

COMMENTARY

Frontier and remote paramedicine practitioner models

AUTHORS

Peter O'Meara¹ PhD, Adjunct Professor *Gary Wingrove² FACPE, CP-C, President, The Paramedic Foundation.Michael Nolan³ MSc, Chief of Paramedic Services

CORRESPONDENCE

*Prof Peter O'Meara peter.omeara@monash.edu

AFFILIATIONS

¹ Monash University, Department of Community Emergency Health & Paramedic Practice Building H, McMahons Road Frankston, Vic, 3199

² Mayo Clinic, Rochester, Minnesota, USA

³ County of Renfrew Paramedic Service, Pembroke, Ontario, Canada

PUBLISHED

16 August 2018 Volume 18 Issue 3

HISTORY

RECEIVED: 9 August 2017

ACCEPTED: 19 December 2017

CITATION

O'Meara P, Wingrove G, Nolan M. Frontier and remote paramedicine practitioner models. *Rural and Remote Health* 2018; **18**: 4550. <https://doi.org/10.22605/RRH4550>

Except where otherwise noted, this work is licensed under a Creative Commons Attribution 4.0 International Licence

ABSTRACT:

Introduction: For the past 50 years paramedic services and paramedic roles in high-income nations have evolved in response to changes in community needs and expectations. The aim of this article is to review paramedic models of

service delivery, with an emphasis on models that have the potential to improve the health and wellbeing of frontier and remote populations.

Methods: Paramedic models of relevance to rural and frontier settings were identified from searches of CINAHL and Medline, while key paramedic-specific journals were individually searched in the event that they were not indexed. Search terms were *ambulance*, *paramedic* and *EMS*. These were then combined with *model** and *rural*, *remote* and *frontier*. These findings were then synthesised.

Results: During the 1950s and 1960s the volunteer transport model, based on the values of community informed self-determination, developed to meet local needs for transport to local hospitals and medical services. Somewhat later, the technological model, characterised by professionally staffed and managed paramedic systems providing prehospital using advanced technology and technically skilled staff, became the dominant model in metropolitan and regional settings. Paramedic practitioner models are now emerging that are part of integrated prehospital systems. These provide a range of services to prevent injury and illness, respond to emergencies and facilitate recovery, and contribute to efforts to produce a healthy community.

Conclusions: Implementation of paramedic practitioner models in frontier and remote settings raises challenging policy and practice issues, including changes in scopes of practice, design of education programs, self-regulation of paramedics, and reimbursement.

KEYWORDS:

health reform, paramedic practitioner, rural health care, workforce issues.

FULL ARTICLE:

Introduction

For the past 50 years paramedic services and paramedic roles in high-income countries, as defined by the World Bank¹, have successfully evolved in response to changes in community needs and expectations. This has seen a transformation from people in often voluntary, semi-skilled roles to paramedics who have extensive professional education, broad scopes of practice and acceptance as health professionals²⁻⁴. Like other frontier and remote health services, paramedic services must establish and maintain services to meet the changing needs of communities that often lack the infrastructure and services taken for granted in metropolitan and regional locations. One distinguishing feature of many frontier and remote paramedic services is the deployment of large numbers of voluntary staff and first responders⁵⁻⁷.

Paramedics and their employers, who provide services through different organisational models, are asked to respond to health system changes, and the changing values and expectations of communities, by continually developing new and innovative models of care⁸. Standing still and continuing to provide the same services as in the past is not a viable or acceptable option⁹. In response to demands for high quality emergency response services, some paramedic services have invested heavily in frontier and remote areas, employing more clinical staff, extending first responder programs and establishing new ambulance stations. Paramedic services and other medical services have successfully reduced mortality related to cardiac arrest and major trauma in more densely populated areas, including regional population centers¹⁰.

