Community Paramedic Literature
## Contents

Creating a practical Paramedic Response Unit Program Evaluation ................................................................. 3  
Choice of EQ 5D 3L for Economic Evaluation of Community Paramedicine Programs Project .........................16  
Evaluating the impact on 911 calls by an in-home programme with a multidisciplinary team ......................21  
Community Paramedicine: higher education as an enabling factor .................................................................30  
Community Paramedicine: A Part of an Integrated Health Care System .....................................................39  
Expanding paramedic scope of practice in the community .................................................................................46  
Community Paramedicine Framework for Planning, Implementation and Evaluation .......................................66  
Economic Value of Community Paramedicine Study (CPS) Patient / Caregiver Satisfaction Survey ...........89  
CREMS Overview .................................................................................................................................................92  
The geographic influence on delivery of community paramedicine programs to frequent users in the County of Renfrew, ON – a poster presentation ..................................................................................96  
Living Longer, Living Well Highlights and Key Recommendations ..........................................................................................................................97  
Economic Value of Community Paramedicine Sample Selection Protocol ..................................................119  
Identifying Sepsis in the Community ...............................................................................................................123  
Integrating a community paramedicine program with local health, aged care and social services: ............131  
A Survey of Community Paramedic Programs in Ontario ...............................................................................138  
Good medicine — the GP paramedic .............................................................................................................160  
Community Health Evaluations Completed using Paramedic Service CHECUPS: ..................................161
Creating a practical Paramedic Response Unit Program Evaluation

The following report will outline a practical, implementable program evaluation design for the County of Renfrew Paramedic Service Paramedic Response Unit Program utilizing the Logic Model Design. The report is divided into two sections - A: Evaluation Design Rationale and B: Logic Model Design – and provides an opportunity to continue the development of the program by outlining the research design, operationalizing outputs and linking constructs and defining statistical methods.

The County of Renfrew Paramedic Service is challenged by its vast geography and unique population settlement patterns and continuously adjusts its service delivery plan to try to improve response times throughout the County. For 2011, the service responded to just fewer than 19,000 emergencies of which 66% were code 4 life threatening calls (County of Renfrew, 2012). Sixty percent of all calls were utilized by patients over the age of 60 years of age and 27% of all calls were utilized by patients over the age of 80 years of age (County of Renfrew, 2011). The catchment area is over 9000 km² with a population of 120,000, expanding to 150,000 for the summer cottage season (Statistics Canada). The Service continues to meet the community demand for non-emergency transfers and inter-facility transfers which also impact its ability to respond to emergency calls in the rural communities.

The County of Renfrew assumed direct responsibility for the provision of land ambulance services on January 1, 2005. At that time the Service model was a Basic Life Support provided by Primary Care Paramedics staffing 7 vehicles 24/7 deployed from 7 leased Ambulance Base Stations located in Arnprior, Barry’s Bay, Chalk
River, Eganville, Pembroke, Petawawa and Renfrew. An additional 10 hour vehicle operating Monday-Friday was deployed from the Pembroke Base to accommodate the large number of non-urgent and scheduled transfers from the Pembroke Regional (General) Hospital. The deployment plan allowed for as many as 5 vehicles to be out-of-county on non-urgent transfers.

Despite regular and strategic tweaking of the current deployment model of 10 staffed ambulances during days and 7 during nights the Service continues to be unable to make dramatic improvements to emergency response times in several areas. An overview of the utilization and response time patterns from 2005-2010 demonstrates that although the Service has been able to decrease its overall response time within the County of Renfrew throughout this time period and now consistently meets its legislated requirements, within the County there are a number of regions that continue to be well outside this 19:00 minute standard. Rural areas in the County with very low call volumes trend toward longer response times, however there are several other areas with higher call volumes that also show this pattern.

Several generalizations paint the picture of this current reality:

- Communities with a significant population density have shorter response times and higher call volumes.
- As the closest available ambulance is dispatched to an emergency call, those areas with a higher frequency of emergency calls force the movement of available services towards them, thus compounding the difficulties in the more remote areas.
• Municipalities where hospitals are located have shorter response times as do those communities whose population density is greatest along the Hwy 17 corridor. Logically and factually speaking the more isolated the area the longer it takes for Paramedics to respond.

• Since 2008 there has been a drastic decrease in the number of deferrable and non-urgent (Codes 1 and 2) calls attended to by the Service. There is a direct correlation to an increased number of requests for prompt (Code 3) calls in the same timeframe (Wirth, County of Renfrew Health Committee Report, 2011).

In addition, recognizing the ever present pressures within the health care system and consistent increase in demand for assistance, the Paramedic Service is responding to these needs through the creation of a Community Resilience Program. Ongoing community and industry partnerships continue to be developed and programs are being delivered which will have a positive impact on morbidity and mortality rates in the county. In consultation with a number of community stakeholders, the County of Renfrew Paramedic Service has developed a number of a programs and services, such as an Aging at Home Program, Wellness Clinics, a Heart Wise Program, AED / CPR Education Program, and the PACCT Program.

Currently, high performance EMS systems have health resources positioned for rapid response but are not always delivering emergency patient care. The utilization of these units can be optimized to provide primary care, as well as emergency services. Rural Australia paramedics have the opportunity to integrate with other health care providers when they are not responding to emergency calls (O’Meara, et al, 2007). Paramedics can contribute to health care when not participating in emergency responses, improving integration with community stakeholders, by focusing on health promotion and illness prevention (Stirling, et al, 2007).
Community Paramedicine is defined as a model of care whereby paramedics apply their training and skills in “non-traditional” community-based environments (outside the usual emergency response/transport model) (EMSCC, 2006). The community paramedic may practice within an expanded scope by applying specialized skills/protocols beyond that which he/she was originally trained for. Or the community paramedic can practice in an expanded role, working in non-traditional roles using existing skills (IRCP, 2011). An example of the expanded role includes the Long and Brier Island Project in the Province of Nova Scotia, Canada, which established a community partnership between the ambulance service and primary care agencies dramatically, altered the traditional work of paramedics (Martin-Misener, et al, 2009).

The County of Renfrew Paramedic Service is considering the creation of an additional program to address both challenges of improving emergency response times as well as adding services to Community Resilience. The Paramedic Response Unit (PRU) Program is being proposed as possible additional program to address the two challenges.

B: Logic Model Design

Our department has come from a ‘start-up’ phase including identification branding, bases, vehicle, personal protective equipment, uniforms, and scheduling (2005-2010). Recently, the paramedic service has moved towards identifying and improving upon our service delivery. The goal of the Performance Measurement System for our department was to re-focus on the next phase of our business, which is estimated to be for the next 5 years. Our department adapted the balance score card. It has the four components with the ‘community’ on top being feed by the remaining three components. The balance score card approach ensures that all of ours services contribute to the achievement of desired results defined in our vision: improved quality of life of
both the residents and visitors of the County of Renfrew. Three themes of (i) capacity building, (ii) innovation and (iii) synergistic partnerships are utilized as mechanisms that define our day to day activities. Each area is a guide that is utilized for reporting our activities to the County Council. Although final decisions are authorized by our department head, many of the ideas are from staff with implementation and monitoring managed by staff. Communication and flexibility with implementation of different strategies provide the best opportunity of success.

With the vision of the department in mind, utilizing the program logic model as well as the formative evaluation process will ensure the best opportunity of establishing a clear picture of the program operation and what it is intended to accomplish. The logic model is a visual representation of the programs that will show how a program is intended to work. In addition, as McDavid and Hawthorn (2006) state in Program Evaluation and Performance Management: An introduction to Practice, “formative evaluations are primarily associated with the analysis of program implementation, with a view to providing program managers and other stakeholders with advise intended to improve the program on the ground.”

In order to construct a PRU Program Logic Model, it was important to engage paramedic staff by surfacing the assumptions of the program. Two town halls allowed the management team to engage the staff and communicate the suggested inputs, components and long-term outcomes of the PRU Logic Model Program. Many questions were asked about the inputs associated with the program, including type of vehicle, number of staff required, qualification of staff participating in the program, hours of operation, starting base location, equipment being utilized, and skill set required. In addition, the components and long-term outcomes were articulated to the staff. From that point, an internal stakeholder planning session was arranged to engage the staff with the
further development of the logic model. Up to three (3) days were scheduled to allow for the development of the implementation objectives, outputs, linking constructs and short-term outcomes. Once the staff had an opportunity to articulate their vision of the program, the senior management team will continue to develop the program. The contribution of staff was utilized in the development of the PRU logic model. The two main components of the PRU Logic Model Program are (1) to respond to life threatening code 4 emergency calls in the community and (2) to lead in the Community Resilience Programs. These two components are linked to the respectively to the two program outcomes of (1) decreasing the overall response times to life threatening code 4 emergency calls in the entire county and (2) having an increased presence in the Community Resilience Programs. The implementation objectives, outputs, linking constructs, and short-term outcomes bridge the components through to the long-term outcomes. The diagram found in Appendix G illustrates each of the parts of the PRU Program logic model. The second part of the PRU Program logic model is the component. There are two components, one of which is the PRU responding to Code 4 life threatening calls. This component is linked to the implementation objective of being available to respond to these calls that originate in the two specific locations within the county – specifically the Whitewater Region and the Killaloe – Griffith corridor. These code 4 responses will be linked to the outputs measurements of the number of calls the PRU respond to. This output in connected to two linking constructs – (a) the number of treat and release and (b) the number of alternate referral transports. Treat and release as well as alternate referral transports, which include having the patient transported to a local Community Health Center or directly to a treatment clinic would result in the bypassing of the Hospital Emergency Department, saving both the patient the inconvenience of being put through the patient flow process as well as the health care expense, contribute to the overall decrease in
service utilization and therefore free up resources for code 4 calls that require transport to definitive care. The linking construct is connected to the short term and long term goals are (a) first reducing the response times in the specific areas of Whitewater Region and Killaloe-Griffith corridor and (b) second reducing the overall response time for the entire county.

