

Land Acknowledgement

We would like to take this opportunity to acknowledge that we are living and working on the Traditional Territories and homelands of First Nations peoples, Métis, and Inuit in what we now call Canada. We respect the histories, languages, and cultures of Indigenous peoples that enrich our communities. We also recognize that our actions and inactions have had a negative impact on the health and wellness of Indigenous peoples. In the spirit of reconciliation, we aim to address these wrongs in our principles and improve our role and actions by incorporating knowledge and understanding into our practices in partnership with Indigenous communities.

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Paramedic Chiefs
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PARAMEDIC CHIEFS OF CANADA

Paramedic Chiefs of Canada (PCC) is the national leadership of paramedicine in Canada. Founded in 2003, the PCC is a voluntary professional organization representing all of Canada's paramedicine systems in its ten provinces and three territories. PCC's mission is to guide the advancement of paramedicine and the profession in Canada.

In this report, key strategic directions have been renewed and are now outlined in ten key principles. Six enabling factors are also defined and serve as priority targets such that the principles can be adopted, supported, and enacted.

Foreword

On behalf of the PCC Board of Directors and steering committee, we are pleased to present this report, *Principles and Enabling Factors Guiding Paramedicine in Canada*. The healthcare system is under significant and increasing strain, and paramedicine systems are struggling to maintain service levels as transfer-of-care delays in emergency departments lengthen and call volumes grow. Demands are outpacing resources. We believe that the present state of paramedicine as well as the profession itself are not viable: they require urgent changes to meet the needs of patients and their communities, the healthcare system, and our providers. Although those challenges are great, so too are the opportunities.

In 2006, the Emergency Medical Services Chiefs of Canada (EMSCC), now PCC, put forward its first visioning document, *The Future of EMS in Canada: Defining the New Road Ahead*, which outlined six strategic directions. The actions and discussions outlined in that strategic framework continue to be relevant today; in this report, they have been expanded into ten research informed principles with six key enabling factors.

If we aggressively embrace these principles and enabling factors, then we will be well prepared to meet the challenges awaiting paramedicine and healthcare systems across the country. Canadians will receive high-quality and aligned paramedicine services if we build on past lessons, learn from today's advances, and engage in important developments for the future. The future of paramedicine is bright, and with concerted action, we can take full advantage of that future for the healthcare system, patients and the profession.

I would like to sincerely thank the PCC Board of Directors, lead investigators, and members of the steering committee, authors and researchers, for their time and considerable contributions. This work would not be possible without their extensive knowledge as well as our partnerships with the McNally Project for Paramedicine Research, Alberta Health Services, York Region Paramedic Services, and the University of Toronto. Paramedic Chiefs of Canada (PCC) is grateful for the support of our gold sponsors, without whose contributions this pivotal document would not have been possible. Thank you to Ferno, Demers Crestline, Stryker, and ESO for your unwavering support of the paramedic community.

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Principles and Enabling Factors Guiding Paramedicine in Canada

A Community-Based Healthcare System

“Considering emerging philosophies in health care, it is clear that how paramedicine has traditionally been structured requires rethinking.”

Executive Summary

Health care in Canada is under significant and increasing strain. This situation has led provincial and federal governments to broaden healthcare system policy to also focus on public health, health promotion and prevention, improving access, increasing the coordination and integration of comprehensive services, and creating better work environments for healthcare providers. There has been a transition from a reliance on doctors and hospitals to additional healthcare professions and alternative care models, including the delivery of care in community clinics, in interprofessional primary healthcare centres, and at home. Paramedicine’s community focus and its position as a mobile healthcare service has led governments to increasingly call upon the profession to contribute.

Considering emerging philosophies in health care, it is clear that how paramedicine has traditionally been structured requires rethinking.

For example, while governments call for better access, connectedness, continuity, and integration, paramedicine—given its current structure, priorities, research contributions, education, and more—may fall short. With paramedicine being called upon to take part in healthcare system advancements, it must examine its own structures, activities, capacities, and priorities through a renewed vision so that it can be better aligned with the direction of health and social services in Canada.

Our approach to identifying this renewed vision included reflecting on the 2006 visioning document, *The Future of EMS in Canada: Defining the New Road Ahead*, an environmental scan and literature review of existing national and international frameworks, and a national study that included input from a diverse array of paramedicine leaders and stakeholders.

Through this process, ten principles and six

enabling factors were identified. They are intended to be a reference for strategic planning; to stimulate, identify, and organize research; to guide practice, policy, education, and professional standards; and to serve as a framework on which to assess the progress and direction of the profession's efforts over time.

“These principles and enablers are intended to serve as a guiding conceptual framework for the structuring and advancement of paramedicine in Canada.”

These principles and enablers are intended to serve as a guiding conceptual framework for the structuring and advancement of paramedicine in Canada. Collectively, they commit the paramedic profession to be accountable to and for itself, to also have greater accountability to the public and communities they serve, and to better align services with patient, community and healthcare system needs. The principles

are not listed in order of importance as they have varying degrees of prioritization or interest in different contexts. Organizing activities under the ten common, shared, and equally valued principles as well as the six enabling factors will support the advancement of paramedicine alongside our community partners in health and social services, and will also connect local and national activities for shared progress.

These principles and enabling factors are also intended to have practical value. Reflecting on how existing practice is structured and aligned with these principles will help front-line members of paramedicine (and healthcare partners) advocate for their use and/or provide feedback about how they can be better used in their local context. As well, they should encourage the paramedicine community to stimulate, position, and guide future work and contributions.

Perspectives from national thought leaders revealed a working conceptual framework that is focused on new accountabilities. We encourage the paramedicine profession and related stakeholders to embrace these principles and enabling factors to ensure that paramedicine in Canada evolves for the benefit of the public, the profession, paramedicine members, and the Canadian healthcare system. ■

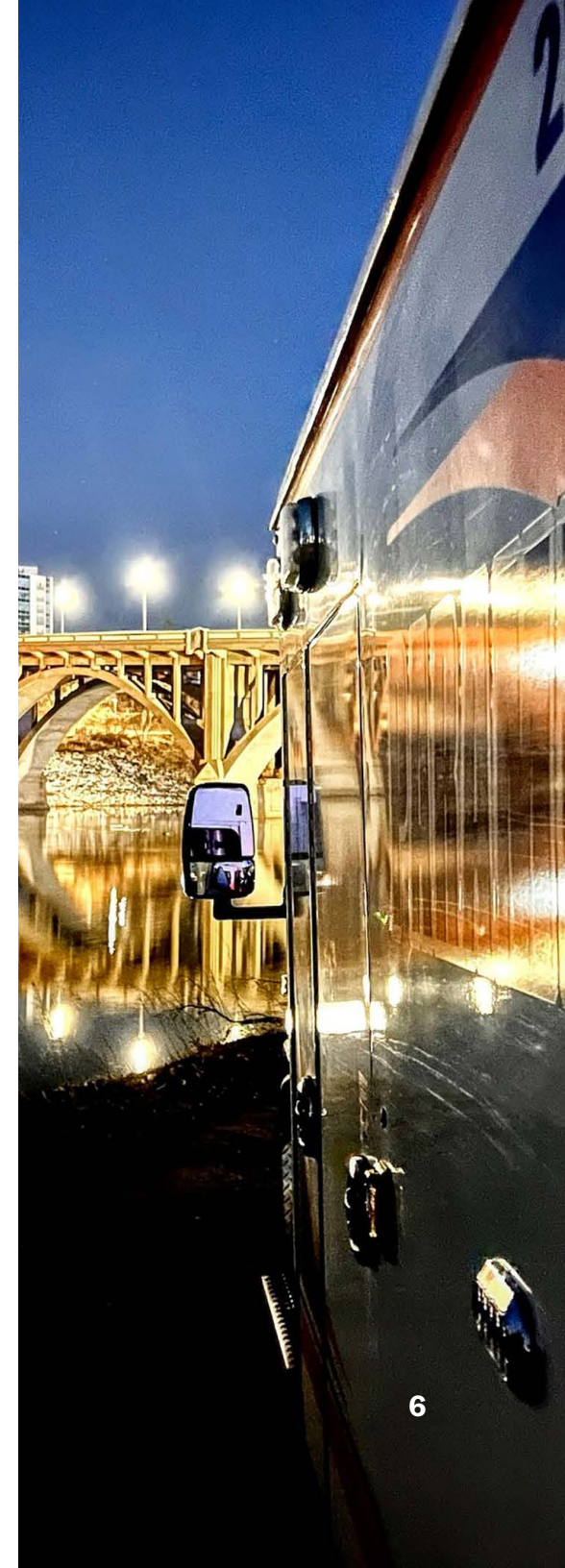


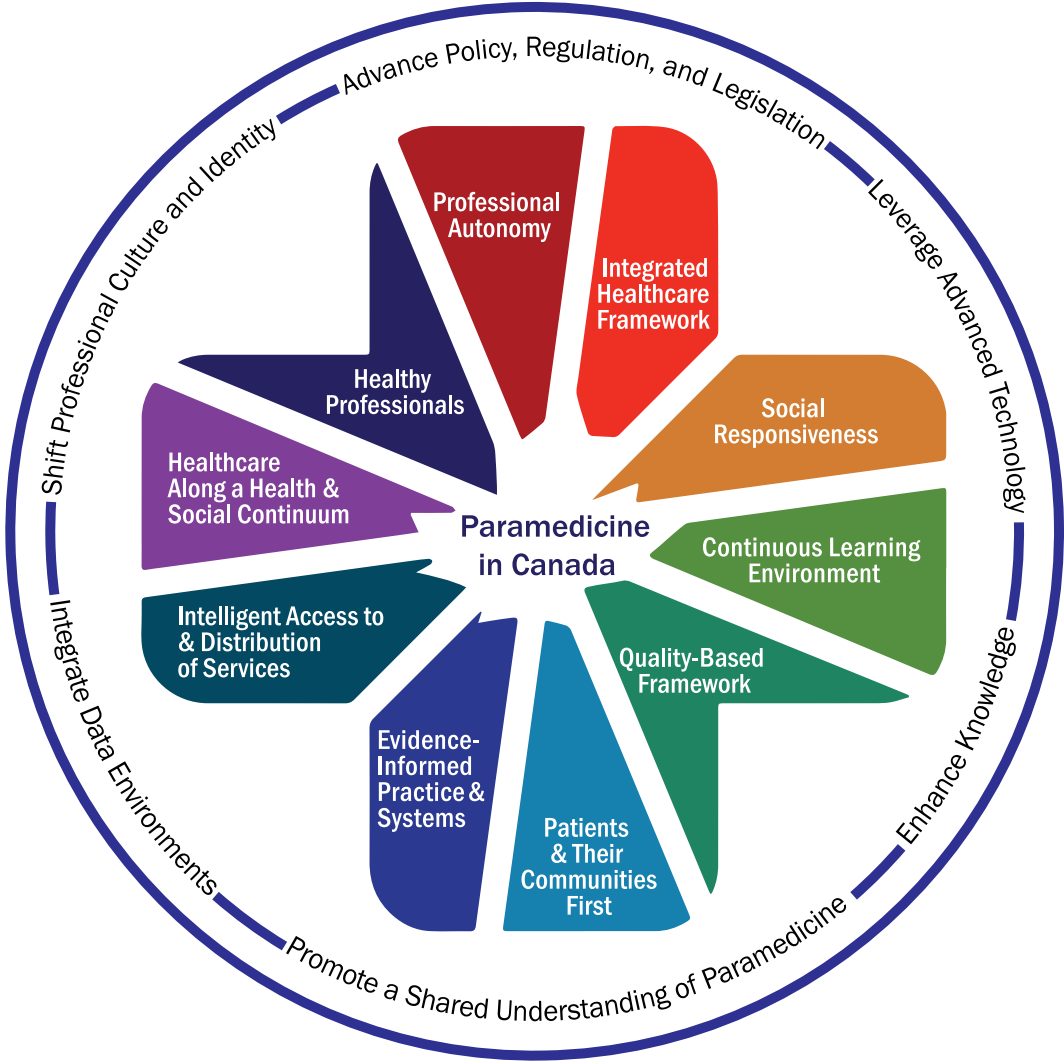
FIGURE 1: Principles and enabling factors guiding the future of paramedicine in Canada.

10 principles

1. Patients and their communities first
2. Healthcare along a health and social continuum
3. Integrated healthcare framework
4. Social responsiveness
5. Professional autonomy
6. Healthy professionals
7. Quality-based framework
8. Intelligent access to and distribution of services
9. Continuous learning environment
10. Evidence-informed practice and systems

6 enabling factors

1. Shift professional culture and identity
2. Enhance knowledge
3. Promote a shared understanding of paramedicine
4. Integrate data environments
5. Leverage advanced technology
6. Advance policy, regulation, and legislation



1

Patients and Their Communities First

Patients are full partners in their health care experience. They have unique relationships with their communities and healthcare resources.

Paramedicine is structured to meet both individual and community needs in an accessible, equitable, compassionately delivered, safe, and effective way. Working within a whole-person framework, encounters with patients are relationship-oriented, culturally sensitive, and attuned to the interconnectedness of patients and their communities.

Patients and communities understand the value and expertise that paramedics provide. Patient-professional partnerships contribute to the planning, evolution, and growth of paramedicine and the paramedic profession.



2

Healthcare Along a Health and Social Continuum



Paramedicine has infrastructure, knowledge, and skills that are crucial to meeting patients' health and social needs.

Patient and community needs are supported through a broad range of health and social services, systems, and strategies.

Paramedicine is a point of entry for many patients into these systems. As such, the profession works with patients and system partners to determine the most appropriate health and social treatment and care pathways that are accountable to patients' needs and will improve outcomes.



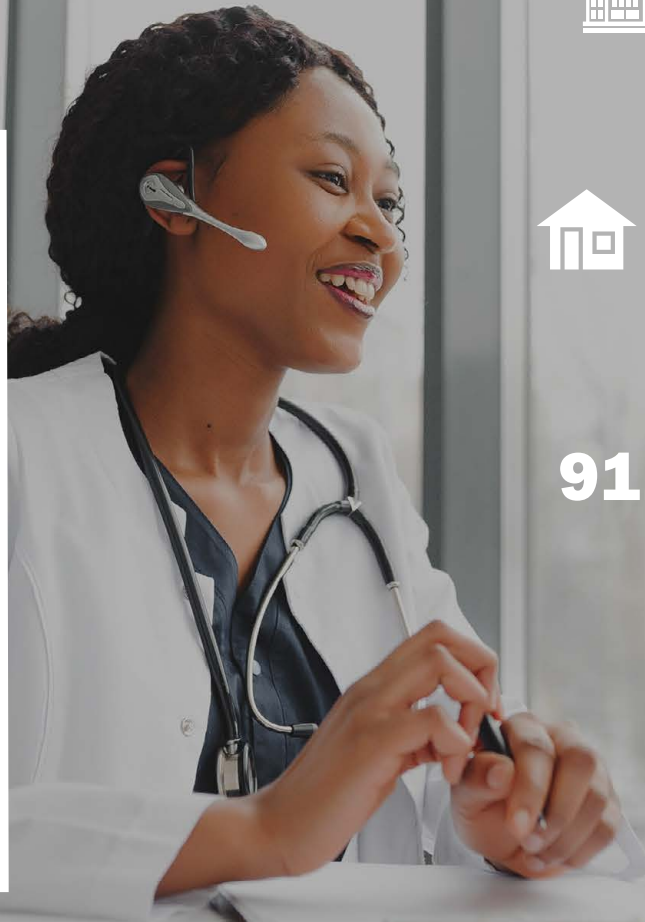
3

Integrated Healthcare Framework

Paramedicine is integrated within healthcare services and is shaped by collaborative partnerships with other health professions, patients, communities, governments, regulators, industries, educational leaders, and evidence-based institutions.

Integrated healthcare frameworks shape the overall structure, practice, and evaluation of paramedicine.

The profession uses accessibility, technology, sustainable funding, and system capacity to provide and support integrated health and social services with and for patients across sectors and in diverse environments, settings, and geography.



4

Social Responsiveness

Social issues are part of paramedicine's accountability, leadership, and clinical frameworks. This includes identifying, designing, implementing, and evaluating initiatives that address structural inequities and social challenges, and gaps in services for at-risk communities and populations.

The profession advocates on behalf of patients, communities, its members, and itself, with a particular focus on those who are traditionally underserved.

Paramedicine and the profession thus contribute to addressing both social injustice and health inequities.



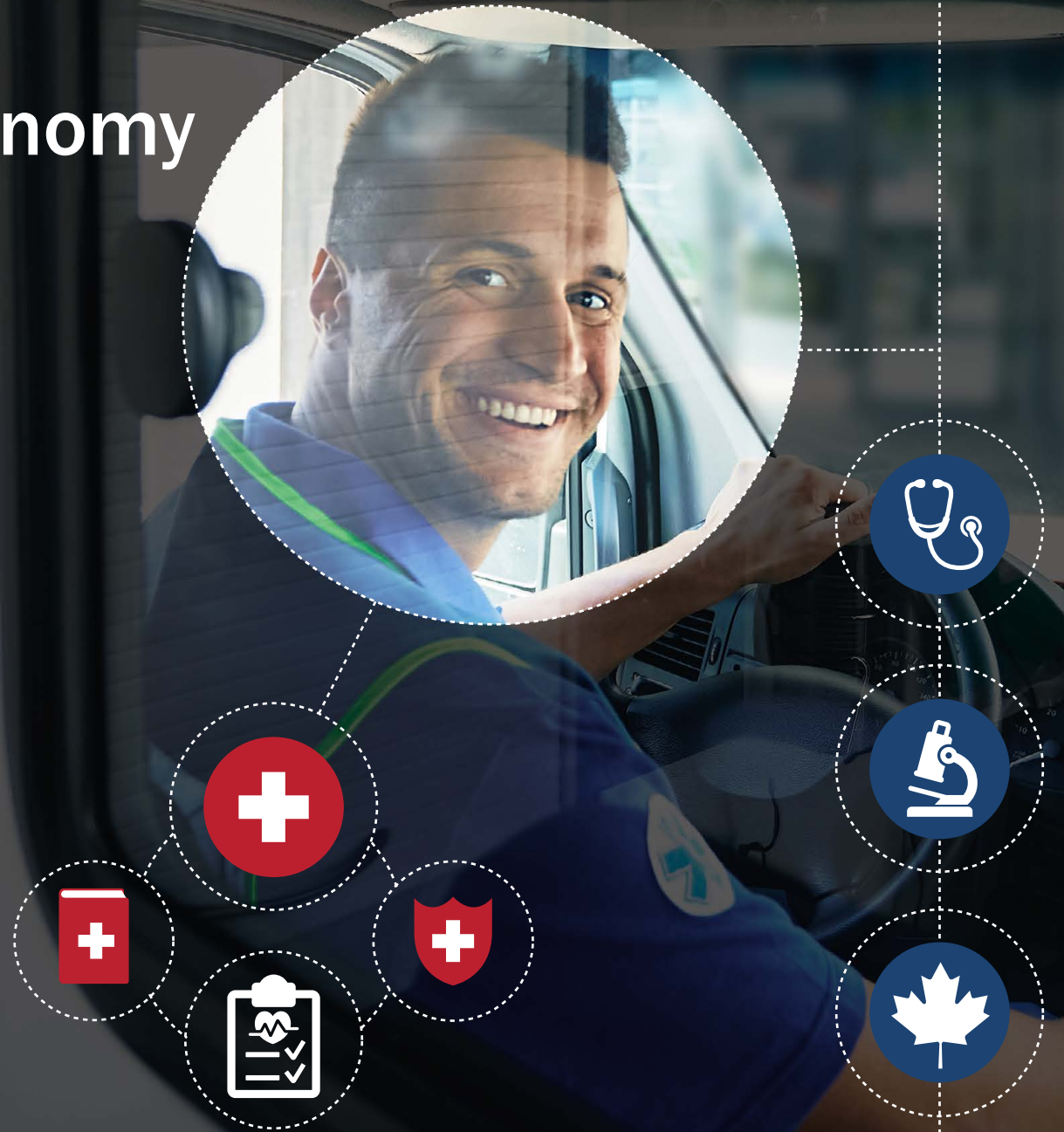
5

Professional Autonomy

The paramedic profession is guided by its own accountable and transparent governance, regulation, knowledge, evidence generation, and improvement processes.

It also engages in formal representation and participation in relevant organizational, educational, healthcare, scientific, government, and professional bodies.

The profession demonstrates its own growth and advancement through its leadership and advocacy initiatives. Paramedicine is guided by these activities with a self-structured mandate, code of ethics, and professional and clinical guidelines.



6

Healthy Professionals

The safety and wellness of the professionals who work in paramedicine is an integrated and prioritized mandate.

This focus is reflected in the determined search for, and solutions to, behaviours, stressors, professional and societal factors, and other threats to safety and wellness.

Decision-making related to organizational structures, policies, priorities, and operations is done and maintained within a wellness framework.

Overall wellness is monitored and reflected in the profession's activities. Systems are accountable to and evaluated based on the health of its professionals.



7

Quality-Based Framework

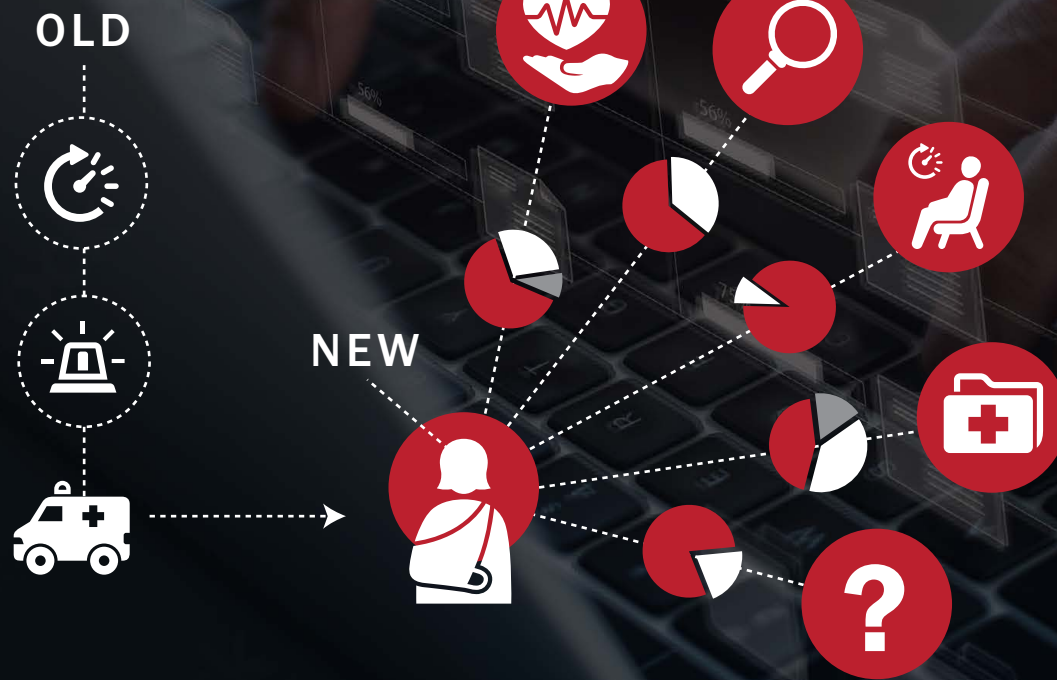
Improvements at all levels — patient care, services, operations and systems, and education — are measured using evidence-informed and meaningful quality indicators.

Evidence-informed performance measurements are intentionally broad and integrated into paramedicine's activities and culture. Quality indicators reflect the broad priorities of paramedicine and health care, align with leading quality frameworks, and shape activities including decisions about future directions, policies, resource allocation, research, practice, and funding structures.

OLD



NEW



9

Continuous Learning Environment

Paramedicine is growth-oriented and involves continuous learning, and adaptation. The profession promotes knowledge generation in the context of its application, knowledge exchange, critical reflection, new insights, and innovation.

Opportunities derived from advanced technologies, data environments, education, and broadening clinical pathways encourage ongoing system progress.

Professional and organizational culture is structured to encourage respectful debate, discussion, and discourse that leads to the generation of new ideas and insights. Formal mechanisms allow new ideas to be systematically tested, implemented, refined, and evaluated.



10

Evidence-Informed Practice and Systems

Evidence guides the practice, oversight, and direction of paramedicine. Knowledge production and use as well as data and evidence are inherent and integrated features of paramedicine. They are used to transform paramedicine practice, systems, behaviours, and principles.

Sufficient resources and infrastructure are allocated to create a vibrant research community, led by the profession, which develops a unique body of knowledge. Data environments are organized and shared, including with scholarly communities, to promote discoveries that are then transformed into evidence-informed practice that benefits patients, professionals, partners, communities, paramedicine, and the profession.



Six Enabling Factors

SHIFT PROFESSIONAL CULTURE AND IDENTITY

Making internal conceptual shifts to what paramedicine is (e.g., identity, purpose, core business, etc.) and how it should be enacted (e.g., an emphasis on health care over public safety, broader social accountabilities, diminishing the profession's para-military roots, elevating professional autonomy, promoting openness to innovation over risk aversion, resolving the debate over specialist versus generalist roles, etc.).

ENHANCE KNOWLEDGE

Advancing the depth and breadth of knowledge in the system, from entry-to-practice to leadership, as a means to achieve future desired states. Advancing knowledge, skills, competencies, and expertise across domains such as clinical care, social sciences, humanities, leadership, economics, quality, research, technologies, and logistics.

PROMOTE A SHARED UNDERSTANDING OF PARAMEDICINE

The need for broad awareness campaigns to educate stakeholders and partners (e.g., the public, academic institutions, related health professions, health leaders, governments, etc.) about the expanded roles and services offered by paramedicine. Historical conceptualizations of paramedicine (e.g., resuscitation and transport) contribute to a misunderstanding among the public and policy-makers and impedes opportunities to integrate into healthcare systems more fully.

INTEGRATE DATA ENVIRONMENTS

The structuring of data environments across jurisdictions to serve broad and still-undefined quality measurement, research activities, and advances. This includes working on data sharing, both internally and externally, as well as linking databases with relevant partners.