Less obvious has been evidence of well-developed strategies to address the complex needs of aging populations in the resource-poor settings typically found in frontier and remote locations. In some countries, extended and innovative paramedic roles have emerged to address these challenges, although they are not always well documented or evaluated¹¹. These models have different names, with the best known described variously as extended care paramedics (ECPs) and community paramedics (CPs) that operate within paramedic services.¹² Another model in which community paramedics are embedded in part of the healthcare system outside of paramedic services is known as the mobile integrated healthcare model. This model is largely confined to the USA, where it is used as a strategy to deal with a highly fragmented health system^{13,14}.

The aim of this article is to review paramedic models of service delivery, with an emphasis on models that have the potential to improve the health and wellbeing of frontier and remote populations.

Methods

A narrative review¹⁵ was undertaken to identify past, present and future paramedic models that have relevance to frontier and remote settings¹⁶. The databases searched were CINHALL and Medline as these were judged to be the most likely to yield useful results, while key paramedic-specific journals were individually searched in the event that they were not indexed. Search terms were *ambulance*, *paramedic* and *EMS*. These were then combined with *model** and *rural*, *remote* and *frontier*. Citation lists were then examined to identify other resources in both the peer-reviewed and grey literature. The search was restricted to English language articles from the year 2000 onwards to ensure that only contemporary articles were identified for synthesis.

Results

Established paramedic models

During the 1950s and 1960s, the volunteer transport ambulance model, based on the values of community informed self-determination, developed in communities to meet local needs for transport of the sick and injured to local hospitals and medical services^{2,17}. This model has been enhanced and still exists in many frontier and remote settings in high-income countries. The technological model, characterised by professionally staffed and managed paramedic systems that provide prehospital care based on the medical model, including advanced technology and technically skilled staff, is the dominant model in metropolitan and regional settings where sufficient resources are available.¹⁸

Paramedic services throughout the world have a long history, with many, such as those in Australia and New Zealand, boasting direct links with St John Ambulance, along with some military connections^{4,19,20}. In the USA, links with fire services have become more prominent than in other high-income countries. This shared history of volunteerism and a military command and control culture has greatly influenced the evolution and day-to-day operation of paramedic services²¹. At a community level, this resulted in a volunteer model of service delivery that was community controlled and operated to meet the prehospital expectations of a local area, resulting in the community feeling safe and secure. This model continues in many paramedic services through the deployment of volunteer personnel and increasing numbers of first responder programs^{6,22}. For many decades, this volunteer model based on community informed self-determination was highly valued and it met the expectations of local communities.

With changes in community expectations, paramedic education and organisational capacities, high-income country paramedic services have evolved to the point where the deployment of professionally trained and paid staff, centralised dispatch systems and standardised clinical practice guidelines is the norm in larger population centers⁵. This technological model is based on the medical model and is characterised by sophisticated management systems and professionally trained personnel who have access to the latest biomedical equipment and who practice a high level of clinical intervention². This model is expensive to establish and maintain due to the level of technology required and its extensive education and training needs⁵. It has been very successful, resulting in significant reductions in mortality and morbidity rates for populations experiencing cardiac arrest and major trauma²³.

The technological model is based on the argument that the specialised health professionals, through their training and experience, are best able to determine the needs of the community. Prehospital emergency health professionals have been found to have a paternalistic approach to patients, having direct input into some aspects of their care²⁴. There is a risk that this worldview might result in paramedics and associated medical specialities becoming estranged from the wider community and health system².

Evolving paramedic models

When considering the strengths and weaknesses of the well-established volunteer transport and technological models in the context of ageing populations and sometimes fragmented health systems, there is an apparent need for an alternative paramedic model²⁵. This recognition has seen the emergence of ECPs in the UK, New Zealand and parts of

Australia^{26,27}. In North America, the concept of the CP has emerged and programs have been extensively implemented and increasingly evaluated for efficacy and cost-effectiveness²⁸⁻³¹. In reality, these two models share common characteristics and objectives, most clearly illustrated in their desire to avoid unnecessary patient transports, emergency department presentations and hospital admissions³¹. Changes in dispatch centre triaging is another related paramedic service strategy used to better manage growing demand for paramedic services³².