The second component of the PRU Program Logic Model is ‘leading in the Community Resilience Programs’. This component is connected to three Implementation Objectives, including (a) wellness clinics, (b) integration and collaboration with community organizations and (c) public education / public relations. Each of these implementation objectives are connected to outputs, including (a) number of wellness clinics, (b) number of health care providers integrations and (c) number of community/educational organizations. Linking constructs for the wellness clinics includes measuring the number of clients assessed; for the integration opportunities, the linking construct is the number of adhoc home visits, and finally, the community/educational organizations are connected to the linking construct of measuring the number of public education / public relation events performed in the community including the number of completed grade and high school presentations. The linking constructs of both the wellness clinics and adhoc home visits are linked to the short term goal in increasing the sense of security of the clients who are at home. The increased number of PR events and school presentation link to the short term goal of increasing the awareness of the paramedic service and proper utilization of 911. Each of these short term goals are linked to the overall long-term goal of increasing Community Resilience.

There are a number of external factors that could influence the PRU Logic Model Program outcomes. Some factors may include the time of day when the emergency call is performed. The
operation of the PRU Program will be twelve hour days only. In addition, the frequency of the call volume can result in the PRU crew being busy with one call when a second or third emergency call requires a response. Weather conditions, road conditions and distance to the emergency call can affect the time required to response to the code 4 emergency call. Social, economic, and health indicators can affect the Community Resilience Program. Research demonstrates that there are a number of factors that determine health beyond availability of and access to health care. These factors, or determinants of health, often occur well before a person becomes ill or seeks out health care. The range of factors includes food, housing, poverty, education, child development, gender, genetics, work conditions, physical and social environment, health practices, social networks, and culture (Hay, Varga-Toth, and Hines, 2006). These factors are critically important in shaping the overall health of a population. In addition to these determinants, the County of Renfrew community needs vary widely demonstrated by the following characteristics: multilingual areas in the county, wide coverage with rural pockets, aging population, 50% of population is overweight or obese, 47% are physically inactive, 25% are smokers, 18% have high blood pressure, 59% do not eat recommended +5 vegetables /fruits per day, high % unemployment, low education levels – post secondary education (54%), high poverty rates & low resource communities, and inadequate affordable housing (Champlain LIHN, 2010). Finally, for the paramedic service, the aging population will have an effect on the number of code 4 emergency calls we expect to respond to in the future. As individuals increase in age from 60 to 70 years of age, the frequency of ambulance utilization increases by over 40% (Clark, FitzGerald, 1999). For the year 2011, our service provided just fewer than 19,000 responses to the communities of the county. Of that, 66% were to individuals over 65 years of age (County of Renfrew, 2012).
This report has outlined a practical, implementable program evaluation design for the County of Renfrew Paramedic Service ‘Paramedic Response Unit’ Program by utilizing the Logic Model Design. By reviewing the evaluation design rationale and utilizing the Logic Model Design, there is an opportunity to continue the development of the program by outlining the research design, operationalizing outputs and linking constructs and developing statistical methods.
Appendix – A

Paramedic Response Unit Logic Model

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Components</th>
<th>Implementation Objectives</th>
<th>Outputs</th>
<th>Linking Constructs</th>
<th>Short-term Outcomes</th>
<th>Long-term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response to code 4 calls</td>
<td>Code 4 Response</td>
<td># of Code 4 Calls</td>
<td># of Treat and Release Calls</td>
<td># of alternate Referral Transports</td>
<td>Decrease target areas response times</td>
<td>Decrease overall County response times</td>
</tr>
<tr>
<td>Operational costs (wages and benefits)</td>
<td>Wellness Clinics</td>
<td># of Wellness Clinics</td>
<td># of clients assessed at each wellness clinic</td>
<td></td>
<td>Increased sense of well being</td>
<td></td>
</tr>
<tr>
<td>Logistic costs (vehicles, patient care equipment, disposable equipment)</td>
<td>Lead in the Community Resilience Programs</td>
<td>Integration and Collaboration with Community Organizations</td>
<td># of integrations with health care providers</td>
<td># of Home Visit Referrals</td>
<td>Increased sense of security</td>
<td></td>
</tr>
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<tr>
<td></td>
<td>Public Education</td>
<td># of community groups</td>
<td># of PR Events</td>
<td></td>
<td>Increased awareness of PS and 911</td>
<td></td>
</tr>
</tbody>
</table>
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Choice of EQ 5D 3L for Economic Evaluation of Community Paramedicine Programs Project

As articulated in the project Charter and PICOT Statement, the Economic Value of Community Paramedicine Programs Study (EV-CP) will seek to determine:

- The economic value of community paramedicine programs for clients and impact on specific services (e.g., EMS and ERs),
- The impact of CP programs on other community-based services, and
- The projected economic value of CP programs on global healthcare costs.

An additional literature review was performed in August 2015 through an approach which was strategically planned, extensive and focused to:

- Consider published best practices in evaluation of community and population based health and wellness initiatives and interventions
- Further inform the project evaluation methodology, particularly the analysis, to gain optimal results while introducing minimal experimental bias and effort needed by project participants
- Maximize generalizability of results across Canada and internationally and to follow on peer-reviewed published articles in community paramedicine

This second literature review (the first having been performed as part of the original methodology design, 2014) was undertaken by one member of the HFHG research team who performed this through consultation with experts in the field of paramedicine followed by a web search. Search engines employed were CINAHL and PubMed, the first step being the identification of relevant titles using various combinations of search terms ‘community,’ ‘paramedicine’ ‘practitioner,’ ‘cost,’ ‘benefit,’ ‘economic,’ ‘Canada,’ and ‘value.’ Abstracts from relevant articles were then reviewed and those warranting further exploration were read in their entirety. High quality articles thought to contribute to development and critique of the project methodology at hand were then included in the project library.

The over-arching purposes and context for this project were the major considerations in undertaking this literature review to further inform methodology. Community paramedicine in this project is hypothesized to be a new, value-added intervention to the current healthcare system. It is thought to be effective from an economic sense, among others, in both rural and urban scenarios; the extent to which economic value is comparatively realized in these environs is an additional aim of the project.

Within the last decade of Canadian healthcare, it has become popular to consider healthcare service as a value laden proposition and measure its effectiveness in that context. The previous view taken upon healthcare as mainly a cost to societies to be minimized while maintaining quality through increased efficiencies has given rise to:
“often conflicting goals, including access to services, profitability, high quality, cost containment, safety, convenience, patient-centeredness, and satisfaction. Lack of clarity about goals has led to divergent approaches, gaming of the system, and slow progress in performance improvement (Porter 2010).”

Value, a product of measuring outcomes relative to costs, considers efficiency. Therefore, any healthcare trial which seeks to determine value of an intervention will inherently incorporate the influence of efficiency; the question remains as to how to define value in healthcare from this perspective. The cost of this intervention, community paramedicine services, is readily derived.

Value in this project will be measured for those patient groups with predominantly one of three chronic diseases, congestive heart failure, chronic obstructive pulmonary disease and diabetes and for the aggregate. Client participants in this study are all high intensity users of 911, emergency rooms and hospital admissions. Porter (2004) states “Providers tend to measure only what they directly control in a particular intervention and what is easily measured, rather than what matters for outcomes.” He further purports “For any condition or population, multiple outcomes collectively define success. The complexity of medicine means that competing outcomes (e.g., near-term safety versus long-term functionality) must often be weighed against each other.”

For this project, we have defined value through the use of Quality Adjusted Life Years. The term Quality of Life is highly subjective and varies considerably across nations and cultures; any instrument used to measure this must take into account local preferences for health (for example, is heart disease worse to have than arthritis in the UK?) as well as be valid and reliable across various disease states. For all reasons discussed to this point, the measurement instrument chosen is the EuroQuol Group’s EQ 5D 3L.

The 2012 Symposium Proceedings for Patient-Reported Outcomes Measurement in Alberta: Potential of the EQ-5D introduces the instrument as:

“The EQ-5D (‘EuroQuol – 5 dimensions’) is a patient-reported outcomes measure that captures five dimensions of health-related quality of life: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. It is appealing as a standardized health outcomes measure for Alberta because, as a generic measure, it is applicable to a wide range of health conditions and can be used as a research tool at both the population health and program levels, and has potential as a clinical monitoring tool. It is designed for completion by the patient, is quick and easy to use and adaptable for use in surveys, face-to-face interviews or the clinical setting. It is commonly used around the world in clinical, population health, health economics and research applications.”