LEVERAGE ADVANCED TECHNOLOGY

The use and integration of advanced existing and emerging technologies (e.g., artificial intelligence, machine learning) to optimize systems and outcomes. This includes attending to drivers shaping the need for technological advances. The future of paramedicine is dependent on understanding, contributing to, engaging, and collaborating with advancing technologies.

ADVANCE POLICY, REGULATION, AND LEGISLATION

The need for paramedicine's involvement in advocacy and decision-making. Having organised groups to work specifically on identifying necessary changes and how they can be achieved and aligning these efforts across the country. Governments and current administrative and stakeholder structures have been identified as barriers to proposed future states.

Principles and Enabling Factors Guiding Paramedicine in Canada

A Community-Based Healthcare System

Full Summary Report



Principles and Enabling Factors Guiding Paramedicine in Canada

A Community-Based Healthcare System

Introduction

This report outlines ten principles intended to serve as a guiding conceptual framework for the structuring and advancement of paramedicine in Canada. It also outlines six enabling factors to support the realization of these principles.

Building on *The Future of EMS in Canada: Defining the New Road Ahead*,¹ the seminal report published in 2006 by the Emergency Medical Services Chiefs of Canada (now Paramedic Chiefs of Canada [PCC]), these principles provide a set of priorities for paramedicine in Canada. They reflect priorities in health care, and transitions that are underway in paramedicine in Canada and internationally.

Together, these principles represent a vision that prioritizes paramedicine's contribution to health care, community involvement and engagement, and the paramedic profession itself. The enabling factors call on stakeholders and paramedicine leaders to engage in activities that will ensure that the principles are fully realized over time. Together, these principles and

enabling factors are a conceptual framework that will guide activities so that they can be enacted flexibly and in local contexts, and at the same time unite these activities under a shared framework to serve the identity, priorities, and advancement of paramedicine across Canada.

This document contains an updated vision and identity for paramedicine in Canada. It is intended to be a resource for paramedics, the healthcare community and system leaders, researchers, educators, other professionals, and the public who want to understand the national direction of paramedicine. It is also intended as a reference for strategic planning, designed to stimulate, identify, and organize research; guide practice, policy, education, and professional standards; and serve as an evaluation framework on which to assess the progress or direction of the profession's collective efforts.



“Paramedicine in Canada is experiencing significant transition in its structure, scope, priorities, and identity.”

Paramedicine in Transition

Paramedicine in Canada is experiencing significant transition in its structure, scope, priorities, and identity. Many of these changes are due to how jurisdictions want paramedics to contribute to the health care needs of their local communities. The work of paramedics, how paramedicine is defined or enacted, and how the public interacts with the paramedicine system have all shifted. This shift has been driven by many factors, including local or provincial leaders working to modernize paramedic care, combined with input from healthcare system partners, governments, interested community members, and a broad range of scholars and professionals.

For example, clinical programs captured under the broad umbrella of “community paramedicine,” are representative of these innovations, local responsiveness, and a transition into new functions.^{2,3} Newer clinical oversight models, broadened educational expectations, practice boundaries, levels of integration, and deployment plans are also reflective of the ongoing advancement, growth, and shifts in what we mean by “paramedicine.”

Recent international research attempting to capture what paramedicine is and what paramedics do has led to the following definition:

“[A] domain of practice and health profession that specialises across a range of settings including, but not limited to, emergency and primary care. Paramedics work in a variety of clinical settings such as emergency medical services, ambulance

services, hospitals and clinics as well as non-clinical roles, such as education, leadership, public health and research. Paramedics possess complex knowledge and skills, a broad scope of practice and are an essential part of the healthcare system. Depending on location, paramedics may practice under medical direction or independently, often in unscheduled, unpredictable or dynamic settings.”⁴

The overall service of paramedicine is, of course, much broader. For example, it includes dispatchers who coordinate assets, other essential professions (e.g., physicians, scientists, and educators), specialized teams and support services (e.g., quality assurance and wellness programs). Still, this international definition reflects the complexity of paramedicine in many parts of Canada today, its aspirations in various Canadian jurisdictions, and its evolution and transitions.

RESPONDING TO HEALTH CARE NEEDS

Paramedicine is well-positioned to serve and respond to a wide range of healthcare system challenges. For example:

- The provision of emergency, urgent, and non-urgent health care services by paramedicine includes linking patients to specialized services, which may reduce morbidity and mortality, and acute care utilization in some patient types;⁵
- The introduction of diversion and alternative

disposition pathways for patients who contact 9-1-1 may contribute to improved patient outcomes while also mitigating strains on healthcare resources (e.g., emergency department);⁶⁻⁸

- The focus on targeted patient populations (e.g., psychiatric, geriatric, palliative, and complex chronic care) are contributing to aligned and efficient community-based paramedic services;⁹⁻¹² and,
- The support of primary and preventative care (e.g., aging at home, mitigating predictors of long-term care admission, harm reduction, and public health programs) may improve satisfaction, access to health and social services, and overall community health.^{8,13}

These changes and innovations have helped create paramedicine systems that are rich in advances but with practices that may not yet be fully confirmed as core to paramedicine. For example, some authors have described aspects of paramedicine as piecemeal patches for a system in crisis that runs the risk of exacerbating inequities; this has been exacerbated by difficulties inherent in conducting research or measuring progress in this field.^{14,15} While health and economic benefits are being realized, advances tend to be localized innovations (although this is changing) and therefore may not be equally distributed across communities, within

or across provinces, or across the country. As well, some features of paramedicine may now be outdated or poorly supported. For example, the singular focus on response times as a measure of service quality, how paramedicine's or paramedics' identities are perceived, who is responsible for knowledge production, and how best to professionalize, all require rethinking.

As paramedicine evolves, there is increasing variability in the views on how best to proceed. This variability can threaten advancement, integration, funding, and a shared understanding amongst members of the profession, adjacent healthcare professions, and the public. Although this variability can create divergence at multiple levels between how paramedicine systems are organized and enacted, it also provides an opportunity to leverage the expansive advances across Canada to better organize paramedicine on a national level (i.e., keeping what works and discontinuing what does not).

In the context of these exciting transitions and innovations, the PCC embarked on a national project to consolidate these views, experiences, and ideas. Such a consolidated view, informed by a set of principles, provides the profession with a structured conceptual framework by which to organize its efforts and facilitate harmonization amongst paramedicine systems nationally, while permitting innovation and flexibility in how its principles are enacted.



“...some authors have described aspects of paramedicine as piecemeal patches for a system in crisis that runs the risk of exacerbating inequities...”



“There has been a transition from a reliance on doctors and hospitals to... the delivery of care in community clinics, interprofessional primary healthcare centres, and at home.”

Health Care in Canada and the Role of Paramedicine

Health care in Canada is under significant strain.¹⁶ Increasingly complex patient and community needs, a growing and aging population, changes in the ways healthcare services are delivered, fiscal constraints along with the higher costs associated with providing health care, and shortages in and the strain on health human resources—especially in the shadow of a global pandemic—have challenged both national and local healthcare systems. Wait times, emergency department overcrowding, a disconnected system, earlier discharge policies, and limited access to primary care or community services, especially by underserved populations, are all indicative of this strain.¹⁷⁻²⁰ The situation has led governments in Canada to broaden healthcare system policy to include a focus on public health, health promotion and prevention, improving access to primary care, increasing the coordination and integration of comprehensive services, and creating better work environments for healthcare providers.²¹ There has been a transition from a reliance on doctors and hospitals to additional healthcare professions and alternative care models, including the delivery of care in community clinics, interprofessional primary healthcare centres, and at home. Consequently, over the last decade, the number of nights spent in a Canadian acute care hospital has declined on a per capita basis, while

alternative care services provided in the home and community have grown significantly.²¹

Paramedicine’s community focus and its position as a mobile community-based healthcare service has led governments to increasingly call upon the profession to do more.²² Historically and traditionally structured as a resuscitation, transportation, and emergency medical service closely aligned with public safety,²³ paramedicine is evolving to include broader and more sophisticated healthcare services. This evolution began with the enhancement of emergency medical services, such as broader scopes of practice for acute medical crises and improved dispositions (e.g., referral and alternate destination pathways) for targeted emergency patient types.^{24,25} Given the points of contact paramedics have in the community with patients/clients, paramedicine systems have leveraged those moments to enact healthcare system enhancements such as earlier identification of health and social needs in the community. Other countries have mitigated wait times, promoted better access to services, and reduced hospital acute care bed use by leveraging and restructuring community and home-based care, data, technology, and other out-of-hospital and primary care-based services.²⁶

The Importance of Restructuring

Paramedicine as a healthcare service and profession is contributing to new ideas and health care philosophies, but in the context of national health care priorities, its contributions have also raised questions about its limitations.^{27,28} Emergency response and care remain fundamental to health care in Canada and to paramedicine; however, its role, and potential roles, in the healthcare system, how the public uses the service, the shifting landscape of the healthcare system in Canada, and advances in knowledge related to health care delivery mean that paramedicine’s core functions, and priorities must change.

The traditional structure of paramedicine requires rethinking. For example, while governments call for

better access to care, improved continuity of care, and integrated health care as healthcare system goals, paramedicine—in its current structure, priorities, research contributions, education and more—may fall short.²⁹ The position in which paramedicine is increasingly finding itself means that newer ways of structuring and supporting the system nationally must be found. That is, with paramedicine being called upon to take part in healthcare system advancements, it must attend to its own edifices, activities, capacities, and priorities through an updated set of guiding principles so that it may be better aligned overall with the direction of health care in Canada.

Approach to Setting Principles to Guide Paramedicine in Canada

Researchers were tasked with identifying key principles and enabling factors to guide paramedicine in Canada.³⁰ These principles were identified through an evidence-informed iterative process conducted between June 2019 and August 2021. The approach began with identifying the need for a renewed and updated framework for paramedicine in Canada. The process involved reflecting on the 2006 statement, examining subsequent activities in paramedicine in Canada, and a national and international environmental scan and

literature review of existing frameworks. The PCC then partnered with the University of Toronto to lead a national study exploring the future of paramedicine in Canada, which included looking at concepts or principles that were outdated and in need of eliminating or revising. The work was supported by the PCC Board of Directors and a dedicated national steering committee.

Using a nomination process, researchers organized semi-structured interviews with stakeholders and thought leaders within the Canadian paramedicine



“The traditional structure of paramedicine requires rethinking...newer ways of structuring and supporting the system nationally must be found.”



community. To promote a diversity of views among these key informants, researchers prioritized their frequency of nominations, stakeholder group, and their geographical representation. An interview guide was structured to explore the current state of paramedicine, shifts that may be necessary, existing and future problems for which paramedicine may be a solution, changes to its structure and conceptualizations, and future priorities.

The steering committee conducted in-depth interviews with 35 individuals (25 men and ten women). The interviewees represented:

- ten provinces and one territory;
- 17 stakeholder organizations (e.g., medical oversight groups, educators, family health teams, provincial health authorities, and regulators, etc.);
- ten stakeholder groups (e.g., directors/chiefs, educators, researchers, and front-line clinicians, etc.); and,
- seven practitioner types (e.g., primary, advanced, and critical care paramedics, nurses, and doctors, etc.).

Interviews were recorded, transcribed, and analyzed using qualitative methods, and the results were used to generate guiding principles and enabling factors.³⁰ To further guide the development and implementation of these principles and enabling factors, experts from

across Canada were invited to develop theory-to-practice statements (*see Appendix*). Academics and practice leaders were asked to do the following:

1. Identify and summarize the relevant scholarly literature related to each principle;
2. Provide implications derived from the literature that the paramedicine community should consider in enacting the principle; and
3. Identify enabling factors that further support each principle, again based on the literature and implications.

Finally, an extensive discourse analysis exploring the paramedicine literature and evidence base was completed.³¹ This review was done to contextualize the principles in the existing literature so as to provide an indication of the degree to which they could be immediately supported or would require additional knowledge evidence or curation. The PCC identified articles focusing on paramedicine, then examined a sample of these articles using elements of discourse analysis. The search yielded more than 50,000 articles, of which more than 2,000 were used.



About the Principles and Enabling Factors

Ten principles and six enabling factors were identified and defined (see Figure 1). These are presented in detail on pages 8-18. Elaborated theory-to-practice statements that were developed by national and international experts are included in the Appendix. These principles are intended to guide system design, behaviour, and evaluation, but can also be enacted with enough flexibility to take into account the existing and evolving literature, progress, system context, and local issues. These principles are not hierarchical or ordered, but instead are expected to hold varying degrees of prioritization or interest in different circumstances. Organizing activities under common, shared, and equally valued principles and enabling factors is intended to support the advancement of paramedicine and to connect local and national activities for shared progress.



Figure 1: Principles and enabling factors guiding the future of paramedicine in Canada.



“...the ten principles describe an evolution for paramedicine in Canada and form a new identity for the paramedic profession and its accountabilities.”

PRINCIPLES

Collectively, the ten principles describe an evolution for paramedicine in Canada and form a new identity for the paramedic profession and its accountabilities. The substantial opportunities embedded within these principles and enabling factors have been described in three broad ways.³⁰

1. **They oblige the paramedic profession to be accountable to and for itself.** This accountability includes prioritizing the wellness of professional, the ability to generate and use evidence and to advocate for itself, and having the capacity to detect and act on areas in need of change.
2. **They point to the need for greater accountability to the public and to the communities they serve.** Today’s public has greater involvement in shaping and structuring access to services, informing performance and quality indicators (i.e., measuring what matters), and ensuring that social and health inequities/injustices are not ignored.
3. **They outline accountabilities related to better-aligned services and as contributing to the healthcare system.** For example, establishing paramedicine as additionally an interprofessional primary care concept and minimizing discontinuities in care both within paramedicine and with adjacent services is paramount. This includes ensuring that services are accessible in either better or different ways, and by organizing paramedicine to provide both health and social services rather than focusing mainly on a transportation model or emergent health needs, or not sufficiently

accounting for social context, community resources, or personal circumstances.

These principles are thus a holistic conceptual model that can lead to a significant evolution of the structure, process, and outcomes of paramedicine. Without being overly prescriptive, they provide an opportunity to consolidate efforts, generate new behaviours, and shape decision-making in and out of paramedicine. While individuals, groups, systems, organizations, and communities currently vary in their alignment with these principles, this conceptual model can guide and provide a framework on which they can focus going forward.

ENABLING FACTORS

The ten principles outlined above are supported by six enabling factors (*see page 18*). These factors represent the parallel activities that provide the foundational structure and processes on which the profession can enact the principles.

For example, a focus on health and social services may require shifts in paramedicine’s professional culture and identity that could create conflict for individuals, the system, healthcare partners, and the public. While interacting with patients in the community as part of their emergency response, asking front-line paramedics to pay attention to the social conditions that affect patients’ health may be viewed as “not my job” (or not “their” job) until a new culture and identity can be formed.

For some, professionalization is synonymous with self-regulation; however, the role of self-regulation may be changing, so while other forms of professional

autonomy are possible, they may require new forms of knowledge. Supporting a “Continuous Learning Environment” and “Evidence-Informed Practice and Systems” may necessitate changes to data environments, policy, legislation, and research. How enabling factors apply to principles is also examined in the theory-to-practice statements (*see Appendix*).

The literature review explored the evidence on which paramedicine is based, including how that evidence changed over time.³¹ When mapped against the principles outlined above, it is clear that the literature as a whole may provide limited knowledge or evidence on which to support the principles. As well, the findings suggest the prevalence of narrow methodological approaches and the need to broaden theoretical underpinnings and the research questions being asked in paramedicine.

Supporting evidence-based decision-making, scholar-led initiatives with capacity and funding will be needed to assist the profession in knowledge production and curation. The need for research (including higher education to support the understanding of and

capacity to conduct research) is therefore identified as a key concept that forms the foundation for all principles and enabling factors.

The complexity and magnitude of the promise associated with these principles calls for vigorous leadership from numerous sectors in attending to all six enabling factors. This may include leadership from governments, as well as policy-makers, regulators, accreditors, community leaders, patient groups, service operators, educators, and academics. Much of what is included in these enabling factors requires additional investment, shared data and cross-jurisdictional dialogue, and shared implementation efforts. Provisions must be made for frequent evaluation and additional study to support the structuring, correction, and refinement of these enablers.

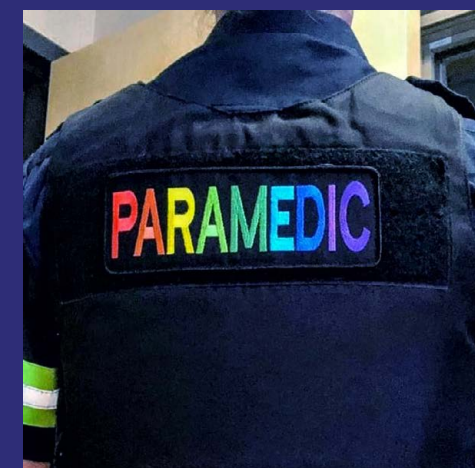
Although the challenges are great, so too are the opportunities, as long as the necessary structures and foundational knowledge are in place to direct change through these enabling factors. Prioritizing paramedicine’s advancement through strong leadership, champions, targeted activities, and science is possible and, for many of the principles, imperative.

Using the Principles and Enabling Factors

In addition to providing a conceptual framework for paramedicine in Canada, the principles and enabling factors are intended to have practical value as well.

For example, they can be used to:

- Guide research targets, including the generation of communities of researchers conducting applied research for a given principle;
- Guide leaders in strategic or master planning;
- Guide discussions about what paramedicine is and how it is structured with those new to paramedicine, with the public, with partners or stakeholders;
- Support the structuring of competency frameworks of education, including continuing professional development;



“The complexity and magnitude of the promise associated with these principles calls for vigorous leadership from numerous sectors in attending to all six enabling factors.”



“An approach to enacting these principles and enabling factors that is rooted in the front-line is encouraged, advocated for, and supported.”

- Guide innovators in advancing areas in need of further development (e.g., technology, databases);
- Guide clinicians and scope-of-practice leaders in additional areas to focus on and develop;
- Guide front-line clinicians on their role and identity in paramedicine; and,
- Guide the future evaluation of the principles and their enactment.

These principles and enabling factors are intended to encourage the paramedicine community to position and guide their work and contributions going forward, and/or to anchor present activities. The intention is to generate conditions and support for the enactment, development, and refinement of these principles and enabling factors over time, but not to restrict existing or aspirational activities.

PRINCIPLES ENACTED AT THE FRONT LINE

Ultimately, these principles and enabling factors are intended to serve policy and practice at the front lines (broadly defined) for improved healthcare system contributions and patient outcomes. It is at the front lines that we will ultimately recognize their value and contribution, and, in turn, it is the front lines that must ultimately inform, demonstrate, and shape their utility.

Reflecting on how existing practice is structured and aligned (or not) with these principles provides an opportunity for front-line members of paramedicine (and healthcare partners) to advocate for their use or

to provide feedback about optimizing their utility in a local context. For example:

- A seasoned paramedic may leverage the Healthy Professionals principle to advocate for policy changes or staff wellness programs;
- Dispatchers may adopt or advocate for better systems to support Intelligent Access to and Distribution of Services;
- A student or new paramedic, when reflecting on their education, may consider the potential limitations of their ability to serve the “social” part of health care and take corrective action;
- A committee member of a paramedicine organization may advocate for the inclusion of community members or better representation of underrepresented or marginalized groups in their committee membership or work;
- A local leader might advocate for more funding to support a researcher or evaluation scientist to ensure Evidence-Informed Practice and Systems and a Quality-Based Framework;
- The business community could seek to provide solutions to help integrate data environments; or
- Adjacent health professions might find ways of further developing an Integrated Healthcare Framework.

An approach to enacting these principles and enabling factors that is rooted in the front-line is encouraged, advocated for, and supported.



Conclusion

Perspectives from national thought leaders in Canadian paramedicine revealed a working conceptual framework centred on new accountabilities to the paramedicine profession and the public, and toward better aligning services within the healthcare system. Ten key guiding principles and six enabling factors provide a pathway to advance paramedicine while ensuring that contextual and regional needs and differences unique to and within Canada can be accounted for. We encourage the profession and related stakeholders to attend to these principles and enabling factors. This is to ensure paramedicine in Canada reflects these principles and a future that will evolve for the benefit of the public, paramedicine members, the healthcare system, and stakeholders. ■

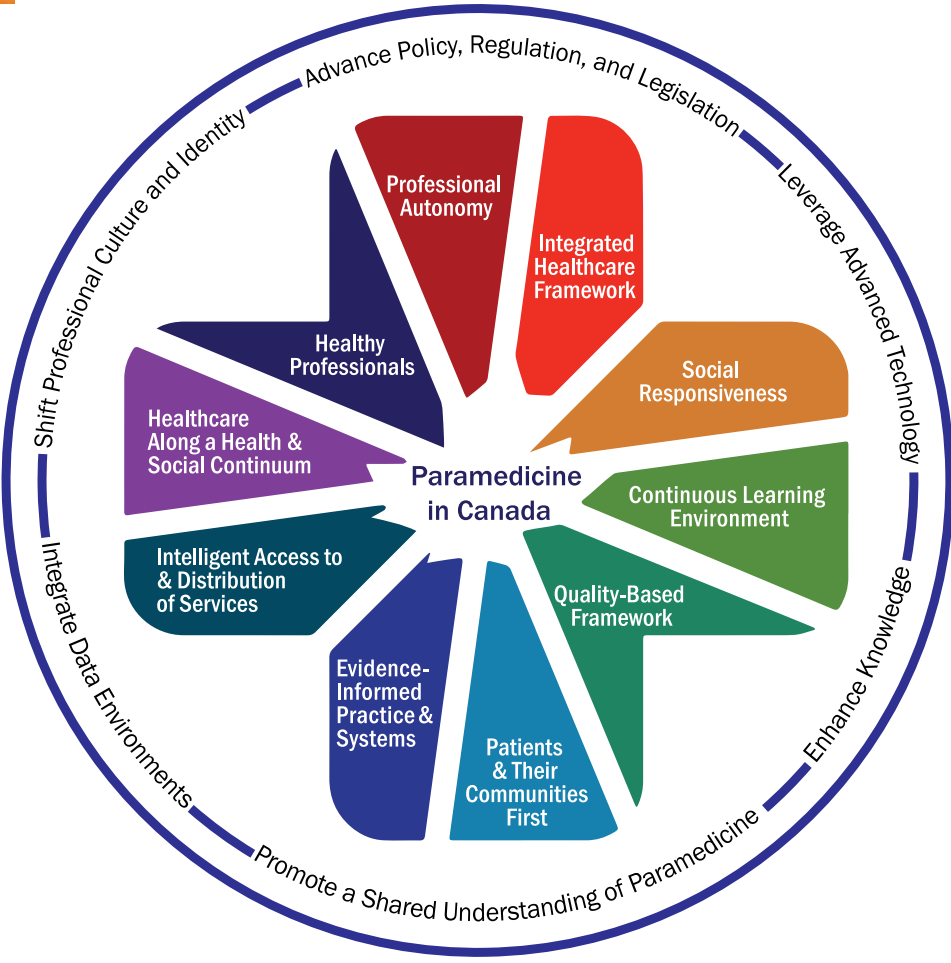


Figure 1: Principles and enabling factors guiding the future of paramedicine in Canada.

Endorsements



“With this paper, the PCC has outlined a timely call to action to the paramedic industry in Canada and its stakeholders. COPR is proud to heed the call. The paper reflects diverse perspectives from national thought leaders and their findings will help our organization in making informed recommendations to the benefit of the public, our healthcare system in Canada, and the wellbeing of the profession. Where appropriate, we will leverage the principles and enablers outlined in the White Paper in our own initiatives to ensure consistency and excellence in paramedicine.”

Tim Ford,
Canadian Organization of Paramedic Regulators (COPR) Board Chair

“The publication of Principles and Enabling Factors Guiding Paramedicine in Canada is an important and foundational document for the paramedic profession. The paramedic profession has evolved significantly in the past decade. The process the authors engaged to solicit information was robust. The results are relevant and informative. The framework of themes and enabling factors will assist clinicians, researchers, educators, and leaders in the profession in aligning priorities with the health care needs of the community.”

Pierre Poirier,
Paramedic Association of Canada

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Principles and Enabling Factors Guiding Paramedicine in Canada

A Community-Based Healthcare System

Appendix: Theory to Practice Statements

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Patients and Their Communities First

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Theory to Practice Statement

Principle

Patients are full partners in their health care experience. They have unique relationships with their communities and healthcare resources. Paramedicine is structured to meet both individual and community needs in an accessible, equitable, compassionately delivered, safe, and effective way. Working within a whole-person framework, encounters with patients are relationship-oriented, culturally sensitive, and attuned to the interconnectedness of patients and their communities. Patients and communities understand the value and expertise that paramedics provide. Patient-professional partnerships contribute to the planning, evolution, and growth of paramedicine and the paramedic profession.

INTRODUCTION

“There is no singular patient perspective, just as there is no singular articulation of a unifying problem statement that unites all patient concerns.”¹ This report has strived not to suggest only one way of considering patient-focused care as a priority in paramedicine, but to highlight relevant literature and a range of priority areas that inform what the principle of putting “patients and their communities first” might look like in paramedicine. A range of patient-focused terms



are used in the literature, including patient centred,^{2,3} patient and family centred,⁴ and person or people centred,⁵ although Hughes, Bamford, and May⁶ found no thematic differences between types of centredness; rather, different terms were used in different contexts. In this statement, we draw on these multiple terms and the literature to inform what might be termed “patient-focused” in paramedicine and how this can prioritize patients and communities first.