The main difference between the ECP and the CP lies in how and when they intervene in the patient journey, with extended care paramedics remaining essentially reactive and assessing and treating patients who have requested an ambulance. Community paramedic roles are more strongly aligned with a public health approach that involves a set of interventions both before and after the standard paramedic cycle of care^{33,34}. Both roles share the need for a broader knowledge base, enhanced skills and well-developed clinical decision-making competencies^{11,35}. They are examples of the emerging paramedic practitioner model.

Paramedic practitioner models are one of the essential components of any integrated prehospital system that aims to provide a range of services to prevent injury and illness, respond to emergencies, and facilitate recovery. Advocates of paramedic practitioner models have the view that prehospital care as an integral part of an integrated healthcare system, with professional staff sharing roles that best utilise their skills and knowledge³⁶. These practitioner models are flexible and provide either an emergency 'safety-net' system or an advanced clinical care system, responding to emergency needs, combined with an integrated public health role that is closely linked to the broader health system. Paramedics have a key role in promoting healthy lifestyles, and preventing death and injury through public education programs³⁷.

Two distinctive characteristics of paramedic practitioner models are the existence of their own research and development agenda and the multiple decision-points that exist during the cycle of care. The practitioner model is arguably more cost-effective than the technological model, while continuing to provide an appropriate level of clinical care for any given community. It is particularly suited to frontier and remote areas with higher paramedic 'down-time' and a dearth of other public health workers³⁶.

Of particular interest to frontier and remote communities is the emergence of CPs, with emerging evidence supporting the argument that CPs could be part of a new model of care that addresses some of the reform needs in the health sector^{13,33,38-40}. This emerging model is a community-focused extension of the traditional emergency response and transportation paramedic model, and is potentially attractive to frontier and remote communities that face the dual challenges of ageing populations and stressed health systems. The CP model has the potential to contribute to the re-calibration of paramedic roles and professional identity.

For frontier and remote communities, CP programs are able to fill identified gaps in the healthcare system by expanding the roles of paramedics and other paramedic service staff such as volunteer personnel and first responders, and providing flexible services designed to meet the needs of local communities. Typical CP program services include^{31,33,39,41}:

- care management and home visits
- falls prevention
- medication management and compliance
- geriatric pathologies (diabetes and chronic obstructive pulmonary disease)
- palliative care
- phlebotomy
- vaccination
- wound care
- community referrals
- home assessments.

Conclusions

The emergence of paramedic practitioner models in various forms suggests that paramedics are able to contribute to the success of multidisciplinary healthcare teams that aim to make a sustained and positive impact on the health and wellbeing of frontier and remote populations^{39,42}. There are growing calls for community paramedicine programs, utilising the knowledge and skills of practitioner paramedics, to respond to a wider range of patients in the community and contribute toward improved health outcomes and quality of life^{25,43,44}.

Successful CP programs are driven by their collaborative efforts to improve and maintain the health and wellbeing of community members, they are integrated with local health systems, have viable treatment and referral options for subacute and chronic patients, are built on broad paramedic education and have inclusive governance systems⁴².

Wider implementation of paramedic practitioner roles, such as ECP and CP models, in frontier and remote settings face a number of potential barriers, such as the need to broaden paramedic scopes of practice, consideration of paramedic prescribing rights, review of paramedic education, the impact of paramedic professional self-regulation, and consideration of the future roles of volunteer personnel and first responders who are not paramedics. Some countries, most notably the USA, have the added challenge of aligning reimbursement systems to emerging paramedic practitioner models that are not focused on transport to hospitals⁴⁵.