Speaking to the current context of healthcare and research we are in, the Symposium acknowledges stronger rational for obtaining patient-reported outcome measures (PROMs):

“the goal of a patient-centered healthcare system is to improve the health and functioning of patients...Moreover, self-care is an important part of healthcare, so obtaining some level of
measurement of patient health and health behaviors will be important for the overall evaluation of health and healthcare.”

In terms of this value approach to measuring interventions in healthcare, QALYs:

- Takes into account both the quantity and the quality (utility) of life
- Quantity refers to years lived, utility is measured as the EQ-5D converted to index numeric
- Values (QALYs) can be readily projected for interventions
- A year of perfect health is scaled to be 'worth' 1
- A year of less than perfect health 'worth' less than 1
- Death is commonly indicated by 0

The use of the EuroQuol represents but one method to inform decision makers regarding resource allocation surrounding interventions. Specific cost savings for elements of the healthcare system can be highly significant and relevant. Since they are readily measurable in most scenarios and represent such a significant outcome of health status, the number of hospitalizations and length of stay (LOS) days saved are often used in value measurements for interventions.
Community paramedics, as a primary care provider, act at the interface of the patients and numerous other elements of the primary care system. It has been postulated that community paramedics (CPs) can stimulate use of underutilized, relatively inexpensive community based services. Since CPs have a broad knowledge of health conditions and associated service providers, it is also thought that client utilization of community services becomes more integrated and efficient.

As a final step in this review, thematic analysis was performed to list the questions the articles under review were attempting to address. This was performed to inform optimally comprehensive costing (cost savings) throughout the Hastings-Renfrew study as a result of community paramedicine. Questions (in no order of priority) emanated as:

- Does community paramedicine act as a safe alternative to more expensive forms of healthcare?
- Does CP reduce 911 calls and ER visitations by clients by ambulance and on their own? Is off-load time reduced?
- Does CP have an effect on EMS service response times? Is it favorable, what is the mechanism and by how much?
- On visiting ERs, do clients require less diagnostic workup and time spent?
- Will CP reduce hospital admission rates and lengths of stay (LOS)?
- ..............in this line of questioning, does CP provide a method for funding agencies to control paramedic costs in the face of aging demographics, increasing prevalence of chronic disease and population growth?
- Does CP promote more efficient use of community resources?
- To what extent does community paramedicine decrease demand on long term care facilities?
- To what magnitude does CP facilitate increased access to primary care physicians and their care teams (example Family Health Team)?
- To what extent does community paramedicine increase and improve communication among clients and their healthcare providers?

While by no means comprehensive, these questions represent avenues for exploration through quantitative data collection and analysis. This has been planned to supplement the EQ-5D study.

There remains at least one significant challenge to the use of the EQ-5D in the analysis to be performed in our project. Inclusion criteria for participation mandate that clients have at least one chronic disease. Over the course of 12 months, one would normally expect disease progression and worsening of EQ-5D scores. The effect of CP may then turn out to not be improvement in QALYs but rather, less progression of the course of disease.

This will be uniquely addressed through regression analysis performed on one or a few quantitative indicators arising from the question list above.
Choice of EQ 5D 3L for Economic Evaluation of Community Paramedicine Programs Project

Calculating the Economic Impact

As noted previously, two methods for calculating economic impact have been chosen this study: activity-based-costing (ABC) and cost-utility analysis. ABC analysis will compare utilization between the control and intervention group using 3 years’ retrospective data and that produced in the study timeframe.

Cost-utility analysis will be calculated by comparing entry and exit study EuroQuols among the control and intervention group, individually and for the aggregate.

We are using the EuroQuol 5D 3L, usage of which was granted by the EuroQuol Group to this study on the basis of participant numbers and purpose.

As mentioned previously there are 5 levels (domains) which are as scored 1, 2 or 3. Accordingly, there are 243 potential combinations for the EQ 5D 3L. The EQ index is obtained in one of two ways: by finding the index numeric on the relevant country matching map of EQ 5D 3Ls to Indices or through an equation unique to the country (reflecting population preferences for health). We shall use both methods as a cross-checking effort.

EQ 5D 3L indices range from 1 through zero to $-0.6$. One (1) is perfect health, diminishing to zero (0) which is death and indices below zero represent states worse than death. This number is then multiplied by the value of one year’s life to arrive at a QALY score.

There exist country specific values for QALYs of one (1) year, in the range of $30,000 for Canada.

Economic impact is then:

\[
\frac{\text{\$QALY (study exit)} - \text{\$QALY (study entry)}}{\text{number of participants in group}} = \text{Economic Impact}
\]

Where for each group \[\text{\$QALY} = (\text{sum of each participant’s value of } 30,000 \times \text{EQ index})/(\text{number of participants in group})\]

This will be calculated for the control and intervention groups separately. As noted earlier, given progressive disease, without intervention one would expect the impact score to be negative.

The control score is then subtracted from the intervention score. Our hypothesis is that intervention score will be > control score. Cost utility is then calculated by dividing this number by the marginal cost of the paramedic service. Cost effectiveness exists if this ratio > 0. Cost efficiency exists if the ratio is > 1 (one).

A number of further analytical possibilities exist to be explored in this study. In this project we will be performing this analysis for a rural area and an urban one and comparing values. Additionally, a variety of calculations could be performed to explore the impact on varying demographic profiles. The
opportunity exists to perform this analysis to assess the impact of community paramedicine on the various chronic diseases included in this study.

Depending on the choice of inputs for the ABC analysis, one would expect a very strong correlation between results found using the two analytical methods. ABC will have the role of complementing and giving further meaning to the cost-utility analysis.

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Prepared by C.W. Ashton, MD
20 August 2015
Evaluating the impact on 911 calls by an in-home programme with a multidisciplinary team

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One of the goals of the Emergency Medical Services Chiefs of Canada (Emergency medical servicesCC), as defined in The Future of Emergency medical services in Canada: Defining the New Road Ahead (Emergency medical servicesCC, 2006) is to ‘mobilise health care. This is defined as ‘creating innovative models of service delivery to meet community-defined needs’ (Emergency medical servicesCC, 2006; The Community paramedic Program, 2009). Collaboration of emergency medical services and community organisations such as primary health care providers, social service agencies, and public safety groups can enable innovative initiatives that have the potential to improve the level of health care within a community and reduce system pressures. The unique mobility of Emergency medical services can lead to the provision of primary health care by paramedics at the place and time where citizens need it, providing services according to the scope of practice determined and required by each community (Emergency medical servicesCC, 2006; Blacker et al, 2009).

Currently, high performance Emergency medical services systememergency medical services have health resources positioned for rapid response but are not always delivering emergency patient care. The use of these units can be optimised to provide primary care, as well as emergency services. Rural Australian paramedics have the opportunity to integrate with other health-care providers when they are not responding to emergency calls (O’Meara et al, 2007). Paramedics can contribute to health care when not participating in emergency responses, thus improving integration with community stakeholders (Stirling et al, 2007).

Abstract

Introduction: Collaboration of emergency medical services and community organisations such as primary health care providers, social service agencies, and public safety groups can enable innovative initiatives that have the potential to improve the level of health care within a community and reduce health care system pressures. The purpose of this research is to evaluate the impact of an ‘aging at home’ program that uses an integrated health care team involving community paramedics on 911 calls.

Methods: This study involved a retrospective case series involving a chart review of clients participating in the ‘Aging at Home’ program located in a rural community in Ontario between January 1 2010 and April 30 2011. Each record was evaluated for the presenting problem and whether transport to a local hospital emergency department was initiated by using 911.

Results: Of the 129 client interactions by community paramedics and personal support workers, 13 chief complaint categories were determined and 15 incidents resulted in emergency department visits by using 911.

Conclusion: The use of community paramedics in an integrated health care team aimed at supporting clients living at home demonstrates a negative correlation in the use of 911 calls.

Key words

Paramedic ● 911 ● Integrated ● Multidisciplinary ● Community health initiative

Accepted for publication: 16 May 2012

Community paramedicine is defined as a model of care whereby paramedics apply their training and skills in ‘non-traditional’ community-based environments outside the usual emergency response/transport model (Emergency medical servicesCC, 2006). The community paramedic may
practice within an expanded scope by applying specialised skills/protocols beyond that which he/she was originally trained for. Alternatively, the community paramedic can practice in an expanded role, working in non-traditional roles using existing skills (International Round of Community Paramedic [IRCP], 2011). An example of the expanded role includes the Long and Brier Island Project in the Province of Nova Scotia, Canada, which established a community partnership between the paramedic service and primary care agencies that dramatically altered the traditional work of paramedics (Martin-Misener et al, 2009).

Background
One of the current issues facing the health care system in the province of Ontario is the inappropriate use of acute care beds. The Ontario government created 14 Local Health Integration Networks to plan, integrate and fund local health services in each region of the province.

[The] aim of the Champlain Local Health Integration Network is to help coordinate health services so that people receive the care they need and deserve in a timely way. The Local Health Integration Network (LIHN) does not provide services directly. Rather, the mandate is to ensure that services are well organised, appropriately funded and meet the needs of residents of all ages’ (LIHN, 2012).