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The Institute of Medicine defines patient-centred care as care that is respectful of and responsive to individual patient preference, needs, and values, and ensures that this guides clinical decisions.⁷ Patient-centred care is widely advocated for reducing health and care inequities and improving health system outcomes² so that healthcare systems can transform from disease-centred to patient-centred models of care.⁸ The idea of centeredness stems from the movement in health care away from the narrow biomedical view (with its embedded paternalism) toward a broader view that encompasses social, psychological, cultural, and ethical sensitivities.⁶

A key component of this transformation to prioritize patients and their communities is a more thoughtful consideration of patient engagement. Carman et al. define patient engagement as “patients, families, their representatives, and health professionals working in active partnership at various levels across the health-care system—direct care, organizational design and governance, and policy making—to improve health and care.”⁹

With this definition in mind, we consider the multiple levels at which patients and communities may be prioritized: direct patient–paramedic interactions, organizational considerations, and policy-making considerations. To keep patients and communities at the focus of care considerations, we draw on literature to inform each level. We then outline the challenges of implementing patient-focused care and provide pragmatic suggestions for embedding the principle of putting patients and their communities first into paramedicine.

DIRECT PATIENT–PRACTITIONER INTERACTIONS

Direct-care considerations in relation to patient engagement include the integration of patients’ values, experiences, and

perspectives related to their health and care.⁹ Patient engagement in this context may range from a patient receiving information from a practitioner to being an active member of the care team in terms of their own health. When patients are partners in their own care, they more fully understand the risks and benefits associated with care choices; practitioners communicate in a timely, comprehensive, and comprehensible way; and practitioners elicit the patient’s values and beliefs about their care choices. Patients are supported and encouraged, and their social networks are involved, where possible.⁹ As well, within direct-care interactions, clinicians’ empathy is considered an essential component of high-quality health care.¹⁰ Patient-centred care accounts for not only the physical but also the emotional needs of patients, with consideration given to the patient perspective regardless of objective vital signs. Shared decision-making is also prioritized, when possible.⁵

Within this context, paramedics are uniquely positioned to provide care to one patient at a time, often in the patient’s own environment.⁵ It is also helpful to consider the different ways in which paramedics are directly involved with patients. Petrie¹¹ categorizes patients seen in the emergency department (ED) into four groups:

1. Unforeseen and high acuity (e.g., major trauma or acute exacerbation of chronic disease);
2. Unforeseen but low acuity (e.g., minor injuries or illnesses, such as a sore throat);
3. Predictable and high acuity (e.g., slow decline of a patient living with frailty, feeding tube blockages); and
4. Predictable and low acuity (e.g., prescription requests, “safe sanctuary” for vulnerable populations).

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Petrie's¹¹ breakdown of patient types identifies the different needs of patients encountered in the emergency setting and the fact that all of these patients are known users of ED (and paramedic) services. Importantly, it also challenges the notion of “inappropriate” emergency patients and the belief that low-acuity patients do not belong in the emergency setting. Identifying these different types of patients encountered by paramedics and the range of reasons for their requiring emergency medical services (EMS) may help paramedics ascertain which patients and communities paramedicine needs to focus on and what patient-focused care might mean for these patients.

Patient-Focused Through Community

When considering direct patient care, it is important to consider direct practitioner interactions with individual patients as well as practitioner interactions with patients from different communities served by the healthcare system. It's particularly important to identify the needs of vulnerable communities served by paramedics. There is a need to respect the rights, knowledge, and experiences of these communities and to incorporate these into patient- or community-focused practice.¹² The term “community” is not necessarily specific to a geographical boundary, but rather to categories such as gender, race, or a shared illness experience.¹ The need to pay particular attention to interactions between healthcare practitioners and patients has also been identified for patients who identify as Black, Indigenous, people of colour,^{13,14} 2SLGBTQ+,¹⁵⁻¹⁷ women,² older adults,¹⁸ those living in poverty,¹⁰ those experiencing homelessness, and those with mental health needs and substance use and addictions issues.^{3,19-21}

There is a need to confront the inequities that we know exist and ensure that paramedic services are considering what patient-focused means for these communities. It is also essential

to acknowledge the strengths and knowledge of these communities and how they could be further involved in informing what patient- or community-focused care should look like. An additional consideration for communities of focus is understanding communities through their different geographies (i.e., urban, suburban, rural, or remote).^{22,23} These distinct community types may require particular attention as to what their needs are and what resources and supports may be central to their care.

ORGANIZATIONAL CONSIDERATIONS

Organizational design and governance considerations influence the systems within which paramedics operate and provide care. Paramedics are usually not “the only ones in the room” when providing care; rather, they are governed by paramedic services and prehospital care governance systems such as base hospitals, municipalities, and provincial regulators. Healthcare systems and organizations must work to address patient care needs, but within the constraints of their available resources.²⁴ Paramedics may be both constrained and supported by the systems within which they operate. The conditions of work for paramedics and the resources on which they rely can have implications for the ways in which the care they provide may be sufficiently patient-focused. Considering how patient engagement may support prioritizing patient and community needs, Carman et al.⁹ also highlight how patients' values, experiences, and perspectives can be incorporated into the design and governance of the healthcare organizations that provide patient care.

Healthcare provider satisfaction within organizations also has significant implications for the quality of care that patients receive and the degree to which it is patient-focused. The experiences of staff affect both the individual and direct care interaction and, as such, the patient experience, as well as the

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performance of organizations.⁴ For example, patient satisfaction is lower when hospital nursing staff are burned out, dissatisfied, and frustrated.²⁴ Austin notes that “compassion fatigue may not ... arise predominantly from too great a demand for compassion, but rather from barriers to enacting compassionate care—barriers which are often systemic”²⁵ (pp158-159). Good quality work environments help address health inequalities for both staff and patients—specifically, environments that employ participatory, co-produced, and empowering approaches to address inequities in power.⁴

At the organizational level, key determinants for implementing patient-centred care include leadership behaviour and support, an organizational culture of learning, communication among staff, fostering staff well-being, and providing sufficient opportunities for ongoing education.²⁴ Organizations must ensure that patient-focused behaviour is valued, rewarded, and addressed appropriately by leadership if the behaviour is not achieved.²⁴ In Rantala et al.’s⁵ study of patient-centred care in the Swedish ambulance service, resistance to the concept occurred when clinicians felt that the framework was not adequately reflected in all aspects of the organization but only expected of the paramedics as individual practitioners. Clinicians wanted to see person-focused care in all aspects of their service, including managers seeing clinicians as people, rather than just employees.

POLICY-MAKING CONSIDERATIONS

The role of broader policies and systems in prioritizing patients and communities for paramedicine is also important to recognize. Because paramedicine interacts with other parts of the healthcare system, paramedic services may be either constrained or supported by policies within that system and beyond. Paramedic services necessarily engage with EDs, other hospital

services, and other parts of the healthcare system. The degree to which paramedics can be patient-focused in their care may therefore depend on what resources or services they are able to offer to patients and what transitions in care from paramedic services look like, such as whether or not they can offer a patient the most appropriate care destination or are required to transport them directly to the ED.¹⁹ This may be both a barrier to patient-focused care when other systems and policy may not be changed, or an avenue for change when paramedic services are able to lead and stimulate change within these other systems.

It’s also important to consider the ways in which paramedics—who encounter people in their daily, lived environments—may inform policy outside of health care and even act as social advocates, identifying where the needs of the patients they regularly encounter are unmet.^{26,27} Patient-focused care may mean acknowledging that patients operate and exist within conditions that are outside of the healthcare system, including the social determinants of health.²⁸ Related policy areas include housing, income, and employment and working conditions, along with structures such as racism, sexism, homophobia, and other forms of discrimination that have significant implications for the health and well-being of patients and paramedics alike.¹⁹ Although many of these areas may be beyond the control of paramedics and paramedic services to influence, engaging with them where possible through education and awareness as well as, potentially, through community paramedicine programs or other avenues for advocacy, may contribute to a more patient- and community-focused lens that takes into account the daily realities that patients face.

At a policy level, there is an increasing recognition of the “importance of wider social drivers and inequalities that constrain health care and the way they exclude many of the

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groups with the poorest health outcomes from health care involvement processes.”⁴ Improving the social determinants of health has a significant role in the prevention and management of chronic illness.²⁸ Addressing policy areas could have implications for addressing patients’ needs beyond emergency medical care, which may support a decrease in call volumes as well as better support of individual patients in need.^{29,30}

CHALLENGES WITH IMPLEMENTING PERSON-CENTRED CARE

To support patient-focused care, patient experiences and community needs require increased prioritization. Although patient experience is a crucial piece of health care quality improvement, it consistently receives less attention than clinical effectiveness and safety.⁴ Patient-centred care approaches highlight patients’ experiences; build empathy, compassion, and connectedness of staff; and promote greater interdisciplinary work. It is challenging, however, to account for power differentials between practitioners and patients and how best to prioritize patient perspectives in light of these differentials.⁴

The literature identifies only one study of a paramedic service formally implementing a patient-focused or person-centred care framework. Rantala et al.⁵ investigated person-centred care in a Swedish ambulance service. A concern from some paramedic practitioners in this study was that person-centred care was more of a catch phrase—it was either not felt to be a new addition to paramedic practice, or, when discussing these “non-technical” skill sets in patient care, clinicians reported that they might be seen as “wimpy” for considering these issues. Given that ambulance services generally function within

a bio-medical context of treatment protocols and algorithms, education is often not focused on viewing a patient as a person; it is also less focused on non-technical skill sets. A person-centred care framework, however, aims to support practitioners in prioritizing these aspects of a caring and interactive relationship between practitioner and patient.⁵ “Focusing on the encounter is paramount as, from a patient perspective, being a person in need of care provided by the ambulance service means being vulnerable, exposed and feeling powerless.”^{5(p8)}

Considering the multiple levels at which patients and communities may be prioritized in paramedicine underscores the possibility that a greater impact could be achieved by implementing interventions across multiple levels. Rowland et al.¹ outline the concept of “mosaics of patient involvement.” As described above, when considering direct patient–practitioner interactions, focus is required not only on the experiences of each individual patient but on the communities of patients served. Engagement with communities is seen as a solution to challenging power dynamics.

Although there are many important patient voices to be heard and brought into focus, these may often be in tension with one another. Engaging with both individual patients and communities of patients bring multiple voices to the table, without one being considered over another.¹ Paramedics’ capacity to provide patient-centred care lies in their ability to connect patients to appropriate resources and supports. Echoed repeatedly in the literatures around patient-centred care is that patients want effective treatment from trusted professionals that is delivered with empathy, emotional support, respect, and involvement in decision-making.^{4,5,9,10,31}

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ENABLING FACTORS AND RECOMMENDATIONS

The enabling factors and recommendations outlined below support the principle of putting patients and communities first to address considerations at all three levels (direct patient–paramedic interactions, organizational considerations, and policy-making considerations):

- **Training and education (domains for paramedic student training and continuing medical education [CME]):** Paramedics and paramedic students should receive education on patient-centred communication strategies tailored to support the interactions of paramedics working in fast-paced emergency response environments as well as community paramedics who may build longer-standing relationships with patients and communities. Cultural competency education addressing equity, diversity, and inclusion education that is included in paramedic training and CME to provide insights for first responders/healthcare workers (e.g., paramedics providing care to vulnerable populations) should also be implemented.^{12,32} A special focus should be placed on cultural safety training for practitioners working with Indigenous populations.³³ The social determinants of health should be addressed through incorporating health equity content into paramedicine curricula.^{12,27}
- **Language:** Person-focused language should be adopted within paramedic services, education, and culture—e.g., using the term “patient requiring palliative support” instead of “palliative patient”; “person with dementia” instead of “dementia patient”; and “person with mental health needs” instead of “psych patient.” In this way, paramedics can help set the tone for how health care is delivered and communicated in the community.
- **Patient-focused research:** Paramedicine has traditionally been bio-medically oriented, with research focused on clinical and safety outcomes. Further research focused on patient experiences has the potential to better inform paramedic services and healthcare systems about what patient-focused care means. Including perspectives from vulnerable communities to help inform what patient-focused care should look like for these communities is critically important. Patient voices can provide important insights into lived experiences; however, it is important that one voice not be considered representative of all patients from a community and, as well, that patient voices are not tokenistic.²¹
- **Patient/public involvement in health care decisions:** There is a distinction between the involvement of patients who are users or consumers of the health system (e.g., an individual patient with chronic obstructive pulmonary disease who relies regularly on paramedic services) and public input into the system (e.g., by laypeople or citizens, who may rely on paramedic services at some point in the future). Although each group has different interests, priorities, perspectives, and experiences, both may support the evaluation, development, organization, and delivery of healthcare services.^{31,34} As paramedicine moves toward prioritizing patients and communities, it may be valuable to include both specific, individual patients in roles that inform the directions of emergency medical services care, and members of the public who may aid in identifying priorities for their community. Patient/public involvement on quality improvement advisory committees would be one such enabling factor in patient involvement with decisions within paramedicine.

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- **Resources supporting paramedics (potential organizational programming and collaboration):** It is important to provide on-scene supports for paramedics aiming to best support patient-focused care—e.g., the ability to call from the scene for clinical advice, make referrals other than to the ED, treat and release, and provide connections or support for patients with social needs through community paramedicine or other services. Community care referrals such as CREMS (community referrals by EMS)³⁵ already exist in many locations as well as in increasing numbers of community paramedicine programs, which continue to evolve and address a range of needs. These programs are relevant to both preventative care aspects as well as emergency response; they also have the potential to play an important role in ensuring that care is patient-focused and meets the needs of the populations being served. Assessing for the involvement of paramedics with or connecting them to interprofessional health teams in more rural and remote communities where resources vary to ensure that patient-focused care is possible for these communities is also key. As well, addressing the social determinants of health through referrals and other community paramedicine initiatives—where the psychosocial issues impacting patients are beyond emergency medical care—is an important enabling factor.
- **Integrated care pathways:** At a policy level, there is a need for the continued integration of paramedic services into healthcare systems with integrated care pathways. Such shifts have begun to occur, particularly at the level of community paramedicine programs; however, continued integration is needed for improved transitions in care to other parts of the healthcare system. Although the protection of personal health information must be prioritized, current privacy constraints create challenges for paramedic services when aiming for patient-centred care (e.g., not being able to obtain and learn from patient outcomes) and have implications for continuity of care and patients’ cohesive care plans.^{36,37}

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CONCLUSION

As paramedicine works toward prioritizing patients and communities, there is a need for engagement and action at multiple levels, including direct patient–paramedic interactions, organizationally, and in policy areas beyond paramedicine. Putting patients first entails respecting and responding to patients’ preferences, needs, and values, and ensuring that they are incorporated into clinical practice. Putting patients first considers not only their physical but also their emotional and psycho-social needs.

Patients are necessarily embedded within their communities, and thus putting communities first has the potential to reduce health and care inequities and improve health system outcomes. Prioritizing communities includes respecting the rights, knowledge, and experiences of vulnerable communities and, beyond paramedicine, may include social advocacy, informing where needs are going unmet. Paramedics operate within organizational and system constraints and require resources and support in putting patients and communities first. To achieve this principle, there is a need for a human-centred focus for patients, communities, and practitioner support and well-being in order to provider care in these ways.

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Principle

Paramedicine has infrastructure, knowledge, and skills that are crucial to meeting patients' health and social needs. Patient and community needs are supported through a broad range of health and social services, systems, and strategies. Paramedicine is a point of entry for many patients into these systems. As such, the profession works with patients and system partners to determine the most appropriate health and social treatment and care pathways that are accountable to patients' needs and will improve outcomes.

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INTRODUCTION

This principle emphasizes the broad role of paramedics in addressing health and social aspects of their patients' lives. Meeting those demands has resulted in the increasing complexity of paramedicine as a system that overlaps and interacts with multiple other systems, including social and community services, emergency response, and health care. Such a broader conception of paramedicine requires a similar view of paramedics as “generalists,” moving beyond the technical and “specialist” focus of early paramedic programs and roles.

Little, if any, literature speaks directly to the concept of specialist versus generalist preparation for paramedics, particularly in a Canadian context. However, a growing body of literature explores the role of paramedics within broad health and social contexts and the impact of social and environmental factors on patients' long-term health and acute medical episodes. This section explores the implications of the Health and Social Continuum for the preparation and education of paramedics.

Traditionally, paramedic education has covered a wide spectrum of traumatic and medical conditions, although the focus has been on types of patient presentations and acute conditions typically seen in the pre-hospital setting.^{1,2,3,4} Only recently has there been an acknowledgement that paramedic education must be broadened and deepened to better understand and accommodate the intersection of health and social aspects of care, as paramedics practise in an increasingly diverse set of healthcare roles and practice settings.

THE HEALTH AND SOCIAL CONTINUUM

The concept of the health and social continuum^{5,6} recognizes that paramedics and their patients form a system that includes, but requires more than a focus on the patient's current medical condition. Paramedicine—and much of its education, policy, and practice—has traditionally focused on individual patient encounters—i.e., “calls.”^{7,8} However, a patient's presenting complaint is only one part of their ongoing health history, which is embedded in broader social and cultural contexts. Social factors (including social determinants of health, gender and intersectionality factors, psychosocial factors, and cultural contexts, among others) are present in all patient encounters.⁹ Sometimes, the social aspect has minimal impact on the patient encounter; other times, the social context is a primary concern.

For example, consider two possible responses to a domestic dispute involving a closed forearm fracture. In one case, two people were arguing when one of them slipped and fell. There was no interpersonal violence and the dispute was relatively minor. In this case, the call is situated firmly on the health side of the continuum.

In another case, paramedics notice that the fractured arm appears to be a “defensive” injury, that the “story” of a fall is inconsistent with the injuries, and that there is obvious—even ominous—tension apparent between the two people. In this case, the potential for further interpersonal violence is the greater threat to the patient than the fracture, and therefore this call has a much greater social component.

Australian research into paramedics' preparation and comfort in managing intimate partner violence (IPV) notes that paramedics are in a unique and even critical position to identify and report instances of IPV. Yet many paramedic education programs do not explicitly cover IPV.⁹⁻¹¹ This research highlights the potential

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for and importance of paramedics engaging with broader social and cultural aspects of patient care. It mirrors similar calls for paramedics to leverage their unique and privileged position as one of the few health care providers who engage with patients in their homes and social contexts to incorporate and monitor social aspects of care and the social determinants of health.^{5,12-15}

The concept of the social and health continuum highlights the changing role of paramedics, yet also reflects a dissonance between emergency medical service's (EMS's) roots as an emergency response service as well as the evolution and integration of paramedicine more broadly as a health care discipline.

OPPORTUNITIES AND CHALLENGES

Paramedic practice emerged in the context of pre-hospital response to medical and traumatic emergencies—or, as framed in an early textbook, emergency care and the transport of sick and injured patients.¹⁶ Until recently, the focus of EMS education, policy, and practice has been on individual patient encounters and the patient's presenting injuries or complaints. Social factors, if considered at all, were identified as part of a patient's past medical history, although there is growing recognition of the importance of social determinants of health.^{12,13} The identification of social factors and mechanisms for reporting or advocating for patients in relationship to their social setting and context were traditionally absent from patient care documentation, history-taking, and transfer-of-care reporting models, and thus received little emphasis within paramedic training and education. Although paramedics have long had a duty to report or refer issues involving safety risks for vulnerable populations,^{17,18} the social aspects of patient care have remained secondary to more immediate medical signs, symptoms, and management.

Several trends have contributed to a growing awareness of the importance of social determinants of health, including an increased incidence of ambulance responses involving factors such as homelessness,¹⁵ mental health issues,¹⁹ substance abuse,²⁰ and the escalating opioid crisis.^{21,22} Paramedics occupy a unique and privileged position, meeting patients in moments of crisis or challenge, often in their homes or at social settings. They experience and gain insight into day-to-day social contexts that are not available to other health practitioners.^{5,12,19,23} There is both an opportunity and a responsibility implicit in this relationship:²⁴ while the core role of paramedicine remains pre-hospital emergency response,²⁵ these trends bring to the forefront the need to build beyond paramedicine's traditional functions—emergency care and transportation—toward a broader conception of patient care and a more fulsome, comprehensive role.²⁴

This opportunity may be a source of dissonance, however.^{5,26,27} Practitioners and stakeholders may not agree on the foundational role of paramedicine, the boundaries of “traditional” EMS, or even on how to name the discipline. A 2016 exploration of the roles and boundaries of paramedicine identified a “core” conception of paramedicine as an advanced medical provider responding by ambulance to provide emergency and urgent care at the patient's side, then transporting the patient to the nearest medical facility, typically an emergency department.²⁵ New and emerging roles for paramedicine change the location of care, the type of care provided, the disposition of the patient, and who are considered to be practitioners in the field—representing a practice more closely aligned with integrated health care. The 2016 study found that the further one looks away from the core role of traditional EMS, the less agreement there was on whether or not the role was within the “boundaries” of paramedicine.²⁵

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Similarly, a 2016 study that informed the development of the *Canadian Paramedic Profile* roles⁵ noted practitioner tension between “straying true to the origins of the profession” and assuming emerging roles within the healthcare system.⁵ As emergency services have responded to increasing numbers of street calls involving mental health issues, addiction, and homelessness, some practitioners have expressed concern with the increasing role of social factors in ground ambulance work.²⁸ Campbell and Rasmussen explored potential roles for social workers in an ambulance setting and noted that many paramedics “lamented that they regularly encountered situations involving complex psychosocial needs, if not heartbreaking scenarios, that were beyond their training, mandate, and capacity to respond effectively.”²⁹ More than three-quarters of Australian paramedics in the above cited IPV studies felt inadequately prepared for managing these types of situations.^{10,11} This tension between traditional and emerging conceptions of practice is evident in literature exploring “ambulance abuse,”^{19,30} perhaps conflating the perceived inappropriate use of 9-1-1 services and emergency ambulances in a pre-hospital EMS system with the broader role of paramedicine as a profession operating in multiple practice settings.

CHANGING IDENTITY, ENHANCED EXPECTATIONS

Each of the examples noted above involves different mixes of health and social considerations. As paramedics move into non-traditional roles and work in non-ambulance settings, they are increasingly providing non-urgent and definitive care such as minor wound management and illness monitoring in remote and industrial settings,^{31,32} primary health care monitoring, preventative care, and patient education.^{5,32,33} These roles include a broader and deeper investigation of patients’ ongoing health and social history.^{8,19}

At the same time, the privileged place of paramedics in ambulance-based response is being leveraged through programs that examine issues such as patient frailty,²³ palliative care,³⁴ identifying elderly at-risk patients,³⁵ and point-of-care testing,³⁶ each of which further emphasizes the incorporation of health and social factors in paramedic assessment and care. Thus, the health and social continuum provides a valuable lens for comparing, contrasting, and understanding the characteristics and requirements of paramedicine’s core and emerging roles, and their implications for paramedics’ professional identity, entry-to-practice, and continuing professional education.

The concept of the health and social continuum highlights the changing identity and expectations of paramedics, which, in turn, emphasizes the importance of reconsidering paramedic education in Canada, particularly in relationship to the concept of specialist and generalist intent. Both the continuing evolution of paramedic practice and the increasing recognition of and emphasis on broader social, interpersonal, and interprofessional aspects of care call for greater breadth, depth, and a more generalist approach to paramedics’ educational preparation.

PARAMEDIC EDUCATION IN CANADA

Paramedic education in Canada can be fairly characterized as a specialist model, preparing graduates for core roles as ambulance paramedics, with supplemental training and education supporting additional roles.

Canadian paramedic programs began emerging in the 1970s.³⁷ Similar to the United Kingdom (UK) and Australian experiences, early Canadian paramedic training programs were often technical in-house training courses developed and delivered to working paramedics by nurses and emergency physicians.^{1,2,33} Curriculum focused on locally encountered patient presentations,

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protocols, and principles of management.¹ There were few paramedic textbooks (none set in the Canadian context prior to 2005),³⁸ and content was drawn from other health disciplines or developed internally.³⁹

As ambulance services developed into comprehensive emergency medical systems, paramedic training programs became more comprehensive, building greater breadth and depth around topics such as cardiovascular, respiratory, and other medical conditions, and maintaining a focus on resuscitation.¹ Programs situated their content and context in local practice through significant clinical and field practicum time.² By 2000, paramedic education in Canada was delivered through a mix of private training agencies, colleges, post-secondary technical institutions, and EMS-operator systems.

Health care in Canada, including paramedicine, is a provincial/territorial concern, and there are no enforceable national standards for scope of practice or educational requirements. Thus, paramedic education programs evolved to meet local or provincial operational and regulatory needs, leading to a patchwork of programs across Canada.⁶

The 2001 *National Occupational Competency Profile for Paramedics* (NOCP)⁴⁰ provided a consensus-based set of foundational competencies at four practice levels that programs across the country could use to develop curricula. The NOCP identified a common foundation of anatomy, physiology, pharmacology, and pathophysiology for a specified range of injuries and conditions encountered in the pre-hospital setting.⁴⁰ Paramedic education programs based on the NOCP could be characterized as having a more solid foundation in the clinical sciences than their 20th-century counterparts; however, the NOCP was still a closed prescriptive system,⁶ and paramedic education in Canada was focused on the assessment, treatment, and transport

of patients with common pre-hospital medical and traumatic conditions.^{3,33}

Current educational programs in Canada have evolved into a staged multi-year set of increasingly complex certification programs—Emergency Medical Responder (EMR), Primary Care Paramedic (PCP), Advanced Care Paramedic (ACP), Critical Care Paramedic (CCP)—supporting core emergency response roles with a wide range of specialized training, often post-employment and employer-specific, to meet the needs of air ambulance, critical care transport, community paramedicine, and specialty roles (e.g., tactical EMS, special events, etc.). Many provinces provide entry-to-practice paramedic education through the post-secondary system, with academic foundations and credentials for PCP and ACP programs at certificate, diploma, and advanced diploma levels.

THE FUTURE OF PARAMEDICINE EDUCATION?

