather the aim was to provide a brief synthesis of the history of the Anglo-American paramedic system in a condensed format [6,7].

Search strategy

A search strategy using a combination of system descriptors and index terms are listed in Table 1 was conducted in *Embase, MEDLINE, Web of Science, CINAHL and Google Scholar* to ensure that the optimal combination of databases needed to conduct efficient searches in health, public safety and emergency services journals was obtained [8]. All articles were searched dating back to the inception of MEDLINE in an effort to capture all relevant literature. Additionally, one of the authors applied a forwards-backwards search technique of all relevant articles.

Due to the historical nature of this narrative review, it was likely that a great deal of information existed that was not in the scientific literature. Therefore, a thorough search of the grey literature to identify non-indexed articles was performed in Open Grey, Google, and Bing using the same search terms listed in Table 1.

Finally, a small group of experts were invited to review the literature list and to provide comments and feedback on our findings. All searches were conducted by one of the authors and a combination of reference management software, Covidence and Endnote X9 (Clarivate Analytics, PA, USA), were used to store and assess all relevant literature [9,10].

Inclusion criteria

Articles were included if they provided historical information related to the Anglo-American paramedic system which comprised educational developments, industrial orientation, scope of practice, the emergence of the autonomous practitioner and legislative oversight. Results were excluded if they contained superseded reports, or if they only briefly mentioned the above themes.

Source of evidence screening and selection

The selection process was conducted in two stages. First, one reviewer evaluated the title, abstract, or website content for historical content. If the reviewer was uncertain at this stage, the article or website was included. In the second stage, full-text articles were obtained, and two reviewers independently reviewed the articles and websites collected in the first stage. The articles and websites were grouped into three categories: included, excluded, and uncertain. The reviewers then compared the categories to ensure inter-

Table 1
Search strategy including system descriptors that were combined with index terms.

System descriptors	Index terms
Anglo-American EMS system	History
Anglo-American paramedic system	Story
Ambulance	Narrative
Emergency medical services	
EMS	
Emergency medical technician	
EMT	
Paramedic	
Prehospital OR Pre hospital OR Pre-hospital	
Out of hospital	

