

# Regulation of Paramedics and Emergency Medical Attendants: A Literature Review - Part 2

Health Professions Regulatory Advisory  
Council (HPRAC)



# A Rapid Literature Review on the Practice of the Paramedic and Emergency Medical Attendant Professions

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Please note that this Rapid Literature Review is a summary of information from other sources, not a representation of the policy position or goals of the Ministry of Health and Long-Term Care. If material in the review is to be referenced, please cite the original, primary source, rather than the review itself.

## OBJECTIVES

The requestor's stated objectives were to examine 1) the practice of the paramedic and emergency medical attendant (EMA) professions, 2) the interprofessional collaboration of individuals in these occupations, and 3) community paramedicine.

For the purposes of this review, the practice of the profession refers to the job profiles, scope of practice, models of practice (i.e., what types of tasks paramedics and EMAs do on the job), and educational requirements of the professions. Interprofessional collaboration refers to how paramedics and EMAs work with one another and other health professionals, while on the job (including potential challenges and best practices). The jurisdictions examined in this review include the United States, United Kingdom, Australia, and New Zealand.

## SEARCH METHODS FOR IDENTIFICATION OF STUDIES

Individual peer-reviewed articles and review articles were identified through the Ontario Ministry of Health and Long-Term Care's computerized library database, PubMed, and Google Scholar. Grey literature was identified through Google and relevant government websites. The search was limited to English sources and therefore may not capture the full extent of initiatives in non-English speaking countries.

The Medical Subject Heading (MeSH) terms "Allied Health Personnel," "Emergency Medical Technicians," "Education," "Licensure," "Certification," "Social Control, Formal," "Social Control, Informal," and "Professional Autonomy," "Interprofessional Relations," "Emergency Medical Services," "Allied Health Professional," "Continuity of Patient Care," "Communication," "Community Health Service," "United States," "Australia," "Great Britain," and "New Zealand" were used in combination with the following keywords to identify relevant articles and documents for this review: "scope of practice," "model of practice," "regulation," "educational requirements," "training standards," "controlled acts," "prehospital emergency care," "emergency medicine," "interprofessional collaboration," "community paramedicine," "community paramedic," "community paramedicine models," "extended role paramedic practitioners," "patient handoff," "patient handover," and "paramedic."

A total of 46 references were identified and cited in this review: four review articles, 19 original research papers from peer-reviewed journals, and 23 documents from the grey literature. [Table 4](#) in the Appendix consists of a summary table with details for each of the sources cited in the review. In total, the searching for relevant material and writing of this review was conducted by three people in five working days.

## SUMMARY OF MAIN FINDINGS FROM THE LITERATURE REVIEW

### Practice of the Profession in Other Jurisdictions

- The US, UK, Australia and New Zealand have established several different levels of practice for emergency services personnel within their jurisdictions, with paramedic titles being recognized as the highest level of practice.
- The national regulatory regimes in the US and UK are more standardized and established than those currently in place in Australia and New Zealand.

### Expanding Scope of Practice

- The role of paramedics has been expanding in countries such as the UK, US, Canada, and Australia. Examples include allowing for paramedics to have increased decision-making authority to treat and release patients, or to be engaged in wider activities such as immunization efforts.
  - In some cases, the expanded paramedic scope of practice has been accompanied by the designation of new role titles and job descriptions such as emergency care practitioner or paramedic practitioner, as well as by the development of new models of practice and interprofessional collaboration.
- Benefits associated with an expanded scope of practice included reduced costs for the healthcare system, increased convenience and accessibility of care, and enhancement of community healthcare resources.
- Concerns included the need for more evidence-based practices, paramedics' abilities for determining the necessity of medical transport, and patient safety.

### Interprofessional Collaboration

- Information loss in patient handover was a major theme of the literature focusing on the challenges; solutions to facilitate effective handovers and reduce information loss in patient handover focused on use of structured processes and templates, improving multidisciplinary education, and the involvement of appropriate and experienced personnel.
- Articles offering insights on effective models of EMS providers' interprofessional collaboration emphasized factors such as the importance of respect and communication; the benefits of improved team collaboration over time; the value of paramedic partnerships with other health care professionals; and the possibilities for serving the needs of remote areas with community-based expanded scope paramedics (known as community paramedicine).

## DESCRIPTION OF THE FINDINGS

The role of paramedics and EMAs traditionally<sup>a</sup> has been defined by providing basic first aid and patient transportation services (Ball, 2005; Al-Shaqsi, 2010), but recently this role has been expanding in countries such as the UK (Cooke, 2006), US, Canada, and Australia (Krumperman, 2010). Examples include allowing for paramedics to have increased decision-making authority to treat and release patients (Cooper et al. 2009), or to be engaged in wider activities such as immunization efforts (Krumperman, 2010). Some of the drivers for these developments have been the desire to reduce unnecessary ambulance transports (Brown et al. 2009), address shortages of health care workers, especially in rural and remote areas (Raven et al. 2006), and offer more convenient and timely treatment to patients (Cooke, 2006). In some jurisdictions the expanded paramedic scope of practice has been accompanied by the designation of new role titles and job descriptions such as emergency care practitioner or paramedic practitioner, as well as by the

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<sup>a</sup> Countries that have used this particular model of emergency medical service delivery include the United States, Canada, New Zealand, Sultanate of Oman and Australia. By contrast, the role of emergency services in continental Europe is more typically characterized by a “stay and stabilize” philosophy built around undertaking more advanced on-scene interventions and “bringing the hospital to the patients” rather than minimizing interventions and “bringing patients to the hospital” as rapidly as possible (Al-Shaqsi, 2010).

development of new models of practice such as community paramedicine and new modes of interprofessional collaboration.

[Section One](#) of this review provides a summary of the existing role profiles for paramedics and Emergency Medical Attendants (EMAs) in the US, UK, Australia and New Zealand. [Section Two](#) offers an overview of the perceived benefits and risks of expanding the paramedic scope of practice. [Section Three](#) outlines recent literature concerning interprofessional collaboration between paramedics and other professionals.

For the purpose of this review, emergency care practitioners (ECPs) are defined as “experienced nurses or paramedics working in autonomous but collaborative roles in the out-of-hospital settings; seeing, treating, releasing (or referring) patients with predominantly minor conditions.” Paramedic Paramedic practitioners (PPs) are defined as having a similar vision and scope of practice as ECPs, but limited to the paramedic profession (Cooper et al., 2009).<sup>b</sup>

## 1. Jurisdictional Scopes of Practice

### 1.1. United States

The National Registry of Emergency Medical Technicians (NREMT) provides national certification of EMTs and paramedics in the United States. However, some states have their own certification programs and different titles. The tasks or procedures EMTs and paramedics are allowed to perform at any level vary by state (US Department of Labor, 2012).

#### 1.1.1 NREMT certification levels

The NREMT currently certifies five levels of Emergency Medical professionals (NREMT, 2012a):

- First Responders (approximately 40 hours of training)
- Emergency Medical Technician (EMT) – Basic (approximately 110 hours of training),
- EMT – Intermediate/85 and EMT – Intermediate/99 (approximately 200-400 hours of training)
- Paramedic (1,000 or more hours of training) (NREMT, 2012b)

To achieve each of these levels of certification, the NREMT requires successful completion of EMS education, passing a practical performance examination and a computer based examination (NREMT, 2012c).

#### 1.1.2. National Highway Traffic Safety Administration (NHTSA) licensure levels

The National Highway Traffic Safety Administration (NHTSA) also defines and describes four levels of EMS licensure within the US National EMS Scope of Practice Model (NHSTA, 2007). These include:

- Emergency Medical Responder (EMR)
- Emergency Medical Technician (EMT)

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<sup>b</sup> Paramedics with an expanded scope of practice also may be described under other job titles or role definitions. Examples include community paramedics (based in general practice surgeries), critical care paramedics (based in hospital intensive care facilities), and treat and refer paramedics (based in minor injury units/walk-in centres) (Ball, 2005). Other common titles and scopes of practice paramedics are included in Section One and Appendix A which outline the official certification and licensure levels employed within the four jurisdictions examined in this review.

- Advanced EMT (AEMT)
- Paramedic

The EMS National Scope of Practice is intended to serve as a guide for US states in developing their own scope of practice legislation, rules, and regulations (NHTSA, 2007). Currently, 46 states require their EMS professionals to be certified by the National Registry of EMTs in order to obtain a license to practice as an EMS professional in their state. Some states require their EMS professionals to maintain certification with the NREMT as part of the continued license; others have their own license renewal process. All EMS professionals are required to complete continuing education (NREMT, 2012b).

### 1.1.3. Difference between certification and licensure

As outlined by the NREMT (NREMT, 2012d), there are some essential differences between certification and licensure:

- Certification is: (1) a voluntary process; (2) provided by a private organization; and (3) used for the purpose of providing public information on those individuals who have successfully completed a certification process (usually entailing successful completion of educational and testing requirements) and demonstrated their ability to perform their profession competently.
- Licensure is the state's grant of legal authority, pursuant to the state's police powers, to practice a profession within a designated scope of practice. Under the licensure system, states define, by statute, the tasks and function or scope of practice of a profession and provide that these tasks may be legally performed only by those who are licensed. As such, licensure prohibits anyone from practicing the profession who is not licensed, regardless of whether or not the individual has been certified by a private organization.

Confusion between the terms “certification” and “licensure” may arise because many states call their licensure processes “certification,” particularly when they incorporate the standards and requirements of private certifying bodies in their licensing statutes and require that an individual be certified in order to have state authorization to practice. Nevertheless, certification by the National Registry, by itself, does not give an individual the right to practice (NREMT, 2012d).

The scope of practice for the NHTSA's four levels of licensure (NHTSA, 2007) is outlined in [Table 1](#) (Appendix A), along with the NREMT's description of the recommended amount of education required for each level (NREMT, 2012c).

## 1.2. United Kingdom

### 1.2.1. Overview of the profession

Emergency medical services in the UK are coordinated by National Health Service (NHS) Ambulance Service Trusts. There are 11 of these in England providing emergency access to health care. Ambulance services in Scotland, Wales, and Northern Ireland are provided by their respective Ambulance Services Trusts (NHS, 2011).

Ambulance crews in the UK may include a range of medical staff such as a/an:

- Emergency care assistant (ECA)<sup>c</sup>
- Paramedic; and
- Senior paramedic (or emergency care practitioner)

To work as a paramedic in the UK, a person must be registered with the [Health and Care Professions Council](#) (HCPC) (NHS Careers, 2012). The HCPC also regulates and approves educational programs that meet the HCPC's standards of education and training for paramedics (HCPC, 2012b). A person who successfully completes an approved program is deemed to meet the HCPC's standards of proficiency for their profession and is able to apply to the HCPC Register (HCPC, 2012b).

Additionally, paramedics also may belong to a professional body in the UK called the College of Paramedics (CoP). Among other objectives, the CoP seeks to represent the views of the paramedic profession to government, employers and other external bodies and to encourage higher standards of professional education and development (CoP, 2009).

### 1.2.2. UK EMS scope of practice and educational requirements

Paramedics' scope of practice is determined by the HCPC and is outlined in the document, [Standards of Proficiency: Paramedics](#). By being a registered member of the HCPC and following its standards of proficiency, members gain the right to use the protected title of their profession ('paramedic') (HCPC, 2012a). The standards of proficiency document for paramedics details the expectations for registered paramedics, skills required for the application of practice, as well as the knowledge and understanding skills needed to practice.

Traditionally, staff joining an ambulance service had been able to work their way up with experience and additional training from care assistant, through ambulance technician to paramedic. This route is no longer open to new entrants. Anyone wishing to work as a paramedic now needs to either secure a student paramedic position with an ambulance service trust, or attend an approved full-time course in paramedic science at a university (NHS Careers, n.d,c).

A summary of emergency ambulance crew member roles and education requirements is provided [Table 2](#) (Appendix A).

## **1.3. Australia and New Zealand**

### 1.3.1. Overview of the profession

Emergency medical services are coordinated by regional ambulance services, which provide both pre-hospital emergency care and the transport of sick or injured individuals through the provision of on-site paramedics (See Eburn & Bendall, 2010). Due to the current absence of national regulation in Australia (and the pending registration of paramedics in New Zealand), the scope of practice for individuals engaged within paramedicine varies among jurisdictions and engaging organisations (Paramedics Australasia, 2012b; Williams et al., 2009).

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<sup>c</sup> The role of ambulance technician is currently being replaced with emergency care assistants.

A 2009 discussion paper notes that currently, clinical practice and licensure is provided by each individual ambulance service at the local/territory level in Australia (Williams et al., 2009). Recently, there has been discussion within academic literature (e.g., Eburn & Bendall, 2010; Williams et al. 2010; 2009) and among professional bodies (e.g., Paramedics Australasia) advocating for further advancing the professionalization of the paramedicine field in Australia and New Zealand (Cotton, 2012).

### 1.3.2. Australia and New Zealand EMS scope of practice and educational requirements

Paramedicine in Australia and New Zealand covers a broad range of classifications,<sup>d</sup> however only professional classifications are described here as this stream is specific to individuals trained as paramedics. Paramedics Australasia, a national professional association representing practitioners who provide paramedic services to the community in Australia and New Zealand, has contributed to setting standards of practice for the paramedic profession, including the development of paramedic competencies that inform the design of paramedic education programs. These competencies are organized into three domains (i.e., professional practice, clinical practice, and professional knowledge) and are highlighted in a document called the [Australasian Competency Standards for Paramedics](#) (Paramedics Australasia, 2011).

To work as a paramedic in Australia or New Zealand, a university Bachelor degree in paramedic or health science is required (Paramedics Australasia, 2012d). The Council of Ambulance Authorities, which represents the providers of ambulance services in each State and Territory of Australia and in New Zealand, accredits<sup>e</sup> entry-level paramedic education programs (The Council of Ambulance Authorities, n.d.a; n.d.b).

A summary of current clinical roles and educational requirements in paramedicine within these jurisdictions is provided in [Table 3](#) (Appendix A).