Paramedic practitioner program implementation challenges paramedic services and paramedics to move beyond their perceived 'core roles' that classify non-emergency patients as someone else's problem. This step will be more achievable when paramedicine is seen itself as more than '... the discipline and profession within which traditional pre-hospital medicine is performed'⁴⁶. A change in orientation from an emergency response system, with the associated public safety identity, to a health service providing clinical care will require paramedic services and paramedics to take a more patient-centred approach to service delivery and to take action to strengthen their community engagement activities^{9,34,47,48}.

REFERENCES:

- 1 World Bank. World bank country and lending groups. 2017. Available: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups> (Accessed 15 December 2017).
- 2 O'Meara P. Models of ambulance service delivery for rural Victoria. 2002. University of New South Wales. Sydney.
- 3 Shah MN. The formation of the emergency medical services system. *American Journal of Public Health* 2006; **96(3)**: 414-423. <https://doi.org/10.2105/AJPH.2004.048793>
- 4 Donnelly A, Munro G. History of ambulance services in Australia and New Zealand. In: K Curtis and C Ramsden (Ed.). *Emergency and trauma*. Elsevier. Sydney, 2011.
- 5 Productivity Commission. *Report on government services 2016*. Canberra: Australian Government Steering Committee for the Review of Government Service Provision, 2016.
- 6 O'Meara P. The prehospital community-volunteer model has a place in rural Australia. *Journal of Emergency Primary Health Care* 2003; **1(1-2)**: 990008.
- 7 Stirling C, O'Meara P. Paramedic practice in rural and regional Australia. In: P O'Meara and C. Grbich (Ed.). *Paramedics in Australia: contemporary challenges of practice*. Sydney: Pearson Education Australia, 2009. Chapter 3.
- 8 Acker J, Johnston T, Lazarsfeld-Jensen A. Industrial paramedics, out on site but not out of mind. *Rural and Remote Health* 2014; **14**: 2856. Available: <http://www.rrh.org.au/journal/article/2856> (Accessed 8 August 2018).
- 9 Newton A, Harris G. Leadership and system thinking in the modern ambulance service. In: P Wankhade and K Mackway-Jones (Ed.). *Ambulance services: leadership and management perspectives*. Cham, Switerland: Springer International Publishing, 2015; 81-93. https://doi.org/10.1007/978-3-319-18642-9_7
- 10 Nehme Z, Andrew E, Cameron PA, Bray JE, Bernard SA, Meredith IT, et al. Population density predicts outcome from