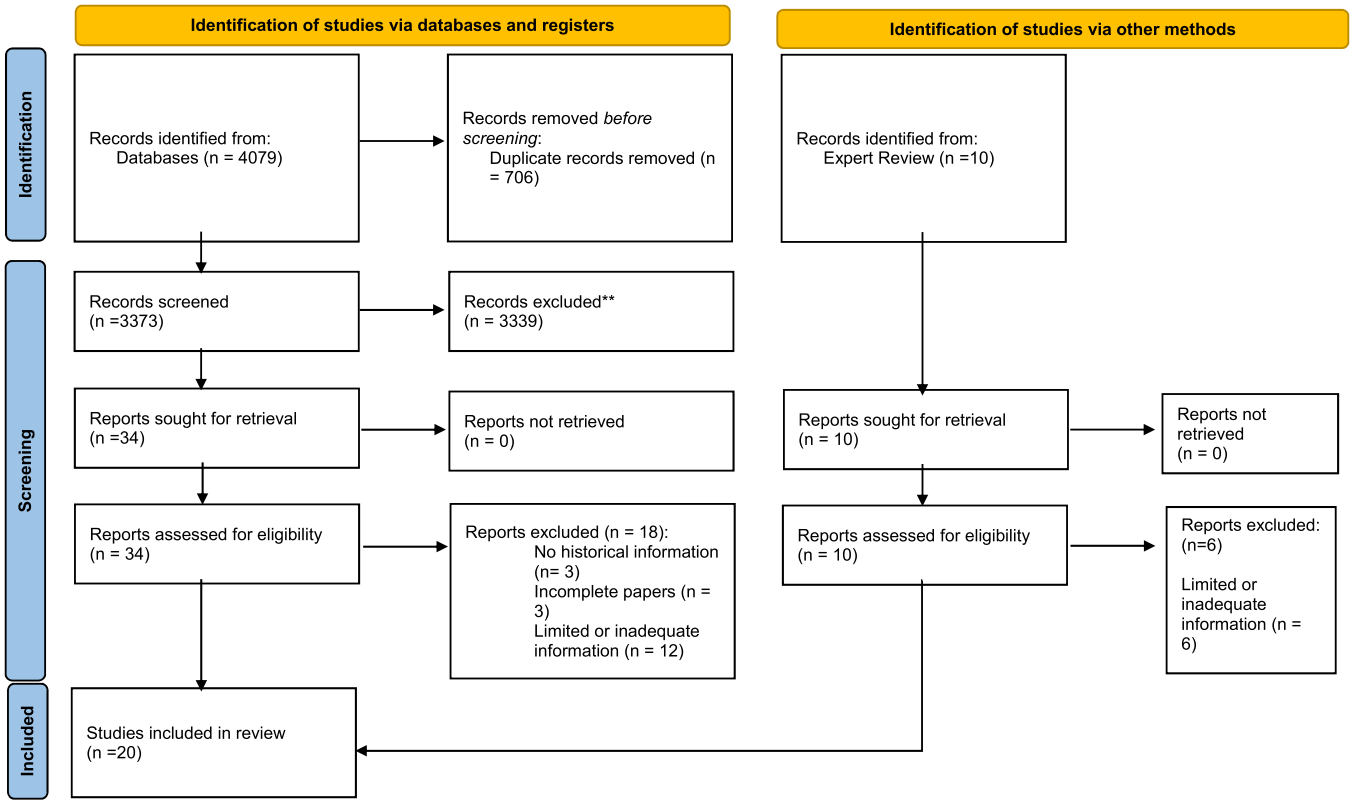

Fig. 1. Search results the PRISMA flow diagram.

rater reliability and validity. Any discrepancies were reviewed by a third reviewer, and a consensus was reached by majority vote.

Results

Search results

A total of 4089 articles were retrieved and reviewed by two independent authors. Our focus was on full text articles describing the history of the Anglo-American paramedic system (Fig. 1). Following removal of duplicates (n = 706) the remaining articles underwent abstract screening (n = 3383) with 20 articles included as part of the narrative synthesis.

Inclusion and presentation of evidence

A narrative analysis was used to report the findings. In the final 20 articles identified, Canada, Australia, New Zealand, the UK, and the U.S. were represented. Publications dates ranged between [1979–2018].

Discussion

The narrative is structured in chronological order and used metaphorical models based on philosophical underpinnings to describe each subsection using two naming conventions. Firstly, an adjective or label to the era was assigned based on the historical evolution of the profession at that time. Secondly, a title for the role of what is now known as the paramedic during each era was assigned that reflected the progression of the occupation.

Acknowledging the complexity of important but brief historical narratives

The history of the Anglo-American paramedic system is immense. Because no one person can possibly consult all these records, no work of history can ever pretend to be comprehensive or universal when compressed into a brief overview presented in a narrative review format. As researchers we must rely on the fragmentary records from the time period under study, which necessarily reveal just part of the story. Our review focuses on a large system, spanning many countries, each with their own unique stories. We acknowledge that subjective decisions must be made about what to include, what to exclude, and how to understand its role in history. No less importantly, it is also controversial, because scholars are bound to disagree with the judgements of other scholars. For these reasons, the guiding principles behind all historical writing must be selection and interpretation: the thoughtful selection of topics and questions that seem most interesting, and the responsible interpretation of sources to construct meaningful arguments. These are the principles we have tried our hardest to adhere to.

Pre 1960's: the war era: the stretcher bearer

Its widely penned that the oldest origins of paramedicine likely begun with Jean Dominique Larrey, Napoleon's chief physician, who organised a system to treat, and transport injured French soldiers [11–13]. During World War I (WWI), western militaries used stretcher bearers and later medics to provide simple interventions to the wounded, a notable example being the Australian medic, John Simpson and his donkey, who ferried injured soldiers from the beach toward strategic evacuation points [14–16]. Interventions and lessons learned in WWI were carried over to World War II (WWII) where military leaders paid more attention to the importance of

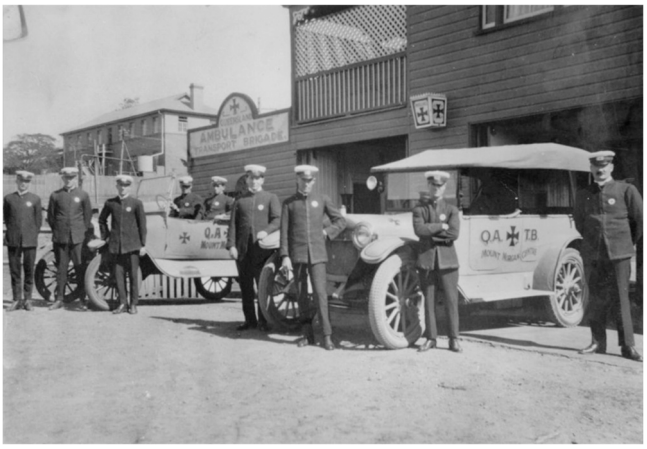

Image 1. Queensland Ambulance Transport Brigade. Reproduced with permission.