## 2. Potential Benefits and Concerns in Expanding the Paramedic Scope of Practice

Studies that found benefits to an expanded paramedic scope of practice identified the potential for reducing the costs for the healthcare system, increasing the convenience and accessibility of care; enhancing community resources; and supporting the roles of other health professionals. For example:

- A 2008 UK randomized control trial revealed that having expanded scope paramedic practitioners (PPs) address the needs of older patients contacting emergency dispatch for falls or other non-life threatening injuries reduced the proportion of emergency department (ED) attendances (53.3% vs. 84%) and time in the emergency department (126.6 vs. 211.3 minutes), when compared with the dispatch of ambulance crews (without PPs). Although this study noted some increased use of health services in the days following the incident for patients in the intervention group, it found that the total costs for the

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<sup>d</sup> These classifications include professional (i.e., paramedic, intensive care paramedic, retrieval paramedic, general care paramedic), technical (e.g., first responder, patient transport attendant – level 1, patient transport attendant – level 2, basic life support medic) and ambulance communications (e.g., emergency medical dispatch support officer, emergency medical dispatcher) streams of engagement (Paramedics Australasia, 2012b).

<sup>e</sup> Graduates from fully accredited programs will be given preference for employment over non accredited programs, subject to all other employment conditions being met with the individual employer (The Council of Ambulance Authorities, n.d.c).



- intervention group were £140 lower than for the control group when routine data (i.e., clinical data from hospitals' patient administration system, emergency department, and ambulance service records) were included (Dixon et al. 2008).
- A 2007 UK study of ECPs working in existing emergency service models of care found that care provided by ECPs appeared to reduce the need for subsequent referral to other emergency and unscheduled care services in a large proportion of the cases. It found no evidence that care provided by an ECP was less appropriate than the care provided by the usual providers for the same type of health problem (Mason et al. 2007).
  - A 2006 UK study indicated that 54% of the contacts with ECP services did not require referral to another health professional or use of emergency transport. It also found that the cost range per ECP patient contact was £24 to £29 per patient compared to an ED contact cost of £55 per patient (Mason et al. 2006).
  - A 2007 Australian qualitative study concluded that using extended scope paramedics in rural locations can improve health care through increasing community response capacity, linking communities more closely to ambulance services, and increasing health promotion and illness prevention work at the community level (Stirling et al. 2007).

Studies that identified risks relating to an expanded paramedic scope of practice focused on issues such as the need for more evidence-based practices, paramedics' abilities for determining the necessity of medical transport, and patient safety. For example:

- A 2012 study of the New Mexico Emergency Medical Services (EMS) scope of practice – which, like those of other US states, has been changed or expanded over time – identified 22 interventions with concerning harm-benefit ratios that were flagged for further analysis.<sup>f</sup> The study also noted that much like EMS care nationally, few EMS interventions have been assessed for efficacy, potential harm, or potential benefit. The authors suggest it is possible that many interventions that have been added to the EMS scope of practice over the years may no longer be supported by the evidence and may be outdated, harmful, or ineffective in the EMS setting (Munk et al. 2012).
- A 2009 meta-analysis noted that the few studies evaluating US paramedic determinations of medical necessity for ambulance transport vary considerably, and only two studies reported complete data. Overall, however, it found an aggregate undertriage<sup>g</sup> rate of between 9% and 29%. The authors conclude that the data do not support the practices of paramedics determining whether patients require ambulance transport (Brown et al. 2009).<sup>h</sup>
- A 2006 UK study of short-term outcomes of older people left at home by emergency crews after a fall found that 49% of the people made healthcare contacts within the two-week follow-up period, with 47% calling emergency services again at least once. There was also an increased risk of death (2.3% versus 0.43%) among these patients compared with the corresponding general population in London (Snooks et al. 2006).

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<sup>f</sup> The most concerning interventions included the use of compressed air anti shock trousers, the use of certain airway control devices, and the administration of certain medications

<sup>g</sup> In this study, undertriage refers to instances where paramedics determined that medical transport to, or treatment in, an emergency department was unnecessary but this determination later turned out to be incorrect.

<sup>h</sup> According to a 2006 report, the ability to triage patients effectively may be influenced in part due to the considerable variation in EMT training throughout the US (Raven, 2006).

- The 2006 UK study on the effectiveness and costs of contacts with ECP services noted recurrent themes raised in the interviews with those involved in the study included patient safety; appropriate levels of governance and supervision; a generic element to education and training to facilitate transferability of skills between NHS providers; and workforce issues around the safety, recruitment, and retention of staff (Mason et al. 2006).

### **3. Interprofessional Collaboration**

The challenges associated with clinical handovers were a major theme of the literature identified on interprofessional collaboration between paramedics and other health care professionals. Other themes concerned effective models for enhancing interprofessional collaboration, the value of combined team training, the potential uses of technology, and the opportunities offered by the community paramedicine model of practice.

#### **3.1. Challenges associated with clinical handovers**

Clinical handover, where patient information and clinical responsibility is transferred from one set of health care professionals to another, is one episode of care where communication failures can occur (Bost et al. 2010; Australian Commission on Safety and Quality in Health Care [ACSQHC], 2008). Governing bodies such as the World Health Organization<sup>i</sup> recognize the importance of improving information exchange between health care professionals as key to minimizing the risk of patients experiencing an adverse event (Bost et al. 2010).

##### **3.1.1. Potential factors affecting the safety of patient handover**

Several factors may affect the safety of patient handovers. A 2012 qualitative study from Denmark identified eight such factors: communication, information, organization, infrastructure, professionalism, responsibility, team awareness, and culture. The study involved a total of 47 interviews with nurses, nurse assistants, physicians, paramedics, and other health professionals from different departments and units. The paramedics (n = 5) had diverse impressions about communicating with the receiving parties in handovers. They sometimes had a definite impression that not all important information they delivered was passed on, written down, received, or understood due to insufficient organisational structures. The study also found that work was done in silos and many of the handover barriers were seen to be related to the fact that only few healthcare providers had a full picture of the patient's complete pathway (Siemsen et al. 2012).

A 2008 report by the Australian Commission on Safety and Patient Quality (ACSQHC) also found that potential barriers to the delivery of effective clinical handover in a variety of healthcare settings may include:

- Lack of a shared understanding or practice
- Lack of interdisciplinary handover and care
- Busy-ness
- Hierarchical hospital culture
- Interruptions and distractions
- Minimal patient and family involvement
- Lack of training and research (ACSQHC, 2008).

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<sup>i</sup> See, for example, World Health Organization (nd), [High 5s Project on Patient Safety](#).

In the specific case of handovers in a trauma centre setting, a 2010 Australian study based on 27 interviews with nurses, paramedics, and doctors found that a noisy environment was considered by nursing staff to adversely impact on handover, while that inattention and dismissive attitudes by trauma team members were among the issues affecting the quality of handovers from the paramedic's perspective. Subjects from all three interview groups made the point that an ineffective handover was one in which perceived extraneous information was communicated and when interruptions occurred (Evans et al. 2010a).

### 3.1.2. The issue of information loss in patient handover

Two articles that document the extent of information loss in the handover of trauma patients from EMS service providers to hospital staff were identified:

- A 2010 article from Australia found that, in the pre-hospital setting, 75% of data items handed over by paramedics to the trauma team were documented; and, in the in-hospital handover, 67% of information was documented. Information least likely to be documented by trauma team members in the pre-hospital setting related to treatment provided; in the in-hospital setting information least likely to be documented related to signs and symptoms (Evans et al. 2010b).
- A 2009 article from the US showed that, even in single-patient handovers with direct verbal contact between EMS providers and in-hospital clinicians, only 72.9% of the key prehospital data points that were transmitted by the EMS personnel were documented by the receiving hospital staff. Elements such as prehospital hypotension, Glasgow Coma Score, and other prehospital vital signs were often not recorded (Carter et al. 2009).

### 3.1.3. Factors that may reduce information loss in patient handover

Potential solutions to facilitate effective handovers and reduce information loss in patient handover in the identified literature focused on use of structured processes and templates, improving multidisciplinary education, and the involvement of appropriate and experienced personnel.

A 2010 systematic review of the literature on clinical handover from ambulance service to the hospital emergency department identified three key themes:

1. Important information may be missed during clinical handover;
2. Structured handovers that include both written and verbal components may improve information exchange; and
3. Multidisciplinary education about the clinical handover process may encourage teamwork, a shared common language and a framework for minimum patient information to be transferred from the ambulance service to the hospital emergency department (Bost et al. 2010).

A 2010 article also found that the following factors contributed to effective handovers from paramedics to trauma teams:

- confident and succinct delivery of information;
- experience of the personnel providing the handover; and
- the presence of appropriate personnel to receive the handover, coupled with their ability to actively listen (Evans et al. 2010a).

The article further noted there was a general consensus from both the paramedics and trauma team that using a template to deliver the information in structured manner was a good concept for

reducing information loss, and that the data elements included in the MIST (Mechanism, Injury pattern, Signs, Treatment) template<sup>j</sup> were appropriate (Evans et al. 2010a).

### 3.2. Effective Models for Interprofessional Collaboration

Articles offering insights on effective models of EMS providers' interprofessional collaboration emphasized factors such as the importance of respect and communication; the benefits of improved team collaboration over time; the value of paramedic partnerships with other health care professionals; and the possibilities for serving the needs of remote areas with community-based expanded scope paramedics (known as community paramedicine).

A 2012 US article suggested that active collaboration between hospitals and EMS was "significantly associated" with lower mortality rates for patients with acute myocardial infarction. It showed that a close collaborative relationship between hospitals and EMS was more apparent in higher performing hospitals. These hospitals made specific investments in and paid attention to EMS through:

- respect for EMS as valued professionals and colleagues,
- strong coordination and communication with EMS, and
- active engagement of EMS in hospital acute myocardial infarction quality improvement efforts (Landman et al. 2012).

A 2007 UK article identified several influences on collaboration in unscheduled emergency care, noting that ECPs' links with other professions were shaped by factors such as the ECP role (e.g., frustrations about patient tasking and conflicting views about teamwork), education and training (e.g., the need for clinical supervision/mentorship) and cultural perspectives (e.g., power and communication conflicts) (Cooper et al. 2007). Recommendations for the enhancement of collaborative practices from this article included:

- the appointment of ECP leads at consultant and masters levels to drive forward the clinical, education, supervision, networking, audit, and research agenda;
- the implementation of short courses designed to break down traditional boundaries and enhance relationship management, self-management, the patient client focus, and political awareness; and
- clinical supervision and mentorship to ensure safe practice and continuous professional development (Cooper et al. 2007).

A 2007 UK article examining a pilot service that dispatched a nurse and paramedic to low-priority ambulance calls found benefits to both patients and staff, with patients being enthusiastic about opportunities for care to be provided in their homes and staff feeling confident in managing calls effectively because of their combined knowledge and skills. Staff also felt that patient care had been improved, and expressed increased job satisfaction and felt they had developed higher levels of skill (Machen et al. 2007). A 2008 UK article on the same type of nurse-paramedic collaboration revealed that introducing this service to the current system of provision would increase the overall cost to the ambulance services. However, it also found a reduction in the transfer rate to the hospital was observed since people could be treated on-scene, leading to reduced admissions to

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<sup>j</sup> The MIST template was developed as a tool to assist paramedics to handover information in a systematic manner. It prompts paramedics to communicate to the trauma team the mechanism of injury, injuries sustained, signs and symptoms, and treatment provided (Evans et al. 2010a).

accident and emergency departments and subsequent hospitalization, thereby suggesting there would be cost savings for the health care system (Widiatmoko et al. 2008).

### 3.3. Combined Team Training

One 2008 US article from the grey literature discussed how combined team training (CTT) can contribute to improved team performance among paramedics, EMTs, and first responders (e.g., firefighters, police officers). It noted that research had shown there were three main areas that distinguish a high-performance team from other teams:

1. Interpositional knowledge gained by team members cross-training on each other's jobs, allowing the team to predict, anticipate, and coordinate more efficiently and effectively.
2. Team communication, including verbal and non-verbal communication skills; the use of timely or informational communication, and brevity, completeness and clarity.
3. Shared mental models, which allow individuals to develop similar visions of what needs to happen to accomplish a team's goal.

The article also offered some general guidelines for developing a CTT program (Tomek et al. 2008).

### 3.4. Use of Technology

A 2010 US article stated that advanced transmission of data from EMS to receiving hospitals was widely supported by the paramedics and trauma teams in the study. However, while computers carried by paramedics were capable of exporting data to the receiving hospital, barriers such as time constraints, workflow issues and infection control issues impeded the ability to do so (Evans et al. 2010a).

### 3.5 Community Paramedicine

As defined by the International Roundtable on Community Paramedicine (IRCP), community paramedicine is "a model of care whereby paramedics apply their training and skills in "non-traditional" community-based environments (outside the usual emergency response/transport model). The community paramedic may practice within an "expanded scope" (applying specialized skills/protocols beyond that which he/she was originally trained for), or "expanded role" (working in non-traditional roles using existing skills)" (IRCP, 2012).

According to the description provided on the website of a Canada-US health care cooperative, the purpose of community paramedics is "to respond to identified health needs in underserved communities, ultimately improving the quality of life and health of rural and remote citizens and visitors" (Community Healthcare and Emergency Co-operative, n.d.).

The Long and Brier Islands initiative in rural Nova Scotia is one example of community paramedicine. Under this initiative, paramedics with additional training began to assess and manage simple wounds, administer tetanus injections and flu immunizations and perform home assessments. The paramedics also worked with a team consisting of an onsite nurse practitioner (NP) and paramedics, and an off-site family physician (Martin-Misener et al. 2009).

- A 2009 article concluded that this initiative had resulted in increased access to health services, higher resident satisfaction with health services, improved collaboration among providers, and reduced travel and medication costs (Martin-Misener et al. 2009).

- Another report on this initiative claims that there had been a 23% decrease in emergency department visits from Islanders since this delivery model was implemented (Misner, n.d.).