- out-of-hospital cardiac arrest in Victoria, Australia. *Medical Journal of Australia* 2014; **200(8)**: 471-475. <https://doi.org/10.5694/mja13.10856>
- 11 Audit Office of New South Wales. *Managing demand for ambulance services*. Sydney: NSW Auditor-General, 2017.
- 12 Thompson C, Williams K, Morris D, Lago L, Kobel C, Quinsey K, et al. *Expanded scopes of practice program evaluation: extending the role of paramedics sub-project final report*. Wollongong, NSW: Australian Health Services Research Institute, University of Wollongong, 2014.
- 13 Choi BY, Blumberg C, Williams K. Mobile integrated health care and community paramedicine: an emerging emergency medical services concept. *Annals of Emergency Medicine* 2016; **67(3)**: 61-366. <https://doi.org/10.1016/j.annemergmed.2015.06.005>
- 14 National Association of Emergency Medical Technicians. *Vision statement on mobile integrated healthcare (MIH) & community paramedicine (CP)* 2016. Available: https://www.naemt.org/docs/default-source/community-paramedicine/MIH_Vision_02-06-14.pdf?sfvrsn=10 (Accessed 20 July 2017).
- 15 Pretorius A, Karunaratne N, Fehring S. Australian physiotherapy workforce at a glance: a narrative review. *Australian Health Review* 2015; **40(4)**: 438-442. <https://doi.org/10.1071/AH15114>
- 16 Office of Rural Health Policy. *Methodology for designation of frontier and remote areas* 2014. Washington, DC: Health Resources and Services Administration.
- 17 Bird P (Ed.). *A history of ambulance services in country Victoria* Bendigo, Victoria: Victorian Ambulance Services Association, 1999.
- 18 Beck B, Bray JE, Smith K, Walker T, Grantham H, Hein C, et al. Description of the ambulance services participating in the Aus-ROC Australian and New Zealand out-of-hospital cardiac arrest Epistry. *Emergency Medicine Australasia* 2016; **28(6)**: 673-683. <https://doi.org/10.1111/1742-6723.12690>
- 19 Goniewicz M. Effect of military conflicts on the formation of emergency medical services systems worldwide. *Academic Emergency Medicine* 2013; **20(5)**: 507-513. <https://doi.org/10.1111/acem.12129>
- 20 Webber A, McManus J. Pre-hospital care overview in Australia and New Zealand – past, present and future. In: K Curtis and C Ramsden (Ed.). *Emergency and trauma care for nurses and paramedics*. Chatswood, NSW: Elsevier, 2016; 15-29.
- 21 Reynolds L. Contextualising paramedic culture. In: P O'Meara and C Grbich (Ed.). *Paramedics in Australia: contemporary challenges of practice*. Sydney: Pearson Education Australia, 2009; 37-52.
- 22 Stirling C, Bull R. Collective agency for service volunteers: a critical realist study of identity representation. *Administration & Society* 2011; **43(2)**: 193-215. <https://doi.org/10.1177/0095399711400046>
- 23 Andrew E, Nehme Z, Wolfe R, Bernard S, Smith K. Long-term survival following out-of-hospital cardiac arrest. *Heart* 2017; **103**: 1104-1110. <https://doi.org/10.1136/heartjnl-2016-310485>
- 24 Erbay H, Alan S, Kadioglu S. Attitudes of prehospital emergency care professionals toward refusal of treatment: a regional survey in Turkey. *Nursing Ethics* 2014; **21(5)**: 530-539. <https://doi.org/10.1177/0969733013505311>
- 25 Kellermann AL, Saultz JW, Mehrotra A, Jones SS, Dalal S. Primary care technicians: a solution to the primary care workforce gap. *Health Affairs* 2013; **32(11)**: 1893-1898. <https://doi.org/10.1377/hlthaff.2013.0481>
- 26 Mason S, Coleman P, O'Keeffe C, Ratcliffe J, Nicholl J. The evolution of the emergency care practitioner role in England: experiences and impact. *Emergency Medicine Journal* 2006; **23(6)**: 435-439. <https://doi.org/10.1136/emj.2005.027300>
- 27 Swain AH, Hoyle SR, Long AW. The changing face of prehospital care in New Zealand: the role of extended care paramedics. *The New Zealand Medical Journal* 2010; **123**: 1309.
- 28 Pearson K, Gale J, Shaler G. *The evidence for community paramedicine in rural areas: state and local findings and*