The LIHN reported that the use of acute beds was not being optimised because the beds were being occupied by patients that should be in an alternative level of care bed. The average alternative level of care occupancy rate in acute care beds continues to rise (LIHN, 2006). A significant number of these patients could return home assuming adequate community supports and therefore potentially decrease the inappropriate use of acute care beds in Ontario hospitals. In response to these issues facing our current Health Care System, the Government of Ontario launched the Aging at Home Strategy. The purpose of this strategy is to allow seniors to live with dignity and independence in their own homes (LIHN, 2008; Lum, 2009). One of the initiatives developed out of the Local Health Integration Network Aging at Home strategy is the 24-hour flexible in-home support housing program (Champlain LIHN, 2010). Services for these high-risk seniors include 24-hr urgent/on-call response, security checks, reassurance services, 24-hr pre-scheduled services (seven-days-a-week, 365-days-a-year), immediate medical and trauma emergency response, personal support and homemaking, and care coordination. These assisted living services are provided in part through collaboration between North Renfrew Long Term Care and the County of Renfrew Paramedic Service.

Methods
Study design
This study was a retrospective case series study that involved reviewing program charts of clients that participated in the LIHN ‘Aging at Home’ 24-hour flexible in-home support housing program located in a rural community, in the province of Ontario between 1 January 2010 and 30 April 2011. Either a community paramedic or personal support worker responded to each client medical or trauma incident. The request for assistance was generated by an alarm activated system, which the client used.

Primary outcome
The purpose of this paper is to review whether the use of community paramedics as part of an integrated health care team, can support clients living at home, resulting in a decrease in the use of 911 calls. The primary outcome is to measure the use of 911 activations.

Setting
The Aging at Home program is situated in the town of Deep River, part of the County of Renfrew, which encompasses 17 lower tier municipalities and one City. It had an area of approximately 770000 hectares and a population of 97454 in 2006 (Statistics Canada, 2011).

The County of Renfrew paramedic service is challenged by its vast geography and unique population settlement patterns and continuously adjusts its service delivery plan in an attempt to improve response times throughout the county. In 2011, the service responded to just fewer than 19000 emergencies of which 66% were code 4 life-threatening calls (County of Renfrew, 2012). Close to 60% of all calls were used by patients over the age of 60 years-of-age and 27% of all calls were used by patients over the age of 80 years-of-age (County of Renfrew, 2011). The catchment area is over 9000 km² with a population of 120000, expanding to 150000 for the summer cottage season (Statistics Canada, 2011). The service continues to meet the community demand for non-emergency transfers and inter-facility transfers which also impacts its ability to respond to emergency calls in the rural communities.

The County of Renfrew assumed direct responsibility for the provision of land ambulance services on 1 January 2005. The service’s current model is an advanced life support provided by Advanced Care and primary care paramedics.
staffing seven vehicles 24 hours a day, 7 days a week deployed from seven leased Ambulance Base Stations located in Arnprior, Barry’s Bay, Chalk River, Eganville, Pembroke, Petawawa and Renfrew. An additional three vehicles operate 12 hours a day, 7 days a week to address the increased call volume during daytime hours.

The County of Renfrew Ambulance Service call volume for high priority calls has increased by about 18.8% average over the past six years. Conversely, the call volume for low priority calls has decreased by about 50.9% over the same period (Ministry of Health and Long-Term Care, 2010). The service has experienced a mean average call volume for the last six calendar years of 17108 each year.

The telephone number used in the Canada to call the emergency services is 911 and is part of the North American Numbering Plan. Similar to 999 in the UK and 000 in Australia, the telephone number provides the public with rapid access to communication centres, which are linked to paramedic service providers via radio networks.

**Intervention**

Access to the Aging at Home program is defined by the provincial government. Candidates eligible to participate in the program must be both on the waiting list for a long-term care bed and be able to remain at home while waiting to be placed. When an opening occurs in the program, the person on the top of the list is offered an opportunity to join the program.

Each client participating in the program is introduced to the call-bell system, which provides direct contact between the client and the paramedic or personal support worker. Direct contact is provided 24 hours a day. When a client is in any distress, the activation of the call-bell system alerts the paramedic or personal support worker. Either the paramedic or personal support worker responds to the clients’ residence. The call-bell system is an Aging at Home program activation system and does not activate 911. The alarm activation can be manually accessible via bracelet, necklace, as well as automatic notification via door alarms, fire and smoke as well as moisture sensors. The local dispatch centre does not have any contact and cannot assign any local emergency call to the community paramedic.

While the Aging at Home program runs 24 hours a day, the County of Renfrew Paramedic Service actively participates for 32 hours per week, which consisted of shifts from 1100–1900 hrs Monday, Wednesday, Friday and Saturday of each week. Each medical/trauma incident managed by a community paramedic is a primary care paramedic (Paramedic Association of Canada, 2001). During each shift, the Community paramedic may be partnered with a Personal support worker or may work independently depending upon the needs of the clients in the program. Throughout the duration of the study period, the community paramedics used the primary care paramedic scope of practice in order to respond, assess and treat the clients participating in the program. The community paramedics used first response equipment in a non-emergency Ford Escape in the event the client required acute medical or trauma intervention. In some responses, the community paramedic may use the vehicle to transport the client to either the physician office or the local hospital emergency department.

The paramedics expanded their role in the program by gaining additional hours of instruction on fall prevention, home safety assessment, urinalysis, diabetic assessment education, wound care, dementia awareness, acquired brain injury communication strategies, basic physiotherapy exercises, as well as health promotion activities. In order to improve communication with clients who experience dementia, paramedics required additional communication instruction. The better understanding of how the client processes information and the use of communication strategies improved the ability to establish baseline behaviour and health. Basic physiotherapy exercises also allowed for the opportunity to evaluate the client and determine what aches and pains were chronic in nature. Medical oversight of the program is provided by the Regional Paramedic Program of Eastern Ontario. The decision to have the client transported or remain at home was made solely by either the community paramedic or personal support worker. The community paramedic established direct physician contact for referral options. When urinalysis assessment, and wound care assessment and treatment were required by the client, the results were shared with the physician. This allowed the physician to communicate the next steps in the health care plan for the client. The added benefit was a decreased number of visits to either the emergency department or physician’s
office.

**Data collection**
Two investigators (MR, AS) transcribed each medical or trauma response attended by either a community paramedic or personal support worker into Microsoft Word and Excel datasheets. Within each response, the name of the client, date of the incident, description of the chief complaint, and whether transportation to the hospital emergency department was facilitated by using 911 was reviewed.

**Analysis**
The total number of interactions with the clients was 129. Of the 129 interactions, 114 did not require the use of 911 with the remaining 15 using 911 and the County of Renfrew Paramedic Service for the transport of the client to the local emergency department. Of the 114 interactions not requiring the use of 911, 86 remained in the home of the client. The CTAS (Canadian Triage and Acuity Score) score of these 86 interactions were further broken down to two interactions with a CTAS 3 score and 84 interaction with a CTAS 4–5 score. The clients that were transported by the County of Renfrew Paramedic Service had CTAS 2 scores for eight of the calls and CTAS 3 for three calls. There were five clients that required community paramedic attention more than ten times each during the study period. A total of 61 interactions representing 47% of the total 129 interactions were requested by the five clients. The most common chief complaint was falls (40%). The number of return visits to the local emergency department in 28-day period was 8%.

To ensure that the decision not to use 911 by either the community paramedic or personal support worker did not put the client at risk, hospital emergency visit and admission records were reviewed 28 days after the initial medical or trauma response by the community paramedic or personal support worker. The decision not to use 911 by the community paramedic or personal support worker was measured against either an emergency department visit or admission during the 28 days. Attendance to the client on day 0 was combined with any unplanned emergency department Visits or hospital admissions in the 28 days that followed to provide information on the care provided. Ethical approval for this study was obtained from the Deep River Hospital Ethic Board.

**Results**
Over the sixteen months, 27 clients were enrolled in the study. The study included residents aged 69–94 years of age, with an average age of 85 years and a median age of 87 years. Of this elderly population, 17 (54%) were women. The distribution of the interactions was 57% medical calls versus trauma calls with 59% of the interactions involving female clients. All 27 clients resided in one or two storey homes dwellings, as well as low rise apartment buildings. Data were available for 100% of 129 medical/trauma incidents. The two investigators coded the chief complaints into 13 categories (Table 1). The categories were established as the interactions were reviewed. The reviewers coded

![Figure 1](https://example.com/figure1.png)

*Figure 1. Derivation of the Client Interactions resulting in 911 Activations.*

CTAS= Canadian triage and acuity scale
the chief complaints independently. A review of the differences was marshalled by the third researcher (CD). The inter-raters reliability achieved a per cent of overall (observed agreement/Po of 0.968993 and a free-marginal kappa score of 0.966409.

Of the 129 medical or trauma client interactions identified in the study period, 86 end results saw the client remaining at the home because of community paramedic or personal support worker intervention and therefore, neither 911 activation nor emergency department visits were required. An additional 28 interactions resulted in the transport of the client to the emergency department but without activating 911. In these 28 interactions, the client was transported to the emergency department using the program vehicle. All of the transports to the emergency department were facilitated by either a paramedic or a personal support worker. Finally, an additional 15, representing 12% of the interactions required a call to 911 to have an ambulance transport the client to the emergency department.