APPENDIX A

**Table 1: NHTSA National EMS Scope of Practice and Educational Requirements<sup>k</sup>**

Level of Licensure	Description of Profession	Educational Requirements
Emergency Medical Responder (EMR)	<ul style="list-style-type: none"> <li>• Renders on-scene emergency care while awaiting additional EMS response and may serve as part of the transporting crew, but not as the primary care giver.</li> <li>• Often employed to provide a mechanism to increase the likelihood that trained personnel and lifesaving equipment can be rapidly deployed to serious emergencies. In all cases, EMRs work as part of a tiered response system.</li> <li>• Scope of practice includes simple, non-invasive interventions to reduce the morbidity and mortality associated with acute out-of-hospital medical and traumatic emergencies (NHSTA, 2007).</li> </ul>	<ul style="list-style-type: none"> <li>• 58 hours of education (NREMT, 2012c)</li> </ul>
Emergency Medical Technician (EMT)	<ul style="list-style-type: none"> <li>• Possesses basic skills focused on the acute management and transportation of critical and emergent patients. Care may occur at an emergency scene until transportation resources arrive, from an emergency scene to a health care facility, between health care facilities, or in other health care settings.</li> <li>• Provides a large portion of the out-of-hospital care. In some jurisdictions, especially rural areas, EMTs provide the highest level of out-of-hospital care.</li> <li>• Scope of practice includes basic, non-invasive interventions to reduce the morbidity and mortality associated with acute out-of-hospital medical and traumatic emergencies.</li> <li>• Minimum licensure level for personnel transporting patients in ambulances (NHSTA, 2007).</li> </ul>	<ul style="list-style-type: none"> <li>• 150 hours of education (NREMT, 2012c)</li> </ul>
Advanced Emergency Medical Technician (AEMT)	<ul style="list-style-type: none"> <li>• Possesses basic and limited advanced skills focused on the acute management and transportation of critical and emergent patients. Care may occur at an emergency scene until transportation resources arrive, from an emergency scene to a health care facility, between health care facilities, or in other health care settings.</li> <li>• Provide an option for communities to offer high benefit, lower risk advanced skills for systems that cannot support or justify Paramedic level care. This is frequently the case in rural and volunteer systems.</li> <li>• Scope of practice includes basic, limited advanced and pharmacological interventions to reduce the morbidity and mortality associated with acute out-of-hospital medical and traumatic emergencies (NHSTA, 2007).</li> </ul>	<ul style="list-style-type: none"> <li>• 150 hours of additional education and must be an EMT first</li> <li>• Some states combine EMT and AEMT education in 300 hour courses (NREMT, 2012c)</li> </ul>
Paramedic	<ul style="list-style-type: none"> <li>• Possesses basic and advanced skills focused on the acute management and transportation of the broad range of patients who access the emergency medical system. Care may occur at an emergency scene until transportation resources arrive, from an emergency scene to a health care facility, between health care facilities, or in other health care settings.</li> <li>• In some communities, paramedics provide a large portion of the out-of-hospital care and represent the highest level of out-of-hospital care.</li> <li>• Scope of practice includes invasive and pharmacological interventions to reduce the morbidity and mortality associated with acute out-of-hospital medical and traumatic emergencies.</li> <li>• The paramedic has the knowledge associated with, and is expected to be competent in, all of the skills of the EMR, EMT, and AEMT. (NHSTA, 2007).</li> </ul>	<ul style="list-style-type: none"> <li>• 1200 hours of accredited education and must be an EMT first (NREMT, 2012c)</li> </ul>

<sup>k</sup> Note these educational requirements refer to the standards for licensure (as opposed to certification). Information on the minimum psychomotor skills required for each licensure level can be found in the NHSTA's 2007 [National EMS Scope of Practice Model](#).

**Table 2: UK EMS Scope of Practice and Educational Requirements**

EMS Role	Description of Profession	Educational Requirements
Emergency Care Assistant (ECA)	<ul style="list-style-type: none"> <li>• ECAs respond to emergency calls as part of an accident and emergency crew or at times as a first responder</li> <li>• They help move patients safely and observe patient vital signs - reporting any changes to the qualified clinician - and communicate relevant information from carers or others at the scene</li> <li>• ECAs also drive a range of ambulance service trust vehicles under normal and emergency circumstances and carry out checks to vehicles at the start of and during each shift to ensure that all equipment is stocked and in working order. They also need to know how to use all medical and life support equipment carried on vehicles that is appropriate to their skill level,</li> <li>• ECAs assist a qualified paramedic, and must work effectively as part of a larger team of people, including other ambulance service personnel (such as line managers and control room staff), other healthcare staff (such as doctors) and representatives from other emergency services (e.g., fire and police services).</li> <li>• ECAs complete relevant documentation and are required to be familiar with communication equipment (including radios and telephones) to inform colleagues about the work they are dealing with. (NHS Careers, n.d.b).</li> </ul>	<ul style="list-style-type: none"> <li>• General education. (e.g., secondary school or equivalent qualifications and/or relevant work experience)</li> <li>• Six to nine week in service training course<sup>1</sup></li> </ul>
Paramedic	<ul style="list-style-type: none"> <li>• Generally, paramedics provide specialist care and treatment to patients who are either acutely ill or injured. They can administer a range of drugs and carry out certain surgical techniques (HCPC, 2012).</li> <li>• They are the senior healthcare professional at an accident or medical emergency and work on their own or with an ECA. They are usually one of a two-person ambulance crew, with an emergency care assistant or ambulance technician to assist them. However, they might work on their own, using a motorbike, emergency response car or even a bicycle to reach their patients. With extra training, they could also become members of an air ambulance crew (NHS Careers , n.d.c).</li> <li>• Paramedics will assess the patient's condition and make potentially life -saving decisions and administer any treatment needed before the patient is transferred to hospital (NHS Careers , n.d.c). This includes:               <ul style="list-style-type: none"> <li>○ Formulating specific and appropriate management plans including the setting of timescales (HCPC, 2012a); and</li> <li>○ Maintaining records appropriately as well as conduct appropriate diagnostic or monitoring procedures, treatment, therapy or other actions safely and skilfully (HCPC, 2012a).</li> </ul> </li> <li>• They are trained to resuscitate and/or stabilise patients using sophisticated techniques, high-tech equipment and drugs(NHS Careers , n.d.c).</li> <li>• They must also practise in accordance with current legislation governing the use of prescription-only medicines by paramedics (HCPC, 2012a).               <ul style="list-style-type: none"> <li>○ Under medicines legislation, registered paramedics can administer a range of parenteral medicines on their own initiative for the immediate, necessary treatment of sick or injured persons without the usual requirement for a prescription or directions of a prescriber (Medicines and Healthcare Products Regulatory Agency Website, 2005).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Secure a student paramedic post with ambulance service trust;</li> <li>or</li> <li>• Attend an approved full-time university course in paramedic science.</li> </ul>

<sup>1</sup> An emergency care assistant takes a six to nine week in-service training course in which they learn moving and handling techniques, first aid, basic patient skills and safe driving techniques. The course incorporates assessment and written practical examinations, successful trainees are then attached to an ambulance station where they work under the guidance of a trained supervisor for a probationary period before working unsupervised (NHS Careers , n.d.b).



Senior Paramedic (or Emergency Care Practitioner)	<ul style="list-style-type: none"> <li>• The role of senior paramedic utilises the skills of paramedics and other professionals (such as specialist nurses with additional skills) to support the first contact needs of patients in unscheduled care.</li> <li>• A senior paramedic is a more advanced role to a paramedic and may have a range of job titles, including emergency care practitioner.</li> <li>• A senior paramedic undertakes a range of activities that include:             <ul style="list-style-type: none"> <li>○ Undertaking basic procedures in the home</li> <li>○ Carrying out and interpreting diagnostic tests</li> <li>○ Undertaking routine assessments of patients with long term conditions in their home</li> <li>○ Referral of patients to social care services, and directly admitting patients to specialist units</li> <li>○ Prescribing a wider range of medications</li> </ul> </li> <li>• A senior paramedic is typically based in GP surgeries, minor injuries units and hospital emergency departments. They may see patients in their own home. (NHS Careers , n.d.d; NHS Careers, 2012)</li> </ul>	<ul style="list-style-type: none"> <li>• Experience as a qualified practitioner (e.g., paramedic)</li> <li>• Receipt of additional training (e.g., greater assessment, examination skills and training for treatment of minor injuries and illnesses).</li> </ul>
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**Table 3: Australia and New Zealand EMS Scope of Practice and Educational Requirements**

EMS Role	Description of Profession	Educational Requirements
Paramedic <sup>m</sup>	<ul style="list-style-type: none"> <li>• A paramedic is a health professional who provides rapid response, emergency medical assessment, treatment and care outside the hospital environment (Paramedics Australasia, 2012d).</li> <li>• Paramedics respond to, assess and manage patients, transport them to a health facility for ongoing care (if necessary) or arrange alternative referral, treatment or care options (Paramedics Australasia, 2012d).</li> <li>• They are often required to make complex and critical clinical judgements without direct supervision (Paramedics Australasia, 2012d).</li> <li>• Their scope of practice includes intermediate life support,<sup>n</sup> use of infection control practices, emergency management of patients and various conditions,<sup>o</sup> electrocardiogram monitoring and interpretation, mental health crisis intervention, management of patients across the lifespan, use of stretcher and other patient movement devices, emergency driving, emergency management and triage, extrication and basic rescue, basic nursing, access to a range of patient referral pathways (depending on local circumstance) (Paramedics Australasia, 2012d).</li> <li>• A paramedic also gathers appropriate information regarding patient's health status, generates health care records, and monitors and evaluates the effectiveness of the care plan (Paramedics Australasia, 2011).</li> </ul>	<ul style="list-style-type: none"> <li>• Bachelor degree in Paramedic or Health Science<sup>p</sup></li> <li>• Internship program</li> </ul>

<sup>m</sup> Other vocational titles (non-army or defence) include: ambulance paramedic; paramedic 3; advanced care paramedic; intermediate life support paramedic (Paramedics Australasia, 2012d).

<sup>n</sup> As defined by the Australian Resuscitation Council in Australia or the Ambulance Service Sector Standard 8156 and New Zealand National Clinical Guidelines in New Zealand (Paramedics Australasia, 2012d).

<sup>o</sup> Including but not limited to: cardiac arrest, anaphylaxis, burns, narcotic over dose , odema, hypoglycaemia, pain control (using narcotics), traumatic brain injury, spinal injury (See Paramedics Australasia, 2012d).

<sup>p</sup> A Diploma of Paramedical Science (Ambulance) is still used by some organizations who hire paramedics, however all major ambulance services in Australia now require paramedic qualifications via university programs (Paramedics Australasia, 2012d).

<p>Intensive Care Paramedic (ICP)<sup>q</sup></p>	<ul style="list-style-type: none"> <li>• An ICP is an advanced clinical practitioner in paramedicine that provides medical assessment, treatment and care in the out of hospital environment for acutely unwell patients with significant illness or injury.</li> <li>• They respond to patients experiencing an acute, life threatening emergency to provide rapid and specialist clinical assessment and implement a targeted management plan for patients with significant alteration or challenge to normal homeostatic function. All patient care is undertaken in collaborative context with other Paramedic staff or health care professionals in attendance.</li> <li>• The ICP is required to make rapid, often complex and critical clinical judgements without direct supervision.</li> <li>• ICPs may be deployed as part of a two person crew from a stretcher equipped ambulance or may operate as a single operator from a purpose designed response vehicle (typically a marked station wagon).</li> <li>• Their scope of practice incorporates that of paramedics, but also includes advanced life support,<sup>r</sup> advanced airway management, intraosseous access, external cardiac pacing and synchronized cardio conversion, and advanced clinical management of pain, acute coronary syndrome and cardiac dysrhythmias. (Paramedics Australasia, 2012e)</li> </ul>	<ul style="list-style-type: none"> <li>• Paramedic with post graduate experiences and post graduate study (e.g., Graduate Diploma or Masters)<sup>s t</sup></li> <li>• An internship</li> </ul>
<p>Retrieval Paramedic (RP)<sup>u</sup></p>	<ul style="list-style-type: none"> <li>• A Retrieval Paramedic is an advanced clinical practitioner in paramedicine that provides medical assessment, treatment and care in the out of hospital environment to facilitate the safe and effective transfer of critically unwell patients to a specialist receiving facility.</li> <li>• RPs respond to critically unwell patients based on either initial information from an incident scene or where patients have been assessed by a primary treating clinician e.g. General Practitioner/primary responding ambulance crew or as requiring transfer to a specialist clinical facility.</li> <li>• The role liaises extensively with onsite clinicians and undertakes a specialist clinical assessment and patient management plan to support the safe transfer of these often complex and time critical patients.</li> <li>• The RP is required to make complex and critical clinical judgements often without direct supervision.</li> <li>• An RP may be deployed as part of a two person crew operating in conjunction with a Medical Doctor or may operate as a single practitioner.</li> <li>• These practitioners may operate from either the road ambulance or aeromedical platform settings.</li> <li>• Scope of practice incorporates that of ICPs and also includes advanced clinical assessment (e.g., interpretation of blood tests and x-rays), specialist clinical management to support the safe transfer of critically injured or ill patients to definitive care, rapid sequence intubation and the use of mechanical ventilators and medication administration devices. (Paramedics Australasia, 2012f)</li> </ul>	<ul style="list-style-type: none"> <li>• ICP with post graduate experiences and post graduate study (e.g., Graduate Certificate or Masters)<sup>v</sup></li> <li>• An internship</li> </ul>

<sup>q</sup> Other vocational titles (non-army or defence) include: mobile intensive care ambulance paramedic, level 5 paramedic, and intensive care paramedic (Paramedics Australasia, 2012e).

<sup>r</sup> As defined by the Australian Resuscitation Council in Australia or the Ambulance Service Sector Standard 8156 and New Zealand National Clinical Guidelines in New Zealand (Paramedics Australasia, 2012e).

<sup>s</sup> In Australia, an Advanced Diploma of Paramedical Science (Ambulance) is still used by some locations (Paramedics Australasia, 2012e).

<sup>t</sup> In New Zealand, either an industrial training qualification or a post graduate Certificate in Advanced Paramedic Practice is required (Paramedics Australasia, 2012e).

<sup>u</sup> Other vocational titles (non-army or defence) include: flight paramedic, air ambulance paramedic, mobile intensive care ambulance flight paramedic, critical care paramedic, and flight ICP (Paramedics Australasia, 2012f).

<sup>v</sup> New Zealand currently requires a Postgraduate Certificate in Advanced Paramedic Practice or relevant industrial training program (Paramedics Australasia, 2012f).