Paramedic education in Canada may be overdue for a fundamental reconceptualization and restructuring, however. National documents describing occupational competencies (the 2001 and 2011 editions of the NOCP,^{40, 41} e.g., and a recently announced project by the Paramedic Association of Canada and CSA Group to develop a national standard incorporating a revised competency profile) have been expanded in the last 20 years to support selected aspects of emerging practice (e.g., health promotion and public safety).⁴¹ Multiple Canadian competency profiles and standards now exist for specific specialty roles, programs, and practice settings (e.g., CBRNE, tactical paramedic, community paramedicine, the opioid crisis, and leadership).⁴²⁻⁴⁸

However, these documents, with their emphasis on prescribed sets of de-contextualized competencies, are poorly aligned with

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the rapid evolution of paramedic practice,⁵ which keeps adding additional educational requirements to paramedic programs. Some, such as point-of-care testing,³⁶ extend existing paramedic practice through additional skills and increased knowledge of sub-acute conditions, chronic disease, and public health principles.⁴⁸ Others, such as palliative care initiatives, ask paramedics to move from being “lifesavers” to “life carers,” and to develop new ways of “slowing down” to provide appropriate care in some settings.^{34,49}

Roles more closely integrated with health care require fundamental paradigm shifts, moving from call-based practice and transfer-of-care to multiple encounters with patients and extended case management involving collaboration with a broad set of healthcare providers.⁸ Yet employer-developed training programs for many of these emerging roles are often focused on the skills and knowledge required for specific programs, rather than on more holistic and standardized curricula that are applicable across different jurisdictions and practice settings.⁵⁰

Individually, these additional competencies and capabilities pose challenges to integration with existing and highly structured occupational profiles and curricula. Collectively, they suggest the need to consider a more comprehensive approach—i.e., a more generalist approach to paramedic education that supports practice across varying career paths and in multiple settings. Documents such as the 2016 *Canadian Paramedic Profile*⁵¹ move from specifying competencies to a more holistic approach that elevates roles such as professional, team member, educator, reflective practitioner, and patient advocate alongside the clinician role emphasized in earlier Canadian competency profiles.

There are increasing calls for paramedicine in Canada and abroad to move to a broader undergraduate curriculum that better prepares graduates for current and future roles within

the discipline,^{6,33,52} and several undergraduate pathways are now available in Canada. Internationally, models such as the UK College of Paramedics’ *Post-Registration Paramedic Career Framework*⁵³ link the multiple career pathways that are required to support a robust profession (e.g., clinical practice, leadership and management, education, research and development) with a comprehensive range of undergraduate, graduate, and doctoral educational requirements.

The rationale for a more holistic and comprehensive education include:

- the evolution from training technicians; fostering clinical competence and broader professional practice;^{33,54}
- supporting the development of enhanced and flexible roles across one’s career;³
- providing a broad foundation for autonomous professional practice;^{6,52}
- ensuring paramedics have a solid academic and health sciences foundation similar to other health professions;^{6,33,52} and
- preparing graduates to assume foundational roles as clinicians, leaders and managers, educators, and researchers in support of a dynamic and evolving profession.⁵³

These moves embody a more “generalist” conception of paramedic education, with the goals of providing a broad-based foundational education similar to other health disciplines, better preparing paramedics to provide varied types of patient care in diverse practice settings, and in support of the continuing integration of paramedicine within the broader health care system.

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CONCLUSION

Paramedics practise in diverse and complex patient environments that include both health and social needs and considerations. Traditional paramedic practice and education emphasized a specialist perspective that focused on emergency care and transportation of patients with illnesses and injuries commonly encountered in land ambulance contexts. Paramedicine has evolved and paramedics have increasingly assumed expanded roles in diverse practice settings. Professional systems, structures, and infrastructure now support a broad range of alternative care and treatment pathways, and thus paramedic preparation and entry-to-practice must also evolve to provide more comprehensive health care education and training.

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Integrated Healthcare Framework

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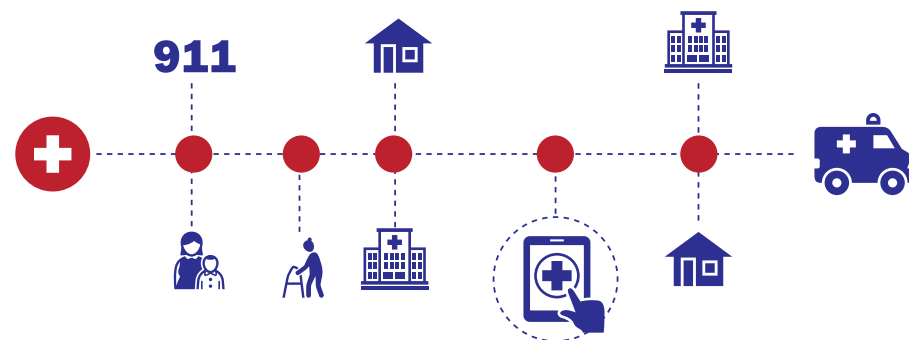
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Principle

Paramedicine is integrated within healthcare services and is shaped by collaborative partnerships with other health professions, patients, communities, governments, regulators, industries, educational leaders, and evidence-based institutions. Integrated healthcare frameworks shape the overall structure, practice, and evaluation of paramedicine. The profession uses accessibility, technology, sustainable funding, and system capacity to provide and support integrated health and social services with and for patients across sectors and in diverse environments, settings, and geography.

WHAT IS INTEGRATED CARE?

Although the term “integrated care” has been in use for many decades, it is currently enjoying a renewed interest in health reform efforts around the world.^{1,2} Although there are many different definitions (see Table 1), generally, integrated care means providing multiple health and social services in a coordinated way that meets the needs of individuals as well as entire populations.³ Proponents argue that patients prefer integrated care—particularly those with complex health and social conditions—as services are less disjointed, more accessible and proactive, and lead to better overall health outcomes.⁴ The evidence supporting the cost effectiveness of integrated care remains mixed and inconclusive because of complexities in performance measurement and a lack of clarity in how success is defined and evaluated.⁴

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Table 1: Definitions of Integrated Care

| AUTHOR | DEFINITION |
|--|--|
| Leutz ³ | “The search to connect the healthcare system (acute, primary medical and skilled) with other human service systems (e.g., long-term care, education and vocational and housing services) to improve outcomes (clinical, satisfaction and efficiency)” ^{3(pp 77-78)} |
| Kodner ²⁰ | “Integration is a coherent set of methods and models on the funding, administrative, organisational, service delivery and clinical levels designed to create connectivity, alignment and collaboration within and between the cure and care sectors. The goal of these methods and models is to enhance quality of care and quality of life, consumer satisfaction and system efficiency for patients with complex, long term problems cutting across multiple services, providers and settings. The result of such multi-pronged efforts to promote integration for the benefit of these special patient groups is called ‘integrated care’” ^{20(p 7)} |
| NHS England ²¹ | “My care is planned with people who work together to understand me and my carer(s), put me in control, coordinate and deliver services to achieve my best outcomes” ^{21(p 4)} |
| WHO Regional Office for Europe ²¹ | “Integrated health services delivery is defined as an approach to strengthen people-centred health systems through the promotion of the comprehensive delivery of quality services across the life-course, designed according to the multidimensional needs of the population and the individual and delivered by a coordinated multidisciplinary team of providers working across settings and levels of care. It should be effectively managed to ensure optimal outcomes and the appropriate use of resources based on the best available evidence, with feedback loops to continuously improve performance and to tackle upstream causes of ill health and to promote well-being through intersectoral and multisectoral actions” ^{21(p 4)} |
| Valentijn ²² | “Network of multiple professionals and organisations across the health and social care system provide accessible, comprehensive and coordinated services to a population in a community” ^{22(p 2)} |
| Minkman ²³ | “[A] coherent and coordinated set of services which are planned, managed and delivered to individual service users across a range of organisations and by a range of co-operating professionals and informal carers” ^{23(p.9)} |

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Value and purpose of integrated care

These diverse definitions (see Table 1) reflect how integrated care may be perceived differently by different stakeholders in different parts of the health system. Inherent in any integrated care model are how value and purpose are defined (i.e., why integrate?). For patients, this may mean having a single point of contact where multiple providers help meet the patient's own goals for care. For providers, it may be organizational processes, rules, and infrastructure that allow them to collaborate on patient care, learn from others, and grow professionally. For health system leaders, it may involve setting policy and regulation to manage the system toward improving population-level health indicators and allocating resources efficiently.

Traditional definitions of “value” and “value for money” generally refer to achieving outcomes for populations relative to the total investment.⁵ However, recent literature examines how value might be defined differently by providers, patients, and their caregivers.⁶ Although not always present, a clear articulation of value and purpose is a useful underpinning for any integrated care program or system. Ideally, integrated care generates value at all levels: for individual patients, providers, funders, system leaders, and the population. This is also referred to as the Quadruple Aim.⁷

Core concepts of integrated care

Some core concepts of integrated care have been helpfully synthesized by Leutz,³ Kodner,⁸ and Valentijn.⁹ Any integrated care program or model can be distilled down to three questions:

1. Who is the target population?
2. What services are being integrated?
3. How are the services being integrated?

The target population, sometimes called the foci of integration,⁸ refers to the target patient population around which services are integrated. For example, if the patient population is defined by a geographic area, the types of services and how they are delivered would differ considerably than if the patient population was defined by a disease state with specific service needs—e.g., people with diabetes or stroke.

The target population is closely linked to the second question: What services are being integrated? Leutz³ notes that “you can integrate all of the services for some of the people, some of the services for all of the people, but you can't integrate all of the services for all of the people.”^{3(p 83)} He defines three levels of integration: linkage, coordination, and full integration, and he suggests that for loosely defined populations who are medically stable and have fewer needs, integration processes should prioritize health screening, linkage, and referrals accessible through multiple points of contact.

For populations with clearly defined needs (e.g., rehabilitation from stroke or management of chronic disease), integration might mean the effective coordination of services across multiple organizations. For a high-needs patient population, in which individuals require specialized services, such as for those with multiple or complex diseases, it is more appropriate to have full integration. This may involve intensive, team-based care from multiple providers, possibly using a single governance and funding structure, centralized case management, and a common patient record to deliver specialized services tailored for individual patients.

Finally, the target patient population and types of services included have implications for how integration takes place. These integration processes include clinical guidelines, organizational procedures, and inter-professional boundaries, as well

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as system-level factors such as laws and regulations. Related to this is how care is funded, which organizations are involved, how quality is measured, and how staff interact with each other, including the tools and approaches staff use to communicate.

For example, complex cancer care may take place in an inpatient setting at a clinic or hospital, where multiple providers are employed by a single organization with shared records and a case coordinator. In contrast, public health disease surveillance in an urban homeless population may occur through a looser network of social workers, shelters, and community agencies. In each of these cases, there are implications for how roles are defined, responsibilities are shared, what organizations are involved, how billing is done, how information is managed, who has liability, and the cultural norms of the care team.

HOW CAN PARAMEDICINE BE MORE ALIGNED WITH INTEGRATED CARE?

It is understood that paramedicine in Canada, as in many Western nations, was originally designed as a trauma and transport service for the critically ill and injured.¹⁰ Over time, the role of the paramedic has grown and expanded, however, both within emergency medicine through programs for stroke, heart attacks, and trauma,¹¹ as well as outside of emergency medicine through community paramedicine¹² and extended-care paramedics.¹² Many of these programs reflect the principles of integrated care: target populations, case management for complex patients, processes to share information with partner agencies, and collaborations between paramedics and other providers. As well, many programs evolved from local grassroots initiatives and vary widely across the country. Given their local nature, barriers to replication of these initiatives tend to include governance, policy, and professional norms. For example,

those attempting to replicate these initiatives often encounter regulatory barriers as they seek to work outside of “traditional” paramedicine. Funding has also been an oft-cited barrier to their expansion.^{13,14}

With these early models in mind, and given the working group’s understanding of integrated care as drawn from its literature review, guidance was developed for how paramedicine in Canada might be more aligned with integrated care. These suggestions are detailed in the following sections and are organized using the rainbow model of integrated care (RMIC), a well-known integrated care framework. The RMIC describes principles, structures, processes, and enablers of integrated care.⁹ It is important to note that the concepts described in the following sections are interconnected and should not be seen as distinct from one another. To better “integrate,” paramedics may need to address many of these things in tandem and at multiple levels. These interrelationships are shown in Figure 1.

Develop consistent patient-focused “bundles” of services that are adaptable for local populations

Paramedicine could classify its services and programs into recognizable “bundles” or “baskets of services” that balance scale and flexibility. This would need to be done in a way that clearly articulates the purpose and value paramedicine adds for patients, providers, and the health system in a given context or team, and allows for flexibility to adapt to the needs of local populations and contexts.

These clearly defined service bundles should also specify the target population, clinical scope of practice, practice setting, training requirements, funding mechanisms, logistics, and organizational procedures. Both standard practice and innovations across the country are good starting points to develop

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these service bundles—e.g., palliative care programs, home-based case management for chronic conditions, advanced life support in emergencies, low-acuity response for long-term care, or drop-in clinics at shelters. These bundles should be clearly communicated, with appropriate room for local variation, to allow health system partners to successfully integrate paramedics into clinical service delivery. Local variation could mean, e.g., that clinical guidelines in a paramedic home-visit program are different in a rural area that is experiencing health staff shortages than in an urban setting where appropriate follow-up is available. While allowing for local variation, these different bundles of paramedic services should be consistent enough to be broadly recognized by health system partners, replicated in multiple jurisdictions, and allow paramedics to predictably fit into a coordinated set of clinical services for individual patients.

Address role ambiguity and prioritize inter-professional education and workplace learning

Paramedics acting in non-emergency functions such as community paramedicine can sometimes experience uncertainty as to how roles are delineated between

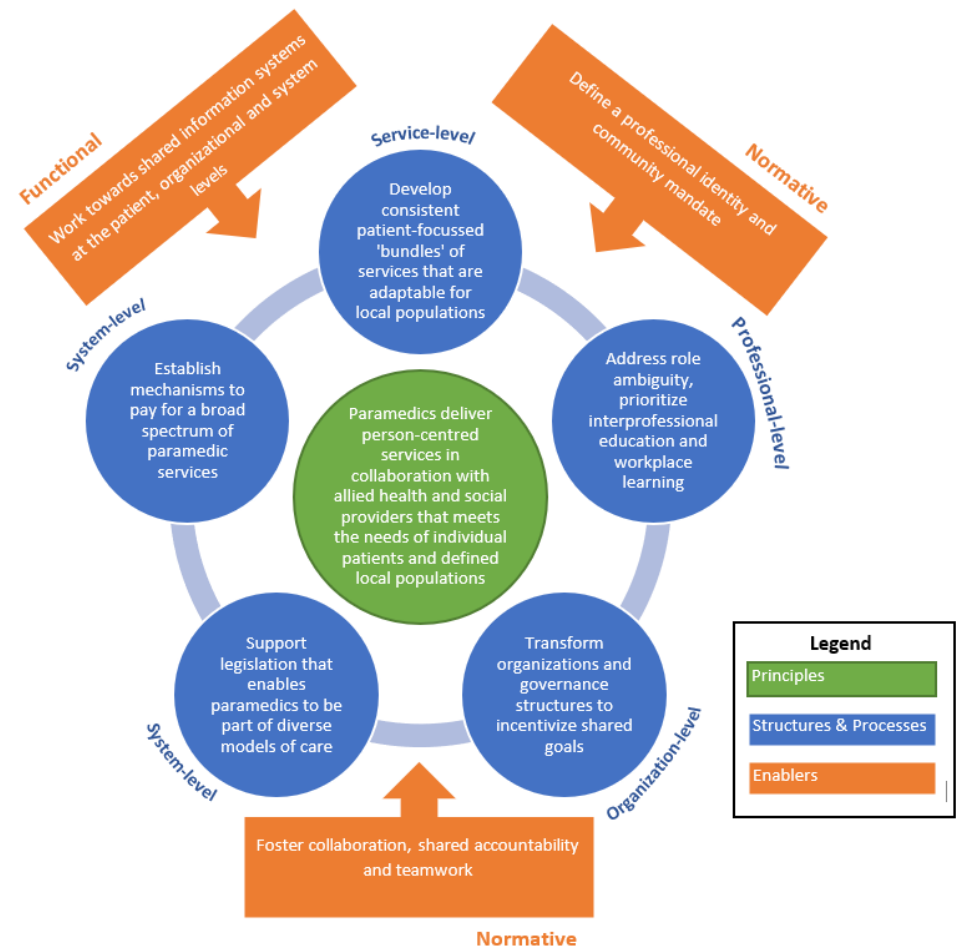


Figure 1: Suggestions for Paramedicine in Canada Reflect the Inter-Related Principles, Structures, and Processes, and Enablers Described in the RMIC

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paramedics and other providers, such as nurses and home care workers. Role clarity and complementarity are frequently an issue in integrated care programs. It is important to remember that some duplication of roles is a feature of integrated care that is to be expected and accepted. In certain contexts, paramedics may contribute their skillsets to complement those of other providers, while in other contexts, their skills may not be unique but rather supplement the services offered by others.

For example, an unscheduled home visit in the middle of the night from a paramedic may involve similar activities as scheduled home nursing, but it is serving an important patient need out-of-hours. Paramedics should embrace being part of patients' "care team" while being cognizant of overlapping roles with their health and social care colleagues. These overlapping roles can and should be flexible, depending on context, program type, and patient needs. These ideas can be reinforced in the workplace through opportunities to job shadow, collaborate, and attend shared training, such that allied health providers would start to see paramedics as part of their team.

Inter-professional education plays a role in laying the groundwork for team-based care. This suggests that paramedics should be exposed to other health professionals—and vice versa—during their education through shared coursework and inter-professional learning opportunities. Paramedic education in Canada focuses on emergency medicine procedures such as resuscitation and intubation. While they have the technical skillset to perform medical acts, paramedics could also benefit from a theoretical frame of reference on the structure of the health system and the philosophies of different providers. Other providers would also benefit from a better understanding of paramedicine by being exposed to it during their training program. As well, better inter-professional education should

be used to expand a paramedic's competency profile beyond emergency medicine skills, particularly in areas of primary care, geriatrics, and social work. This would better prepare paramedics to take part in a wider berth of care teams. In order for paramedicine to play a role in integrated care delivery, paramedics should be encouraged to see their role as broader than simply transport to an emergency department.

The factors described above are all potential shortfalls in the vocational nature of paramedic education in Canada compared with university-based health degree programs, where paramedic educators may be able to work more closely with faculty in nursing, social work, and medicine. Higher-education programs that work more closely with university faculties can help paramedics gain the theoretical foundation, broader skillset, and inter-professional education they need to be better prepared to take part in integrated care.

Transform organizations and governance structures to incentivize shared goals

The organizational relationships between paramedicine and other health and social care organizations affect the ability of paramedics to take part in integrated care models. As well, how paramedicine is organized varies across the country: it is part of health authorities in some provinces, such as British Columbia and Alberta, while it is a service run by municipalities in other provinces, such as Saskatchewan and Ontario.

In some cases, private providers are involved, while in others, they are public entities. This can be a "taboo" topic, however, as it relates to "who owns," "who is responsible for funding," and "who governs" the paramedic system; however, it is an important topic to address. The incentive for a private or municipal paramedic organization to perform broader roles in the health system

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is arguably different than when paramedics are part of a larger provincial health entity.

These incentives need to be aligned to make integrated care possible. This can be done through adopting network governance¹⁵ principles such as joint accountability and shared goals between paramedicine and other providers, including collaborative leadership teams, joint performance indicators, and the ability to share funding between paramedicine, health authorities, hospital boards, and other community-based services. For the reasons noted above, the mechanisms to operationalize this would be different in each provincial context and need to involve some combination of structural and process-based changes.¹⁵

Support legislation that enables paramedics to be part of diverse models of care

Legislation and regulation play a significant role in enabling integrated care. To better take part in integrated care, paramedics would need to advocate for changes that allow for flexibility in clinical scope and practice settings. Because paramedic legal frameworks vary across Canada, the barriers in every province will be slightly different. In provinces with self-regulation, some of this responsibility would fall to the colleges of paramedicine. In other provinces, it may mean legal changes around medical control and educational standards.

While regulation plays an important role in safeguarding patient safety, it should also enable paramedics to be trained in a variety of skills, be employed by a variety of organizations, play multiple roles within teams, and effectively collaborate with other providers. This also means developing appropriate quality frameworks and performance indicators that reflect the different roles and settings in which paramedics work. Quality and performance should be measured at multiple levels—clinical,

organizational, and overall health outcomes—and reflect the values and purpose of a given integrated care system or model.

Establish mechanisms to pay for a broad spectrum of paramedic services

There are many ways to structure funding for integrated care models. An effective funding model varies according to the goals of a program, target population, duration and frequency of services, the providers and organizations involved, and where the money come from.¹⁶ For example, an integrated approach to supportive, ongoing, home-based management of chronic heart and lung disease could be funded using bundled payments to one central organization that enrolls patients and coordinates all services (including paramedicine, social services, home care, and emergency care), as required. In contrast, payment for emergency care around a single episode such as heart attack or stroke might look quite different, with one-off payments made for specific services to separate organizations and providers.

To better participate in various models of integrated care, clear and transparent mechanisms to pay for different types of paramedic services should be established. Payments should be possible from multiple health organizations, including those in governments, primary care organizations, and hospitals. Payment options should include those for a variety of services, including assessment, treatment, home visits, transport, and clinic-based care. They should also allow for different types of bundling and capitation—e.g., per patient enrolled in a long-term program such as community paramedicine. Establishing clear payment models that can be well understood by healthcare partners will serve as an enabler to paramedic involvement in integrated care programs.

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Work toward shared information systems at the patient, organizational, and system levels

Information systems are a key enabler of integrated care. At the patient level, providers should have sufficient information to care for patients in a manner that complements the work of other providers and meets their goals of care. At the organizational and system levels, information systems should allow for research, learning, evaluation, and planning to support population health. Health information systems are a complex, ongoing area of work. They will not be an area in which paramedic services must lead; however, paramedic services should actively participate in broader dialogue with the rest of the health and social care system about shared information systems. This includes shared electronic medical records at the patient level and contributing to provincial and national administrative datasets. It is understood that this must be done in the context of privacy laws and regulatory requirements, which, in some cases, may need to be updated to include paramedicine.

Define a professional identity and community mandate

A number of programs, such as community paramedicine, evolved when gaps in local health and social services were noted by paramedics or communities and it was recognized that the skills and abilities of paramedics could fill these gaps. On the one hand, this ability to be flexible and creative has been a strength of paramedics within the health systems they serve, allowing them to meet local needs. Paramedics have historically been able to see a problem in local service delivery and help solve it. On the other hand, this approach risks relegating paramedics to being “gap fillers” who are “bolted onto the side” of the health system, with little recognition of the need for and value of better coordinating their involvement with the rest of

the system. The paramedic community would benefit from a better articulation and expression of their professional identity and mandate in a way that allows health sector partners to recognize the need to include paramedics in different primary, specialty, and emergency care models.

Some unique benefits of paramedics within care teams might include expertise in working in community-based and home settings, 24/7 availability, being mobile in the community, and the ability to work across geographic boundaries. The paramedic professional identity, if appropriately normalized within paramedicine and communicated outside of it, would enable purposeful and valuable involvement within models of integrated care.

Foster collaboration, shared accountability, and teamwork

Integrated care is more than just program design, legislation, and funding; it’s a way of thinking. Operationalizing integrated care depends on the behaviours, values, and culture amongst health and social care professionals. Being collaborative, having shared accountability, and being goal-oriented are among the most important values in integrated care.¹⁷ However, some of these values may be in conflict with existing norms around emergency services and emergency care. For example, strict protocols, one person being in control, and a “hero” mentality can be useful in an emergency setting, but can also inhibit the humility, collaboration, and co-creation required in integrated care.

Given their roots in emergency work, paramedics may need to foster values and norms within their community to better enable integrated care. This can be systematically supported by creating opportunities to work with and learn from others, and encouraging learning, debate, and role-modeling from leadership and management.

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CONCLUSION

The suggestions for paramedicine in Canada to be more aligned with integrated care are broad and far reaching (see Table 2), and span all levels: clinical practice, inter-professional education, organizational governance, legislation, funding structures, information systems, and professional norms. Although the task may seem daunting, it is important to note that there are many examples across the country where paramedicine is already doing some of these things.

Rural community paramedicine in Ontario, palliative care in multiple provinces, and extended care paramedics in long-term care in Nova Scotia are all examples of potential “bundles of services.” Updated national educational standards for paramedicine are an active area of work, and inter-professional education is being explored in vocational colleges as well as nascent Bachelors of Paramedicine programs in Prince Edward Island, Ontario, and Alberta. The successful organizational model for a cardiac care

network in Toronto is one example of paramedics participating in network governance.¹⁸ New funding models for paramedic services are being trialled by governments across the country.¹⁹ Information systems continue to be a larger area of discussion in health care, but some community paramedic home visit programs have successfully integrated with primary care patient information systems for case management.

Finally, the norms and culture of paramedicine are evolving as a new generation of paramedics enters practice.

These pockets of change can serve as starting points to help jurisdictions across Canada share their learning and experiences with one another. As systems evolve across the country, this statement is a high-level blueprint that can serve as a “guiding light” to inform that evolution in a direction that is more aligned with integrated care.