Falls accounted for 40% of interactions. A review of the data revealed that all the falls occurred in the kitchen, bathroom or bedroom. Of the 51 interactions, 48 clients were assessed and treated without the need of 911 or Emergency Department resources. In another 15 interactions, clients experienced anxiety episodes. Each of the anxiety episodes were defused through the assessment of the client followed by ensuring the provision of the client's safety in their home. In an additional 14 interactions, generally unwell clients were monitored for fluid intake while managing both nausea and vomiting.

The next set of interactions involved the management of clients that experienced either urinary tract infections or urinary retention difficulties (eight interactions). The ability to perform urine analysis, assess for urinary retention and refer to the family physician for medical follow up diverted these patients from the hospital emergency department. The next category made up an additional 6% and includes gastrointestinal problem/medical services. The gastrointestinal problem/medical services include either incontinence urine or faeces or bowel obstruction.

With each incident, either the community paramedic or the personal support worker were first to arrive to the resident, had the opportunity, in all but four interactions, to assess the patient. Further, the activation of 911 and request the assistance of a transporting paramedic crew could be initiated if required. In the interactions where transport was required, the determination for paramedic transport to the emergency department was based upon the client's required care needs being beyond the capacity of the community paramedic or personal support work.

In the case of the four additional 911 activations and visits to the emergency department, each of these occurrences was initiated by family members for the clients of the program. The program was made aware of the 911 activation and emergency department visit after the occurrence.

A total of 71 clients presented themselves to local hospital during the study period. Of the 71 visits, 48 were emergency department visits and 23 were admitted as in-patients. Of the 48 emergency department visits, 28 were transported by the program, 13 by the County of Renfrew Paramedic Service, and seven were follow up appointments. When reviewing the required use of 911, the incidents involved sepsis, pneumonia, lower back pain, unresponsiveness, dislocation of the knee, shortness of breath with tachycardia as well as a Foley catheter removal resulting in uncontrolled bleeding. The number of return visits to the local emergency department in 28 day period was 8%. All of the follow up appointments were associated with the 41 original emergency department visits. There were no emergency visits or hospital admissions as a result of the non-transport interactions completed by either the community paramedic or personal support worker.

**Discussion**

The result of this retrospective analysis demonstrates that during 86 incidents, which consisted of 84 CTAS 4 or 5 and two CTAS 3 scores, safe care was provided without the use of 911 and the emergency department resources. The Canadian Triage and Acuity Scale is divided into five triage levels:

- **Triage level 1**—resuscitation, outlines conditions that are threats to life and limb
- **Triage level 2**—emergent, outlines conditions that are a potential threat to life, limb or function
- **Triage Level 3**—urgent, outlines conditions that could potentially progress to a serious problem requiring emergency intervention
- **Triage level 4**—less urgent, outlines conditions that have the potential to progress to a serious problem and would benefit from intervention within 1–2 hours
- **Triage level 5**—non-urgent, outlines conditions that are acute but non-urgent or conditions of a chronic nature.

As stated by Bigham et al (2011), with the diverse scope of practice, many have suggested paramedics may be well suited for treating patients with minor...
Clinical

A number of studies have evaluated the safety of the client when care is provided by paramedics by assessing the unexpected visits to the emergency department or admissions after the assessment and treatment provided by the paramedic has been completed (Mason et al, 2007, 2008). After reviewing our findings, there is additional support for the suggestion that paramedics can make safe decisions regarding patient care needs in the community. The decision not to use 911 was validated by reviewing the hospital records for unplanned hospital visits and admissions for the clients of the program in the 28 days after the initial episode. Each intervention was reviewed by chief complaint and cross referenced for any emergency department visit or hospital admission.

Limitations
We assessed a single integrated team in north-eastern Ontario, which limits the extent to which the results can be generalised to other programs. In addition, this study is limited by sources of error common to all retrospective chart reviews, such as incorrect recording of data on the initial log, incorrect transfer of data, missing data on the log, and inconsistent interpretation of the logs. The creation of the categories had a high inter-raters reliability rating between the two evaluators. This...
Clinical

Key points

- Implies that the contribution of the community paramedic in the Aging at Home program can contribute to the reduction in 911 activations without compromising the health of the clients.

- Results of the retrospective case series study analysis demonstrates a negative correlation in the use of 911 calls.

- Analysis demonstrates that during 114 of the 129 incidents, safe care was provided when 911 resources were not used.

- Continued exploration into the delivery of EMS skills in ‘non-traditional’ community-based environments must to be based on community needs.

High rating may be a bias as a result of the two evaluators being of the same paramedic service working in the same geographical and cultural area.

Each client interaction record reviewed did not indicate whether a paramedic or personal support worker lead in the assessment and treatment. The limited number of interactions may make generalising these results to other settings challenging. In addition, the question of whether all clients seen by community paramedic or personal support worker would have called 911 if this new service was not implemented for every interaction can be challenged.

The implicit design of retrospective case series studies excludes the use of a control group and cannot take advantage of a before-after or time series research design, and therefore exposes this study to internal validity challenges. Internal validity could include maturation. As the program participants grow older and the medical challenges become more complex, the demands for interactions will increase. The increased frequency of visits may not be transferable to an avoidance of a 911 call. Instrumentation is another potential internal threat to validity. The documentation process changed during the research time period. This change could affect the effectiveness of the documentation of interactions.

Future direction

Shah et al (2010) makes the observation that gives a clear demonstration of this program the improvement of quality of life for seniors. They can remain safe and at home through the use of local collaboration of existing services. This study involving community paramedics creates the impetus for a number of interactions that may be worth considering. Additional research opportunities exist with the Aging at Home program.

First, a comparative study where data collected would compare the 36 hours covered by the paramedic versus the hours covered by the personal support worker would provide an opportunity to evaluate the community paramedic contribution in isolation. A review of the number of 911 activations during the paramedic shifts could demonstrate the exact contribution of the Community paramedic versus the Personal support worker in the reduction in use of 911. Second, as (2004), Dixon (2009) and Martin-Misener et al (2009) suggested, there may be cost savings available with community paramedicine. This study was unable to analyse these results but future studies should be developed to quantify the potential savings to Emergency medical services and the emergency department. Third, the need to report on the satisfaction of the clients is required. A satisfaction survey similar to the ‘The Common Measures Tool’ criteria defined in the Toward Citizen-Centred Service Delivery: A How-To Guide for the Service Improvement Initiative (ICCS (Institute for Citizen-Centred Service) 2007) should be considered. The criterion includes timeliness, knowledge, extra mile, fairness, and outcome and could contribute to the overall satisfaction of community paramedic contribution to the primary care arena. Fourth, the needs of the clients demonstrate a requirement to increase the knowledge base of the health care system, as well as an expanded scope of knowledge, skills and attitudes of community paramedics in order to meet the health care needs of the client in each community (Woollard, 2006; Blacker et al, 2009). Research may also be required to validate whether this knowledge and skills is best provided in an organised and recognised format of a post graduate program (Mason, 2003; Blacker et al, 2009) or a self directed paramedic service delivery program. In order to establish professionalism and high quality patient care, consideration for standardisation of competencies of community paramedics may be required (Woollard, 2006). The Paramedic Association of Canada is the home of the Canadian National Occupational Competency Profile, which currently defines competencies for emergency
medical responder, primary, advanced and critical care paramedics but does not include a community paramedic profile (Paramedic Association of Canada, 2011).

Finally, looking for opportunities to integrate health services in partnership with other health professional to promote disease and injury prevention is required (Blacker et al., 2009). Research that reports on the integrated care may provide valuable information on the best approach to ensure coordinated provisions of care (O’Meara et al., 2007). Patient- or client-centred guidelines can only be attained by a multi-professional designed approach that allows the client to receive ongoing care within the community (Integrated care, 2005; Mirando et al., 2005).

Conclusions

This study implies that the contribution of the community paramedic in the Aging at Home program can contribute to the reduction in 911 activations without compromising the health of the clients. This paper acknowledges that the impact analysis of 911 activations is only one way to evaluate the contribution of the community paramedic in a 24-hour flexible in-home support program by a multidisciplinary health care team. The study also suggests that additional research can further validate the community paramedic contribution through the use of a comparative study. In addition, there is an opportunity to explore the questions of potential system financial savings; defining community paramedics core competencies, and determining the level of satisfaction of the clients.


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Community paramedicine: higher education as an enabling factor

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Community paramedicine: Higher education as an enabling factor

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SUMMARY

The aim of this case study was to describe one rural community paramedic model and identify enablers related to the implementation of the model. It was undertaken in the County of Renfrew, Ontario, Canada where a community paramedicine role has emerged in response to demographic changes and broader health system reform. Qualitative data was collected through direct observation of practice, informal discussions, interviews and focus groups.

The crucial role of education in the effective and sustainable implementation of the community paramedicine model was identified as one of four enablers. Traditional paramedicine education programs are narrowly focused on emergency response, with limited education in health promotion, aged care and chronic disease management. Educational programs hoping to include a wider range of topics face the twin challenges of an already crowded curriculum and predominately young students who fail to see the relevance of community primary care content.

A closer match between the paramedicine curriculum and the emerging roles of paramedics, whether they are community paramedics, extended care paramedics, or as yet unformed roles is needed if paramedics are to become valued members of the health care team.