<p>General Care Paramedic (GCP)<sup>w</sup></p>	<ul style="list-style-type: none"> <li>• A GCP is an advanced clinical practitioner in paramedicine that specialises in facilitating a comprehensive medical history/assessment, initiation of relevant treatment and appropriate referral for low and medium acuity patients in a variety of community and clinical settings with an emphasis on managing a patient in their own environment/context.</li> <li>• They attend to both scheduled and unscheduled lower acuity patients where they undertake a thorough clinical assessment of the patient's medical history and condition, order any pathology testing as required, interpret the results and based on a clinical diagnosis institute a short/medium term care plan with appropriate medical referral as required. The GCP has a significant understanding of pathophysiology, pharmacology and disease process.</li> <li>• GCPs are required to make complex and critical clinical judgements in a multidisciplinary, collaborative team environment ensuring involvement of the patients primary treating health care professional where possible and without direct supervision.</li> <li>• This role currently operates predominantly in the community, residential aged care or supported care facilities or on occasions rural/remote hospitals.</li> <li>• Typically this professional is currently deployed as single operator in a purpose equipped vehicle without stretcher capacity or as an expert clinical resource in an ambulance communications facility.</li> <li>• The GCP's Scope of practice incorporates that of paramedics, but also includes specialist patient assessment (e.g., point of care blood testing, ordering x-rays and specimen testing), immunization, urinary catheters, feeding tube insertion, reduction of common dislocations (e.g., finger, anterior shoulder), the specialist management of wounds, infections, dehydration, soft tissue injury, chronic pain as well as palliative care, and referral to general medical practitioners, nurses, palliative care services and community social services. (Paramedics Australasia, 2012g)</li> </ul>	<ul style="list-style-type: none"> <li>• Paramedic with post graduate experiences and post graduate study (e.g., Masters)</li> <li>• An Internship</li> <li>• Achievement of ICP practice<sup>x</sup></li> <li>• GCPs are usually educated via internal development programs delivered by employing service providers</li> </ul>
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<sup>w</sup> Other vocational titles include: extended care paramedic or community paramedic (Paramedics Australasia, 2012g).

<sup>x</sup> In some paramedical services only

**APPENDIX B**
**Table 4 –Identified literature on the practice of paramedic and EMA professionals, interprofessional collaboration, and community paramedicine <sup>y</sup>**

No.	Description	Reference
<b>Review Articles</b>		
1	<p><b>Aim:</b> To provide a critical review of research on clinical handover between the ambulance service and emergency department (ED) in hospitals. <b>Method:</b> Data base and hand searches were conducted using the keywords ambulance, handover, handoff, emergency department, emergency room, ER, communication, and clinical handover. Data were extracted, summarised and critically assessed to provide evidence of current clinical handover processes. <b>Results:</b> From 252 documents, eight studies fitted the inclusion criteria of clinical handover and the ambulance to ED patient transfer. Three themes were identified in the review: (1) important information may be missed during clinical handover; (2) structured handovers that include both written and verbal components may improve information exchange; (3) multidisciplinary education about the clinical handover process may encourage teamwork, a shared common language and a framework for minimum patient information to be transferred from the ambulance service to the hospital ED. <b>Conclusion:</b> Knowledge gaps exist concerning handover information, consequences of poor handover, transfer of responsibility, staff perception of handovers, staff training and evaluation of recommended strategies to improve clinical handover. Evidence of strategies being implemented and further research is required to examine the ongoing effects of implementing the strategies. According to the authors, barriers to effective clinical handover between the ambulance and the ED include a lack of common language or understanding between health care disciplines, inattention to handover and lack of active listening skills, variable quality and quantity of information exchanged during handover, lack of clear leadership, lack of teamwork skills, busy and complex environment and repetition of handover. They suggest that these findings suggest that effective and high quality handovers in the ED are hindered by barriers that largely centre around interprofessional communication with the result that important clinical information may be missed during the process. Interprofessional communication occurs during the ambulance to ED patient transfer process and the barriers encountered are similar to other hospital multidisciplinary clinical handovers.</p>	<p>Bost, N., Crilly, J., Wallis, M., Patterson, E., &amp; Chaboyer, W. (2010). Clinical handover of patients arriving by ambulance to the emergency department – A literature review. <i>International Emergency Nursing, 18</i>, 210-220.</p>

<sup>y</sup> Please note the studies, programs, and findings presented in this table may originate from jurisdictions with health systems that are significantly different from Ontario's. If there is intent to draw heavily from one or more sources presented in this table, we recommend that you contact the lead author of this review for assistance with evaluating the local applicability.

No.	Description	Reference
2	<p><b>Introduction.</b> Reducing unnecessary ambulance transports may have operational and economic benefits for emergency medical services (EMS) agencies and receiving emergency departments. However, no consensus exists on the ability of paramedics to accurately and safely identify patients who do not require ambulance transport. <b>Objective.</b> This systematic review and meta-analysis evaluated studies reporting U.S. paramedics' ability to determine medical necessity of ambulance transport. <b>Methods.</b> PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Cochrane Library databases were searched using Cochrane Prehospital and Emergency Care Field search terms combined with the Medical Subject Headings (MeSH) terms "triage"; "utilization review"; "health services misuse"; "severity of illness index," and "trauma severity indices." Two reviewers independently evaluated each title to identify relevant studies; each abstract then underwent independent review to identify studies requiring full appraisal. Inclusion criteria were original research; emergency responses; determinations of medical necessity by U.S. paramedics; and a reference standard comparison. The primary outcome measure of interest was the negative predictive value (NPV) of paramedic determinations. For studies reporting sufficient data, agreement between paramedic and reference standard determinations was measured using kappa; sensitivity, specificity, and positive predictive value (PPV) were also calculated. <b>Results.</b> From 9,752 identified titles, 214 abstracts were evaluated, with 61 studies selected for full review. Five studies met the inclusion criteria (interrater reliability, kappa = 0.75). Reference standards included physician opinion (n = 3), hospital admission (n = 1), and a composite of physician opinion and patient clinical circumstances (n = 1). The NPV ranged from 0.610 to 0.997. Results lacked homogeneity across studies; meta-analysis using a random-effects model produced an aggregate NPV of 0.912 (95% confidence interval: 0.707–0.978). Only two studies reported complete 2×2 data: kappa was 0.105 and 0.427; sensitivity was 0.992 and 0.841; specificity was 0.356 and 0.581; and PPV was 0.158 and 0.823. <b>Conclusion.</b> The results of the few studies evaluating U.S. paramedic determinations of medical necessity for ambulance transport vary considerably, and only two studies report complete data. The aggregate NPV of the paramedic determinations is 0.91, with a lower confidence limit of 0.71. These data do not support the practice of paramedics' determining whether patients require ambulance transport. These findings have implications for EMS systems, emergency departments, and third-party payers. <b>Limitations.</b> This study limited its primary analysis to determinations made by paramedics because paramedics have different assessment skills and broader knowledge than EMTs. Incorporating determinations of medical necessity made by nonparamedic personnel in a secondary analysis, however, did not change our overall findings. It also excluded studies from other countries because EMS systems, paramedic education, social expectations, and the medical–legal environments in other countries differ substantially, and this could affect both the decision-making process used by paramedics and any reference standard determinations of medical necessity. Studies of paramedic determinations of medical necessity in a number of specific environments or situations were also excluded (e.g., mass gatherings, trauma centre cases).</p>	<p>Brown, L.H., Hubble, M.W., Cone, D.C., Millin, M., Schwatz, B., Patterson, P.D., et al. (2009). Paramedic Determinations of Medical Necessity: A Meta-Analysis. <i>Pre-Hospital Emergency Care</i>, 13(4), 516-527.</p>

No.	Description	Reference
3	<p>Aims: The aim of the literature review was to identify new and emerging out of hospital emergency care roles and to describe their activity and impact. Background: Demographic changes, increased demands for health services, altered working practices, and health system economic pressures have led to the development of a disparate set of new health care roles. Emergency Care Practitioners (ECPs) tend to be experienced nurses or paramedics working in autonomous but collaborative roles in the out of hospital setting; seeing, treating, releasing (or referring) patients with predominantly minor conditions. The vision for and practice of Paramedic Practitioners (PPs) is essentially similar to that of the ECP, but limited to the paramedic profession. Data sources: MEDLINE, EMBASE and CINAHL databases, and the two search engines Google and Google Scholar were searched for contemporary studies in the identified study area. Review methods: All publications identified through the search were assessed for relevance. Those that discussed new roles were included (n = 34) and empirical studies (n = 14) analysed in detail. Results: ECP and PP roles are having an impact on patient care, including an average 25% reduction in the conveyance rate to hospital, improved interprofessional working, immediacy of treatment and referral, and high patient satisfaction. Limited economic data suggests savings of between £31 (USD 55) and £37 (USD 65) per case when ECPs replace standard ambulance responders. Concerns have been expressed about patient safety, recruitment and training levels, regulatory and role implementation issues. Conclusion: Further work is required to fully understand the patient safety, clinical practice, professional role and financial implications of these new roles.</p>	<p>Cooper, S.J.R. &amp; Grant, J. (2009). New and emerging roles in out of hospital emergency care: A review of the international literature. <i>International Emergency Nursing</i>, 17, 90-98.</p>
4	<p>This article states that recognition of the paramedic “profession” began in 2003, with the introduction of statutory registration and the promotion of graduate entry. The paper explores the published evidence which surrounds paramedic practice in an attempt to identify the skills, training, and professional capacity that paramedics of the future will require. It notes that the role of the paramedic has evolved, moving away from its focus on basic first aid and patient transportation, to encompass higher levels of patient care and transform the prognoses of patients suffering from a wide range of trauma and medical conditions. A systematic analysis was carried out of key reviews and commentaries published between January 1995 and April 2004, and informal discussions with experts and researchers in the field were undertaken. The paper concludes there was little high quality published evidence with which to validate many aspects of current paramedic practice. To keep pace with service developments, paramedic training must embrace the complexities of autonomous practice. Undoubtedly in the short term, paramedics must be taught to appropriately identify and manage a far wider range of commonly occurring conditions, minor illnesses, and trauma. However, in the longer term, and more importantly, paramedics must learn to work together to take ownership of the basic philosophies of their practice, which must have their foundation in valid and reliable research.</p>	<p>Ball, L. (2005). Setting the scene for the paramedic in primary care: A review of the literature. <i>Emergency Medicine Journal</i>, 22(12), 896-900.</p>

Articles in Peer-Reviewed Journals		
5	<p><b>Study objective:</b> Evidence suggests that active collaboration between hospitals and emergency medical services (EMS) is significantly associated with lower acute myocardial infarction mortality rates; however, the nature of such collaborations is not well understood. The authors seek to characterize views of key hospital staff about collaboration with EMS in the care of patients hospitalized with acute myocardial infarction. <b>Methods:</b> An exploratory analysis of qualitative data previously collected from site visits and detailed interviews with 11 US hospitals that ranked in the top or bottom 5% of performance on 30-day risk standardized acute myocardial infarction mortality rates, using Centers for Medicare &amp; Medicaid Services data from 2005 to 2007. The authors selected all codes from the previous analysis in which EMS was most likely to have been discussed. A multidisciplinary team analyzed the data with the constant comparative method to generate recurrent themes. <b>Results:</b> Both higher- and lower-performing hospitals reported that EMS is critical to the provision of timely care for patients with acute myocardial infarction. However, close collaborative relationships with EMS were more apparent in the higher-performing hospitals, which demonstrated specific investment in and attention to EMS through respect for EMS as valued professionals and colleagues, strong communication and coordination with EMS and active engagement of EMS in hospital acute myocardial infarction quality improvement efforts. <b>Conclusion:</b> Hospital staff from higher-performing hospitals described broad, multifaceted strategies to support collaboration with EMS in providing acute myocardial infarction care. The association of these strategies with hospital performance should be tested in a larger representative study. <b>Limitations:</b> Examples of study limitations indicated by the study authors include: study findings cannot be generalized to all hospitals and EMS agencies; this study does not discuss the perspective of EMS providers; and the study findings are qualitative and should be further evaluated quantitatively to determine their relationship with risk-standardized mortality.</p>	<p>Landman, A.B., Spatz, E.S., Cherlin, E.J., Krumholz, H.M., Bradley, E.H., &amp; Currie, L.A. (2012). Hospital collaboration with emergency medical services in the care of patients with acute myocardial infarction: Perspectives from key hospital staff. <i>Annals of Emergency Medicine</i>, article in press.</p>
6	<p><b>Introduction:</b> Few emergency medical services (EMS) interventions in New Mexico have been assessed for efficacy, potential harm, or potential benefit. There is concern that many interventions added over the years may be outdated, harmful, or ineffective in the EMS setting. A formal process for reviewing the state EMS scope of practice using literature review and expert consensus is discussed. In Phase One of the project, interventions in the New Mexico EMS scope of practice were prioritized for further review by surveying a national cadre of EMS experts to evaluate EMS interventions using a utilitarian harm/benefit metric. <b>Methods:</b> An electronic survey based on the 2010 New Mexico EMS Scope of Practice statute was administered from March through June, 2011. A national cadre of 104 respondents was identified. Respondents were either State EMS medical directors or EMS fellowship directors. Respondents were asked to rate the potential harm and the potential benefit of specific EMS interventions on a 5-point ordinal scale. Median harm and benefit scores were calculated. <b>Results:</b> A total of 88 completed surveys were received. Twenty-two (22) highest-priority interventions (those with a harm/benefit median score ratio of &gt;1) were identified. Seven additional second-priority interventions were also identified. These interventions will be advanced for formal literature review and expert consensus. <b>Conclusions:</b> The New Mexico EMS Interventions Project offers a novel model for assessing a prehospital scope of practice.</p>	<p>Munk, M-D., Fullerton, L., Banks, L., Morley, S., McDaniels, R. Castle, S., et al. (2012). Assessing EMS scope of practice for utility and risk: The New Mexico EMS interventions assessment project, Phase I results. <i>Prehospital and Disaster Medicine</i>, 27(5), 452-457.</p>