Image 2. Early Mobile Intensive Care Ambulance prototype. Reproduced with permission.

minimising the time between injury and the initiation of definitive medical care [17].

In the Korean and Vietnam Wars, the time from injury to the initiation of medical care was further shortened. Surgical care was organised as close to the front line as possible to provide soldiers with quick access to field hospitals [18], and new and innovate forms of transport, in the form of helicopters, enhanced this process allowing for the development of the "golden hour" concept which significantly reduced mortality amongst soldiers [19]. The knowledge, skills, and experiences gained while providing medical assistance to the wounded during these military conflicts accelerated the improvement of emergency care and transport and became a basis for the birth of the first evolution of the modern-day ambulance service.

1960. –1979: the birth of ambulance era: the driver

The modern ambulance service typically consisted of a patchwork of unregulated systems, with services commonly being provided by hospitals, fire departments, industry, volunteer groups, or in some cases undertakers [20]. Although first aid was practiced, the inherent symbolism in the design of early ambulance uniforms (Image 1) attests to the primary function as being that of a driver whose primary role was to 'get' patients to the hospital or medical centre as quickly as possible [21]. Physicians staffed ambulances in rare cases, a sign of early physician dominance to come. However, in most instances the task of transporting patients was left to minimally trained or untrained personnel and was considered to be a low status working class occupation akin to being a 'driver'. The historical significance of the early physician involvement in paramedicine appears to have had a lasting effect on the profession. A recent scoping review noted physician dominance to be a key driver in the divergence of practice and professionalisation status within the Anglo-American paramedic system, particularly in North America [22]. This is in part due to a lack of advocacy tied to physician leadership. The medical director is responsible for patient care activities performed by paramedics, takes responsibility for their appropriateness, and ensures that these activities are within the scope of practice and operational expectations [23]. This model, known as medical direction in paramedicine, continues to have a strong hold over the profession, particularly in the US and Canada, where paramedics and paramedic leaders have limited power or agency to change a system that is embedded in the legal structures and accreditation requirements of state legislatures [24]. A notion supported by recent literature showing that systems in the US and Canada are more closely aligned with public safety rather than healthcare and public health, resulting in a care delivery model that is more linear and less focused on developing an approach to care that connects patients with the right care, the first time [22,25].

In the Australasian region, the origin of the ambulance service lies with the St John Ambulance Brigade whose early occupational ideology is steeped in the philosophy of 'The Order of the Hospital of St John of Jerusalem'. The organisation provided formal ambulance services until around 1959 when the system of care incrementally moved towards government funded ambulance services in most parts of the region, with some parts of Australia and New Zealand still reliant on St John Ambulance to provide jurisdictional ambulance services today [21,26–28]. The Australian model innovated and in September 1971 Melbourne moved away from the traditional driver approach to launch a mobile intensive care ambulance (Image 2) staffed with two advanced clinicians and a doctor based at the Royal Melbourne Hospital as part of a three-month trial providing care to coronary patients and road traffic accidents [29].

Similarly, the UK and has a long history associated with the St John Ambulance Association with its origins dating as far back as 1877. The slow but eventual evolution towards professionalisation in the UK begun in January 1966 when the UK saw its first group of highly trained officers enter practice as part of the Mobile Coronary Care Unit based at the Royal Victoria Hospital in Belfast [30]. The unit was designed to allow intensive care treatment to start in the patient's home. Five years later a similar initiative based in Brighton launched a pioneering cardiac and emergency training programme [31,32]. In 1974, the NHS took over control of the ambulance services, which then became one organisation, but with local management and considerable autonomy [33].