Keywords

Paramedic, emergency medical technicians, rural health, education

INTRODUCTION

Paramedics are increasingly becoming first line primary health care providers in small rural communities and as a result they are developing additional professional responsibilities throughout the cycle of care (1-3). Throughout the world, Emergency Medical Services (EMS) are increasingly required to provide a wider range of clinically-focused services than in the past and to also be more accountable than ever before. In parallel with these pressures, paramedics are developing new professional roles and identities that are broader and more sophisticated than that of the traditional emergency response model (4-6). Rural paramedics, in particular, are increasingly working as the ‘expert’ in the discipline of acute primary health care in unstructured community settings (2).

The emergence of more complex professional paramedic roles raises questions related to community and professional expectations and the identification of enabling factors associated with the sustainability of emerging models, such as community paramedicine roles. These factors may include the degree to which paramedicine is integrated within the health system, effectiveness of clinical governance systems, educational foundations for paramedics, and the development of appropriate clinical pathways for patients and clients (7). This paper addresses paramedicine education as one of these enabling factors.
New and expanded paramedicine roles are emerging in response to an increasingly ageing population with more complex morbidities, higher community expectations and the contraction of some other health services (8). For instance, many smaller, rural hospitals have limited or no emergency department or maternity services, while many family physicians are unwilling or unable to provide house calls to isolated patients for a variety of reasons, including the threat of violence (9,10). As an example, reports indicate that in Australia less than half of the country’s family physicians regularly conduct home visits (11). Emergency Medical Services and paramedics throughout the world are consequently stepping into these gaps and facing the twin challenges of changing levels of clinical practice and greater demands for accountability.

As a result, EMS and paramedics are increasingly facing higher levels of organizational and professional scrutiny through mechanisms such as clinical governance systems and occupational registration requirements (12-14). In their patient focused interactions with other health professionals they need to balance specialized expertise with their inherent role and education limitations. This working environment of paramedics is unique in the health system.

In 2005, the 1st International Roundtable on Community Paramedicine was held in Nova Scotia, Canada. This loosely-bound group has since developed a definition of community paramedicine that is gaining currency around the world. To reduce the potential for confusion their definition was adopted for this study.

Community Paramedicine is a model of care whereby paramedics apply their training and skills in “non-traditional” community-based environments, often outside the usual emergency response and transportation model. The community paramedic practices within an “expanded scope”, which includes the application of specialized skills and protocols beyond the base paramedic training. The community paramedic engages in an “expanded role” working in non-traditional roles using existing skills.(15)

The aim of this case study was to describe a Canadian community paramedic model and to identify enablers related to successful implementation. This paper focuses on education as an enabler, with the others to be reported in detail elsewhere.

METHODS

Setting

This case study was undertaken in the County of Renfrew, Ontario, Canada where a community paramedic role has emerged in response to demographic changes and broader health system reform. The County was formed in 1861 and is made up of a number of small to medium sized towns, including Arnprior, Eganville, Pembroke, Renfrew, Barry Bay, Petawawa and Deep River, along with many other small villages and settlements. It sits along the boundary between the provinces of Ontario and Quebec and is largely defined by the Ottawa River.

The County of Renfrew Paramedic Service was formed in January 2005 as part of a Province-wide re-organization of paramedic services that locates service delivery at a municipal level and regulation at a provincial level. The Paramedic Service is part of the County’s Emergency Services Department. It is financially and structurally separate to the provincial health system. The service’s current model is an advanced life support system provided by Advanced Care Paramedics and Primary Care Paramedics, as defined under the Canadian Occupational Competency Profile (16), staffing seven vehicles 24 hours a day, seven days a week deployed from seven leased Ambulance Base Stations (17). At the time of the study, there were another three 12 hour-day shift crews deployed across the County.

Research Approach

Building on previous research in Australia (2), a range of qualitative methods were used to validate the professional boundaries of community paramedics and identify enabling factors associated with successful community paramedicine programs. The La Trobe University Human Research Ethics Committee approved the research (FHEC12/8).

Descriptions of the emerging paramedic roles were sought from managers, with the other data collected through a combination of direct observation of practice, informal discussions, interviews and focus groups. This qualitative approach from Stake (18) allowed the capture of data encompassing the richness and diversity of the community paramedicine role within a natural setting that allowed issues to be studied in depth. It also placed practice within the wider community context (19). Participants in the case study were recruited through purposive sampling and included:
- Community members, including patients, family and carers
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- Paramedics and EMS managers from the County of Renfrew and Greater Ottawa area
- Paramedic educators in the Province of Ontario
- Physicians, nurse practitioners and other health care providers who interact with community paramedics
- Expert informants, such as health economists and health service managers

Three focus groups of between 10 and 20 participants and 11 interviews with 14 participants were conducted using purposive sampling to draw in a range of respondents including EMS managers, paramedics, other health professionals and community members. Three facilitators, with backgrounds in paramedicine, nursing and health services research carried out the interviews and two of the investigators facilitated the focus groups. Focus groups and interviews were used because of their ability to encourage detailed, emotive responses, unconstrained by specific questions of a survey, to the points raised by the facilitators. It was an opportunity to collate common issues or expectations and provide a stimulating environment to encourage specific contributions.

The research team used the paramedicine domains of practice identified in an Australian study model to locate the elements of the specific community paramedicine program and to develop the focus group and interview questions. This approach reduced the risk of facilitator bias. These questions focused on the role of community paramedics in terms of community engagement, emergency response, situated practice and primary health care (2). There were no targeted questions that related to the education and training of community paramedics.

The focus group discussions and the expert informant interviews were recorded and transcribed, with each transcript being coded and analysed using classic thematic analysis techniques through manual methods consistent with the recommendations of Strauss and Corbin (20). Using inductive thematic analysis enabled identification of common themes within the qualitative data and the building of an explanatory theory, without the constraint of having to establish how these themes link together or explain all facets of the data (21).

Complementing the focus groups and interviews was field observation of the community paramedic in a natural setting - often described as naturalistic research (18). This type of qualitative research is distinctly different from observational studies used in epidemiology as it involves the systematic, detailed observation of behaviour and talk (22). Informal discussions with participants also formed an important component of this observational phase of the data collection process and helped establish the general perception pattern of the community paramedicine program (19). The advantage of using this approach was that it shone a light on any discrepancies between rhetoric and reality. For this reason observational methods were well suited to this case study of a community paramedicine program. This source of data facilitated a richer understanding of the behaviours and interactions of community paramedics in their natural setting. The resulting observations validated those data that had been gathered from documents, the EMS organization, interviews and focus groups.

During the field observation component of the research a record of community paramedics’ practice was noted, along with the principal researcher’s own feelings and responses. These notes were recorded during or immediately after events occurred (22). Analysis of the field notes was commenced during the data collection phase through content analysis, an iterative process of developing categories from the notes, testing them against concepts and other data, and refining them.

RESULTS

The Renfrew Community Paramedic Program developed in response to identified needs in a number of the communities within the County, primarily because of movements in populations and often a lack of services or physicians. The model emerged organically from existing structures and local needs and is built on strong partnerships between the Paramedic Service and other health and social services. A wide range of disparate community health initiatives have evolved into a coherent community paramedicine program. The program consists of four key elements:

- Ageing at Home Program
- Paramedic Wellness Clinics
- Ad hoc Home Visiting Program
- Paramedic Response Unit Program

The community paramedicine program has evolved over a number of years as the critical needs of the clients and specific communities have emerged. Some of these have included the institution of strategies that assist clients at risk of falls, address the long-term problems associated with diabetes, and the challenge of supporting families dealing with the challenges associated with dementia and Alzheimer’s. These strategies are consistent with developments in other parts of the Canada, United Kingdom and the United States of America (6,23). This program exists...
because paramedics both recognised a need and had the flexibility to create new services.

So really the way that the community paramedic programs, and there are multiple programs within the umbrella here in the County, were developed was really from the paramedics themselves and from the service recognizing that there were all kinds of gaps in the system and that we needed to find a way to start to plug those gaps either formally or informally. (Participant 4)

… at least in part, one of the strengths of the Community Paramedic Program is that because it’s sometimes rightly or wrongly not seen as part of the traditional health system people see them as non-traditional partners and you can actually consider doing things that are a bit more innovative. So it is sort of the flip side to being outside the system. (Participant 3)

Community paramedics identified they were working in new ways that used very different skill sets from the EMS norm. They were often looking at environmental, chronic disease and prevention issues.

… most of the times we are working proactively to nip the problems before they happen. So if we see an altered behaviour in a client you know because we know them like the back of our hand. I say to [the Community Paramedic] “Are they drinking, do they need a urine to go to the hospital?” (Participant 15)

You know maybe it is an anxiety issue with somebody they are just feeling a little under the weather and want to talk so it’s half an hour of sitting in the living room chatting and seeing what is going on and trying to get an idea of the bigger picture and little things like that. So very much I would say my use of medical technology is almost secondary in my day to day functions throughout the program. It’s always available to me, it is always in my vehicle but it can sometimes play very much a minor role in me being there and me being a part of the program. (Participant 9)

Communication skills were identified as an area of major importance in the community paramedic role and the most important area where paramedicine education could be most improved.