7	<p>Aims: Improvement of clinical handover is fundamental to meet the challenges of patient safety. The primary aim of this interview study is to explore healthcare professionals' attitudes and experiences with critical episodes in patient handover in order to elucidate factors that impact on handover from ambulance to hospitals and within and between hospitals. The secondary aim is to identify possible solutions to optimise handovers, defined as "situations where the professional responsibility for some or all aspects of a patient's diagnosis, treatment or care is transferred to another person on a temporary or permanent basis". Methods: The authors conducted 47 semi-structured single-person interviews in a large university hospital in the Capital Region in Denmark in 2008 and 2009 to obtain a comprehensive picture of clinicians' perceptions of self-experienced critical episodes in handovers. They included different types of handover processes that take place within several specialties. A total of 23 nurses, three nurse assistants, 13 physicians, five paramedics, two orderlies, and one radiographer from different departments and units were interviewed. Results: The authors found eight central factors to have an impact on patient safety in handover situations: communication, information, organisation, infrastructure, professionalism, responsibility, team awareness, and culture. With respect to organization, paramedics had diverse experiences about communicating with the receiving parties in handovers. They sometimes had a definite impression that not all important information they delivered was passed on, written down, received, or understood due to insufficient organisational structures. Conclusions: The eight factors identified indicate that handovers are complex situations. The organisation did not see patient handover as a critical safety point of hospitalisation, revealing that the safety culture in regard to handover was immature. Work was done in silos and many of the handover barriers were seen to be related to the fact that only few had a full picture of a patient's complete pathway.</p>	<p>Siemsen, I. M. D., Madsen, M. D., Pedersen, L. F., Michaelsen, L., Pedersen, A. V., Andersen, H. B., Østergaard, D. (2012). Factors that impact on the safety of patient handovers: An interview study. <i>Scandinavian Journal of Public Health, 40</i>(5), 439-448.</p>
8	<p>This article discusses the differences between the main models of international emergency medical service (EMS) systems: the Anglo-American and the Franco-German models. The Anglo-American model is based around "scoop and run" philosophy. The aim of this model is to rapidly bring patients to the hospital with less pre-hospital interventions. The model is usually allied with public safety services such as police or fire departments rather than public health services and hospitals. The Franco-German model of EMS delivery is based on the "stay and stabilize" philosophy. The motive of this model is to bring the hospital to patients. This model is usually run by physicians and they have extensive scope of practice with very advanced technology. The article further explains that the current international EMS systems have varied features and practices but they all resemble the main models of EMS systems in one way or another. The aim of international EMS systems is to adapt a model that meets the local needs and targets with diverse cultural, political and financial factors of each individual community. Advocating for a single system that fits all is a slippery approach to take in a rapidly changing world. It concludes by noting that in 2004 Oman introduced an EMS system based on the Anglo-American model under the auspices of the Royal Oman Police. The model is designed to respond to trauma cases resulting from endemic Road Traffic Crashes, with pre-hospital care provided by all-advanced life support trained emergency medical technicians.</p>	<p>Al-Shaqsi, S. (2010). Models of international emergency medical service systems. <i>Oman Medical Journal, 25</i>(4), 320-323.</p>
9	<p>This paper identifies that there is a growing private ambulance sector, notwithstanding legislative prohibitions on the provision of ambulance services that exist in nearly all Australian State and Territories. Notwithstanding these prohibitions, there appears to be no intention to prosecute private ambulance providers and, indeed, governments probably appreciate that these services fill a need and reduce the demand for non-emergency services on state run ambulance services. The paper defines what is meant by ambulance services and describes what is prohibited in each Australian jurisdiction and then argue that, to ensure that the providers of ambulance services continue to deliver a quality service to the public, there should be a legally sanctioned system to register paramedics and the use of various titles associated with the pre-hospital sector must be restricted.</p>	<p>Eburn, M., &amp; Bendall, J.C. (2010). The provision of Ambulance Services in Australia: a legal argument for the national registration of paramedics. <i>Journal of Emergency Primary Health Care, 8</i>(4).</p>



10	<p><b>Background</b> Clinical handover between paramedics and the trauma team is undertaken in a time-pressured environment. Paramedics are often required to handover complex problems to a multitude of staff. There is evidence that information loss occurs at this transition. The aims of this project were to (1) develop a minimum dataset to assist paramedics provide handover; (2) identify attributes of effective and ineffective handover; (3) determine the feasibility of advanced data transmission; and (4) identify how to best display data in trauma bays. <b>Methods</b> Qualitative study of paramedics and trauma team members in Australia. A thematic analysis was undertaken using grounded theory. <b>Results</b> Ten paramedics and 17 trauma team members were interviewed. A minimum dataset modified on an existing template was developed to include fields required by the trauma team to inform immediate treatment; there was general consensus from both paramedics and the trauma team that the concept of using a template to deliver the minimum dataset was good and that the data elements in the MIST<sup>z</sup> (Mechanism of injury/illness, Injuries [sustained or suspected], Signs, including observations and monitoring, Treatment given) template were appropriate. Respondents stated that an effective handover was one which was delivered succinctly and in a structured manner, and contained only vital data necessary to direct immediate treatment. Experience was a key factor in being able to give a good handover. The presence of appropriate personnel to receive the handover, coupled with their ability to actively listen were important factors in determining a good handover for paramedics. Conversely, three paramedics, five doctors and three nurses made the point that an ineffective handover was one in which perceived extraneous information was communicated and when interruptions occurred. While three paramedics felt that dismissive attitudes by trauma team members impacted on their ability to handover effectively and that they often had to repeat themselves because of inattention, three trauma team members stated that they became dismissive when paramedics ‘rambled on’. Advanced transmission of data to the receiving hospital was widely supported. While computers carried by paramedics were capable of exporting data to the receiving hospital, barriers such as time constraints, workflow issues and infection control issues impeded the ability to do this in the current environment. <b>Discussion</b> There is support for the adoption and further evaluation of a handover template. It can provide valuable structure to the face-to-face handover, and experience from other specialties suggests it can reduce information loss. Strategies to enable information to be transmitted in advance of the patients’ arrival must address concerns voiced by paramedics. <b>Limitations:</b> One limitation of this study is the fact that paramedics with experience handing over the care of trauma patients were purposefully selected for this study and it may be that less experienced paramedics would identify different barriers to transmitting information to trauma team members (although most trauma patients are transferred by intensive care road and air paramedics).</p>	<p>Evans, S. M., Murray, A., Patrick, I., Fitzgerald, M., Smith, S., &amp; Cameron, P. (2010a). Clinical handover in the trauma setting: A qualitative study of paramedics and trauma team members. <i>Quality and Safety in Health Care</i>, 19, e57.</p>
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<sup>z</sup> The MIST template was developed as a tool to assist paramedics to handover information in a systematic manner. It prompts paramedics to communicate to the trauma team the mechanism of injury, injuries sustained, signs and symptoms, and treatment provided (Evans et al. 2010a).

11	<p><b>Introduction:</b> The aim of effective clinical handover is seamless transfer of information between care providers. Handover between paramedics and the trauma team provides challenges in ensuring that information loss does not occur. Handover is often time pressured and paramedics' clinical notes are often delayed in reaching the trauma team. Documentation by trauma team members must be accurate. This study evaluated information loss and discordance as patients were transferred from the scene of an incident to the Trauma Centre. <b>Methods:</b> Twenty-five trauma patients presenting by ambulance to a tertiary Emergency and Trauma Centre were randomly selected. Audiotaped (pre-hospital) and videotaped (in-hospital) handover was compared with written documentation. <b>Results:</b> In the pre-hospital setting 171/228 (75%) of data items handed over by paramedics to the trauma team were documented and in the in-hospital handover 335/498 (67%) of information was documented. Information least likely to be documented by trauma team members (1) in the pre-hospital setting related to treatment provided and (2) in the in-hospital setting related to signs and symptoms. While 79% of information was subsequently documented by paramedics, 9% (n = 59) of information was not documented either by trauma team members or paramedics and constitutes information loss. Information handed over was not congruent with documentation on seven occasions. Discrepancies included a patient's allergy status and sites of injury (n = 2). Demographic details were most likely to be documented but not handed over by paramedics. <b>Conclusion:</b> By documenting where deficits in handover occur the authors can identify points of vulnerability and strategies to capture this information. <b>Limitations:</b> There are a number of limitations in this study, for example: this is a relatively small study confined to trauma patients and the authors cannot be sure that findings can be generalized to other Emergency and Trauma Centres, Emergency Departments or patient groups and as with any observational study, it may be that behaviour by paramedics of trauma team members was modified as a result of being observed.</p>	<p>Evans, S.M., Murray, A., Patrick, I., Fitzgerald, M., Smith S., Andrianopolous, N., &amp; Cameron, P. (2010b). Assessing clinical handover between paramedics and the trauma team. <i>Injury: International Journal of the Care of the Injured</i>, 41, 460-464.</p>
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12	<p><b>Background:</b> Over the past century the Australian paramedic discipline has changed dramatically; moving from its origins of an ambulance driver to its current practitioner role and integral member of the Australian health care system. However, at present the Australian paramedic discipline is not considered a full profession. The issue of whether the discipline currently believes it is a profession, and if it wants to achieve full professional status will be examined. <b>Objectives:</b> This paper has two objectives - to examine if the Australian paramedic membership views the discipline as a profession, and if paramedic community wants to be considered a profession within Australia. <b>Methods:</b> A convenience sample was used for this study that included participants who attended the inaugural National Association Paramedic Academics in September, 2008. An investigation of professionalization attitudes were investigated using a paper-based self-report questionnaire. <b>Findings:</b> A total of 63 experts participated in the study. Forty (63.5%) of the participants were male and 23 (36.5%) were female, with 44% of the participants (n=28) being between 35-44 years of age. The majority of the participants reported that the paramedic discipline would benefit from being recognised as a full profession (M=4.62, SD=.771) within Australia and that the higher education sector has an important part to play in this process (4.49, SD=0.74). The majority felt that national registration would not occur within the next 2 years (M=2.52, SD=1.12). A significant difference (p=0.001) between participants from Victoria, New Zealand and Queensland about whether the paramedic discipline would achieve national registration produced was noted. <b>Conclusions:</b> The findings from the survey suggest two points in relation to professionalism of the paramedic discipline within Australia. Firstly, the paramedic discipline is not a profession and secondly, the paramedic discipline wants to become recognised as a profession. Other professional factors such as national registration, autonomy and the development of a unique body of knowledge require further investigation. This study notes that at present, two traits are not demonstrated by the Australian paramedic sector: professional authority; and unique body of knowledge. It is argued these are not demonstrated, given the absence of national registration, regulation, accreditation of paramedics or national curricula standards for paramedic education programs.</p>	<p>Williams, B., Onsman, A., &amp; Brown, T. (2010). Is the Australian Paramedic Discipline a Full Profession? <i>Journal of Emergency Primary Health Care</i>, 8(1).</p>
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13	<p><b>Introduction:</b> Little is known about how effectively information is transferred from emergency medical services (EMS) personnel to clinicians in the emergency department receiving the patient. Information about prehospital events and findings can help ensure expedient and appropriate care. The trauma literature describes 16 prehospital data points that affect outcome and therefore should be included in the EMS report when applicable. <b>Objective:</b> To determine the degree to which information presented in the EMS trauma patient handover is degraded. <b>Methods:</b> At a level I trauma center, patients meeting criteria for the highest level of trauma team activation (“full trauma”) were enrolled. As part of routine performance improvement, the physician leadership of the trauma program watched all available video-recorded full trauma responses, checking off whether the data points appropriate to the case were verbally “transmitted” by the EMS provider. Two EMS physicians then each independently reviewed the trauma team’s chart notes for 50% of the sample (and a randomly selected 15% of the charts to assess agreement) and checked off whether the same elements were documented (“received”) by the trauma team. The focus was on data elements that were “transmitted” but not “received.” <b>Results:</b> In 96 patient handovers, a total of 473 elements were transmitted, of which 329 were received (69.6%). On the average chart, 72.9% of the transmitted items were received (95% confidence interval 69.0%– 76.8%). The most commonly transmitted data elements were mechanism of injury (94 times), anatomic location of injury (81), and age (67). Prehospital hypotension was received in only 10 of the 28 times it was transmitted; prehospital Glasgow Coma Scale [GCS] score 10 of 22 times; and pulse rate 13 of 49 times. <b>Conclusions:</b> Even in the controlled setting of a single-patient handover with direct verbal contact between EMS providers and in-hospital clinicians, only 72.9% of the key prehospital data points that were transmitted by the EMS personnel were documented by the receiving hospital staff. Elements such as prehospital hypotension, GCS score, and other prehospital vital signs were often not recorded. Methods of “transmitting” and “receiving” data in trauma as well as all other patients need further scrutiny. <b>Limitations:</b> One of the main limitations of this study was the unexpected 30% rate of videotape capture for full trauma evaluations, resulting in a smaller sample size than anticipated.<sup>aa</sup> The EMS physicians extracting data from the charts also did not have a process to resolve discrepancies (e.g., whether to give credit for partial information such as ‘over 70 mph’ or ‘high speed’ instead of the actual crash speed). The authors also noted that it was also possible that the trauma team obtained information from a source other than the handover or knew information they did not record in the chart, resulting in an inaccurate estimate of the degree of information loss.</p>	<p>Carter, A. J. E., Davis, K. A., Evans, L. V., &amp; Cone, D. C. (2009). Information loss in emergency medical services handover off trauma patients. <i>Prehospital Emergency Care</i>, 13, 280-285.</p>
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<sup>aa</sup> This was due to a combination of factors, including failure to activate the videotaping system and delayed activation of the videotaping system (after the EMS handover) had been completed. However, given that the demographics of the study handovers were consistent with the general “full trauma” population seen at the institution, the authors felt that the data presented was a representative sample.