- the role of the State Flex Program*. Flex Monitoring team briefing paper no. 34. Portland, ME: University of Southern Maine, 2014.
- 29 Guy A. Community paramedicine: a preventive adjunct to primary care. *University of British Columbia Medical Journal* 2014; **6(1)**: 17-18.
- 30 McGinnis K. *Rural and frontier emergency medical services: agenda for the future*. Kansas City: National Rural Health Association, 2004.
- 31 Bennett KJ, Yuen MW, Merrell MA. Community paramedicine applied in a rural community. *The Journal of Rural Health* 2018; **34(Supplement 1)**: 39-47.
- 32 Eastwood K, Morgans A, Smith K, Hodgkinson A, Becker G, Stoelwinder J. A novel approach for managing the growing demand for ambulance services by low-acuity patients. *Australian Health Review* 2016; **40(4)**: 378-384. <https://doi.org/10.1071/AH15134>
- 33 Abrashkin KA, Washko J, Zhang J, Poku A, Kim H, Smith KL. Providing acute care at home: community paramedics enhance an advanced illness management program – preliminary data. *Journal of the American Geriatrics Society* 2016; **64(12)**: 2572-2576. <https://doi.org/10.1111/jgs.14484>
- 34 Evashkevich M, Fitzgerald M. *A framework for implementing community paramedic programs in British Columbia*. Richmond, BC: Ambulance Paramedics of British Columbia, 2014.
- 35 O'Meara P, Ruest M, Stirling C. Community paramedicine: higher education as an enabling factor. *Australasian Journal of Paramedicine* 2014; **11(2)**.
- 36 O'Meara P. Would a prehospital practitioner model improve patient care in rural Australia? *Emergency Medicine Journal* 2003; **20**: 199-203. <https://doi.org/10.1136/emj.20.2.199>
- 37 O'Meara P, Tourle V, Stirling C, Walker J, Pedler D. Extending the paramedic role in rural Australia: a story of flexibility and innovation. *Rural and Remote Health* 2012; **12(2)**: 1978. Available: <http://www.rrh.org.au/journal/article/1978> (Accessed 8 August 2018).
- 38 Mason S, Wardrope J, Perrin J. Developing a community paramedic practitioner intermediate care support scheme for older people with minor conditions. *Emergency Medicine Journal* 2003; **20**: 196-198. <https://doi.org/10.1136/emj.20.2.196>
- 39 Patterson DG, Coulthard C, Garberson LA, Wingrove G, Larson EH. What is the potential of community paramedicine to fill rural health care gaps? *Journal of Health Care for the Poor and Underserved* 2016; **27(4)**: 144-158. <https://doi.org/10.1353/hpu.2016.0192>
- 40 Nolan M. *Community paramedicine: submission to the Standing Committee on Health*. Ottawa: Emergency Medical Services Chiefs of Canada, 2011.
- 41 Ruest M, Stitchman A, Day C. Evaluating the impact of 911 calls by an in-home programme with a multidisciplinary team. *International Paramedic Practice* 2012; **1(4)**: 125-132. <https://doi.org/10.12968/ippr.2012.2.2.41>
- 42 O'Meara P, Stirling C, Ruest M, Martin A. Community paramedicine model of care: an observational, ethnographic case study. *BMC Health Services Research* 2016; **16**: 39. <https://doi.org/10.1186/s12913-016-1282-0> PMID:26842850
- 43 Steeps RJ, Wilfong DA, Hubble MW, Bercher DL. Emergency medical services professionals' attitudes about community paramedic programs. *Western Journal of Emergency Medicine* 2017; **18(4)**: 630. <https://doi.org/10.5811/westjem.2017.3.32591>
- 44 Spence D. Bad medicine: good medicine – the GP paramedic. *British Journal of General Practice* 2017; **67(660)**: 314. <https://doi.org/10.3399/bjgp17X691445>
- 45 Munjal K, Carr B. Realigning reimbursement policy and financial incentives to support patient-centered out-of-hospital care. *JAMA* 2013; **309(7)**: 667-668. <https://doi.org/10.1001/jama.2012.211273>

46 National Emergency Medical Services Management Association. *Position statement: call for common nomenclature for the profession of paramedicine* Platte City, MO: National Emergency Medical Services Management Association, 2017.

47 Martin A, O'Meara P, Farmer J. Consumer perspectives of a community paramedicine program in rural Ontario. *Australian Journal of Rural Health* 2016; **24(4)**: 278-283. <https://doi.org/10.1111/ajr.12259>

48 Escott M. Technicians & clinicians: how do we make room for both? *Journal of Emergency Medical Services* 2017; **July**: 56.

This PDF has been produced for your convenience. Always refer to the live site <https://www.rrh.org.au/journal/article/4550> for the Version of Record.