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Table 2: Summary of Suggestions for Paramedicine in Canada

| ELEMENTS OF INTEGRATED CARE | DESCRIPTION (ADAPTED FROM RMIC) | SUGGESTIONS FOR PARAMEDICINE IN CANADA |
|---|--|--|
| <i>Underlying principles and purpose of integrated care</i> | | |
| Person-focused | Address the medical, social, and psychological needs of an individual | These underlying principles do not lend themselves to specific suggestions; rather, they are embedded throughout |
| Population-based | Address the needs of well-defined populations | |
| <i>Processes and structures of integrated care</i> | | |
| Services (clinical) | Multidisciplinary care planned with and provided to patients in a seamless, coordinated way that addresses their goals and needs | Develop consistent patient-focused “bundles” of services that are adaptable for local populations |
| Professional | Inter-professional education, teamwork, and value creation for providers and professionals | Address role ambiguity and prioritize inter-professional education and workplace learning |
| Organizational | Joint accountability, openness, and trust between organizations to meet the goals of integrated care | Transform organizations and governance structures to incentivize shared goals |
| System | Alignment of regulatory frameworks, market characteristics, and the political and social climate | Support legislation that enables paramedics to be part of diverse models of care, and establish mechanisms to pay for a broad spectrum of paramedic services |
| <i>Enablers of integrated care</i> | | |
| Functional | Information sharing, monitoring and benchmarking systems, learning processes, and regular feedback | Work toward shared information systems at the patient, organizational, and system levels |
| Normative | Shared vision, reliable behaviour, shared values and culture among people involved, and leadership | Define a professional identity and community mandate and foster collaboration, shared accountability, and teamwork |

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Further Reading: Frameworks and Theories

Integrated Healthcare Framework

| PROGRAM DESIGN | DESCRIPTION | SOURCE |
|---|--|----------------------------------|
| Rainbow model of integrated care (RMIC) | Taxonomy of integrated care. Describes integrated care through two principles (person-centred and population-based); four levels of processes (clinical, professional, organizational, and system level); and two enablers (functional [information systems, quality frameworks] and normative [values, culture, and behaviour]). The RMIC is also a useful tool for thinking about integration at multiple levels (micro, meso, and macro). | Valentijn et al. ^{9,22} |
| Development model of integrated care | Initially developed to assess progress toward “integration” through the presence and relevance of specific observable activities (89 activities along nine dimensions). This may be an appropriate tool to use in the context of a specific program or organization. | Minkman ²⁴ |
| Chronic care model | Commonly used to organize community- and clinic-based services for patients with specific chronic conditions such as diabetes, chronic obstructive pulmonary disease, and congestive heart failure. Services could include preventative care such as health education, symptom monitoring, and exercise and nutrition; they could also include managing acute exacerbations. | Bodenheimer et al. ²⁵ |
| E-health enhanced chronic care model | A revised version of the chronic care model, developed to include the use of new technologies such as remote monitoring, wearable technologies, and digital integrated patient care records within chronic care management programs. | Gee et al. ²⁶ |
| PRISMA | Developed in Canada, this model is used to facilitate the coordination of services across disparate organizations for people living independently in the community who are elderly, frail, or have a disability. | Hébert et al. ²⁷ |

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| GOVERNANCE & FUNDING | DESCRIPTION | SOURCE |
|---|---|--------------------------------|
| Network governance | Discusses different governance models and approaches to effectively collaborate across different organizations in order to achieve shared (or conflicting) goals. | Provan and Kenis ¹⁵ |
| Project INTEGRATE financial models | A European Union-funded research project on integrated care. It released a comprehensive report that outlines different payment structures used within integrated models of care, as well as their benefits, drawbacks, and appropriateness, depending on the goals of a model of care. | Kalseth et al. ²⁸ |
| Typology of payments | A helpful framework for matching payment structures with specific integrated care program characteristics. | Stokes et al. ¹⁶ |
| VALUES AND NORMS | DESCRIPTION | SOURCE |
| Values of integrated care | A list of 23 values associated with integrated care models, including definitions for each. It discusses the role of values at the provider, organizational, and system level, with some guidance on how to shift values and norms at each of these levels. | Zonneveld et al. ¹⁷ |
| Values of integrated care from the perspective of patient and caregiver | Six attributes of person-centred care from the perspectives of patients and caregivers in Ontario, Quebec, and New Zealand, outlining what is most important in their care and how it can be achieved. | Kuluski et al. ²⁹ |
| Shared mental models | Outlines the psychological factors that may influence inter-organizational and inter-professional relations. More specifically, it highlights how the convergence and divergence of stakeholders' knowledge and beliefs influence interactions (or the lack thereof). | Evans and Baker ³⁰ |
| Multi-professional collaboration | Specific actions and management approaches to foster collaborative behaviours within the workplace. | Sørensen et al. ³¹ |

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Principle

Social issues are part of paramedicine's accountability, leadership, and clinical frameworks. This includes identifying, designing, implementing, and evaluating initiatives that address structural inequities and social challenges, and gaps in services for at-risk communities and populations. The profession advocates on behalf of patients, communities, its members, and itself, with a particular focus on those who are traditionally underserved. Paramedicine and the profession thus contribute to addressing both social injustice and health inequities.



SOCIAL ACCOUNTABILITY

It is widely accepted that the determinants of health (DOH) play a significant role in overall health.^{1,2} As a result, global organizations have called for healthcare providers to address social issues and inequitable care as part of their practice.³⁻⁵ Social accountability in health care was first defined by the World Health Organization in 1995 as “the obligation ... to direct education, research and service activities towards addressing the priority needs of the community, region, and/or nation [that health

care providers] have a mandate to serve.”⁴ As health care shifts its focus from disease-specific treatment to person-centred care, providers must ensure they are addressing the root causes of poor health, including DOH.

Socially accountable health care requires collaboration between policy makers, administrators, academic institutions, communities, and health professions.⁶⁻⁸ These key stakeholders must have shared values around social accountability in order to successfully affect the DOH in their

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local community.⁶ Specific stakeholders for social accountability in the practice of paramedicine are analogous to those in the greater healthcare system: government officials, paramedic leadership, policy makers, educators, other healthcare services and providers, community organizations, patients and their caregivers, and paramedics themselves. The values and goals of each group must incorporate social accountability principles to ensure tangible action toward reducing health disparities.

For paramedicine to continue its evolution into a mature, self-sustaining healthcare profession, social accountability must be embedded in all models of care. This will ensure that paramedic clinical guidelines and standards address not only acute illness but all DOH, for all patients, in an inclusive manner.³ Social accountability in paramedicine—including education, clinical practice, workforce, operations, and system design—is imperative to ensuring the future of paramedicine in the modern healthcare landscape.

PARAMEDICINE AND SOCIAL ACCOUNTABILITY

Healthcare systems continually struggle to access hard-to-reach populations.^{5,9} Paramedicine has evolved into a healthcare profession that provides high-quality mobilized care in community settings across the country. The broader healthcare sector is beginning to recognize the ability that paramedics have to deliver health care to any community, regardless of time of day, environment, or other accessibility challenges. The network of care created by paramedics provides an essential opportunity to bring health care to isolated and vulnerable communities.¹⁰⁻¹² However, this role can only be achieved if the paramedic profession works collectively to prioritize socially accountable practice.⁴ The principles of social accountability strengthen the profession's duty to provide equitable, culturally competent care to patients and

families in all environments, regardless of race, gender, ethnicity, social status, or any other demographic.

As the role of paramedics in the Canadian healthcare system grows, the need for socially accountable practices within the profession becomes more urgent. Social accountability is imperative to the Quadruple Aim, specifically the goals of improving the patient experience of care and improving overall population health.¹³ As well, a lack of specific focus and training on socially accountable care practices can lead to negative provider attitudes.¹⁴ Implicit biases and prejudices of healthcare providers have been shown to affect the quality and treatment decisions of care.¹⁵⁻¹⁷ These prejudices are, unfortunately, common, with the media reporting multiple examples of Canadian provider bias in 2020 alone.¹⁸⁻²⁰ Provider biases have been specifically demonstrated through correlation with empathy levels in paramedic students.²¹ Thus, the need to embed social accountability principles into paramedic education and practice is important for both ethical and quality-of-care reasons.

Paramedicine primarily serves the public. Consumers of paramedicine services are increasingly demanding more of providers and are looking to obtain services that fit their specific needs. Community involvement is critical to identifying needs, setting priorities, and establishing and evaluating new models of care.²² Through engagement with the community, paramedicine can evolve in a patient-centred manner and ensure that social accountability is embedded into all of its operations.

Educational programs and schools have a duty to respond to the changing landscape of paramedicine. These organizations must be aware of the evolving needs of the community and develop formal mechanisms for responding to, and advocating for, these needs.²³ Paramedic services and organizations should provide evidence-based care and examine new models of care

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that account for DOH. This work must be done in collaboration with affiliated healthcare organizations, the community, other professional groups, policy makers, and governments to develop a shared vision of an evolving and sustainable healthcare system for the future.

In creating a socially accountable profession, the focus must shift from reactionary response to proactive anticipation of needs. Boelen et al.²⁴ defined a matrix to measure how well a profession is moving toward social accountability (see Table 1).

Using this approach, a socially accountable paramedic practice anticipates social needs, incorporates societal feedback in creating service objectives, contextualizes education based on identified needs, ensures that graduates are of high quality, and focuses on patient impact when evaluating new models of care.²⁴ To accomplish this, paramedicine must define specific indicators that measure progress and success in implementing a socially accountable organization.

PARAMEDICINE AND ENTREPRENEURSHIP

Entrepreneurship is defined as “the pursuit of opportunity beyond resources controlled.”²⁵ Although often thought of in a for-profit business context, this definition is also applicable to paramedicine, particularly regarding future endeavours. The definition implies that a focused and relentless effort is needed to respond to short windows of opportunity, where opportunity suggests an identified gap that requires a novel solution. For example, virtual care collaborations with other healthcare providers in large geographic regions create an opportunity for paramedicine to leverage its highly mobile nature in delivering specific in-person care that providers have agreed on. This interpretation of entrepreneurial activity is in line with the Organisation for Economic Co-operation and Development

Table 1: Social Obligation Scale Outlining Gradients of Social Obligation Based on Six Different Elements²⁴

| SOCIAL OBLIGATION SCALE | | | |
|---------------------------------|--------------------|----------------------------------|-----------------------------|
| | Responsibility | Responsiveness | Accountability |
| Social needs identified | Implicitly | Explicitly | Anticipatively |
| Institutional objectives | Defined by faculty | Inspired from data | Defined with society |
| Educational programs | Community Oriented | Community based | Contextualized |
| Quality of graduates | Good practitioners | Meeting criteria professionalism | Health system change agents |
| Focus of evaluation | Process | Outcome | Impact |
| Assessors | Internal | External | Health partners |

(OECD) definition, in which entrepreneurialism is considered to be “human action in pursuit of the generation of value.”²⁶

Other areas within the healthcare sector, notably public health, have already embraced the concepts of entrepreneurship in developing programs and initiatives.²⁷ Adapting the definition, paramedic entrepreneurship encompasses the “opportunistic creation and implementation of catalytic innovation” that allow for improved delivery of specialized paramedic services to communities. This model specifies that entrepreneurial activities should be collaborative in nature and accountable to the populations being served. Additionally, they should not be limited to current resources, as entrepreneurial endeavours often create financial and social growth.²⁷ This public health model is of particular importance to paramedicine, as its resources to deploy novel programs that better serve the community are often lacking.

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To minimize risks and maximize success in the development of new initiatives, paramedicine should utilize system development techniques that streamline and enhance evolution. Agile development and rapid cycle evaluation allow projects to be implemented in an iterative fashion, where phases build toward a final state after several iterations.²⁸ Coupled with rapid cycle evaluation methods, which focus on realist approaches rather than formal randomized controlled trials, this enables a rapid, rigorous development of new paramedic endeavours.²⁹ Partnerships with key stakeholders in these iterations is crucial to ensuring success, as cross-pollination of ideas between sectors helps develop better care models.³⁰ Rather than work in isolation, paramedicine must collaborate with traditional partners—e.g., hospital, primary care, mental health and addictions groups—and non-traditional partners, such as policy makers, lobbyists, and, most importantly, patient advisors.

Disruptive innovation occurs when a new idea “sneaks” into an established area and creates a more cost-effective and sustainable model.³¹ Many paramedicine initiatives represent disruptive innovations that replace existing approaches with more cost-effective and efficient solutions. For example, a remote patient-monitoring program in Ontario demonstrated a 300% return on investment and an average reduction of 33% in 9-1-1 calls, emergency department visits, length of stay, and readmissions³² with, specifically, a 42% reduction in 9-1-1 calls and a 40% reduction in emergency department visits.³³ Not only was this project financially successful, it also ensured that patients received the most appropriate care.

Combining the concepts of social accountability and entrepreneurship leads to the concept of social entrepreneurship. In this model, paramedicine seeks to identify the needs of individuals, enhancing equity and access while also utilizing the entrepreneurial approach to enable rapid and efficient implementation

of solutions. This model has been very effective in several health sectors and can be adapted to paramedicine.²⁷ With the appropriate competencies, paramedic leaders can leverage both entrepreneurship and social accountability in developing new models of care.

ENACTING SOCIAL ACCOUNTABILITY AND SOCIAL ENTREPRENEURSHIP IN PARAMEDICINE

One clear barrier to the establishment of socially accountable practices in paramedicine is the lack of a cohesive governing body or accreditation program. Other medical professions have consistent regulatory standards in each province that enact and enforce standards for socially accountable care.³⁴ These principles are further strengthened by their valuation in accreditation programs.³⁵

Although national-level paramedic groups do exist, they have no direct governance capacity over local paramedicine operations. They lack the national infrastructure to hold services accountable to profession-level strategies and standards.³⁶ Some provinces have legislation that allows self-regulation of paramedics; however, this still leaves the enactment and enforcement of socially accountable practice to the discretion of each province and lacks the cohesiveness of a national-level approach. Having the ability to create standards around social accountability is not sufficient to achieve equity-of-practice goals. This can only be accomplished through a shift in paramedic culture that prioritizes professionalism and person-centred care. This type of shift, in turn, requires unified national strategies that align the priorities of the paramedic profession with the rest of the healthcare sector. These strategies include entrepreneurial-style projects that pilot care specifically tailored to meet community needs.

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Interventions and initiatives to address social accountability must be role-specific and tailored to all system levels and stages of the paramedic career life cycle. Socially accountable practice should start in paramedic education. Paramedic academic institutions must develop curricula that prioritize education about DOH, equity-oriented care models, and collaboration with local community groups. Currently, the National Occupational Competency Profile (NOCP) has no specific social accountability competency. Although the ideas and values are briefly touched on in a general competency (1.1 Function as a Professional; p 25), the sub-competencies relate to attributes of general professionalism rather than specific strategies for incorporating socially accountable practices into care delivery.³⁷

Additionally, paramedic educational programs should endeavour to ensure that they are recruiting and supporting diverse student cohorts. As educational programs are the starting point for all paramedics, it is essential that schools eliminate barriers that lead to inequity in terms of the gender, race, ethnicity, or social status of individuals entering the profession.³⁸

At the individual level, clinicians need to incorporate questions about DOH and social challenges into patient histories.³⁹ Any pertinent findings from these questions should be included in documentation and communicated during care transitions. Paramedics must be educated about the social services and programs available in their area. Knowledge of local services allows paramedics to recommend patients for referral to social programs, helping bridge gaps in a patient's basic needs.³⁹

The valuation of social accountability must also be present in the paramedic workforce. Investments into paramedic workforce diversity that focus on ensuring employees are representative of the populations they are servicing is essential for establishing trust and connections with the community. As well, workforce

diversity at all levels can help drive paramedic professional discourse and build social entrepreneurship programming.

Paramedic services should enact entrepreneurial-style projects to build collaborations and partnerships with vulnerable groups in their communities. Ideally, these partnerships will include academic institutions, providing paramedic students with learner placements that can help build bio-psychosocial skills.⁴⁰ Services must develop policies and processes that acknowledge social accountability and the role of paramedics in ensuring health equity.²² Themes and discussions of social accountability should be incorporated into continuing medical education and practice updates. These should include discourse around self-reflection, cognitive biases, and how implicit attitudes affect care.

All provincial and national paramedic organizations must have clearly communicated values around social accountability. These groups should champion the calls to action that currently exist in Canada around decreasing health disparities for marginalized populations, including those listed in the Truth and Reconciliation Commission report.⁴¹ National organizations should bring attention to the role paramedics have in the health-care system and champion social entrepreneurship that brings care to marginalized groups. Paramedic research and clinical experience should also be leveraged to advocate for social programming and change.

ENABLERS AND LEVERS

Accreditation standards are a key lever for embedding social accountability into paramedic services.³⁵ As outside agencies, accreditation organizations reflect the current standards of practice and expectations of care across all types of health care. Accreditation bodies act as an external pressure for the adoption

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of both socially accountable clinical practices and organizational policies.³⁵ They also generally function at a national level, allowing for uniformly enforced, socially accountable practices across provinces. The prioritization of social accountability by accreditation bodies will also encourage services to take on more entrepreneurial projects to pilot care delivery.

Healthcare data play an essential role in how paramedic services should approach social entrepreneurship. Paramedic organizations collect huge amounts of healthcare and geographical data that go largely unexamined and unused. Through data analysis of call volumes, locations, and types, organizations can learn about the specific populations they serve.⁴² This information can then be used to develop local projects and build community partnerships that address the issues in their area.⁴³ These collaborations will not only increase the social accountability of the paramedics and services involved, but also have the potential to reduce burdens on other areas of health care while increasing patient satisfaction through the delivery of the most appropriate care.

The interaction of socially accountable paramedic practice and social media is multifaceted. Social media provides a platform for paramedics, services, and organizations to engage with their communities. It can help widen both paramedic and societal perspectives of modern paramedic practice while also bringing attention to marginalized populations and innovative community programming.⁴⁴ However, the nature of social media allows individuals to put forward and amplify—both intentionally and

unintentionally—messages of prejudice, bias, and racism. These messages are destructive and erode the public's confidence in paramedicine and out-of-hospital service providers.⁴⁵

Although some services and regulatory bodies have social media usage policies, again, there is no single national standard or guideline for paramedic social media use. Instead, enforcement of social accountability and professionalism on social media is left to the discretion of the local paramedic employer or, if applicable, a regulatory college. Notwithstanding the potential pitfalls, social media remains a powerful tool for engagement of the paramedic profession with social entrepreneurship.

CONCLUSION

Paramedics play an important role in the Canadian healthcare system. They deliver high-quality care on demand, in any region, to whomever needs it. Their potential to address gaps in the current healthcare environment is only starting to be realized. However, to fulfill their potential in modern health care, the paramedic profession must ensure that its values are aligned with those of all other healthcare providers. This requires the enactment of socially accountable practice at all levels of the paramedic profession, as well as championing social entrepreneurship and national strategies that highlight and enforce these practices. It is only through a consistent national emphasis on the importance of social accountability and social entrepreneurship that paramedicine will adopt it as a professional identity.

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Professional Autonomy



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Principle

The paramedic profession is guided by its own accountable and transparent governance, regulation, knowledge, evidence generation, and improvement processes. It also engages in formal representation and participation in relevant organizational, educational, healthcare, scientific,

government, and professional bodies. The profession demonstrates its own growth and advancement through its leadership and advocacy initiatives. Paramedicine is guided by these activities with a self-structured mandate, code of ethics, and professional and clinical guidelines.

1: INTRODUCTION—RELEVANT SCHOLARLY LITERATURE

The concept of a profession, and professional autonomy, has a complex history in the scholarly literature. This statement uses the term “profession” to refer to a sociological concept that is generally considered to be a special and important type of occupation.^{1,2}

Professions have been an interest of study in sociology for more than 100 years and,

throughout this time, the definition and boundaries of what a profession is, and what autonomy means in relation to this, have shifted considerably.² This review highlights important concepts and approaches across this vast literature as they relate to the concept of professional autonomy. The term “professionalization” is used frequently; as well, Adams’s^{3(p21)}

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conceptualization of the “historically variable confluence of factors, processes, and activities that shape the emergence of professions and professional development” is used to refer to aspirational strategies to advance the occupation and increase status. In many ways, professionalization is linked to the concept of autonomy, as the following literature review illuminates.

The first part of this statement outlines the empirical research available on the paramedic profession, with a focus on what is known about professional autonomy to date. The second part outlines the main theoretical approaches from the sociology of professions that are relevant to the study of professional autonomy.

Summary of the Literature

A small, though growing, body of literature on paramedic professionalization exists, mainly from the United States, Australia, and the United Kingdom (U.K.); this literature is examined chronologically below. Two ethnographies on paramedics and ambulance attendants were published in the 1980s.^{4,5} In his work, Metz called the emergency workers of this time “blue-collar professionals,” as training was minimal, work standards were poor, their medical scope of practice was small, and they had little control over their day-to-day work. Mannon^{4(p142)} expressed a similar sentiment, stating that although paramedics had a desire to be seen as a profession, poor working conditions and physician authority over medical practice hindered professionalization efforts. Both of these studies positioned paramedics as having relatively little autonomy at the level of the profession, especially compared with other healthcare professions, such as medicine.

In 2019, writing about conditions in the U.K., McCann & Granter⁶ argued that over the last several years, paramedics in that country experienced successful professionalization efforts,

noting their better pay, improved working conditions, and higher education credentials. The authors expressed optimism that paramedics could continue down this successful pathway; however, they also cautioned that paramedics do not yet fully control their own profession, as organizational and managerial influences continue to affect the regulation, employment conditions, and future of paramedicine in the U.K.

The Australian perspective on paramedic professionalization has also documented similar changes. Inclusion as a healthcare professional under state legislation and higher educational credentials are positioned as cornerstones of paramedic professionalization, the goal of which is to lead to autonomy and control, the solidification of paramedic identity, and new healthcare roles.^{7,8} Reed et al.’s⁹ scoping review of the literature on paramedic professionalization found that this topic has been largely explored from a trait perspective only, and that other theoretical perspectives have received limited attention.

In summary, a small body of paramedic literature on professionalization suggests that upward advancement is important to paramedics and is being actively pursued through traditional professionalization pathways (e.g., state licensure and advanced education). What professional autonomy means and its implications as a concept remain relatively unexplored, however, particularly in the Canadian context.

The Sociology of Professions

The sociology of professions literature is a vast body of knowledge that comprises a complex array of ideas about professional autonomy. A review of this literature, including its main theoretical approaches, highlights why theories of the professions have changed. A chronological approach is appropriate given contemporary scholars’ recommendation to consider professionalization and its related topics as historically situated² and to position

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what is known about the paramedic profession within these different theoretical areas.¹

Trait and Functionalist Approaches (1930s–1960s)

Early thinking in the sociology of professions literature fell under two approaches: the trait approach and the functionalist approach. The trait approach aimed to define professions based on a series of unique features used to differentiate professions from other occupations.¹ This type of classification approach was largely atheoretical. A more advanced form of the trait approach was the functionalist approach. Scholars writing from this perspective assumed that professions were a stabilizing force and were important to a well-functioning society.¹⁰ Professions were conceptualized as elite, highly valued occupations, and professional growth was conceptualized as natural and linear.¹ The study of the professions during this era was based on the study of what is now considered the professional “elite,” such as medicine, law, and engineering,^{1(p171)} with some scholars arguing during this time that only these occupations could be considered true professions.¹²

Critical Approaches (1950s–Present)

Although earlier functionalist approaches viewed professions as important and central social actors, critical theory approaches aimed to examine which social actors (including, but not limited to, the professions) had power, why they had power (and others did not), and the consequences of these relationships. Critical perspectives aim to understand how power structures the relationships between groups of social actors (in this case, professions, governments, the public, organizations, and other actors). This body of literature is diverse and broad, and continues to grow, as it is still used today; thus, only a brief summary is provided below.

A focus on power is important to the study of professional autonomy, as it highlights the complex system of factors that affect the professions. For example, Johnson¹³ prioritizes the role of the state in granting privileges to the professions in exchange for their expertise and knowledge. In this way, the professions act as an extension of state governance systems, highlighting how professional autonomy, and a profession’s ability to control its own affairs, is contingent on the profession’s relationship to the state. Professions that are able to use their knowledge and expertise to solve relevant societal issues may be granted more power by the state.

Feminist approaches, such as the work of Anne Witz,¹⁴ have shown how professionalization can be gendered. Her work showed how medicine, which was male dominated in the 20th century, used its elite position to control subordinate, women-dominated professions, such as nursing and midwifery, as a way to protect its status.

Although most contemporary scholars still contend that professions have some amount of autonomy and power,^{2,15} the declining power and autonomy of the professions have also been documented.^{16,17,18} The de-professionalization literature argues that the professions no longer have the power and autonomy they once had, and thus the term “profession,” as it was once understood, has been threatened and eroded.¹⁶

Factors contributing to decreased autonomy include increased government control over professional self-regulation and the widespread use of managerial and neo-liberal policies in governments and organizations.^{15,16,18} Increasing public knowledge (and access to knowledge) and technology have also been documented as threatening the central hold of professions over expert, abstract knowledge, thus weakening their important place in society.¹⁷

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Neo-Weberianism

Neo-Weberianism is a sociological approach to the study of professions that is centred on the concept of social closure.^{19,1,3} Social closure refers to the ability of professions to leverage their social and cultural position to secure economic gains and monopolization over an area of work. This perspective holds that most professions have self-governing bodies that aim to directly control the market, often acting to serve their own interests.¹

Neo-Weberianism also prioritizes the role of the state, which grants professions secure legal boundaries through state licensure. This has traditionally led to higher legitimacy, autonomy, and power. Historically, being granted self-regulation was important, as it allowed professions to have control over an area of the market through exclusionary practices (e.g., determining who is a member of the profession, title protection standards, and entry-to-practice requirements).^{1,3} Comparative research from a Neo-Weberian perspective has highlighted how successful social closure is linked to socio-political conditions, such as the ability to convince the state of the profession's claims, rather than the profession's length of education or access to knowledge.³

Neo-institutionalism

The work of many of the above-noted scholars helped to highlight that professions are not fixed categories—rather, they are constantly changing and being re-negotiated in response to broader societal trends and factors. The final theoretical perspective examined in this statement is one that aims to understand how change occurs in complex social systems.

Neo-institutional theory is a macro-theoretical perspective that seeks to explain how formal and informal social systems structure actions, thoughts, and behaviours.²⁰ From a neo-institutionalist perspective, professions are key agents of institutionalization, as they play an important role in ordering, structuring, and giving meaning to an area of social and economic life.^{21(p795)} Neo-institutional theory positions professions as important agents of social change²² that can enact change by creating new areas of work or new types of professionals.²¹ From this perspective, the professions may carry out a process of professionalization to perpetuate their own influence and preserve their legitimacy. This perspective has a nuanced view of autonomy, viewing professions as having the capacity to pursue their goals and projects; however, it also considers how they face pressure to conform to broader socio-cultural, legal, and economic rules, norms, and ideas.