14	<p><b>Background:</b> A scheme to train paramedics to undertake a greater role in the care of older people following a call for an emergency ambulance was developed in a large city in the UK. <b>Objectives:</b> To assess the cost effectiveness of the paramedic practitioner (PP) scheme compared with usual emergency care. <b>Methods:</b> A cluster randomised controlled trial was undertaken of PP compared with usual care. Weeks were allocated to the study group at random to the PP scheme either being active (intervention) or inactive (control). Resource use data were collected from routine sources, and from patient-completed questionnaires for events up to 28 days. EQ-5D data were also collected at 28 days. <b>Results:</b> Whereas the intervention group received more PP contact time, it reduced the proportion of emergency department (ED) attendances (53.3% vs 84.0%) and time in the ED (126.6 vs 211.3 minutes). There was also some evidence of increased use of health services in the days following the incident for patients in the intervention group. Overall, total costs in the intervention group were £140 lower when routine data were considered (p=0.63). When the costs and QALY were considered simultaneously, PP had a greater than 95% chance of being cost effective at £20 000 per QALY. <b>Conclusion:</b> Several changes in resource use are associated with the use of PP. Given these economic results in tandem with the clinical, operational and patient-related benefits, the wider implementation and evaluation of similar schemes should be considered.</p>	<p>Dixon, S., Mason, S., Knowles, E., Colwell, B., Wardrope, J., Snooks, H., et al. (2009). Is it cost effective to introduce paramedic practitioners for older people to the ambulance service? Results of a cluster randomized control trial. <i>Emergency Medical Journal</i>, 26, 446-451.</p>
15	<p><b>Aim:</b> This longitudinal study was designed to address four research questions and the hypothesis that adults living in a rural Nova Scotia island community receiving primary health care and emergency services from a team that included an on-site nurse practitioner (NP) and paramedics and an off-site family physician would, over time, demonstrate evidence of improved psychosocial adjustment and less expenditure of health care resources. <b>Background:</b> In Canada, there is a growing awareness and commitment to addressing the challenges of providing primary health care services in rural areas. The model described in this article was developed because concerned community leaders lobbied for improved access to primary health care services. In response, Emergency Health Services (EHS) decided better use could be made of paramedics who, though stationed on the Islands around the clock, were responding to only one emergency call every third day. Following an education program, paramedics began to assess and manage simple wounds, administer tetanus injections and flu immunizations and perform home assessments. Resident response was positive; nevertheless, they continued their advocacy efforts for a broader range of services. Thus EHS introduced the NP-paramedic-physician model of care and commissioned an independent evaluation. A literature review supported the role of NPs in primary health care and a potential role for paramedics. No studies were found that evaluated the combination of NPs, paramedics and physicians as providers of primary health care. <b>Methods:</b> Structured questionnaires, individual and group interviews with patients, health and social service care providers and administrators and community members were used to describe and evaluate the impact of the model of care over the three years of the study. <b>Findings:</b> The innovative model of care resulted in decreased cost, increased access, a high level of acceptance and satisfaction and effective collaboration among care providers. Participants reported positive collaboration among the core health team as well as with the rest of the multidisciplinary health care team in the district. Challenges related to collaboration between the NP and paramedics identified in earlier years were not mentioned in interviews conducted at the conclusion of the project. Rather, participants reported effective collaboration and cooperation between NPs and paramedics. Organizational structures to support the innovative model of primary health care were identified.</p>	<p>Matin-Misener, R., Downe-Wamboldt, B., Cain, E., &amp; Girouard, M. (2009). Cost effectiveness and outcomes of a nurse practitioner-paramedic-family physician model of care: The Long and Brier Islands study. <i>Primary Health Care Research and Development</i>, 10(1), 14-25.</p>

16	<p>Over the last one hundred and twenty years, the Australian paramedic sector has changed dramatically; influenced and informed by a range of social, health, economic, professional, and political forces. However, there has been little reflection of those changes in either the perception of the discipline as a profession or the manner in which its membership is trained, socialised, and educated. This paper explores the links between professionalization and education in the paramedic field. Paramedics are currently at best seen as a 'semi-profession' and a great deal of discussion about whether the discipline actually wants to achieve full professional status exists. Comparisons will be made with the professions of nursing and physiotherapy, outlining <i>how</i> and <i>why</i> they progressed from a semi-professional status to a fully recognised profession, culminating in a discussion about which characteristics the paramedics discipline as yet lacks. A review of common professional traits suggests three areas where the discipline falls short: 1) the delineation of its professional compass, especially in relation to extant recognised cognate (and competitive) professions, 2) National registration and regulation resulting in professional self-control and accreditation, and 3) Higher Education and the development of a unique body of professional knowledge. Finally it will be argued that the recognition and addressing of the gaps by the relevant policymakers, regulators, employers and academics will lead to the formulation of strategies that are most likely to result in professional status for paramedics in Australia.</p>	<p>Williams, B., Onsman, A., &amp; Brown, T. (2009). From stretcher-bearer to paramedic: the Australian paramedics' move towards professionalisation. <i>Journal of Emergency Primary Health Care</i>, 7(4).</p>
17	<p><b>Aim:</b> To evaluate a new service development whereby a nurse and a paramedic working in partnership attended non-urgent emergency calls. <b>Background:</b> The demand for emergency ambulance services both nationally (in the UK) and internationally has been steadily increasing. A large proportion of calls made to the emergency ambulance service are classified as non-urgent. An alternative response to these calls may release the standard ambulance service to attend more urgent calls. A pilot project was initiated in order to provide an alternative response to non-urgent emergency calls in an Ambulance Trust in England with support from the local Primary Care Trust. This alternative response comprised a district nurse or an emergency nurse practitioner dispatched with a paramedic to visit low-priority emergency calls. The pilot service was trialled during a 15-week period in 2003–2004. <b>Methods:</b> This paper evaluates the cost effectiveness of the pilot service by examining both the resource use and the outcomes of the service. <b>Findings:</b> It was found that introducing this service to the current provision would increase the overall cost to the ambulance services. However, a reduction in conveyance rate to the hospital was observed as people could be treated on-scene. A reduction in conveyance rate to the hospital would lead to reduced admissions to accident and emergency departments and subsequent hospitalization. This paper provides an indication that further development of this type of service has the potential to be cost effective, if the wider health care economy is considered, as the cost savings made in secondary care could more than balance the costs to the Ambulance Services in providing such a service.</p>	<p>Widiatmoko, D., Machen, I., Dickinson, A., Williams, J., &amp; Kendall, S. (2008). Developing a new response to non-urgent emergency calls: Evaluation of a nurse and paramedic partnership intervention. <i>Primary Health Care Research and Development</i>, 9, 183-190.</p>

18	<p><b>Objective:</b> To identify collaborative instances and hindrances and to produce a model of collaborative practice. <b>Methods:</b> A 12-month (2005–2006) mixed methods clinical case study was carried out in a large UK ambulance trust. Collaboration was measured through direct observational ratings of communication skills, teamwork and leadership with 24 multi-professional emergency care practitioners (ECPs), interviews with 45 ECPs and stakeholders, and an audit of 611 patients <b>Results:</b> Using a generic qualitative approach, observational records and interviews showed that ECPs’ numerous links with other professions were influenced by three major themes as follows. (i) The ECP role: for example, “restricted transport codes” of communication, focus on reducing admissions, frustrations about patient tasking and conflicting views about leadership and team work. (ii) Education and training: drivers for multi-professional clinically focussed graduate level education, requirements for skill development in minor injury units (MIUs) and general practice, and the need for clinical supervision/mentorship. (iii) Cultural perspectives: a “crew room” blue collar view of interprofessional working versus emerging professional white collar views, power and communication conflicts, and a lack of understanding of the ECPs’ role. The quantitative findings are reported elsewhere. <b>Conclusions:</b> The final model of collaborative practice suggests that ECPs are having an impact on patient care, but that improvements can be made. The study authors recommend the appointment of ECP clinical leads, degree level clinically focussed multi-professional education, communication skills training, clinical supervision and multi-professional ECP appointments.</p>	<p>Cooper, S., O’Carroll, J., Jenkin, A., &amp; Badger, B. (2007). Collaborative practices in unscheduled emergency care: Role and impact of the emergency care practitioner – qualitative and summative findings. <i>Emergency Medicine Journal</i>, 24, 625-629.</p>
19	<p><b>Aims:</b> To explore patients’ and staffs’ perceptions of a pilot service which dispatched a nurse and paramedic to low-priority ambulance calls. <b>Methods:</b> Patients’ opinions of both pilot and standard service groups were obtained through qualitative questionnaire data and individual interviews. Staffs’ perceptions were explored via two focus groups. Questionnaires were sent to a convenience sample of 128 patients attended by the pilot service and 128 patients receiving the standard service. Initially 19 questionnaire participants agreed to be interviewed. Focus group participants (n = 11) included nurses and paramedics involved in the pilot service. <b>Results:</b> Sixty-four questionnaires were returned and 11 interviews were conducted. Patients receiving the pilot service were enthusiastic about opportunities for care to be provided in their home. Involvement in the pilot service was a positive experience for staff. They felt confident in managing calls effectively because of their combined knowledge and skills, and believed that the quality of patient care had been improved. They also experienced increased job satisfaction and skills development. <b>Conclusion:</b> Both patients and staff expressed positive views about the pilot service. Patients appreciated being treated at home and staff believed that working together provided more appropriate care for patients and enhanced interprofessional development.</p>	<p>Machen, I., Dickinson, A., Williams, J., Widiatmoko, D., &amp; Kendall, S. (2007). Nurses and paramedics in partnership: Perceptions of a new response to low-priority ambulance calls. <i>Accident and Emergency Nursing</i>, 15, 185-192.</p>

20	<p><b>Background:</b> An emergency care practitioner (ECP) is a generic practitioner drawn mainly from paramedic and nursing backgrounds. ECPs receive formal training and extended clinical skills to equip them to work as an integral part of the healthcare team working within and across traditional boundaries of emergency and unplanned care. Currently, ECPs are working in different healthcare settings in the UK. <b>Objectives:</b> (1) To evaluate appropriateness, satisfaction and cost of ECPs compared with the usual service available in the same healthcare setting, (2) to increase understanding of what effect, if any, ECPs are having on delivery of health services locally and (3) to evaluate whether ECP working yields cost savings. <b>Methods:</b> Using a mixed-methods approach, data were collected quantitatively and qualitatively from three different types of health provider setting where ECPs are operational, in three areas of England. Data were collected by sending two questionnaires to each patient eligible to be seen by an ECP, at three and 28 days after presentation; telephone interviews were conducted with a sample of staff that included ECPs, other health professionals and stakeholders (e.g., managers) in each of the three settings; and routine data were analysed to provide a perspective on costs. <b>Results:</b> After adjusting for age, sex, presenting complaint and service model, some differences in the processes of care between the ECPs and the usual providers in the three settings were observed. Overall, ECPs carried out fewer investigations, provided more treatments and were more likely to discharge patients home than the usual providers. Patients were satisfied with the care received from ECPs, and this was consistent across the three different settings. It was found that ECPs are working in different settings across traditional professional boundaries and are having an impact on reconfiguring how those services are delivered locally. Costs information (based on one site only) indicated that ECP care may be cost effective in that model of ECP working. <b>Conclusion:</b> Care provided by ECPs appears to reduce the need for subsequent referral to other emergency and unscheduled care services in a large proportion of cases. The authors found no evidence that the care provided by an ECP was less appropriate than the care by the usual providers for the same type of health problem. <b>Limitations:</b> The authors identified several limitation of this study. They note that it relied on self-reported use of health services at 28 days for their appropriateness of care outcomes. The authors also noted that the method of recruitment of patients may have resulted in selectivity, making it possible for some biases in the comparisons reported. They also warn that the economic findings should be regarded with caution as the savings of approximately £291 (US\$566) per patient seen by an ECP in service one were based on limited data in one operational setting and may not be generalizable. They also note that within a 999 ECP model, the finding may be affected by whether or not the practitioner was formerly employed as a nurse, as a paramedic or from another background.</p>	<p>Mason, S., O'Keefe, C., Coleman, P., Edlin, R., &amp; Nicholl, J. (2007). Effectiveness of emergency care practitioners working within existing emergency models of care. <i>Emergency Medicine Journal</i>, 24, 239-243.</p>
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21	<p><b>Introduction:</b> This article explores how community engagement by paramedics in an expanded scope role contributes to both primary health care and to an overall improved emergency response capacity in rural communities. Understanding how expanded scope paramedics (ESP) can strengthen community healthcare collaborations is an important need in rural areas where low workforce numbers necessitate innovation. <b>Methods:</b> Four examples of Australian rural ESP roles were studied in Tasmania, New South Wales, South Australia and Victoria to gather information on consistent elements that could inform a paramedic expanded scope model. Qualitative data were collected from semi-structured interviews with key stakeholders and organisational documents. Thematic analysis within and across cases found community engagement was a key element in the varied roles. This article relies heavily on data from the Victorian and Tasmanian case studies because community engagement was a particularly strong aspect of these cases <b>Results:</b> The ESP in the case studies increased interactions between ambulance services and rural communities with an overall benefit to health care through: increasing community response capacity; linking communities more closely to ambulance services; and increasing health promotion and illness prevention work at the community level. Leadership, management and communication skills are important for paramedics to successfully undertake expanded scope roles. <b>Conclusion:</b> ESP in rural locations can improve health care beyond direct clinical skill by active community engagement that expands the capacity of other community members and strengthens links between services and communities. As health services look to gain maximum efficiency from the health workforce, understanding the intensification of effort that can be gained from practitioner and community coalitions provides important future directions.</p>	<p>Stirling, C.M., O'Meara, P.O., Pedler, D., Tourle, V., &amp; Walker, J. (2007). Engaging rural communities in health care through a paramedic expanded scope of practice. <i>Rural and Remote Health, 7</i> (839).</p>
22	<p><b>Background:</b> The emergency care practitioner (ECP) is a generic practitioner who combines extended nursing and paramedic skills. The "new" role emerged out of changing workforce initiatives intended to improve staff career opportunities in the National Health Service and ensure that patients' health needs are assessed appropriately. <b>Objective:</b> To describe the development of ECP Schemes in 17 sites, identify criteria contributing to a successful operational framework, analyse routinely collected data and provide a preliminary estimate of costs. <b>Methods:</b> There were three methods used: (a) a quantitative survey, comprising a questionnaire to project leaders in 17 sites, and analysis of data collected routinely; (b) qualitative interpretation based on telephone interviews in six sites; and (c) an economic costing study. <b>Results:</b> Of 17 sites, 14 (82.5%) responded to the questionnaire. Most ECPs (77.4%) had trained as paramedics. Skills and competencies have been extended through educational programmes, training, and assessment. Routine data indicate that 54% of patient contacts with the ECP service did not require a referral to another health professional or use of emergency transport. In a subset of six sites, factors contributing to a successful operational framework were strategic visions crossing traditional organisational boundaries and appropriately skilled workforce integrating flexibly with existing services. Issues across all schemes were patient safety, appropriate clinical governance, and supervision and workforce issues. On the data available, the mean cost per ECP patient contact is £24.00, which is less than an ED contact of £55.00. <b>Conclusion:</b> Indications are that the ECP schemes are moving forward in line with original objectives and could be having a significant impact on the emergency services workload. <b>Limitations:</b> The studies took place within tight deadlines, which restricted more detailed data collection and analysis. Only 50% of the sites surveyed were operational. Patient contact data were also incomplete and limited in content. The authors note that this was primarily because data submission by each ECP scheme was voluntary, and data collection was not designed for research purposes, but to monitor activity in each site.</p>	<p>Mason, S., Coleman, P., O'Keefe, C., Ratcliffe, J., &amp; Nicholl, J. (2006). The evolution of the emergency care practitioner role in England: Experiences and Impact. <i>Emergency Medicine Journal, 23</i>, 435-439.</p>