In North America, the late 1960′s heralded the assignment of Emergency Medical Services (EMS) development to the Department of Transportation. This occurred following a landmark report titled *Accidental Death and Disability: The Neglected Disease of Modern Society,* more commonly known as the "white paper" [34]. Despite its recommendations, which included rapid innovation of EMS systems, supported by evidence-based policies, the report largely took the view that EMS was primarily a transportation service and not a medical service. In the report, the only emergency care described was first aid as taught in the American Red Cross program "First Aid on the Highways," despite the existence of more advanced prehospital treatments [35,36]. However despite this, one pioneering service, known as the Freedom House Ambulance Service, based in Pennsylvania, implemented a different care model. The grass roots community service, founded in 1967, was the first EMS system in the US to be staffed by paramedics with training beyond that of first aid and was considered to have played a part in the very early professionalisation of the US EMS system [37]. In Canada, the paramedic

system evolved similarly and simultaneously to the US however with a differing stimulus for advancement cantered around its unique universal healthcare factors.

Whilst this Department of Transportation report is commonly heralded as the likely stimulus for the creation of the modern ambulance service, a look back at history reveals that this is only partly true for North American systems, with earlier evidence showing that other developed western nations such as the UK, Australia and New Zealand embarked on their own unique journeys to progress the profession around the same time. It is at this point where the early divergence in practice between Anglo-American paramedic systems likely occurred. This variance was embedded in the distinct early nomenclature used to describe the profession with a system either using the term EMS or ambulance to describe its system of care. This language likely formed the professional undertone which in later decades would help determine two new and separate sub-models of practice within this system. The first, those using the term ambulance, achieving professionalisation, a process underpinned by strong clinical governance, national registration, professional regulatory boards, self-regulation and a move towards higher education supported by the development of entry-to-practice degrees. And the second, those using the term EMS, continuing to operate under the delegation of a physician's licence, with more technical based education standards, resulting in a patient care model reliant on medical protocols, physician consultation, and high hospital conveyance rates [22,25].

1980. –1999: the technical revolution era: the technician and the ambulance officer

The 80′s played an important role in laying the foundation for higher education and increased scope of practice for the profession, both factors being vital pillars in the journey toward better care for patients. Almost all Anglo-American paramedic systems experienced simultaneous advances in technical accreditation during this period, with many hospital-based programmes being offered by nurses and physicians with the aim of gradually enhancing the scope of practice for paramedics [38]. As the profession entered the 90′s paramedic colleges and scholars, which had spent decades lobbying in support of the continued professionalisation of paramedicine, helped turn the spotlight on higher education, transitioning the profession away from a technician towards the role of ambulance officer. In 1994, Charles Sturt University in Australia commenced the first paramedic degree conversion programme for paramedics [39], and in 1996 the UK based University of Hertfordshire followed with a similar degree [40].

The move to higher education is considered a crucial aspect in the professionalisation of paramedicine and that having a unique, profession-specific body of knowledge driven by academia was ultimately the key to obtaining full professional status as was evident in decades to come [41]. This came in the form of a deliberate move by ambulance services toward recognising mandatory degree qualifications as an entry to practice criterion, supported by strong academic affiliations. However, it would not occur in most Anglo-American paramedic systems for another two decades, with the UK being the first to implement the directive in 2013, nearly a decade after a recommendation by the NHS authored report *Taking Healthcare to the Patient – Transforming NHS Ambulance Services* which recommended, ".that there should be a mandatory move to higher education delivered models of training and education for ambulance clinicians" [42]. Tertiary education is now common in many countries such as Australia, New Zealand [40] and the UK [43], and is emerging in the US and Canada. In these jurisdictions, university education is being discussed as an enabling factor for paramedics and critical in recognising the 'academisation' of paramedicine and the increasing role that education plays in legitimising the profession, creating a body of knowledge, and forming a basis for future practice [44].

This era also demonstrated that the advancement of education was closely associated with increases in paramedic led clinical care, including enhanced assessment and triage skills, along with a more complex scope of practice driven by an increase in out of hospital research. These developments appear to be the precursor toward the adoption of advanced care models as a standard of care. As the profession matured, a movement toward self-governance and autonomous practice alongside other health care professions begun to form. This work was underpinned by two decades of advocacy, support and guidance driven by professional bodies, or colleges as we now know them, who spent the 80′s and 90′s growing their expertise and capability.

2000. –2019: the professional era: the paramedic and the clinician

In the new millennium, paramedicine continued its advancement towards professionalisation and recognition as a health care profession with inaugural registration of paramedics in the UK occurring in 2000 by the [then] Council of Professions Supplementary to Medicine (CPSM) [45,46]. Australia and New Zealand followed nearly two decades later with the USA and Canada continuing to subscribe to a complex network of state / provincial and municipal licencing requirements [47].