Concluding Remarks: Embracing Theoretical Eclecticism

Although contemporary scholars have largely abandoned a trait-based approach to the sociological study of the professions, professionalizing occupations may adopt this view and seek out the traits and attributes of other successful professions.^{1,2} However, as a number of scholars have demonstrated, in many cases, the power and legitimacy that were once products of these traits have been challenged by state, managerial, and economic influences.^{15,16,17,23} Thus, the allure of specific traits by professionalizing actors may be misaligned with their ability to confer professional legitimacy and status. However, a neo-institutional perspective suggests that power should be considered in nuanced terms, and that marginal actors can enact change in diverse ways.

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2: IMPLICATIONS

A Reflexive Approach

This literature review leads to a critical examination of whether professions can still be self-determining, as described in the definition. For example, self-regulation, while still the dominant model of regulation in Canada, is not only determined by the profession—rather, it is co-determined by the state, the profession, and the public (and, increasingly, directed more by the public and the government).²⁴ Influences on practice may come from other professions, government, the public, healthcare organizations, and others. Others have suggested that strategic alignment within, not apart from, medicine can strengthen professional autonomy. For example, Williams et al.²⁵ propose that one of the most deliberate steps taken toward professional autonomy in Australia was that of paramedics “moving out” of the emergency services sector and into the healthcare system.

A neo-institutional approach would suggest that being influenced by the dominant worldviews of a particular industry (in this case, medicine) does not mean that the profession has no agency or lacks autonomy. Social actors can become reflexive about their institutional environment and explore new ways of thinking and acting. Critically examining concepts such as professional autonomy may allow the community to explore novel ways of being autonomous and consider the implications of a particular course of action. This does not mean that self-determination is not a worthwhile goal; however, the community should be encouraged to consider what this means within a broader ecosystem of socio-cultural, economic, and political factors.

Individual Versus Professional Autonomy

Autonomy is an abstract philosophical concept, and this in itself represents a challenge to paramedicine. Other professions have also struggled when engaging with the concept. For example, despite autonomy being outlined as a key component of nursing practice, it remains poorly understood in nursing, with a variety of definitions used simultaneously.²⁶

A key implication that needs to be considered by the community is autonomy at the level of the individual practitioner versus autonomy at the level of the profession. The definition provided stipulates that autonomy occurs at the level of the profession; however, it would be a false dichotomy to say that this does not also affect individual autonomy. How the two levels of autonomy are related is much more complex, however.

The autonomy of individual paramedics can vary due to regulatory or organizational influences or because of personal factors—in other words, depending on the context.^{27,28} Collen describes paramedics in the early 2000s in the U.K. as “broadly autonomous,” which implied “significant responsibility ... with little or no supervision or support.”^{29(p 1)} This broadly autonomous role has been realized through advancements in education, health service demands, and the value placed on the role of paramedics within the healthcare system. This is despite a lack of true autonomy at the discipline level. Paramedics in the U.K. are regulated by the Health and Care Professions Council, which is responsible for the regulation of 16 professions across country, nine of which are considered allied health professions. They are not self-regulated and are subject to any clinical restrictions placed on their practice by their employer. Perhaps because of this lack of autonomy in regulatory matters, the paramedic discipline in the U.K. has advanced through other means, such

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as representation on working groups, advancing curriculum and professional development guidance, and having an easily identifiable national voice on professional matters, which is represented through the College of Paramedics (which is not a self-regulating college but, rather, a collegial organization).

3: CONCLUSION—THE NEED FOR AN EMPIRICAL APPROACH

In the last ten years, there has been a significant increase in the volume of research examining the paramedic profession and professionalization. Although there are similarities in what is valued by paramedicine across jurisdictions, the varying socio-cultural, economic, and political conditions of paramedicine in Canada (and across Canada) require empirical investigation. The Canadian paramedic community should be encouraged to examine autonomy as locally situated and, as well, to examine variations in professionalization across different geographical, sociocultural, legal, and economic contexts. This will require knowledge across a number of social science disciplines (e.g., political science, sociology, health policy, and anthropology) and a variety of epistemological positions and theoretical framings. The sociology of professions literature is a useful tool in this work.

An empirical approach to studying the paramedic profession through a reflexive process of looking both inward and outward may also help align research priorities within the profession. For example, the concept of self-directed evidence generation may require further exploration: What type of research is prioritized? From what theoretical and epistemological positions? Who should do this research? The community may need to consider the generation of evidence for the benefit of the profession, the public, and marginalized groups who have historically been omitted or ignored from such evidence due to structural factors.

In summary, we encourage an understanding of professional autonomy that examines power and control in nuanced terms and that draws on a range of theoretical insights. In this way, professional autonomy is most appropriately conceptualized as an emergent concept that should be understood by considering the economic and socio-cultural relationships between professions, organizations, the government, and wider societal contexts.

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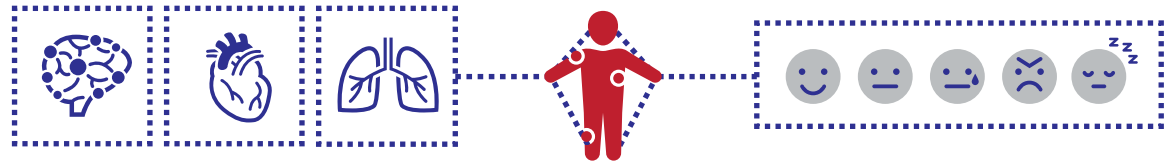
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Healthy Professionals



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Principle

The safety and wellness of the professionals who work in paramedicine is an integrated and prioritized mandate. This focus is reflected in the determined search for, and solutions to, behaviours, stressors, professional and societal factors, and other threats to safety and wellness. Decision-

making related to organizational structures, policies, priorities, and operations is done and maintained within a wellness framework. Overall wellness is monitored and reflected in the profession's activities. Systems are accountable to and evaluated based on the health of its professionals.

INTRODUCTION

Research conducted with paramedics and other public safety personnel (PSP) regarding their mental health and well-being has gained momentum in Canada since 2015. There has also been increased engagement from PSP stakeholders and knowledge users, including the Paramedic Chiefs of Canada and the Paramedic Association of Canada, toward building evidence-informed mental health supports for PSP.

This statement highlights recent research results and identifies potential evidenced-informed resources specific to the Canadian paramedic context; however, the content herein does not reflect a comprehensive assessment of all available research.

The Canadian Institute for Public Safety Research and Treatment's (CIPSRT's) Glossary of Terms is the source document for key definitions used herein to support continuity and consistency of language.¹

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WHAT DO WE KNOW ABOUT PARAMEDICS' MENTAL HEALTH?

Data collected from two national research studies^{2,3} provide prevalence estimates for several mental health symptoms and disorders among paramedics, including the following:

- Mental health disorders (based on self-report using screening tools):
 - Post-traumatic stress disorder (PTSD): approximately 24.5%
 - Major depressive disorder: approximately 29.6%
 - Generalized anxiety disorder: approximately 20.5%
 - Social anxiety disorder: approximately 20%
 - Panic disorder: approximately 10.3%
- General symptoms
 - Anxiety: 10% (mild); 17% (moderate); 12% (severe or extremely severe)
 - Depression: 11% (moderate); 5% (severe or extremely severe)

Substance use may also be problematic for paramedics. Respondents in one national study reported on prevalence rates for alcohol use that might be considered “severe” (6.1%).² Results from another national study suggested that 8.2% of paramedics were using controlled substances for recreation (65.2%), pain control (34.8%), or “other” reasons (34.8%)—the most frequent of which was mental health concerns.^{3,4}

There are several important caveats to the prevalence information regarding paramedic mental health and substance use noted above. For example, the available studies differ with respect to their data collection methods, standardized instruments, sample

sizes, and statistical analyses. The estimates frame disorders as “present” or “not present”; however, individuals typically experience symptoms on a continuum, wherein even “subclinical” symptoms can cause distress or impairment, and for which paramedics may benefit from evidence-based clinical supports. The available results should be considered preliminary, and warrant replication and extension involving clinical interviews and longitudinal data. Future research should also assess for mental health difficulties that interact with occupational stressors (i.e., organizational and operational),⁵ including workplace violence and moral injury.

WHAT DO WE KNOW ABOUT THE STRESSORS THAT MAY INFLUENCE MENTAL HEALTH?

Several factors can affect the overall mental health of a paramedic, such as occupational stressors that include, but are not limited to, potentially psychologically traumatic exposure (PPTE).^{1,5,6} Work-related violence and fatigue may be particularly problematic occupational stressors experienced by paramedics.^{7,8} Individual interpretations of stressors are crucial for understanding potential mental health impacts,⁹ and the available evidence suggests that many instances of PPTE can be associated with mental health injuries.⁶

Occupational stressors can be subdivided into organizational stressors and operational stressors. Organizational stressors include experiences associated with job context or setting (e.g., conflict with supervisors, changes in policies), whereas operational stressors typically include stressors directly tied to work content or duties (e.g., shift work, the risk of being injured).¹⁰ Exposure to organizational and operational stressors has been linked to symptoms of PTSD, anxiety disorders, and depressive disorders.^{5,11,12}

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Critical incidents are a diversely described subset of PPTE that are believed more likely to evoke unusually strong emotional reactions among PSP;¹ however, the impact of PPTEs is necessarily idiosyncratic, and any number of PPTEs may be associated with mental health injuries⁶ and physical health challenges.¹³ The result is that any PPTE may be a critical incident depending on interactive elements involving the individuals involved, the timing, and the context; accordingly, designating a subset of PPTE as “critical” is likely less useful than allowing individual PSP to designate any given PPTE as a “critical incident” that warrants additional support.

In one study by Bigham and colleagues,⁷ most of the paramedic respondents (75%) reported experiencing some form of violence in the previous 12 months, including but not limited to verbal assault (67%), intimidation (41%), physical assault (26%), sexual harassment (14%), and sexual assault (3%). Recent research has provided preliminary evidence to support the contention that work-related violence may be associated with mental health injuries.¹⁴ The rate of and extent to which paramedics experience violence, and the effects of that violence, remains lacking and warrants further research.

Fatigue plays a substantial role in mental health and well-being. Paramedics have reported not feeling sufficiently rested when reporting for duty and being more fatigued than the general population.³ In one study, many paramedics (55%) in a large urban service reported their fatigue was related to safety outcomes, including injuries, exposures, safety-compromising behaviours, medication errors, and adverse events.⁸ Insomnia has also been associated with diverse mental health symptoms related to PTSD.¹⁵ Overall, managing fatigue and rest appears to be an important opportunity for improving paramedic mental health and well-being.

WHAT DO WE KNOW ABOUT THE PHYSICAL HEALTH OF PARAMEDICS?

Physical and mental health are interrelated and important foci for diverse research projects. The benefits of research are particularly important for paramedics because of the frequent injuries incurred because of their work^{3,13} that require time off for treatment and recovery.³ Among PSP, paramedics report difficulties with neurological (6.1%), digestive (11.0%), endocrine/metabolic (10.5%), and respiratory conditions (7.2%).¹³

The available results suggest that paramedics may experience role limitations (e.g., time off work, the need for modified work) due to poor physical health and pain.³ Poor physical health may also impede the ability of paramedics to fully engage in other areas of their lives, based on evidence from comorbidity research on mental health and chronic pain.¹⁶⁻¹⁹ The details and sequelae specific to paramedics (e.g., the impact on mental health, finances, relationships) remain largely under-explored within the Canadian context. Current data related to the physical health of Canadian paramedics have similar methodological limitations as the research on mental health and well-being.

STRATEGIES TO SUPPORT THE MENTAL HEALTH AND WELL-BEING OF PARAMEDICS

There is a serious lack of research evidence regarding programs designed to support the mental health and well-being of paramedics.^{20,21} The insufficient evidence means there is no way to make confident recommendations about which programs to select or about best practices to pursue to support the mental health and well-being of paramedics.

When deciding whether to use a specific program, tool, strategy, or intervention, paramedics and paramedic service organizations

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are strongly encouraged to carefully consider credibility, rigour, utility, and cost-benefit.

Focusing on the mental health and well-being of paramedics is supported by legislation (e.g., *Supporting Ontario's First Responders Act (Posttraumatic Stress Disorder)*, 2016, and the development of standards (e.g., CSA Psychological Health and Safety in the Paramedic Service Organization—Z1003.1-18), as well as the availability of PSP-specific tools and resources to increase self-awareness and understanding of their mental health and well-being (e.g., see www.cipsrt-icrtsp.ca and <http://www.pspnet.ca>).

The following efforts are important to consider in supporting the health and well-being of paramedics.

Proactive Strategies

Proactive efforts to support paramedic mental health may include implementing psycho-educational interventions to increase literacy about how to mitigate work-related stress, messaging that decreases the stigma related to mental health, and the provision of organizational-level mental health supports (e.g., access to registered mental health professionals).

Specific strategies may include the following:

- Encouraging individuals to regularly self-screen using the CIPSRT self-assessment tool, which allows for anonymous self-screening of several mental health concerns (see <https://ax1.cipsrt-icrtsp.ca>) and can support paramedics choosing to access evidence-based care early.
- Using evidence-informed educational resources that are available at no charge—for example:
 - The Public Services Health & Safety Association (Ontario) developed a series of six Ready for Duty

e-learning modules designed to help current and future paramedics develop and sustain healthy behaviours (see <https://www.pshsa.ca/training/free-training/ready-for-duty-elearning-series-introduction-module>).

- The Ready for Duty (R4D) app, which is designed to help paramedics adopt safe, effective, movement-centric, resistance training exercises²². The R4D app, coupled with the movement e-learning module noted above, may help paramedics plan and conduct effective, movement-focused fitness sessions. The R4D app is available for both Android and iOS devices.

Although many proactive efforts are focused on individuals, organizations also have a responsibility to carefully review their cultures and make systemic changes that support paramedic well-being.

These efforts may include, but are not limited to the following:

- Implementing tools such as the CSA Psychological Health and Safety in the Paramedic Service Organization—Z1003.1-18 (see <https://www.csagroup.org/article/z1003-1-18/>).
- Fatigue management may also be beneficial,²³ and work is under way to address fatigue among Canadian paramedics.²⁴
- Paramedic service organizations can also support paramedics by making public commitments to develop and maintain programming to support paramedics' mental and physical health (e.g., psycho-education or peer-support programs).⁵

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Responsive Strategies

Organizations should work to decrease both internal and external barriers to obtaining services when a paramedic develops a mental health injury. Reducing barriers may involve informing paramedics via electronic and hard-copy communications of the services that are available to them, while also reinforcing that service access and use remains confidential.

Interventions for the general population that have used a trauma-informed approach (e.g., https://ncsacw.samhsa.gov/userfiles/files/SAMHSA_Trauma.pdf) or that follow related best-practice guidelines (e.g., <https://www.apa.org/ptsd-guideline>) may also be beneficial for paramedics; however, evidence-informed treatments tailored to PSP may be particularly effective. For example, PSPNET (<https://www.pspnet.ca/>) is a relatively new evidence-based resource tailored specifically for PSP.^{25,26} PSPNET is a confidential, online cognitive therapy treatment program available to PSP in New Brunswick, Nova Scotia, Quebec, and Saskatchewan, and is supported by funding from the federal and provincial governments, with no charge to individual PSP or their PSP agencies. At the time of writing, discussions to make PSPNET available in other provinces and territories were taking place based on current results and evidence of substantial need for services,²⁷⁻²⁹ with the PSPNET team appearing ready to proceed pending government approvals.

Recovery from a mental health injury may be a short- or long-term process. Recovery is not always a linear process and may involve relapses. The nature of PSP work means that any given PSP may experience multiple mental health injuries during their career.⁶ There is also evidence of important interactions between PSP mental health, organizational stressors, and operational stressors⁵. PSP leadership and PSP human resources personnel should be prepared to support paramedic mental health from an

evidence-informed position that includes awareness, compassion, and access to evidence-informed support, and that may require broader organizational changes.

Program Evaluation

- The Psychological Services Subcommittee of the Canadian Association of Chiefs of Police has developed a structured checklist that can assist in the decision-making process. The checklist has been adapted (with permission) for CIPSRT to disseminate. The checklist outlines the key questions and considerations that are necessary in the evaluation of any programming and is freely available (<https://www.cipsrt-icrtsp.ca/assets/evaluating-wellness-products-and-services-intended-for-public-safety-personnel.pdf>).
- Any selected program, tool, or intervention should be implemented alongside an integrated and tailored program evaluation, which ideally is conducted by an independent experienced research team with an independent research ethics board. Program evaluations allow users to assess the actual impact of program implementation on the problem(s) of interest. There are several approaches to program evaluation, and no “one size fits all” solution. Instead, independent evaluations should provide the most robust evidence. Resources that may be useful in supporting program evaluation have been included in “Further Reading,” below.
- Regardless of development stage, the intervention, tool, or resource must be based on credible research evidence. Extreme caution must be exercised when using interventions that lack sufficient scientific rigor to support their use. Paramedic service organizations are strongly

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encouraged to work with academics, researchers, and clinicians who are extremely familiar with the areas of mental health and paramedicine, as well as with interdisciplinary and applied community research.

- Caution must be exercised when choosing to use for-profit programs. Even well-intentioned programs may lack sufficient research evidence to support their claims. The “something is better than nothing” argument is not necessarily true. Sometimes, implementing programs that are not at least informed by available evidence can cause more harm than good. Paramedics may be best supported through continued advocacy for fully funded mental healthcare services that have integrated research programs for continuous improvement. Paramedics and their respective service organizations should therefore try to use programs and services that are publicly funded and informed by academically peer-reviewed research evidence.

KEY ENABLERS IN SUPPORTING THE HEALTH AND WELL-BEING OF CANADIAN PARAMEDICS

Enhancing Knowledge

A key enabler for the future of paramedicine is the enhancement of knowledge. Collaborative, coordinated, and cohesive approaches to data collection, as well as implementing the subsequent evidence-informed recommendations, may be effective for supporting paramedic well-being. Paramedic service organizations are strongly encouraged to share the results of their own evaluative work (e.g., internal quality improvement/quality assurance analyses) and the growing evidence-informed

recommendations provided through the CIPSRT. Evidence-informed decisions can have a direct impact on paramedic well-being.

Supporting research is also important for the improvement of paramedic health and well-being; accordingly, paramedic service organizations are encouraged to develop relationships with academic institutions and researchers that may be able to provide the expertise, financial support, and human resources for research.

The CIPSRT has been tasked with serving as the hub for knowledge translation and dissemination and is the best resource for understanding the current state of evidence. The CIPSRT Academic, Researcher, and Clinician Network (ARC Network) is a network of professionals with expertise in PSP, including paramedics, and post-traumatic stress injuries (<https://www.cipsrt-icrtsp.ca/en/about-us/arc-network>). Paramedic service organizations can also learn about ongoing research efforts focused on supporting PSP mental health by reviewing a list of current projects available (<https://www.cipsrt-icrtsp.ca/en/research/current-projects>).

CONCLUSIONS

Researchers are critical team members for helping paramedics, their leaders, their families, and all related stakeholders understand the needs of individual and collective paramedic services and foster dialogue and collaborative efforts in support of paramedic physical and mental health. Facilitating the active involvement of paramedics in research, and in the implementation of evidence-informed and evidence-based well-being strategies, is also critical for improving paramedic physical and mental health.

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The evidence base for paramedic health and well-being is evolving. Although we already have evidence that paramedics may be experiencing mental health challenges at a greater rate than the general population; nevertheless, more research is needed. Many important elements are already in place, including a hub for knowledge translation (see <https://www.cipsrt-icrtsp.ca/>), as well as ongoing and growing research efforts and engagements from Canadian stakeholders. The work of supporting paramedic mental health and well-being will always involve continuous-improvement efforts and commitments to collaboration and innovation.

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CORE RECOMMENDATIONS

1. Research into paramedic mental health and well-being is constantly evolving. Paramedic service organizations should take advantage of publicly funded resources that are evidence informed and, where available, evidence-based (e.g., CIPSRT, PSPNET), to maximize their access to the best available information, practices, and tools.
2. Paramedic service organizations should undertake rigorous evidence-informed and evidence-based evaluations of any programs that are deployed to support paramedic mental health and well-being at the individual and organizational levels, and also follow the contemporary recommendations available from the CIPSRT.
3. Paramedic service organizations should use evidence-informed and, where available, evidence-based, proactive strategies to mitigate the impact of diverse stressors and protect paramedic mental health and well-being.
4. Paramedic service organizations should implement evidence-informed and, where available, evidence-based, responsive strategies to redress mental health injuries and protect paramedic mental health and well-being.
5. Paramedic service organizations should integrally contribute to the development and implementation of iteratively improving evidence-based practices to protect, support, and redress paramedic mental health and well-being before, during, and after their careers.

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FURTHER READING: RESOURCES FOR PROGRAM EVALUATION

Evaluating Health Promotion Programs (Public Health Ontario)

<https://www.publichealthontario.ca/en/health-topics/public-health-practice/program-planning-evaluation/evaluating-programs>

Workplace Health Promotion (Centers for Disease Control and Prevention)

<https://www.cdc.gov/workplacehealthpromotion/model/evaluation/index.html>

Health Promotion Evaluation: Recommendations to Policymakers (World Health Organization)

https://www.euro.who.int/_data/assets/pdf_file/0004/159871/E60706.pdf

Developing a Logic Model (British Columbia First Responders' Mental Health)

<https://bcfirstrespondersmentalhealth.com/resource/logic-model-guide/>

Gap Analysis Tool (British Columbia First Responders' Mental Health)

<https://bcfirstrespondersmentalhealth.com/resource/gap-analysis-tool/>

A Guide to Evaluation in Health Research (Canadian Institutes of Health Research)

https://cihr-irsc.gc.ca/e/documents/kt_lm_guide_evhr-en.pdf

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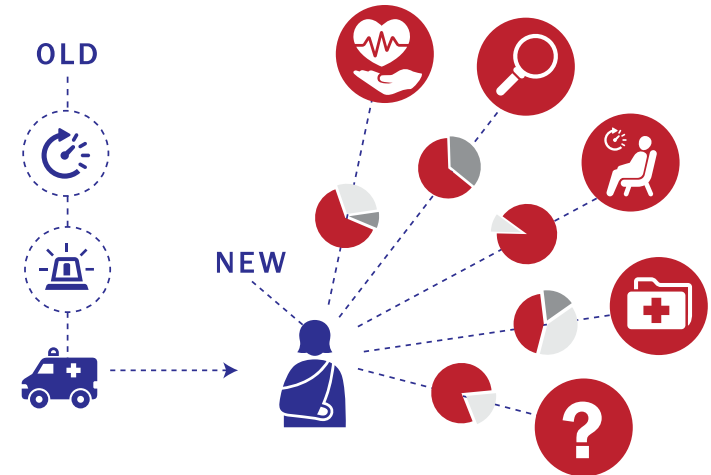
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Principle

Improvements at all levels—patient care, services, operations and systems, and education—are measured using evidence-informed and meaningful quality indicators. Evidence-informed performance measurements are intentionally broad and integrated into paramedicine’s activities and culture. Quality indicators reflect the broad priorities of paramedicine and health care, align with leading quality frameworks, and shape activities including decisions about future directions, policies, resource allocation, research, practice, and funding structures.



INTRODUCTION

This statement is a brief synopsis of the principles of health care quality and patient safety, including opportunities and enabling factors for improved pre-hospital care in Canada. As the complexities around scope and practice continue to increase, it is critical that the future of paramedicine is grounded in improving quality, safety, and the experience of giving and receiving care. Achieving a culture of safety and improvement requires:

- Developing a shared understanding of quality and safety principles and practice, centred on patient and family experience;
- Ensuring sustained leadership support for system change;
- Creating an infrastructure for measurement that includes reporting adverse events; and
- Developing policies and processes that ensure a sustained learning system.

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While this statement does not allow for a full review of all components of quality and safety, it does outline opportunities for leaders to translate evidence to practice specific to quality of care and patient safety, adverse events and disclosure of harm, quality improvement (QI), patient and family involvement, and the implementation of best-practice standards.

QUALITY OF CARE AND PATIENT SAFETY

Quality of care is defined through the lens of the dimensions of quality. This was first outlined in 2001 by the Institute of Medicine, which created a framework that includes the following six aims for the healthcare system:¹

1. **Safe:** Avoiding harm to patients from the care that is intended to help them.
2. **Effective:** Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and misuse, respectively).
3. **Patient-centred:** Providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions.
4. **Timely:** Reducing waits and sometimes harmful delays for those who receive and those who give care.
5. **Efficient:** Avoiding waste, including waste of equipment, supplies, ideas, and energy.
6. **Equitable:** Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, or socioeconomic status.

Additionally, in 2007, the Institute for Healthcare Improvement in the United States developed the Triple Aim to optimize health system performance: improving a patient's experience of care, improving population health, and doing this at a reasonable cost. In 2014, a fourth aim was added: improving the experience of providing care. Its addition was recommended to fully realize the objectives of the Triple Aim.

A CULTURE OF SAFETY

The World Health Organization defines patient safety as:

The absence of preventable harm to a patient during the process of health care and reduction of risk of unnecessary harm associated with health care to an acceptable minimum.

Organizations that are leaders in care provision achieve patient safety through a culture of safety. In a safety culture, the patient is at the centre of all decision-making and employees are willing and empowered to report risks to patient safety. A culture of patient safety is the culmination of building a just culture and being committed to the philosophies and practices of a learning organization. It requires robust organizational leadership, courage, and commitment from everyone in the organization.

Just Culture

The term “just culture” is defined as “[w]orkers who feel safe, trust enough to report hazards and their own errors.”² Traditionally, the management of adverse events and close calls in emergency medical services (EMS) was achieved by addressing practitioner competency or, worse, claiming “no harm, no foul” rather than examining the system level for non-human contributors to the adverse event.