23	<p><b>Introduction:</b> A high number of emergency (999) calls are made for older people who fall, with many patients not subsequently conveyed to hospital. Ambulance crews do not generally have protocols or training to leave people at home, and systems for referral are rare. The quality and safety of current practice is explored in this study, in which for the first time, the short-term outcomes of older people left at home by emergency ambulance crews after a fall are described. Results will inform the development of care for this population. <b>Methods:</b> Emergency ambulance data in London were analysed for patterns of attendance and call outcomes in 2003–4. All older people who were attended by emergency ambulance staff after a fall in September and October 2003, within three London areas, were identified. Those who were not conveyed to hospital were followed up; healthcare contacts and deaths within the following 2 weeks were identified. <b>Results:</b> During 2003–4, 8% of all 999 calls in London were for older people who had fallen (n = 60,064), with 40% not then conveyed to hospital. Of 2151 emergency calls attended in the study areas during September and October 2003, 534 were for people aged <math>\geq 65</math> who had fallen. Of these, 194 (36.3%) were left at home. 86 (49%) people made healthcare contacts within the 2-week follow-up period, with 83 (47%) people calling 999 again at least once. There was an increased risk of death (standard mortality ratio 5.4) and of hospital admission (4.7) compared with the general population of the same age in London. <b>Comment:</b> The rate of subsequent emergency healthcare contacts and increased risk of death and hospitalisation for older people who fall and who are left at home after a 999 call are alarming. Further research is needed to explore appropriate models for delivery of care for this vulnerable group.</p>	<p>Snooks, H.A., Halter, M., Close, J.C.T., Cheung, W-Y., Moore, F., &amp; Roberts, S.E. (2006). Emergency care of older people who fall: A missed opportunity. <i>Quality and Safety in Health Care</i>, 15, 390-392.</p>
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Grey Literature		
24	<p>This news posting on the Paramedic's Australia websites states that PA New Zealand prepared a formal submission to the recent review of the Health Practitioners Competence Assurance (HPCA) Act 2003. The review commenced on August 31 2012 with the release of a discussion document published by the Ministry of Health seeking views from stakeholders. The scope of the review was agreed by Cabinet, with the aim of ensuring that the Act retains the ability to safeguard health practitioners' competence in a changing health system. The PA Submission to the review discussed the key issues relevant to paramedics in New Zealand highlighting the important role that paramedics play in the patient journey and the commencement of medical treatment in the out-of-hospital environment There is a link to the full submission, which can be accessed at: <a href="http://www.paramedics.org.au/content/2012/10/PANZ-Submission-2012-Review-of-HPCAA.pdf">http://www.paramedics.org.au/content/2012/10/PANZ-Submission-2012-Review-of-HPCAA.pdf</a>.</p>	<p>Cotton, A. (2012). <a href="#">PA Submission to the New Zealand Ministry of Health</a>. Paramedics Australasia Website. Last accessed December 2012.</p>
25	<p>The Health and Care Professions Council (HCPC) is a regulatory body, set up to protect the public. It maintains a <a href="#">Register</a> of health and care professionals who meet the HCPC's <a href="#">standards</a> for training, professional skills, behaviour and health. Currently, the HCPC regulates 16 professions, including operating department practitioners and paramedics. All of these professions have at least one <a href="#">professional title</a> that is protected by law, including the term 'paramedic'. This means, for example, that anyone using the title 'paramedic' must be registered with HCPC. If a registrant does not meet HCPC standards, the organization can take action which might include stopping a person from practising. For further information, see HCPC, <a href="#">About us</a>.</p> <p>This review also used information from on the following webpages of the HCPC website:</p> <ul style="list-style-type: none"> <li>• Standards of Proficiency: Paramedics (HCPC, 2012a) <a href="http://www.hpc-uk.org/assets/documents/1000051CStandards_of_Proficiency_Paramedics.pdf">http://www.hpc-uk.org/assets/documents/1000051CStandards_of_Proficiency_Paramedics.pdf</a> This document sets out the standards of proficiency for Paramedics. It is also expected that registrants abide by the standards of conduct, performance and ethics outlined by HCPC in separate documents These standards are effective from November 1<sup>st</sup>, 2007 and were amended in August 2012 to reflect the name change to the HCPC.</li> <li>• Approved Programmes (HCPC, 2012b) <a href="http://www.hpc-uk.org/education/programmes/">http://www.hpc-uk.org/education/programmes/</a> This webpage highlights HCPC's role in approving programmes within the UK which lead to eligibility to apply for the HCPC <a href="#">Register</a>.</li> <li>• HCPC, Professions: Paramedics (HCPC, 2012c) <a href="http://www.hpc-uk.org/aboutregistration/professions/index.asp?id=10#profDetails">http://www.hpc-uk.org/aboutregistration/professions/index.asp?id=10#profDetails</a> According to the HCPC, a paramedic is defined as providing specialist care and treatment to patients who are either acutely ill or injured. They can administer a range of drugs and carry out certain surgical techniques. (See HCPC, <a href="#">Professions</a>).</li> </ul>	<p>Health &amp; Care Professions Council Website. (2012). <a href="#">About us</a>. London, UK: Health &amp; Care Professions Council. Last Accessed December 2012.</p>
26	<p>This webpage outlines the vision and mission statement of the International Roundtable on Community Paramedicine (IRCP). The page defines community paramedicine as a model of care whereby paramedics apply their training and skills in "non-traditional" community-based environments (outside the usual emergency response/transport model). The community paramedic may practice within an "expanded scope" (applying specialized skills/protocols beyond that which he/she was originally trained for), or "expanded role" (working in non-traditional roles using existing skills).</p>	<p>International Roundtable on Community Paramedicine [IRCP] (2012). <a href="#">IRCP Vision and Mission Statements</a>. Last accessed December 2012.</p>

27	This page from the National Registry of Emergency Medical Technicians identifies the five levels of national certification in the US: First Responder, Basic, Intermediate/85, Intermediate/99, and Paramedic. Exam questions (items) are written by national experts in EMS including state officials, educators, employers, and EMS physicians. Certification through the NREMT indicates that a standard level of competency has been met. Certification means an individual has demonstrated entry level competency, but does not authorize a person to work. Emergency medical professionals are required to obtain a state license to work.	National Registry of Emergency Medical Technicians [NREMT] website (2012a). <a href="#">Fast Facts</a> . Last accessed November 2012.
28	This page from the National Registry of Emergency Medical Technicians (NREMT) explains how the NREMT relates to the provision of EMS services. The site explains that EMS professionals may be educated as First Responders (requires about 40 hours of training), EMT-Basics (requires about 110 hours of training), EMT-Intermediates (requires 200-400 hours of training) or Paramedics (requires 1,000 or more hours of training). It also notes that state EMS Offices issue licenses to EMS professionals and ambulance service providers, along with a variety of other tasks. Currently 46 states require their EMS professionals to be certified by the National Registry of EMTs in order to obtain a license to practice as an EMS professional in their state. Some states require their EMS professionals to maintain certification with the NREMT as part of the continued license; others have their own license renewal process. All EMS professionals are required to complete continuing education.	National Registry of Emergency Medical Technicians [NREMT] website (2012b). <a href="#">Integration of NREMT and EMS</a> . Last accessed November 2012.
29	This webpage from the National Registry of Emergency Medical Technicians (NREMT) describes the nature of the EMS profession and provides general information on the recommended amount of education required to reach each level. The recommendations are as follows: Emergency Medical Responder (EMR), 58 hours of education; Emergency Medical Technician (EMT), 150 hours of education; Advanced Emergency Medical Technician (AEMT), 150 additional hours of education; Paramedic, 1,200 hours of accredited education. The webpage also notes that to be an AEMT requires a person to first be an EMT, then take the advanced education course, and that some states combine EMT and AEMT education in 300 hour courses.	National Registry of Emergency Medical Technicians [NREMT] website (2012c). <a href="#">Become involved as an EMS professional</a> . Last accessed November 2012.
30	This page from the National Registry of Emergency Medical Technicians (NREMT) outlines the differences between certification and licensure. It notes that although the general public continues to use the terms interchangeably, there are important functional distinctions between the two concepts. Certification is: (1) a voluntary process; (2) provided by a private organization; and (3) used for the purpose of providing public information on those individuals who have successfully completed a certification process (usually entailing successful completion of educational and testing requirements) and demonstrated their ability to perform their profession competently. Licensure refers to the state's grant of legal authority, pursuant to the state's police powers, to practice a profession within a designated scope of practice. Under the licensure system, states define, by statute, the tasks and function or scope of practice of a profession and provide that these tasks may be legally performed only by those who are licensed.	National Registry of Emergency Medical Technicians [NREMT] website (2012d). <a href="#">Certification v. licensure</a> . Last accessed November 2012.

31	<p>This booklet highlights the range of opportunities that today's ambulance service has to offer. It reviews the NHS as a workplace, provides insight into some of the key roles inside the ambulance service, outlines a career framework, and specifies the opportunities available within the ambulance service as well as the training or education required to work there. The following roles are highlighted:</p> <p><u>Emergency care assistants (ECAs)</u> - often work alongside a paramedic answering 999 calls. Under the direct supervision of the paramedic, ECA's carry out essential emergency care, such as controlling severe bleeding, treating wounds and fractures and looking after patients with possible spinal injuries.</p> <p><u>Paramedics</u> - One of the first healthcare professionals to arrive at a range of emergency and non-emergency situations. Often the senior member of a two-person ambulance crew, with an emergency care assistant to assist. However, a paramedic may also work on their own, using a motorbike, emergency-response car or even a bicycle to reach your patients. When they arrive at the scene of an emergency, they will assess the patient's condition and take potentially life-saving decisions about any treatment needed before the patient is transferred to hospital. A paramedic will start giving the treatment, with the assistance of the emergency care assistant. In non-life-threatening situations, they will also have to use their professional judgement to make key clinical decisions.</p> <p><u>Senior Paramedic</u> - A paramedic with additional skills and qualifications that would allow them to carry out more treatments and take on more responsibility. They work in one of a wide variety of settings such as GP surgeries, minor injury units, walk-in clinics and hospital emergency departments. They may also see patients in nursing or residential homes, schools or prisons.</p>	<p>NHS Careers. (2012). <a href="#">Careers in the ambulance service</a>. Bristol, UK: NHS Careers. Last accessed November 2012.</p>
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32	<p>Paramedics Australasia (PA; formerly the Australian College of Ambulance Professionals, ACAP) is the national professional association representing practitioners who provide paramedic services to the community. Paramedic practitioners are best known for their involvement in the delivery of out of hospital emergency medical care through their work with various Ambulance Service organisations throughout Australia. However, paramedics work in many environments including community, industrial, military and university settings as well as on humanitarian and relief operations. PA provides a national platform for the development and promulgation of policies and service standards that will enhance the quality of patient care. PA does this by representing the interests of practitioners on matters such as the professional standards of education, training, and continuing; the professional development of paramedic practitioners; The funding, standards, quality and accreditation of emergency service providers; and the registration and associated regulatory framework of paramedic practice.</p> <p>This review used information from several web pages on the Paramedics Australasia website. These include:</p> <ul style="list-style-type: none"> <li>• What is a paramedic? (Paramedics Australasia, 2012b) <a href="http://www.paramedics.org.au/paramedics/what-is-a-paramedic/">http://www.paramedics.org.au/paramedics/what-is-a-paramedic/</a></li> <li>• Competency standards (Paramedics Australasia, 2012c) <a href="http://www.paramedics.org.au/paramedics/competency-standards/">http://www.paramedics.org.au/paramedics/competency-standards/</a></li> <li>• Paramedics (Paramedics Australasia, 2012d) <a href="http://www.paramedics.org.au/paramedics/what-is-a-paramedic/paramedic/">http://www.paramedics.org.au/paramedics/what-is-a-paramedic/paramedic/</a></li> <li>• Intensive care paramedic (ICP) (Paramedics Australasia, 2012e) <a href="http://www.paramedics.org.au/paramedics/what-is-a-paramedic/intensive-care-paramedic-icp/">http://www.paramedics.org.au/paramedics/what-is-a-paramedic/intensive-care-paramedic-icp/</a></li> <li>• Retrieval paramedic (RP) (Paramedics Australasia, 2012f) <a href="http://www.paramedics.org.au/paramedics/what-is-a-paramedic/retrieval-paramedic-rp/">http://www.paramedics.org.au/paramedics/what-is-a-paramedic/retrieval-paramedic-rp/</a></li> <li>• General care paramedic (GCP) (Paramedics Australasia, 2012g) <a href="http://www.paramedics.org.au/paramedics/what-is-a-paramedic/general-care-paramedic-gcp/">http://www.paramedics.org.au/paramedics/what-is-a-paramedic/general-care-paramedic-gcp/</a></li> </ul>	<p>Paramedics Australasia Website. (2012). <a href="#">Who we are</a>. Last accessed November 2012.</p>
33	<p>The National Health Service (NHS) is divided into two sections: primary and secondary care. Primary care is the first point of contact for most people and is delivered by a wide range of independent contractors, including GPs, dentists, pharmacists and optometrists. Secondary care is known as acute healthcare and can be either elective care or <u>emergency care</u>. The NHS is structured into various 'Trusts' including primary care trusts, acute trusts, care trusts, mental health trusts and ambulance trusts. Emergency vehicles are provided by the NHS ambulance services trusts. There are 11 ambulance trusts in England. <a href="#">The Scottish, Welsh</a> and <a href="#">Northern Ireland</a> ambulance services provide cover for those countries.</p>	<p>National Health Service Website. (2011). <a href="#">The NHS structure</a>. England, UK: National Health Service. Last accessed November 2012.</p>