Communication is the big one. I think the fact that one of the roles of paramedics is that they do often go into homes so they are often used to that kind of setting and they are used to the dynamic of not working just with the patient but working with the family as well. … It is not just paramedic to patient … there are family members around as well. So they have to deal with all that plus they are getting a sense of the setting so I think that they come in with that knowledge.

So I think communication is the big thing because they not only have to get the information from the patient, observe the setting and then that communication has to be passed onto the primary practitioner or whether it is the CHC [Community Health Centre] or somebody else. … their model of care is very much based on a holistic model so there is a lot of population health factors and those kinds of thing. So I think a knowledge of that is really imperative so if you are doing home visits and you are working with the CHC. (Participant 7)

Building trust and long term relationships were seen as enabling factors underpinning the emerging role of community paramedicine. It may be that building these trusting relationships only requires a change in attitude amongst paramedics to build on the high level of trust that people already have in paramedics.

You have to build the trust and what I find really neat since I started this program with these guys is every one of these guys, whether it be a Medic or a PSW (Personal Support Worker) or a housekeeper, they all get a really neat relationship. One of them with a certain client and then that’s the trust and that is the start of the trust that we build. (Participant 15)

One interesting aspect of these trust building exercises with patients, families and other health professionals is that paramedics normally deal with patients on a very short-term basis and it is a very big departure for paramedics to form long-term relationships with patients and families.

That’s right, and to seek out that long-term relationship … [Community Paramedic] you have grown with the program obviously, like when you think about yourself coming straight out of training you are trained for an emergency response situation thank goodness, but to come into this program is a little different? Absolutely you are here for emergency
response as well but you are here for as you said long term. (Participant 15)

Many of the participants identified that the establishment of the Renfrew County community paramedicine program was only the first step toward implementation and sustainability. Study participants were strongly of the view that the program needs to become institutionalized and not be dependent on individual champions to ensure its ongoing existence. There is clearly a need for structures and mechanisms to make the program sustainable and to maintain standards of safety.

From an educational perspective, the findings indicated that community paramedicine programs are more likely to succeed if paramedic education and training provides graduates with suitable breadth and depth of capabilities that move beyond the traditional paramedic emergency response competencies. These conclusions are consistent with the experience of other community paramedic programs around the world where paramedics have consistently "... received additional training above and beyond the scope of practice for a locally identified paramedic." In Canada, a National Occupational Competency Profile for the Community Paramedic role is reportedly being developed by the Paramedic Association of Canada that will help inform educational programs for community paramedics.

The education and training of paramedics in the Province of Ontario is largely based in the Community College system with students undertaking Primary Care Paramedic (PCP) two-year Diploma program that includes defined hours of theory, clinical activities in hospitals, and ambulance service practicum. Advanced Care Paramedics (ACP) undertake an additional one year of education and training in the Community College system. There are also Critical Care Paramedic programs offered to those staff involved in specialist roles such as air retrieval.

The PCP programs cover the following areas of study:

- Anatomy and Physiology;
- Psychopathology/Crisis Intervention;
- Pharmacology;
- Health Care Communication;
- Medico-Legal Aspects;
- Physical Education;
- Patient Care Laboratory;
- Patient Care Theory;
- Emergency Medicine;
- Emergency Vehicle Operation;
- Medical Directives;
- Clinical Practicum; and
- Field Practicum.

Advanced Care Paramedics (ACP) in the Province of Ontario undertake a one-year Graduate Certificate programs that include:

- Advanced Pharmacology;
- Advanced Care Skills (Cardiac, Airway Management, Respiratory, Medical Emergencies, Trauma);
- Professional Practice;
- Skills Practicum;
- Hospital Practicum; and
- Advanced Care Paramedic Ambulance Practicum.

Participants in this case study highlighted the highly technical nature of the existing educational paramedicine programs in the Province of Ontario that focus on emergency responses and acute medical conditions. Many expressed the view that to undertake and embrace the community paramedicine role, paramedics need a broader educational base, with more knowledge and skills in patient assessment, clinical decision-making, and a greater appreciation of the public health aspects of patient and community health and well-being.

The other thing is that they are trained for emergencies … clinics that you are having or the Ageing at Home Program is not an emergency type situation, so anecdotally what I have heard is it’s been a big learning curve for some of those paramedics going into homes establishing relationships with people because they certainly don’t do that when they are just picking them up on the side of the road and bringing them in? (Participant 6)

While paramedicine education programs in the Province of Ontario include assessment and clinical decision-making related to emergency care, one community college educator made the point that an already crowded curriculum limited the capacity to provide a broader educational platform. A particular need for education related to health promotion and prevention was identified. Participants clearly described those areas of paramedicine education and training that could be improved, as well as acknowledging those areas of expertise that paramedics already have that may be useful in a community paramedicine role.

"The other thing is that they are trained for emergencies … clinics that you are having or the Ageing at Home Program is not an emergency type situation, so anecdotally what I have heard is it’s been a big learning curve for some of those paramedics going into homes establishing relationships with people because they certainly don’t do that when they are just picking them up on the side of the road and bringing them in? (Participant 6)"

... there isn’t any education on health determinants, social determinants, the actual structure of how the system works ... what kind of skills do we need to be able to possess or what skills do we need or what knowledge do we need to be able to successfully integrate, collaborate with our partners. (Participant 3)
In relation to the community paramedicine role in the County of Renfrew and elsewhere the education and training challenge is twofold. Firstly, the curricula of the current paramedicine programs are already at full capacity with acute care topics and skills. And secondly, the widespread difficulty of convincing predominately young students that the role of future paramedics is more about community primary care practice than answering emergency calls (24,27,28).

I mean a lot of people who come into my program are looking for the lights and sirens and trauma and excitement and when we start talking about something with a slower pace in community paramedicine, we take them back. … a lot of students sort of walk in the door going, I want to drive fast, lights and sirens and car crashes and all that good stuff, and when you say, well in actual fact that’s about five percent of your career, 95 percent of your career looks much more like community paramedicine. (Participant 10)

Some participants in this study indicated that they would like to see paramedicine programs evolve into four-year degree courses comparable to other health professional disciplines and paramedic programs in Canada and other parts of the world (29-33). One suggestion made was that community paramedicine could become a specialist stream within a degree program, incorporating public health subjects and some specific procedural skills. Those paramedics taking part in the Renfrew County Community Paramedicine Program already undertake a five day Geriatric Emergency Medical Service course.

This latter idea has obvious links to developments in the United States of America, where a community paramedicine curriculum has been developed that incorporates public health topics and specific procedural skills (23,34). In Australia and New Zealand degree-level paramedicine programs incorporate many of these public health topics. These well-established higher education programs include a mix of three-year paramedicine degrees and some four-year double degrees in combination with Nursing or Public Health. It is expected that degree-level paramedicine qualifications will be mandatory in Australia and New Zealand by 2015 (3).

DISCUSSION

The findings from this case study provide a rich picture of the working environment of community paramedics and how their roles may develop as part of an integrated health system. A range of enablers were identified, including the crucial role of education in the effective and sustainable implementation of the community paramedicine model. The limitations of this case study though prevent any definitive conclusion or generalizations. The results are not generalizable to other services because participants were recruited from within one geographic area. This did allow the analysis to integrate knowledge of the professional ethos and program with participants’ responses. Further studies are needed to validate the findings reported here.

Traditional paramedicine education programs are narrowly focused on emergency response, with limited education in cultural safety, health promotion, aged care and chronic disease management (24). In many paramedicine programs there is a lack of education in the social determinants of health and how the wider health system operates (29). The lack of cultural diversity amongst paramedics in many settings highlights the importance of a broadly-based education system that addresses the public and community health needs of communities (35).

Paramedicine programs that aspire to a broader curriculum that includes a wider range of topics and competencies face the challenges of an already crowded curricula and also overcoming the perceptions and expectations of predominately young students that paramedicine work is restricted to responding to emergencies. Convincing students and other stakeholders that community primary care content is relevant to the future practice of paramedicine within an integrated health system is a key policy challenge for educators, leaders of paramedic services and the paramedicine profession.

Amongst the short-comings of the current paramedicine education system in the Province of Ontario is that there is not a significant amount of education on health determinants, social determinants, or the structure of how the health system works. Students are not taught about where paramedicine services fit into the health system, or what kind of skills and knowledge paramedics need to possess to be able to successfully integrate and collaborate with other institutions or health professions. This is particularly important in community paramedicine programs where there is a strong emphasis on maintaining patients in their own homes.

A closer match between the paramedicine curriculum and the emerging roles of paramedics, whether they are community paramedics, extended care paramedics, or as yet unformed roles is urgently needed if paramedicine is to become an effective and valued part of an integrated health system (31,36-39). Based on this Canadian case study, paramedicine programs
would benefit from an expanded curriculum that includes:
- Generic health and social service education
- Social determinants of health, and other public health topics
- Acute and chronic mental health
- Chronic disease management
- Geriatric emergency medicine
- Wound care
- Understanding of community (sociology)

These ‘extra’ paramedicine topics are strikingly similar to those identified in the North Central EMS Institute community paramedicine curriculum in the United States that is designed to be offered as a ‘postgraduate’ course to experienced paramedics (34). In the short-term this is a useful approach to ‘up-skilling’ existing paramedics taking on community paramedicine roles. However, it does not address the need for a strong underpinning education for all paramedics who may practice as a community paramedic or in other evolving roles, such as extended care or remote area paramedics.