A just culture is an atmosphere of trust in which healthcare workers are supported and treated fairly when something goes

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wrong with patient care. It is crucial to patient safety as it creates an environment in which people (healthcare workers and patients) feel safe to report errors and concerns that could lead to patient adverse events. Reports of errors and patient safety hazards as a result of pre-hospital care are important sources of information about weaknesses in the system; addressing these from a learning and QI perspective mitigates the risk of recurrence and improves patient safety.²

Principles of a Just Culture

1. The organization must ensure that it uses an unbiased and consistent approach to the review and response to incidents: system first, individuals second.
2. All employees trust that the organization uses and follows effective mechanisms and methodologies to ensure consistency of approach when managing adverse events.
3. Reviews will evaluate each situation with consideration of the mitigating circumstances and relevant context, rather than adopting a “no harm, no foul” approach.
4. Individuals will not be held accountable for system-level contributing factors and will be managed with respect and dignity.
5. Organizational leaders are accountable for ensuring that all decisions are made based on learnings and the best evidence available. Engagement of all stakeholders—including all relevant medical staff as well as patients and families—will occur.
6. Individuals must feel safe and empowered to report and discuss risks to patient safety.

7. In a just culture, individuals must still be held appropriately accountable for wilful non-compliance to rules, reckless behaviour, or intent to harm.³

Reporting Culture

“Health care organizations should be encouraged to participate in voluntary reporting systems as an important component of their patient safety programs.”⁴

Health care is inherently complex, and therefore its provision is inherently dangerous. Often, voluntary reports are the only way an organization becomes aware of a potential risk to patient safety. Learning from adverse events, good catches (near misses), and hazards that occur in health care settings allows organizations to identify safety concerns, promote a culture of safety, and encourage continuous learning.

Currently, many patient safety reporting systems are web-based and allow for anonymous adverse event reporting, as well as efficient data analysis and information management to help identify trends. Successful patient safety reporting systems are supported by policies and procedures that promote and encourage non-punitive reporting of adverse events where safety trends are measured, followed, reported publicly, and acted upon.

Adverse Events Disclosure

When the safety of a patient is compromised as a result of clinical care, it is important to be transparent and disclose incidents to the patient and/or family members. National and international literature support sharing the facts about what happened, steps that were and will be taken to minimize harm, what will be done to prevent similar events in the future, and how the patient/family member will be provided with an honest apology. Disclosing a patient safety incident to the patient shows respect,

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involves the patient in the clinical decision-making process, and facilitates safe and appropriate clinical care in the future.

QUALITY IMPROVEMENT

The terms “quality” and “patient safety” are often used interchangeably, and there is significant debate about the interplay between these concepts. However, one chooses to define these tenets, one thing is certain, however: a patient safety issue is also a quality issue, and vice versa.

Emergency medical services systems have a fiduciary responsibility to the citizens who fund these enterprises to provide healthcare services that align with the six dimensions of quality. Stakeholders expect and demand high-quality services, but the stakes become elevated in the very complex health care environment where mistakes can have dire consequences for patients.

A quality assurance (QA) program ensures that organizations are doing what they say they do. Most EMS services have some form of a QA program that evaluates clinical care by reviewing and assessing the quality of the care being provided.

There are many ways that EMS systems can obtain these data. Examples include:

- Clinical audits;
- Peer reviews;
- Key performance indicators;
- Focused audit of specific clinical themes;
- Adverse event reporting and learning systems;
- Complaints and commendations processes;
- Practitioner feedback from all areas of health care;

- Accreditation;
- QA reviews (protected conversations); and
- Patient safety reviews (non-protected conversations).

Quality improvement (QI) is a much more challenging endeavour to achieve. Developing system-wide strategies to create change requires significant resources and time, as the opportunities for improvement are often complex and multi-faceted in nature. The ultimate goal of QI is to improve patient outcomes.

The science of improvement, which is built on the concepts and theories of Dr. W. Edwards Deming, includes the interaction of system thinking, understanding variation, the psychology of change, and the theory of knowledge that is applied to improve and achieve an optimal level of performance.

Multiple methods and tools can be used to make improvements, many of which originated from the aviation and automotive industries. The model for improvement (or Plan-Do-Study-Act cycles) developed by Associates in Process Improvement, is a simple yet powerful and successful tool for accelerating improvement that has been used by many health care organizations.

At a high level, pre-hospital QI programs typically have the following hallmarks:

- Strong leadership at every level, which mandates the organizational commitment to QI that creates a patient safety culture;
- A focus on patients and families (patient-centred care);
- Strong stakeholder relationships;
- Linkages back to the organization’s strategic plan;
- Reliable data managed by experts who understand how information works;

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- Clinical policies that set organizational expectations; and
- A commitment to evidence-based practice.

Creating QI capacity within an organization is required to identify improvement ideas and execute improvement projects.

PERFORMANCE MEASUREMENT

The quality and performance of ambulance services have traditionally focused on indicators that are deficient, are not a true reflection of quality and safety of care, and that provide little direction for improvement efforts.⁵

The 2020 Canadian Quality & Patient Safety Framework for Health Services⁶ provides evidence-informed direction for health system action to “drive improvement and to align Canadian legislation, regulations, standards, organizational policies, and public engagement on patient safety and quality improvement.” The framework highlights current and emergent needs for all health services and settings.

Data gathering on quality of care and patient safety is paramount to a sound quality program, as it indicates how the system is performing and where the opportunities are for improvement.

As part of emphasizing patient-centred care, outcome measures are expanding to include patient-reported outcome measures and patient-reported experience measures,⁷ which seek to add robust qualitative measures to the traditional quantitative measures.

DESIGNING CARE WITH PATIENTS AND FAMILIES

There is a wealth of literature supporting the engagement of patients, families, and providers as equal health care stakeholders to promote safer care and improve the patient experience.

Patient and family engagement may be conducted by asking for input, co-designing and/or partnering with them in delivering care, monitoring, evaluating, setting policies and priorities, and through governance. Encouraging discussion with patients and families helps leverage their perspectives and knowledge to inform initiatives for improvement and allows for consultation and collaboration to help improve services and, ultimately, patient outcomes.

ACCREDITATION STANDARDS

Subscribing to an approved accreditation provider and its associated cycle of performance assessment relative to standards and resulting improvement strategies can be an important enabler of a sustained and sustainable QI culture. Accreditation is most effective when it is not viewed as a single event but rather as an iterative process of an external third-party assessment against standards, creating improvement strategies to address gaps and monitoring the changes that result from those actions.

Accreditation can also act as an important component of a learning-focused health system. Evidence suggests that the influence of accreditation on quality is maximized when organizations believe both conceptually and operationally in its value; when it is viewed as consistent with the mandate, context, and mode of service delivery; and when it drives collective improvement

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Quality Based Framework

action.⁸ Developing a culture of improvement that is supported by accreditation is an opportunity for:

- Systematically engaging staff and stakeholders to develop reflective and relevant standards, and associated measurement;
- Developing strategic and operational structures to support sustained, meaningful participation in accreditation;
- Building the capacity for quality and safety leadership at all levels; and
- Creating and sharing strategic goals and associated measurement strategies specific to quality and safety.

QUALITY GOVERNANCE

There is a growing recognition that organizational governance and leadership are fundamental to high-quality care and patient safety. Adept governance is the foundation of successful organizations and ensures that decision-making, structures, and information flow are effective. In high-performing systems, standards between organizations, government and regulatory colleges should be aligned, and the jurisdiction of each is clear.

Establishing a QI infrastructure in the organization to provide leadership, strategic direction, governance, and support to organizational quality initiatives has been shown to correlate with improved patient outcomes. Functions can include developing principles, policies, and guidelines related to quality of care; studying, investigating, and evaluating care provided in the pre-hospital setting; overseeing a quality and safety plan, QI initiatives, and patient experience; monitoring quality indicators; tracking and trending patient safety events; and identifying areas for improvement.

CONCLUSION

Historically, EMS quality has focused on operational indicators that are easily quantifiable (e.g., response times). As EMS continues to integrate into the health care system, there is a need for the profession to strengthen evidence-based practices and align with the principles of quality of care outlined in this statement.

In a quality-driven EMS service, efforts to improve patient outcomes and the overall quality of care should focus on improving patient safety. As such, leaders must promote a culture of safety that is supported by patient safety reporting systems and a system-level approach to QI.

The Paramedic Chiefs of Canada have an opportunity to provide a national mandate and the leadership needed to incorporate the principles outlined in this statement and to translate the goals and actions in the Canadian Quality and Patient Safety Framework for Health Services to improve both the present state and shape the future of pre-hospital care.⁶

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Quality Based Framework

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ENVIRONMENTAL SCAN

Intelligent resource allocation will be a key cornerstone of advancing the field of paramedicine. Traditionally, 9-1-1 calls are handled by a dispatch centre, which, in turn sends out a transport ambulance.¹⁻⁸ Some jurisdictions locate the dispatch function at the provincial level, others in regional centres, and still others in a hybrid of these. There is movement toward modernizing the underlying technology by enabling texts, images, and even a phone's location information to identify a caller's location.⁹ Several areas use dispatch algorithms that are based on medical evidence, which are believed to allow for more careful triage of the incoming call. Regardless of the triage level, though, the call will almost always result in the dispatch of a full ambulance with the intent of transporting the patient to the emergency department (ED).

Recently, there has been a growing recognition that not all callers need to go to the ED. In parallel, paramedic systems have seen growing integration into, and partnerships with, many different health services. Several initiatives have grown out of this evolution, including specialized paramedics and systems, such as community paramedics and mobile integrated health teams. These models are demonstrating success at safely preventing avoidable ED transport while being closely aligned to the central concept of “Right patient, right care, right place, right time.”

In addition, alternate destination programs are enabling direct field transport of patients to more appropriate services, such as withdrawal management services or urgent care facilities¹⁰ (Hamilton Paramedic Service, internal communication). These alternate-destination programs have demonstrated a significant recovery in resources by reducing time on task by one to three hours per call.

Looking at programs from other jurisdictions across the world illustrates the potential benefits that can be gained by integrating paramedicine services within the larger health system and providing a coordinated approach to caring for specific populations in the community. A few examples highlight some of the common features of these successful initiatives:

Alberta: The province's complex care hub has been developed to manage complex patients in the home and avoid preventable ED transports.¹¹ Based out of a central “Assess, treat, and refer” centre, the program's central coordination leverages existing health services and community paramedics to provide care in the home.

Renfrew County, Ontario: Its virtual triage and assessment centre operates outside of the 9-1-1 system to provide access to virtual care from various providers, including community paramedics, registered nurses, and physicians.¹²

United Kingdom: Ambulance trusts of the National Health Service are leading the integration of all health sections into one centralized hub, which coordinates out-of-hospital care.¹³ By using a clinical hub model, access to multiple resources and response types are coordinated in one central location and provide various alternate responses to a caller—“Hear, treat & discharge,” “Hear, treat & refer,” “See, treat & refer,” “See, treat & discharge,” and “See, treat & convey.” Supported by integrated referral pathways, traditional silos are eliminated and access can be granted to any type of health provider. Initiatives include direct access to physicians in the field, managing frail and elderly patients in the home, video conferencing to manage strokes in the field, a falls response team composed of a paramedic and occupational therapist, and a mental health response unit composed of a paramedic and a mental health nurse. Initiatives that provide treatment in the home would be

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consistent with care received in long term care settings, and preventing avoidable ED transports.¹⁴ In Niagara, Ontario, emergency medical services (EMS) is using these models in their ambulance transformation initiative.¹⁵

Denmark: Call centres are staffed by physicians and nurses who provide direct advice to callers and can book an appointment for the ED via text or mobile messaging.¹⁶

Taken as a whole, enhancing traditional dispatch models, providing options to prevent avoidable ED transports, taking a proactive approach, and integrating various health sectors into one clinical hub provides the infrastructure to intelligently manage resources. Based on a review of existing programs from around the world, it is clear that the following components must be in place to enable alternate response models:

- A centralized coordination centre that is staffed by or has easy access to multiple healthcare services and expertise;
- An evidence-based dispatch system that is able to assign resources based on medical need;
- An ability to provide more detailed secondary triage for those calls identified as being lower acuity;
- A proactive approach to preventing unnecessary 9-1-1 calls by using mobile integrated health teams and community paramedics;
- The availability of alternate response vehicles that can respond to specific call types with the appropriate expertise on board;
- The elimination of silos between health system providers and a system-wide integration of each providers' specific strengths; and

- A professional practice model that allows paramedics to function under a regulatory college and direct their own unique practice needs;

MODELING, SYSTEM STATUS MANAGEMENT, DECISION SUPPORT, AND APPLYING ANALYTICS TO REAL-TIME DECISION-MAKING

Industries around the world are empowering their human resources like never before, using tools that automate and enhance service-delivery objectives in an increasingly hybrid model of person and technology. The paramedic discipline is no different. Advances in decision-support technologies using sophisticated algorithms that apply both artificial intelligence (AI) and machine learning (ML) are taking centre stage. The result of this evolution will enable the optimized allocation of paramedic resources in both urgent and non-urgent settings.

For those seeking emergency medical assistance, improvements in geolocation technology are allowing for streamlined and highly specific locating.¹⁷ Call evaluation can be augmented using smartphone features, whether it is measuring CPR compression rates¹⁸ or monitoring vital signs.¹⁹ As well, as these incidents are evaluated, an ML framework can “listen in” to help quickly and accurately identify certain types of incidents, including out-of-hospital cardiac arrests.²⁰ In parallel with emergency dispatching of paramedics, responses can be “crowd-sourced”²¹ using nearby community responders²² to attend appropriate scenarios benefiting from urgent response, often assisting the “time-to-patient” period by several minutes in the process.²³

It is well established that the principles of system status management can be used to shape deployment policies that improve

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system responsiveness.²⁴ These strategies continue to evolve,²⁵ and future improvements to computing capabilities, including quantum computing,²⁶ will make complex optimization problems easier to solve and apply in real time.

With the ongoing scrutiny of the appropriate use of a urgent lights-and-sirens response, it is reasonable to expect fewer requests for paramedic resources to be classified as urgent.²⁷ Increasingly, tools are available to identify non-urgent responses,²⁸ as well as others that support coordinated encounters, whether it be to community-based²⁹ programs or for routine inter-facility transport.³⁰ Optimized scheduling using decision-support tools will ensure maximum utilization of available resources, while fulfilling established performance objectives.

Communications centres that are responsible for the appropriate coordination of paramedic resources will tightly integrate with allied agencies. This includes well-defined interoperability channels between first-responder agencies, but also within the health system, where real-time connections to ED, health information systems, and medical providers will be commonplace. Unleashing the power of their data hubs, health systems will begin sharing information to support broader public health goals, including the use of dispatch data as a surveillance tool in monitoring the severity of influenza or other epidemics.³¹

The adoption of these technologies introduces new risks. Failures resulting in system downtimes will be acutely felt by staff whose performance has become reliant on technology.³² Business continuity planning will also include new considerations. With infrastructure that is vital to daily operations becoming increasingly virtualized in cloud-based architectures, these systems are becoming appealing targets for those with malicious intents.³³ Governments and service delivery organizations will need to adapt accordingly and implement measures that safeguard key systems.

POLICY/LEGISLATION AROUND TECHNOLOGY INTEGRATION AND PRIVACY

Emergency medical services, like other parts of the health industry, is well positioned to enhance care using AI and ML. Although there will be legislative hurdles to overcome, the health system will lead the way in this regard.

An example that demonstrates the challenges that lie ahead is what happens when a 9-1-1 call is received in the dispatch centre, requesting a response for shortness of breath. Using AI tools, keywords can suggest the appropriate response for this event. This information is enhanced with historical information from previous responses to this address, neighbourhood, or facility. As well, historical outcomes through the mining of health information identifies themes and patterns. This combined information enhances an appropriate response to this caller.

Although these concepts are new, information regarding their use is now appearing in reports and reviews, and are highlighting a number of issues and concerns. An obvious concern includes the collection of data and how it is used in the AI environment, as the applicability and reliability of AI to support decision-making relies on the sharing and utilization of large amounts of data,³⁴ which may not be permitted under the health privacy laws of specific jurisdictions. As well, there is a concern that the data will be misused, may generate biased results, or be used for other purposes for which consent has not been given.³⁵ Creating a data platform that can use AI requires a strict analytical and legal assessment of AI's impact on privacy, security, bias, and consumer protection.³⁶

Another concern is around the issue of transparency. Academics refer to the “black box” phenomenon, which describes the lack of understanding of how the output was produced and how to control the results.³⁷ Because of concerns that such opaque

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and powerful tools may be biased or discriminatory, healthcare systems may be required to transparently explain how the algorithm works to patients, practitioners, and governments.³⁸ Finally, data exploration needs to occur across jurisdictions to reduce episodes of bias and improve AI effectiveness.³⁵

COMMUNITY RESOURCE ENGAGEMENT IN THE CONTEXT OF RESPONSE, INTER-FACILITY LOGISTICS, AND COMMUNITY HEALTH IN URBAN AND RURAL ENVIRONMENTS

A systematic review of the use of text or mobile phones to alert first responders shows promising results in the out-of-hospital cardiac arrest response. One study compared the mobile app-to-text workflows and found that use of the mobile application increased response by 70% and decreased response time. The application workflow increased the likelihood that the patient would receive cardiopulmonary resuscitation before the arrival of EMS.³⁹

Transport to the appropriate destination continues to be a workflow that receives attention with respect to leveraging technology. A white paper from the European Critical Care Foundation describes an integrated decision-support solution to determine the appropriate destinations for trauma patients that would incorporate real-time geospatial data along with patient health information such as vitals.⁴⁰

The use of drones has also received a significant amount of attention, as their use by governments, including first responders such as fire departments, increases rapidly. Mathematical and geographic modelling have demonstrated theoretical benefits to the use of drones to deliver automated external defibrillators to the scene of an out-of-hospital cardiac arrest. However, there

are a number of legislative and regulatory hurdles to overcome before putting this into practice.⁴¹

CLINICAL DECISION SUPPORT IN THE DISPATCH CALL CENTRE ENVIRONMENT

Decision-making is a complex process,⁴² and decisions made by paramedics are based on a variety of information sources, including experience, knowledge, research, and available evidence.⁴³ Decisions are often time-critical and based on limited information, which can have serious consequences for patients if made incorrectly.⁴⁴ Within paramedic services, such decision-making has historically occurred between two paramedics, or with additional resources layered in to add additional experience, expertise, or organizational authority. The use of technology, demands on a paramedic's clinical responsibility, as well as the amount of information required to do the job, have all expanded significantly in recent years. With the move toward higher education, the role of paramedics in making effective and appropriate clinical decisions in equivocal circumstances is increasingly feasible.

Culturally, paramedic practice has not typically embraced an approach of shared and collective decision-making through consultation with other healthcare specialists, as is the deeply ingrained norm in medicine and other clinical disciplines.⁴⁵ Although the creation of clinical practice guidelines has aided in clinical decision support for paramedics, the introduction of experienced and increasingly specialized clinicians in expanded roles within contact centres enables 24/7 support for clinical staff at all grades.

Clinical decision-making is an inherently biased process.⁴⁶ Previous experience, cognitive biases, and other influences

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affect the quality of the interpretation, analysis, and synthesis of information and the formulation of a quality plan of action.⁴⁷ The use of clinical decision support systems (CDSS) to provide a consistent process of assessment and determining dispositions has a number of significant benefits and represents a major development in technological support for paramedics at the front line.⁴⁸ Early development of CDSS quickly established the need for a system predicated on symptom discrimination, requiring the development of a risk-ranked set of exclusion questions and appropriate pathways and dispositions. With such a tool, paramedics can provide highly effective clinical decision-making support to their peers as well as support dispatchers in redirecting patients to the most appropriate service, regardless of the initial point of access.⁴⁹

The implementation of new technologies, such as CDSS, requires support across the organization as such change is never a one-off event but rather an ongoing process. In order for paramedics to adopt such new technologies, implementation needs to be supported effectively at the organizational level.⁵⁰ As well, paramedics need to have the skills and professional capabilities to operate such clinical support functions. These skills include critical appraisal, risk stratification, and active listening.⁵¹

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Continuous Learning Environment¹

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Principle

Paramedicine is growth-oriented and involves continuous learning, and adaptation. The profession promotes knowledge generation in the context of its application, knowledge exchange, critical reflection, new insights, and innovation. Opportunities derived from advanced technologies, data environments, education, and broadening clinical pathways encourage ongoing system progress. Professional and organizational culture is structured to encourage respectful debate, discussion, and discourse that leads to the generation of new ideas and insights. Formal mechanisms allow new ideas to be systematically tested, implemented, refined, and evaluated.

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Continuous Learning Environment

INTRODUCTION

A continuous learning environment is a key piece of the puzzle for the future vision of paramedicine. It is a foundational principle that will both influence and be influenced by the other nine principles and six enablers. At the core of a continuous learning environment is the concept that knowledge is created, implemented in practice, assessed, and then repeated. This iterative process promotes an evolution of paramedicine, and a mechanism by which innovation can occur.

Implicit within the Continuous Learning Environment principle is the role of both an individual and the system in which they work. While not unique to this principle, there will be a push-pull relationship between the individual professionals of a system and the system itself. A profession that attracts and nurtures individuals who have intellectual curiosity—people who ask those classic questions: “who, what, where, when, why, and how”—and a system that supports this curiosity through valuing, celebrating, and encouraging knowledge and innovation will facilitate evolution and positive change. The counterfactual to such a culture is a profession and system that either does not support intellectual curiosity, or actively discourages or restricts it. This may be through outdated management styles and restricted opportunities to create change, especially for those on the front lines of the system.

The purpose of this report is to highlight key attributes that may contribute to a continuous learning environment in paramedicine, and enablers that can create such an environment.

KEY ATTRIBUTES OF A CONTINUOUS LEARNING ENVIRONMENT

Culture

Culture can be defined as behaviours, beliefs, and values within a particular group.² In paramedicine, culture has been described in numerous contexts, including safety³, clinical practice⁴, and research.⁵ Understanding culture, and how it may influence action, is an important step in understanding and modifying behaviour. For example, the Canadian Emergency Medical Services (EMS) Research Agenda, which described barriers and recommendations to building the research enterprise in EMS in Canada, identified culture as an important cross-cutting theme that can be a barrier as well as a strength. Specifically, it highlighted the importance of embedding “research culture” into EMS systems to encourage more research and more translation of research to action.⁶ In this context, barriers include EMS systems having little to no working relationships with academia, a lack of inclusion of research in EMS strategic planning, and a lack of appreciation of the importance of research. This culture example highlights how EMS systems don’t value research, and therefore don’t prioritize actions that build the research enterprise.

By definition, culture pertains to a particular group, but that does not mean it cannot be influenced by individuals. The professionalization of paramedicine, and the expectation of continuous education by paramedics and other professionals who work in paramedicine systems, have and will continue to increase over time. As individuals in the system are encouraged and indeed expected to continuously learn and adapt, this may exert pressure on systems to create a culture where innovation and creativity are encouraged and supported, and not criticized and denigrated. Conversely, the system may also create a culture

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of change that encourages individual professionals to challenge their own thinking. For example, paramedics reported being at the crossroads of two competing cultures when asked about paramedic-initiated community referral programs to social support services: the traditional culture of emergency care, rapid assessment, and transport, versus a new culture of assessing a patient's unmet long-term needs, and creating a plan to address these needs in the community.⁷

In short, to create a continuous learning environment, the professionals working in paramedicine must have an innate culture of curiosity, coupled with a system that fosters a culture where respectful debate, discussion, and discourse flourish, and where innovation and creativity are celebrated. Next, we examine how a continuous learning environment is facilitated with the use of advances in technology, as well as research and knowledge curation.

Technology

A sine qua non for the creation of knowledge in modern paramedicine systems is technology and data. Indeed, many recent and near future innovations in paramedicine are based or dependent on technology. Implicitly, technology encompasses the patient, the paramedic, the system and how all meet at the interface of interconnectivity. Below are examples of the influences that advancing technology have on how paramedicine operates, and how technology is contributing to an environment of continuous learning, creation of knowledge, and innovation.

The Patient

Technology has afforded the ability to deliver care in new and meaningful ways. Electronic medical records with point-of-care access provide a medical history and clinical narrative for a

patient who cannot speak for themselves.⁸⁻¹⁰ Remote patient monitoring allows trending and measurable change in patient vital signs with interventions in the management of chronic disease by paramedics.¹¹ Internet of Things (IoT) sensors can also be used to monitor a patient's environment for safety, for example, uneven surfaces and other aspects that affect quality of life and dignity.¹² Telemedicine accessed via mobile devices allows the patient to consult virtually with all providers in their care in a way that is equitable, accessible and collaborative.^{13, 14} This application of technology is creating knowledge and procedures that has never before existed for paramedicine systems, and are encouraging continuous learning for professionals and systems, and an evolution of traditional ways of thinking.

The Paramedic

Patient care & paramedic safety

Technological advancements enhance the paramedic's ability to assess and treat patients both directly and indirectly. Recent studies reveal how tools such as point-of-care-ultrasound (PoCUS)^{8, 9, 11, 15}, point-of-care testing (PoCT)^{16, 17} and even mobile CT scanners¹⁸ are increasingly available to support patient diagnostics in the out-of-hospital setting.

Augmenting direct patient care are technologies and devices that were once limited to the in-hospital setting. Some examples include video laryngoscopy to increase first-pass intubation success rates¹⁹ and waveform capnography to confirm endotracheal tube placement.²⁰ Non-invasive ventilation (NIV) devices are now readily available to reduce prehospital intubation rates,^{21, 22} while resuscitative endovascular balloon occlusion of the aorta (REBOA) can be used in the military and air ambulance settings to manage pelvic haemorrhage.^{23, 24} Paramedics can now employ automated CPR devices²⁵ and receive real-time

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feedback using accelerometers to enhance the quality of their chest compressions.²⁶

Research shows how technology has also indirectly enabled paramedics to enhance patient care. For instance, wearable technology can facilitate physician support to paramedics who are triaging in disaster situations.^{27, 28} Community paramedics are also using telemedicine to monitor their regular clientele when in-person visits are not feasible.²⁹ Other studies report how unmanned aerial vehicles can assist with scene size-up and scene management in mass casualty incidents.³⁰⁻³² Furthermore, body-worn cameras (BWCs) have been trialled to augment paramedic documentation.³³

Clinical decision support tools or applications help to reduce cognitive load, support decision-making, and enhance patient safety in the uncontrolled paramedic environment. For example, mobile applications can be used to reduce drug administration errors³⁴ and potentially to support trauma triage in the field.³⁵ Computer-based decision-making tools have also been trialled to assist with non-conveyance decisions for elderly falls.³⁶ This highlights that artificial intelligence can and will be utilised in patient care applications, for example, aiding dispatchers in identifying critically ill patients¹⁵ and contributing to definitive diagnoses.¹⁶

Finally, evolution of technology is supporting paramedic safety and wellbeing. Many paramedic services have implemented hydraulic stretchers to reduce musculoskeletal injuries³⁷, while some are issuing personal carbon monoxide detectors to their staff.³⁸ Personal wearable technologies such as smartwatches, smartphones, and other wearables can measure paramedic stress, fatigue, and a number of physiological variables.³⁹

Technological innovations are driving a continuous learning environment as paramedics, and the systems in which they work, continuously align and creatively implement devices that create new clinical and operational processes or augment existing ones.