34	<p>Paramedics Australasia (PA) is the peak professional body representing paramedics in Australia, New Zealand and the Pacific region. The organisation has an important role in setting standards of practice for the profession, and this role includes the development of paramedic competencies that inform the design of paramedic education programs. These competency standards represent the first consensus document that describes essential paramedic attributes. These have been developed to support course accreditation and regulatory frameworks to enable paramedics to provide safe and effective health care for the communities they serve. These standards were the result of a comprehensive review of contemporary standards adopted by international paramedic professional associations as well as those developed by medical, nursing and allied health disciplines and in countries with similar practice settings to those found in Australia and New Zealand. The review included an assessment of competency standards developed by paramedics in jurisdictions with similar practice and operational systems, including the National Occupational Competency Profile developed by the Paramedic Association of Canada and the Benchmark statement: Health care programme (Paramedic) for paramedics in the UK. The review of extant standards and the development of this first version of paramedic competency standards for paramedics in Australia and New Zealand was undertaken by an expert panel of educators and clinicians. The competencies comprising the Australasian Competency Standards for Paramedics are organised within the domains of professional practice, clinical practice, and professional knowledge.</p>	<p>Paramedics Australasia. (2011). <a href="#">Australasian Competency Standards for Paramedics</a>. Last accessed November 21, 2012</p>
35	<p>This article, from the website of the Journal of Emergency Medical Services, outlines the history of community paramedicine in the United States. It explains that paramedicine is still evolving in the context of the larger health-care profession, which is now also in transition with health-care reform. Since the 1980s, Emergency Medical Service (EMS) medical directors, system administrators and paramedics have acted to expand the scope of services EMS provides and, in some cases, the scope of practice as well. It notes that there have been two distinct clinical directions for this expanded role on both ends of the patient acuity spectrum. The first direction involves the advancement of paramedics' clinical skills toward those of critical care nursing, for the care and transport of critical patients from one hospital to another. The second direction for expansion of the paramedic role is at the opposite end of the patient acuity continuum, where EMS increasingly cares for patients with non-emergency episodic medical problems. Internationally, community paramedic is widely used in Canada and Australia, mainly in rural EMS systems. In the last four years, England has reorganized its EMS and primary care systems to include the new paramedic practitioner who focuses on community health. In the United States, the health-care reform legislation signed into law by President Barack Obama in March authorized funding for four regional pilot projects supporting innovations for delivering coordinated, accountable regional systems of emergency care. The goal was to get the patient to the right care, delivered by the right care provider, at the right time, resulting in the best outcomes and most efficient use of the region's health-care resources. Although the U.S. Department of Health and Human Services has not yet developed the specifications and requirements for these pilots, they represent an opportunity for communities interested in incorporating innovations in the EMS care of the non-acute patient into these proposals for the regional pilots.</p>	<p>Krumperman, K. (2010). <a href="#">History of Community Paramedicine</a>. Last accessed December 2012.</p>

36	<p>Soon after the Health Professional Council (HPC) [now the Health and Care Professional Council, HCPC] was formed and the Orders in Council were approved by the Privy Council, it was required that the HPC had to liaise with a professional bodies for all the professions that the registrar was responsible for. At that time the only profession not to have professional body was the Ambulance profession. Two colleagues from Essex Ambulance Service undertook the necessary work to set up a professional body in order to ensure that the profession would be represented and fulfill the self regulation responsibilities for standards and education. The name of British Paramedic Association (BPA) was agreed at an inaugural meeting held at AMBEX in 2001. From this point the development of the BPA began, and has now taken the name the College of Paramedics (CoP).</p> <p>This review used information from several web pages on the CoP website. This includes:</p> <ul style="list-style-type: none"> <li>• CoP - About Us (CoP, 2009a) <a href="https://www.collegeofparamedics.co.uk/about_us/">https://www.collegeofparamedics.co.uk/about_us/</a></li> <li>• Becoming a paramedic(CoP, 2009b) <a href="https://www.collegeofparamedics.co.uk/about_us/public_information/how_to_become_a_paramedic/">https://www.collegeofparamedics.co.uk/about_us/public_information/how_to_become_a_paramedic/</a></li> </ul> <p>Historically, entry into the paramedic profession was achieved by working through various roles within a specific NHS ambulance service. Prospective paramedics often began by working in the non-emergency Patient Transport Service, before moving into accident and emergency work by qualifying as an ambulance technician. Then, following a period of experience in the technician role, candidates would sit entry exams and then complete a training course to become a qualified paramedic. With the increasing number of University courses leading to paramedic qualification, this is no longer the case. Those who wish to, can join a University Degree straight from school that leads to registration with the HPC [HCPC] as a paramedic.</p>	<p>College of Paramedics Website. (2009). <a href="#">About Us</a>. Last accessed November 15, 2012.</p>
37	<p>This report examines various aspects of safety and quality in healthcare in Australia, including topics such as patient identification, medication safety, and clinical handover. The chapter on clinical handover notes that potential barriers to the delivery of effective handover may include: lack of a shared understanding or practice, lack of interdisciplinary handover and care, busyness, hierarchical hospital culture, interruptions and distractions, minimal patient and family involvement, and lack of training and research.</p>	<p>Australian Commission on Safety and Quality in Healthcare [ACSQHC] (2008). <a href="#">Windows into Safety and Quality in Health Care</a>. Last accessed December 2012.</p>
38	<p>This article discusses how combined team training can contribute to improved team performance among paramedics, EMTs, and first responders (e.g., firefighters, police officers). It noted that research had shown there were three main areas that distinguish a high-performance team from other teams: (1) interpositional knowledge gained by team members cross-training on each other's jobs, allowing the team to predict, anticipate, and coordinate more efficiently and effectively; (2) team communication, including verbal and non-verbal communication skills; the use of timely or informational communication, and brevity, completeness and clarity (3) shared mental models, which allow individuals to develop similar visions of what needs to happen to accomplish a team's goal. The article also offers some general guidelines for developing a CTT program.</p>	<p>Tomek, S. (2008) <a href="#">Combined Team Training</a>. EMS World. Last accessed December 2012.</p>



39	<p>This report describes the National Highway Traffic Safety Administration's National EMS Scope of Practice Model. The National EMS Scope of Practice Model supports a system of EMS personnel licensure that is common in other allied health professions and is a guide for States in developing their Scope of Practice legislation, rules, and regulation. States following the National EMS Scope of Practice Model as closely as possible will increase the consistency of the nomenclature and competencies of EMS personnel nationwide, facilitate reciprocity, improve professional mobility and enhance the name recognition and public understanding of EMS. The National EMS Scope of Practice Model defines and describes four levels of EMS licensure: Emergency Medical Responder (EMR), Emergency Medical Technician (EMT), Advanced EMT (AEMT), and Paramedic. Each level represents a unique role, set of skills, and knowledge base.</p>	<p>National Highway Traffic Safety Administration (NHTSA, 2007). <a href="#">National EMS Scope of Practice Model</a>. Washington: US Department of Transportation.</p>
40	<p>This commentary raises concerns about the safety and effectiveness of emergency care practitioners. It explains that the role of the emergency care practitioner (ECP) had been expanding rapidly over the past three years in the UK. The rationale of this development was to have prehospital practitioners, from nursing and paramedic backgrounds, who could treat and discharge patients, and avoid taking them to the emergency department. This would allow more convenient and timely care for the patient, without the need for transport to hospital for less serious conditions. The political reason for the development was to help reduce ambulance response times, by decreasing ambulance turnaround times and to reduce waits in emergency departments by decreasing attendances. The commentary concludes with saying that as new roles are developed, it is important to ensure that safety and quality of healthcare are evaluated, as well as achieving changes and targets in other processes.</p>	<p>Cooke, M. (2006). Emergency Care Practitioners: A new safe effective role? <i>Quality and Safety in Health Care</i>, 15, 387.</p>
41	<p>This report from the Australian Centre for Prehospital Research explores the potential for expanded paramedic healthcare roles for Queensland, Australia. The report notes that in recent years, a review of health care delivery models, and the development of generic health care worker roles, has been supported by health care reform analysts and in various state and federal health policy documents. Expanded scope programs such as Nurse Practitioners (NPs) have been shown to improve healthcare delivery, providing people in rural and remote communities greater access to routine procedures, advice and follow up care. There is currently a shortage of health professionals across Australia and its greatest impact is felt in rural and remote areas. The evidence from recent evaluations of NPs suggests this model has improved health outcomes and has been widely accepted, with a high level of patient satisfaction. Paramedics serving in some rural and remote communities have engaged in various expanded practice activities in an unofficial capacity and have demonstrated interest in formally developing these roles. There is potential to further extend the capacity of health services by exploiting this opportunity to formalize and expand paramedic expanded practice roles, and by developing generic health worker models. A review of paramedic expanded practice programs trialled in the USA, Canada, and the UK and of subsequent evaluation studies was conducted. The diversity of these programs partly reflects the purpose for which they were designed and have been tailor made to meet local community needs. The successes, failures, and challenges worked through in developing these programs are presented. The report states that many of these programs have been demonstrated to improve community health outcomes while remaining economically feasible, and have achieved community acceptance and high levels of satisfaction.</p>	<p>Raven, S., Tippett, V., Ferguson, J.G., &amp; Smith, S. (2006). <a href="#">An exploration of expanded paramedic healthcare roles for Queensland</a>. Queensland: Department of Emergency Services. Last accessed December 2012</p>

42	<p>The Medicines and Healthcare products Regulatory Agency (MHRA) is the government agency which is responsible for ensuring that medicines and medical devices work, and are acceptably safe. The MHRA is an executive agency of the Department of Health.</p> <p>Under medicines legislation, registered paramedics can administer a range of parenteral medicines on their own initiative for the immediate, necessary treatment of sick or injured persons without the usual requirement for a prescription or directions of a prescriber. This webpage also provides a list of medicines which may only be administered by ambulance paramedics on their own initiative for immediate, necessary treatment of sick or injured persons.</p>	<p>Medicines and Healthcare Products Regulatory Agency Website. (2005). <a href="#">Paramedics: Exemptions</a>. Last accessed November 20, 2012.</p>
43	<p>The Community Healthcare and Emergency Cooperative website defines the role of Community Paramedic. It states that the Community Paramedic will respond to identified health needs in underserved communities, ultimately improving the quality of life and health of rural and remote citizens and visitors. Roles will include outreach; wellness; health screening assessments; health teaching; providing immunizations; disease management, including a thorough understanding of monitoring diabetes, congestive heart failure and other high cost diseases and the methods and medications used to treat them; recognition of mental health issues and referral into the existing mental health care system; wound care; safety programs; and, functioning as physician extenders in rural clinics and hospitals in communities that have them.</p>	<p>Community Healthcare and Emergency Co-operative. (nd). <a href="#">Community Paramedic</a>. Last accessed December 2012.</p>
44	<p>Ambulance services provide healthcare in emergency and non-emergency settings and so there are a number of different careers available. This website outlines the range of careers in the ambulance service. These include ambulance care assistant/patient transport service (PTS) drivers, emergency care assistants, emergency medical dispatchers/call handlers, paramedics, PTS and handlers, and senior paramedics.</p> <p>This review used information from several web pages on the NHS Careers website. These include:</p> <ul style="list-style-type: none"> <li>• Emergency care assistant (NHS Careers , n.d.b) <a href="http://www.nhscareers.nhs.uk/explore-by-career/ambulance-service-team/careers-in-the-ambulance-service-team/emergency-care-assistant/">http://www.nhscareers.nhs.uk/explore-by-career/ambulance-service-team/careers-in-the-ambulance-service-team/emergency-care-assistant/</a></li> <li>• Paramedic (NHS Careers , n.d.c) <a href="http://www.nhscareers.nhs.uk/explore-by-career/ambulance-service-team/careers-in-the-ambulance-service-team/paramedic/">http://www.nhscareers.nhs.uk/explore-by-career/ambulance-service-team/careers-in-the-ambulance-service-team/paramedic/</a></li> <li>• Senior paramedic (NHS Careers , n.d.d) <a href="http://www.nhscareers.nhs.uk/explore-by-career/ambulance-service-team/careers-in-the-ambulance-service-team/senior-paramedic/">http://www.nhscareers.nhs.uk/explore-by-career/ambulance-service-team/careers-in-the-ambulance-service-team/senior-paramedic/</a></li> </ul>	<p>NHS Careers. (n.da). <a href="#">Careers in the ambulance service team</a>. Last accessed November 15, 2012.</p>

45	<p>This document from the website of the International Roundtable on Community Paramedicine provides an overview of the Long and Brier community paramedicine initiative. The abstract states that in a time of fiscal health restraints where resources, both human and financial, are stretched to the limit, an innovative design for the delivery of primary health care to two island communities was underway. Community paramedicine, while not a new idea, had never before been used in collaboration with a nurse practitioner and an off-site physician. This is the delivery model currently being used on two isolated, island communities in Nova Scotia known as Long and Brier. At the time of this report, there had been a 23% decrease in Emergency department visits (for the years 2002 and 2003) from Islanders since this delivery model has been implemented. The document further notes that with the addition of the nurse practitioner's scope of practice, came an expansion of the types of services available to the Island residents. This enabled paramedics to complete more complex care such as wound care, take part in flu clinics and become involved in community preventive education sessions, e.g. fall prevention in seniors.</p>	<p>Misner, D. (nd). <a href="#">Community Paramedicine: Part of an Integrated Health Care System</a>. Last accessed December 2012.</p>
46	<p>The Council of Ambulance Authorities (CAA) is an organization that provides leadership for the provision of ambulance services in Australia, New Zealand and Papua New Guinea. The CAA accredits entry-level paramedic education programs (for more information see: <a href="http://caa.net.au/en/education">http://caa.net.au/en/education</a>). Membership of the CAA includes the principal providers of ambulance services in each State and Territory of Australia (i.e., <a href="#">The Australian Capital Territory Ambulance Service</a>, <a href="#">Ambulance Service of New South Wales</a>, <a href="#">Ambulance Tasmania</a>, <a href="#">Ambulance Victoria</a>, <a href="#">Queensland Ambulance Service</a>, <a href="#">South Australia Ambulance Service Inc.</a>, <a href="#">St John Ambulance Australia (Northern Territory) Inc.</a> and <a href="#">St John Ambulance Australia (Western Australia) Inc.</a>) and in New Zealand (<a href="#">St John New Zealand</a>, and <a href="#">Wellington Free Ambulance</a>).</p> <p>Other pages from this website were included in this review, including:</p> <ul style="list-style-type: none"> <li>• Accreditation of Paramedic Education Programs (The Council of Ambulance Authorities Website , n.d.b) <a href="http://caa.net.au/en/education">http://caa.net.au/en/education</a></li> </ul>	<p>The Council of Ambulance Authorities Website. (n.da). <a href="#">About us</a>. Last Accessed December 6, 2012.</p>

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