The regulation of paramedics in many jurisdictions was largely driven by professional bodies and was a major step in transitioning paramedicine from a trade to a profession that was serious about protecting the public and using its knowledge, skills, and judgement to govern itself in the public interests as well as taking ownership of its future. Regulation provides both a mechanism for ensuring standards and an opportunity for paramedicine to examine how it engages with the communities that they serve [44].

As health care demand begun to increase around the world, fuelled by an ageing population and a scarcity of primary health care resources, the communities' expectations of the modern-day services provided by paramedics begun to change. This increase in low acuity workload transformed the scope of services provided by paramedic services and paved the way for the implementation of non-traditional care models, including community paramedicine and urgent primary care paramedics [28]. Paramedic systems, driven by the increasing need for their services, begun to provide alternate treatment and conveyance pathways aimed at emergency department avoidance where patients were instead connected with the right care, the first time. These primary care type roles aimed to provide health prevention, advanced assessment, and complex treatment and care plans to patients in their home as a means of increasing access to basic health care services in non-urgent settings. Urgent primary care paramedics also moved into non-traditional healthcare settings, providing access to care in GP clinics and urgent and primary care centres in the UK, a significant sign of a profession demonstrating its agility to traverse complex healthcare environments in support of a stressed healthcare and public health system [48,49].

As the profession matured, paramedicine, supported by medical networks including cardiac, stroke, trauma and resuscitation care begun to develop an expanded repertoire of needs led treatment and conveyance guidelines. One such example being the identification and treatment of STEMI in the prehospital environment [50], a move acknowledging the acute role paramedics play in the continuum of healthcare [28]. Another notable example of improvement in care driven by an expanded body of evidence was the introduction of independent and supplementary prescribing rights in the UK in 2018 [51]. This important regulatory change helped paramedicine strengthen its ability to provide patients with a range of care options

including “see and treat” and “hear and treat” mobile healthcare services.

Along with advanced treatment options came new and innovative ways of assessing low acuity patients. Many jurisdictions adopted secondary telephone triage systems in an effort to divert low-acuity patients away from emergency department settings and better connect patients with the right care the first time [52]. Secondary triage delivered by ambulance services changed the way patients access care, with the ambulance service call centres transforming from an “every caller gets an ambulance” type model to a system that realised its own role in helping patients navigate the complex healthcare system. This new model of treatment now connects patients with alternate, appropriate, and more timely medical care whilst at the same time helping to improve access to care for acute presentations.

Conclusion

Paramedicine, like other allied health professions, has successfully navigated the pathway toward professionalisation in a considerably short period of time. From its beginnings as stretcher bearers the profession has looked outwards to emulate the success of its healthcare colleagues in establishing its own unique body of knowledge supported by strong clinical governance, national registration, professional regulatory boards, self-regulation, and a move towards higher education supported by the development of entry-to-practice degrees. Whilst the profession has achieved many great milestones, their application across multiple jurisdictions within the Anglo-American paramedic system remains inconsistent and more research is needed to explore why this is.

In looking to the future, one wonders where the next 10 years will lead. Early indications support the introduction of Chief Paramedic Officer roles as guardians and advocates of continued innovation as well as the early continued exploration of roles for paramedics in the public health sector and the integration of advanced technologies and artificial intelligence into the delivery of clinical care. Ultimately each paramedic can and should contribute to the journey by adhering to a patient cantered care approach and continuing to progress the profession toward the future.

Limitations

The attempt to cover such a broad range of developments across decades in different countries resulted in a limited analysis and is a weakness of this review. The authors intend to focus on the wider influence of social, political, economic and health system factors related to the history of the Anglo-American paramedic system in future papers.

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The research team would like to confirm that the manuscript is original work and that no part of the manuscript has been published or submitted elsewhere for publication. The manuscript has also adhered to ethical standards of the sponsoring university, Monash University.

Furthermore, authors have contributed to the development of the ideas, writing and/or final review of the submitted manuscript, and all authors have read and approved this version of the manuscript and its submission to the journal.

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Conflicts of interest

The authors declare that they have no competing interests with respect to the authorship and/or the publication of this article. No funding was received for this work, and the authors have no conflict of interest.

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