Paramedic Education

Preparing the paramedic professional is intimately tied to their initial and continuing education process. In the pandemic of 2020, education underwent a tectonic shift. Face-to-face classes were replaced with emergency remote teaching,^{40, 41} while colleges and universities searched for computer based and immersive learning alternatives to hands-on learning.⁴²

Technologies such as mixed reality (MR) and augmented reality (AR) will supplement simulation for experiential learning while immersive virtual reality (iVR) is currently being used to improve paramedic skills acquisition⁴³⁻⁴⁵ and skills maintenance.^{46, 47}

Virtual reality, both immersive and 2D, also provide a medium for self-directed learning to improve diagnostic and critical decision-making skills⁴⁸ and has been recognized as representing “opportunities to enhance resuscitation training [which] may improve learning outcomes.”⁴⁹

Technology has provided learning supports that were previously non-existent, creating new opportunities to augment formative and continuing learning for professionals working in paramedicine systems.

Systems and Interconnectivity

With the increased burden on prehospital health care from a variety of factors, there is a push to get more value out of the healthcare dollar. To do so, systems across the workplace need to be optimized and automated using technology that enable the

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clinician and service to work at peak efficiency in a sustainable environment. These can include voice and data communications systems, information systems, and display systems.⁵⁰

These principles need to be applied to systems such as automated vehicle location (AVL) and computer-aided dispatch (CAD)⁵¹, employee scheduling, electronic patient care records (ePCR), and logistics/supply chain and resource management.

The future care context will require high bandwidth and low latency communications wherever possible⁵²⁻⁵⁴ with 5G wireless infrastructure poised to be a solution.¹⁴ These technologies will provide seamless experience to the provider and patient when interacting with cloud based or remote care resources and telepresence.¹³ There are already prototypes of the “super ambulance of the future,”⁵⁵ and proposals for framework for the interconnectivity network.⁵⁴

Short range wireless communications (i.e., Bluetooth, radio frequency identification, near-field communication) and low-energy mesh-type networks (i.e., LoRa/LoRaWAN) allow location of objects, personnel, and patients.⁵⁶ They also enable data collection from sensors to be received and consolidated onto monitored dashboards for paramedics to have available at a glance. These technologies can be used to simplify connectivity between patient care devices, paramedic devices, and the next generation of smart ambulances and care context.

Inefficiencies and compatibility issues cause failures of existing 4G and Terrestrial Trunked Radio (TETRA) communications technology to service the needs of current and future prehospital responses.⁵⁷ In the future, the architecture and interface needs to be seamless. This concept can even be extended to include platform agnosticism, mitigating any barriers that might result from not having access to a specific hardware platform.

In short, the technological systems of the future need to be seamless, mission critical, and able to operate in the austere environment of paramedicine. While difficult to create and maintain, they will provide new opportunities for learning and challenge existing practices, and hence are critical structure to a continuous learning environment.

RESEARCH AND KNOWLEDGE CURATION

As paramedicine develops the principle of continuous learning, creating knowledge or evidence will be critical. Creating knowledge may take two broad forms: the creation of new knowledge from research, and the curation of existing knowledge through research reviews.

Creating New Knowledge

No internationally accepted definition of research exists, but many definitions include the concepts of extending knowledge through some sort of organized, disciplined, and systematic process.⁵⁸ Research is a critical part of continuous learning as learning requires the most up-to-date and rigorous knowledge. From research, local knowledge gleaned from metrics, and health and performance indicators⁵⁹, quality assurance and improvement, and program evaluation information can augment our knowledge of a particular topic. However, there are numerous barriers to implementing research in paramedicine, which includes but is not limited to: funding, research positions, research knowledge, mentorship, and access to data.⁶ Without a research enterprise, paramedicine may not be able to truly understand the efficacy, effectiveness, and efficiency of its systems, and may create structure and processes that are not built on a solid evidence foundation.

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Knowledge Curation

Knowledge curation is the process by which researchers and other experts define, detail, and explore the knowledge within a field.⁶⁰ It is an important step in leveraging the knowledge that is being created from research, and translating that knowledge into meaningful action. Knowledge curation requires a knowledge base, researchers and experts in evidence-based literacy, and content experts in paramedicine. The absence of knowledge curation may lead to an esoteric knowledge base that is inaccessible to end knowledge users. An example of a knowledge curation system in Canada is the Prehospital Evidence Based Practice database created and operated by Dalhousie University ([EMSPEP Database \(TOC\) \(nshealth.ca\)](https://www.nshealth.ca/emspep)), which is a “living systematic review” that distills clinically focused research into strength and direction of evidence. Other national and local initiatives are needed, however, so professionals working in paramedicine systems, and the leaders of these systems, are equipped with rigorous and useable knowledge.

IMPLICATIONS OF THE CONTINUOUS LEARNING ENVIRONMENT PRINCIPLE FOR THE FUTURE OF PARAMEDICINE

Patient Care Implications

Recent advancements highlight how technologies for patient assessment, diagnostics, and treatment are successfully migrating from in-hospital to out-of-hospital settings. Future clinical research will continue to drive the availability of advanced technology, putting pressure on paramedic systems to provide funding, training, and operational readiness to keep pace with evidence-based care.

Patient-centred care involves bringing the right care to the patient and technology will further enable paramedics to assume the responsibility for transport versus referral decisions. With healthcare resources predicted to become increasingly strained, paramedicine will continue to shift towards a model where patients are transported to the hospital by exception rather than by default. Devices, decision support tools, and an integrated network of consultants to support a non-conveyance model will continue to play important roles to promote patient safety and ensure that the best decisions are made.

To support this, software and software interfaces need to be developed using best practices for open-source development and standardized frameworks, as well as having well-documented application programming interfaces (API) to decrease the chance of incompatibilities. This can also allow for better security auditing⁶¹ and improved longevity and compatibility. However, there are also usability risks associated that should be identified and mitigated in the product development.⁶²

With the adoption of technology to aid patient care comes the understanding that those utilizing it must be properly trained and supported and also have the requisite level of digital literacy. Paramedic organizations will need to acquire this expertise in their training and development teams, or partner with those that can provide it. As available technology becomes increasingly sophisticated, paramedics will be required to adopt a culture where change is expected and embraced.

In short, both paramedics and paramedicine systems will need to adopt a continuous learning environment as technology creates new opportunity for practice change. This continuous learning environment must include an innovative and creative culture, and a rigorous research and knowledge curation system to support learning if positive changes to patient care are to occur.

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Implications on education for the paramedic

Paramedic education, including formative and career-long learning, will continue to undergo changes that will demand exploration and harnessing of new media and flexible student-centred delivery models. Learners should be able to choose between in-class, online, synchronous, asynchronous, virtual, mixed, or augmented reality modes of education, while harnessing artificial intelligence, analytics, adaptive learning, and biometrics. Developers of continuing professional development (CPD) should harness technologies that are cost effective and enhance learning. They should also endeavour to conduct research to ensure new learning strategies are pedagogically robust.

Another aspect of education for paramedics is feedback. Many paramedicine systems do not provide opportunities for their paramedics to learn from the care that they are providing. Prehospital care is typically delivered over a short time frame that is abruptly terminated when the patient is handed over to the emergency department staff. In almost all cases, this occurs before the paramedic can learn if their diagnostic hypotheses were correct or see the impact of their interventions. This deprives paramedics of the natural feedback cycle available to in-hospital practitioners who spend longer with the patient. Formal feedback mechanisms are critical for paramedics to hone their diagnostic skills and continue to learn throughout their career⁶³, especially as paramedics may have a unique clinical reasoning approach that aligns with the unpredictable, low information and austere environment in which they often work.⁶⁴ Objective measures, often gained from technology, help paramedics appreciate the effectiveness of the care they have provided, especially as post-incident self-reflection may be inaccurate given that dynamic and rapidly evolving situations often require a mixture of cognitive and psychomotor skills. An

example of the success of feedback is in resuscitation care, where paramedic feedback is considered a critical element of improving survival.⁶⁵

In short, education for professionals that work in paramedicine systems, especially paramedics, will continue to evolve. Creating a continuous learning environment for paramedics throughout their career will involve collaboration between paramedicine systems and educational institutes, and between in-hospital and pre-hospital caregivers, but also involve a robust clinical feedback process, and most importantly require a fundamental commitment from paramedics to learn.

Implications on paramedic wellness and resilience

The work of paramedics involves a combination of physical and cognitive demands, oftentimes in challenging environments. The goal to provide the highest level of patient care is underpinned by a workforce that needs to be healthy and resilient. There are current indications that paramedics have high reported rates of illness and injury, not only in Canada, but also internationally.⁶⁶⁻⁶⁸ Additionally, minimizing fatigue during the discharge of duties should be both a current and future goal.⁶⁹

Technologies such as smart watches and other biometric monitoring devices can accurately measure aspects of health status and wellness. Paramedic services and other organisations who employ paramedics can be informed by this and work to balance the health of employees with operational readiness. Provider wellness is paramount for patient and provider safety.

The responsibility for provider health and wellness is shared between the professional and the system in which they work. Both parties need to understand the benefit of health monitoring technologies. These types of technologies should not be used in a punitive fashion, but rather to build or support a base of

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information that can inform policy and procedure and make the workplace an even safer environment.

A continuous learning environment cannot be created if paramedics and other professionals are struggling to cope. Healthy professionals are critical to achieving a continuous learning environment.

Implications on sustainability

Many of the technology innovations and activities of paramedicine systems that will inform a continuous learning environment will require energy of some sort.^{70, 71} The sustainability of paramedicine systems will be an important and burgeoning area of research as Canada has set a goal of net-zero emissions by 2050.⁷² There are many ways in which paramedicine systems can contribute to the success of this goal now, from retrofitting existing infrastructure with green technologies, the planning of new infrastructure with renewable energy sources and better building materials, to electrifying the fleet. Transportation accounts for 25 percent of Canada's national emissions⁷³, and much of a paramedicine system's emissions are from vehicle fuel related carbon output.⁷⁴⁻⁷⁶ As Canada leads the world in greenhouse gas (GHG) emissions per kilometre driven by its light duty vehicle fleet⁷⁷, this should be a priority when considering sustainability in paramedicine. Technology innovations have created opportunities for paramedicine fleets to move to electric vehicles (EV)⁷⁸, which may reduce CO₂ emissions per kilometre, resulting in immediate and lasting climate benefits. Electrifying the paramedic fleet, starting with non-transport first response vehicles, would be a reasonable first step.

Paramedic services can also take advantage of available government subsidies to achieve net-zero energy buildings, which produce and store enough energy to remain off the grid or be autonomous. This can be achieved with electricity generated from solar

voltaics, geothermal, and/or wind, coupled with battery storage. Alternatively, services can source their electricity from companies that exclusively harness renewable energy. Other initiatives may include reducing response to and transportation of patients to hospitals through alternative triage and treatment pathways.⁷⁰

In short, creating a continuous learning environment will include the generation of knowledge around sustainability of systems and activities. Ironically, the creation of a continuous learning environment itself will require considerable energy consumption.

ENABLERS TO CREATING A CONTINUOUS LEARNING ENVIRONMENT

As has been previously described, culture, technology, and research and knowledge curation are key attributes to creating a continuous learning environment. However, these attributes cannot be implemented or optimized without strong leadership and funding.

While strong leadership may be (mis)interpreted as being authoritarian and controlling, we would advocate for the opposite. Continuous learning environments will be created by leaders who support professionals rather than manage employees or students. Paramedics and the other professionals who work in a paramedicine system require formative and ongoing learning opportunities that encourages professional curiosity. They need to work in systems that treat them as professionals with an organizational culture of innovation and excellence that leverages technology. As a system, paramedicine must not be restricted or curtailed by traditional and directive "medical control" models^{79, 80}, nor by the inappropriate application of confidentiality regulations that prevents feedback and reflective practice. Rather, it should move towards a professional autonomy model that encourages growth of paramedicine through continuous learning. What is needed

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is collaboration between paramedicine and other professions, particularly from medicine. Paramedicine requires mentorship as it matures from its nascent stage of development—especially in building continuous learning environments. Professionals who work in paramedicine need support by paramedicine leaders and systems to be at their best; embracing mistakes, which will happen, but also recognizing that valuable learnings can prevent them in the future, and that punitive cultures prevent innovation and progress. Perhaps most important is the professional commitment to continuous learning from individual paramedics. While feedback and formal education opportunities can be provided by the system, it is the individuals commitment to continuous learning that will drive the system, the profession, and the quality of patient care.

Funding is a critical aspect to creating a continuous learning environment, requiring subsidization from individual paramedicine systems and educational institutions, but also from regional, provincial, and national collaborative initiatives. Research funding can be leveraged but requires solidarity in effort and collaboration to be competitive against relatively more mature research programs in medicine and other professions. Supporting the research enterprise in paramedicine in Canada will be important, including the continued elaboration of a Canadian national research agenda to align with future visions.^{5, 6, 81-83}

CONCLUSIONS

We have described three key attributes and implications of a continuous learning environment, and enablers to creating such an environment. At its core, a continuous learning environment is about knowledge creation, implementation, and continued assessment. This principle will be cross-cutting and impact, and be impacted by, the nine other principles and six enablers described in this report. As Alvin Toffler stated, “the illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.”⁸⁴

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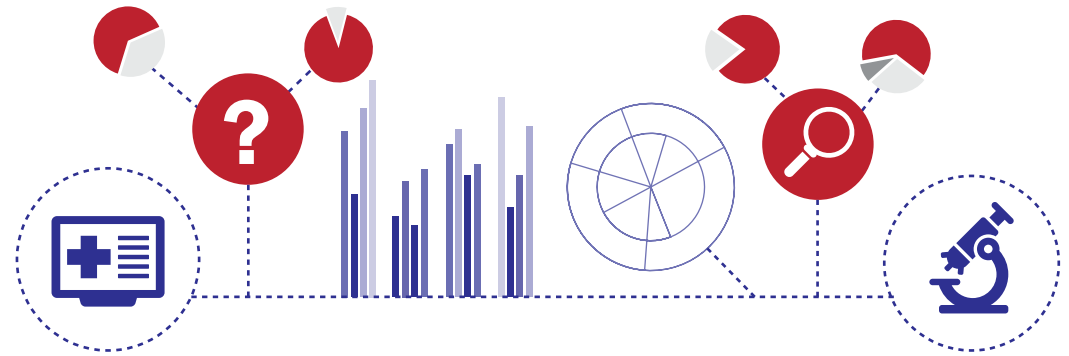
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Principle

Evidence guides the practice, oversight, and direction of paramedicine. Knowledge production and use as well as data and evidence are inherent and integrated features of paramedicine. They are used to transform paramedicine practice, systems, behaviours, and principles. Sufficient resources and infrastructure are allocated to create a vibrant research community, led by the profession, which develops a unique body of knowledge. Data environments are organized and shared, including with scholarly communities, to promote discoveries that are then transformed into evidence-informed practice that benefits patients, professionals, partners, communities, paramedicine, and the profession.

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INTRODUCTION

Paramedic and paramedic service performance quality has traditionally been rooted in metrics of response time intervals, call frequency, and service delivery for a small proportion of patients, based on emergent conditions.¹ As the field of paramedicine has expanded, it has become clear that an out-of-date, single-use data input model requires updating to reflect the much wider array of paramedic service diversification and the implementation of new technological metrics available to prepare paramedicine for the future. The paramedicine industry must make a commitment to using more sophisticated data extraction and analysis, and make data a point of focus in order to improve paramedic-centered care and create partnerships with allied agencies. These needed changes include updating an antiquated system and focusing on improving three primary regions of data: patient health records, performance indicators, and database management.

THE CURRENT STATE

Patient Health Records

Increasingly, the Canadian healthcare sector is moving away from using paper-based patient health records toward modernized electronic health records (EHRs) for patient-care documentation. In most provinces and territories, paramedic services use a combination of either paper or electronic patient call reports (ePCRs), in addition to other documentation, such as referral forms, incident reporting, and patient screening. Although the ePCR has been adopted in most Canadian paramedicine services, some services still rely on paper-based call reports.

Electronic health records offer a diverse set of improved proficiencies, including patient transfer of care to the emergency

department (ED), a reduction in organization logistical structuring, an improvement in the quality of clinician decision-making, and less time lost to managing clinical information.^{2,3} Barriers that have prevented the broad implementation of electronic patient records include a lack of technological capabilities (hardware or software), the preferences of individual users or services, a lack of economic investment, a lack of information technology infrastructure, and knowledge gaps about the benefits of EHRs.^{2,3} The type of information that is recorded in an EHR after each patient–paramedic interaction is determined by the governing bodies of each province or territory and is not nationally standardized. Although most provincial documentation standards are similar, standards on patient characteristics or paramedic interventions that need to be recorded are not routinely updated to reflect current evidence or how collected data should be used.⁴

Key Performance Indicators

Canadian paramedic services predominantly rely on traditional metrics of emergency service delivery to demonstrate organizational successes, assess quality of care, and analyze metrics for performance. Individual paramedic services use response time intervals and call response frequency as their primary data-driven appraisal processes, including metrics such as time from call dispatch to ambulance arrival and total call length.¹ Although response time metrics are a strong indicator of evaluation for public expectation of emergent calls, rapid response for life-threatening conditions only represents a relatively small proportion of total ambulance call occurrences, which are assessed for quality of care based in time intervals of response and transport to the hospital.⁵ While paramedic services also assess measurements of performance using input (e.g., number of ambulances per capita) and outcome measures (e.g., mortality

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rates of cardiac arrest patients), process measures in response times from 9-1-1 call received to paramedic arrival and hospital arrival are more easily quantifiable and readily used.¹ At the paramedic level, clinical performance feedback is underutilized in assessing and informing future practice, aside from quality improvement checks by governing bodies.⁶⁻⁸

Database Management

As a whole, the Canadian healthcare sector has increased its acquisition, exchange, and integration of patient-level data to improve practices; however, this has not been a steady priority for paramedicine. Most paramedic services (provincial or regional) warehouse their patient- and service-level logistical data within their own services and/or through independent private vendors. Personal health information legislation restricts the accessibility of patient-level data, as documented by paramedics, to primarily the healthcare custodians of the records (i.e., paramedic services).

Although provincial paramedics services usually amalgamate their data into one principal database, provinces with individual paramedic services do not. A lack of consistency across Canada is apparent in each paramedic service's ability to share patient health records due to national and provincial legislative restrictions on personal health information. Principal rationales behind a paramedic service's willingness to share its data, in capacities such as de-identified records or aggregate totals, have not formally been researched and are therefore largely unknown. The sharing of paramedic data occurs primarily between each paramedic service and the hospitals of received ambulance patients, overseeing bodies (for quality-assurance purposes), the patient, courts (by request only), and for stakeholder reporting. Paramedic service data have been shared with universities for scientific research, but not on a consistent or ongoing basis, and is largely service dependent.

FRAMING A FUTURE STATE

Rethinking Performance Metrics

There is a lack of scientific evidence to inform the establishment of valid benchmarks or evaluation spectrums for paramedic and paramedic service performance.^{9,10} As the field of paramedicine advances to provide a more diverse and comprehensive service delivery model, paramedic systems need to modernize their conceptualization of data collection and analysis.¹¹ Implementation, monitoring, and reforming industry targets could broaden paramedic services' approach to data management and create new standards for assessing quality of service. Such reform should include implementing new performance targets to be used in conjunction with traditional non-clinical measures, rather than replacing them.¹¹

New performance measures should focus on individual patients (e.g., frequency, clinical context), surrogate clinical markers, training, and high-quality benchmarks specific to clinical conditions.⁹ Clinical benchmarks should be stratified by acuity in order to measure relevant outcomes based on a patient's immediate needs and whether these benchmarks were met (e.g., survival in high acuity versus pain score improvement in low acuity); this will allow for adjusted measures of performance in the future.¹⁰

Traditional response time intervals are attractive for benchmarking performance for several reasons: they are relatively easy to measure, do not rely on direct paramedic input, are easily quantifiable, and are easily understandable by policy-makers and stakeholders.⁵ However, as paramedicine models expand into more healthcare avenues, systems should strive for modernized data collection, analysis, and reporting for paramedic clinical significance.

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Examples of diverse paramedicine delivery expansion include on-scene referrals, ambulance diversion from the ED, assessment without transport, community paramedicine, virtual-care visits, or remote patient monitoring. Each paramedicine delivery model should require its own performance benchmarks and not rely on a singular model. Such measures should be contextualized to be model specific and could expand to include triage accuracy, patient management adherence to protocols, proportion of emergency calls correctly identified at call dispatch, and patient outcomes, measured in acute contexts.¹² To align service priorities, patients, industry benchmarks, and governance, paramedic services should build obtainable measures in areas of structure (e.g., facilities, staffing, deployment), process (e.g., patients, clinical), and outcomes (e.g., patient outcomes, improvements in patient-quantifiable clinical measures, satisfaction among patients and stakeholders) as a proactive strategy for quickly advancing and expanding the profession.¹³

Mature Patient Health Records

Advancements in interoperable patient health records have been underway in Canada for many years, yet have not been broadly integrated into the paramedicine sector.¹⁴ A central component for integrating patient health records in paramedicine will be a softening of the barriers that prevent clinicians from accessing paramedic-documented patient data. Granting wider accessibility to paramedic data will rely on health system administrators, governments, and paramedic services working toward an integrated health record and developing standards for real-time access.¹⁴

All patient health records should be transitioned away from paper-based documentation to electronic recording, as studies suggest that EHRs increase compliance with assessment

documentation, reduce inconsistencies, improve productivity, reduce costs over time, and enable further efficiencies such as coordinating care amongst clinicians and granting patients access to their records electronically.^{15,16} As traditional paramedicine advances into divisions of primary, preventative, community, and specialized care, granting clinicians access to EHRs, as documented by paramedics, will be essential to establishing further coordination of patient care plans and ensuring patient safety if transportation to alternative healthcare destinations becomes more prevalent.^{17,18}

Paramedicine can contribute to a more integrated healthcare system by enabling mature electronic patient records. Mature records transition away from single-use and basic-entry reports to more advanced data entry with integration in advanced healthcare portals, data hubs, and administrative datasets. Examples of mature patient health records in the paramedicine context include an increase in point-of-care data inputs, auto-completion of frequently used fields for repeat patients, patient portal connectivity, coordination of care planning for non-emergent conditions, referrals, remote patient monitoring, access to prior ambulance patient health records in real time (i.e., at time of 9-1-1 response) or conducting virtual health consultations.¹⁹

In the absence of a nationally standardized EHR, provinces should move toward creating a standardized care report template that complies with provincial legislation standards and is specific to a model of paramedic delivery of service (e.g., 9-1-1 response, community paramedicine).²⁰ Due to the diversity and complexities of delivering paramedic service in each province, a nationally standardized EHR may not be feasible or beneficial. The construction of a national minimum dataset that can act as a standardized minimum requirement for recording patient-level

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characteristics would assist in streamlining data consistency, support innovation provincially, and empower prospective analytic approaches on a national scale.

Reporting Systems, Quality Improvement, and Data Access

Although the potential for improving paramedic service functionality and patient care management using big-data analytics has been recognized, the paramedicine industry has broadly underutilized this resource.²¹ The implementation of big-data analysis for examination, monitoring, or reporting on paramedic performance at the national, provincial, service, regional, or patient level has been difficult to translate into improvements without established high-quality databases or accessibility by entities outside of the healthcare custodians (paramedic services). Provisions and clear guidelines should, if they do not already, be generated in each province to provide healthcare agents, researchers, and stakeholders not specific to paramedic practices a systematic process to apply for temporary or project-specific access to population-level paramedicine data for research and quality-assessment purposes. Additionally, the creation of a singular provincial database to house ambulance electronic patient health records could help streamline data collection for each service (if not a provincial service), ensure data are collected accurately, and prevent fragmented, inoperable data.²²

The technological requirements for such production function and data management infrastructure could be initiated through private vendors that specialize in data repositories, if paramedic services are unable to do so. By standardizing high-quality paramedic data collection and storage within a consolidated data registry, aggregate and patient-level data could be made available to external instructional bodies to create population-level metadata with linkages to administrative databases, such as the

Canadian Institute for Health Information or the Institute for Clinical Evaluative Sciences, given that privacy and legislative concerns are mitigated by the prospective benefits of sharing paramedic health data.^{21,23–25}

By constructing a population-level paramedic database on a provincial or national scale, it will become more feasible to study changes in daily paramedic operation and assist in its development through avenues of research, artificial intelligence, prognostic modeling, big-data analytics, and regionalized analysis. Linking paramedic records to administrative hospital outcomes will also create a diverse opportunity for individual paramedic growth and feedback.

Metadata examination could provide new opportunities for research in paramedicine, such as comparing the agreement of paramedic-determined primary complaints with hospital diagnoses, or investigations into the impacts of paramedic-initiated interventions on patient outcomes in the ED. A degree of future-state performance indicators should be made available through publicly accessible environments, such as Statistics Canada, to encourage transparency and uniformity in reporting and provide user-friendly statistics for public access.

CONCLUSION

Paramedicine must commit to modernizing and broadly implementing complex data measurement, extraction, and analytical resources for the advancement of the profession. Focusing on patient health records, performance indicators, and database management is an important strategy to help generate a data-driven foundation for paramedicine to build on for the future.

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