The longer-term approach to broadening paramedicine education is to develop longer, more holistic degree programs that are comparable to the other health professions, such as doctors, nurses, social workers and the allied health professions who work alongside paramedics in a variety of settings (37,40-42). While there exist a considerable number of degree-level paramedicine programs throughout the world (31,33,43,44), the concept is not well established in North America. This reluctance to embrace higher education for paramedics may be related to the historical beginnings of EMS in North America, professional identity and professional status of paramedics, the cost and duration of degree level program relative to the expected remuneration, or the differing registration and accreditation requirements that make the transferability of qualifications problematic (42,45,46).

For community paramedicine there is a broader requirement that the role itself is clearly understood and acknowledged within EMS, amongst the other health professions and by those institutions that both fund and regulate the provision of those health services that constitute the distinctive activities and responsibilities of community paramedics (23,47). Appropriate education of current and aspiring paramedics is a vital step toward a more widespread understanding of the current role of paramedicine, the development of a distinctive body of knowledge, as well as stimulating discussion of the professional identity of the profession now and in the future (48).

CONFLICT OF INTEREST
The authors declare they have no conflict of interest.

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Community Paramedicine: A Part of an Integrated Health Care System

Abstract
In this time of fiscal health restraints where resources, both human and financial, are stretched to the limit, an innovative design for the delivery of primary health care to two (2) island communities is underway. Community paramedicine, while not a new idea, has never before been used in collaboration with a nurse practitioner and an off-site physician. This is the delivery model currently being used on two (2) isolated, island communities in Nova Scotia known as Long and Brier. There has been a 23% decrease in Emergency department visits from Islanders since this delivery model has been implemented.

Background
The islands of Long and Brier are approximately a thirty-minute drive from Digby, Nova Scotia with access to both Islands restricted to passenger car ferries. The total population of both Islands is approximately 1240 year round residents with the numbers swelling temporarily during the summer months. Transport from the farthest island, Brier, is a 50-minute trip requiring two ferries to reach the general hospital in Digby. The regional hospital requires an additional hour of travel time.

In rural Nova Scotia, health care is not as readily available as in the urban centers. As a result, rural communities are repeatedly challenged to provide accessible health care to their populations. The residents of the Island’s communities recognized this need and in conjunction with Emergency Health Services Nova Scotia (EHS) launched a three-year multi-phased initiative.

The first phase provided twenty-four hour/7 days a week (24/7) emergency paramedic coverage on the Islands. To this end, an ambulance base was established in Freeport on Long Island. An abandoned clinic, which had originally housed the Island’s physician, was renovated to accommodate the paramedics.

The second phase consisted of paramedics administering flu shots, holding clinics and checking blood pressures. Policies, procedures and protocols
necessary to the safe delivery of this type of patient care were developed by EHS. In addition, paramedics began to take phone calls from the community residents for non-emergent services such as diabetic checks.

The third phase of the project saw the addition of a nurse practitioner able to care for patients through a collaborative practice agreement with a physician located in the town of Digby. With the nurse practitioner’s scope of practice, came an expansion of the types of services available to the Island residents. As a result, paramedics were able to complete more complex care such as wound care, take part in flu clinics and become involved in community preventive education sessions, e.g. fall prevention in seniors.

The project’s focus dramatically altered the traditional work of the paramedics. Accustomed to quickly responding to emergency calls within a specified period of time, paramedics were now being called upon to, among other things, share a cup of tea with island residents as part of a falls prevention assessment where the paramedics assessed both resident and their environment for fall hazards.

A community liaison committee identified a need for drawing blood for routine tests since this required a two (2) hour minimum round trip to the Digby General Hospital. As a result, a learning session designed to teach paramedics phlebotomy skills was developed. Several other learning sessions were also provided. These sessions included, but were not limited to, congestive heart failure assessment, administration of antibiotics, wound care, urinalysis assessment, suture/staple removal, diabetic assessments and medication compliance.

**Community Introduction**

Informing the community of the new programs created to deliver health care proved to be a challenge. To address this, several community town hall meetings were held. These forums served to not only inform but also to solicit feedback from the community. Several other forms of media were also used. These included articles in the local newspaper and a pamphlet describing the services and how to access them.

Providing a service built on the needs of the public and the community required a community health needs assessment. To accomplish this, a survey was distributed to community residents. Survey data results were collected and entered into a database. Though confidential, it allowed health care
professionals to plan programs according to information derived from the survey.

**Program Implementation**

Based on the identified community needs, programs were designed and clinics were scheduled. Paramedic educational sessions were provided to enable paramedics to become proficient in handling patients on a non-urgent basis.

Patients requiring community paramedic services could access the service in several ways. Patients or their families call and request a visit; family physicians request the service directly or the nurse practitioner refers patients. As an example, a male resident sustained a partial thickness burn to his entire lower right leg. Initially paramedics transported him to the general hospital as an emergency call. Upon his return to the Island, daily dressings changes were required. Paramedics completed this daily dressing with the nurse practitioner available for consultation as required. Following physician orders, the paramedics completed the sterile dressing each day for three weeks. As a result, the burn injury was completely healed within a four-week period with no adverse effects.

The following is yet another example of the type of services being offered. An elderly Islander was having large fluctuations in blood glucose levels due to medications for non-insulin dependant diabetes. The patient’s physician changed the dosage to better regulate the blood glucose and decrease the fluctuations. Paramedics completed a week of daily house visits to check the blood sugar. Subsequently, the patient’s medications dosage was successfully altered without the patient having to travel daily to the hospital for a blood glucose check.

**Collaborative Relationships**

The Islands are home to three fire departments and a Coast Guard station. The fire departments are very active in the community with many of the members having completed the education necessary to be medical first responders.

Paramedics have been participating in monthly educational sessions aimed at enhancing the local first responder’s theoretical base. Each month a lecture is taught on a topic of interest chosen by the first responders. In conjunction with the theory, a practical skills station is set up. First responders are then
required to practice what they have been taught. For example: A lecture on proper documentation was followed by a rotation to a skills station, which allowed the first responder to care for a patient and then practice completing the paperwork.

Coast Guard members have participated in several of these educational sessions and have played an active role in a mock scenario that required a rescue at sea.

Community paramedics have also developed collaborative relationships with the VON and home care programs as they work together to provide for the health care needs of the community.

**Community Programs**

A new addition to the services being offered is the adopt-a-patient program. This program is designed to provide consistency and continuity of care for patients. Patients requiring frequent visits for such things as wound care or a congestive heart failure assessment are placed up for “adoption”. A paramedic then signs up to care for that patient and is responsible to set up times for regular visits. The program has been well received.

Several other programs designed to supplement the day-to-day services include bicycle helmet safety, CPR and first aid courses and proper car seat installation.

**Statistics**

Initially, the community use of the services was slow, however, within two months, a sharp increase in utilization occurred. The following graph depicts the use of services over a one-year period.
In addition, Emergency Department visits by Islanders decreased by 23% shown in the graph below for the years 2002 and 2003.

**Conclusion**

Fiscal restraints, long travel times, isolation and inability to recruit a physician combined to force a remote Island(s) community off the coast of Nova Scotia to look at an innovative service delivery model. As a result, the Community Paramedicine service was created. This service integrates the traditional work of paramedics with the non-traditional – i.e. working collaboratively with a nurse practitioner/off-site physician. The result has
seen a decrease in Emergency department visits and approximately 250-300 patient contacts/month.

Community paramedicine’s adaptability and versatility within the confines of safe practice make it an ideal option for remote, isolated difficult to resource communities.

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Expanding paramedic scope of practice in the community
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# Table of Contents

Executive Summary 7
Background 8
Methodology 10
Summary of Evidence 11
Evidence-Based Recommendations 15
Conclusion 16
Bibliography 18
Executive Summary

Background

Paramedics are an important health human resource and are uniquely mobile in most communities across Canada. Recently, challenges in the delivery of healthcare have prompted governments from around the globe to consider expanding the role paramedics play in health systems. Utilizing paramedics for the management of urgent, low-acuity illnesses and injuries has been coined “community paramedicine” but the role, safety and effectiveness of this concept is poorly understood. We undertook a review of the international literature to describe existing scientific evidence related to community paramedic programs.

Method

An international group of experts developed a search strategy and a health information specialist executed this search in 3 medical science indices for articles published in the last decade. We included all English research studies that reported a research methodology in our review. Two authors independently screened citations in a hierarchical manner. Differences were resolved by consensus. The data was abstracted and results were synthesized.

Summary of Evidence

Over 2420 articles were screened and 9 met the inclusion criteria. The scope of the 9 studies was mixed, and 3 of the papers were derived from a single randomized controlled trial. This trial showed that community paramedicine may be beneficial to patients and health systems in terms of both clinical outcomes and cost effectiveness. Patient satisfaction was higher in the group treated by community paramedics. The other studies drew conclusions favouring community paramedicine, however their methodologies were weak and their results must be interpreted cautiously.

Evidence-Based Recommendations

Several recommendations can be made based on limited available evidence from a single randomized controlled trial of community paramedicine:

- A randomized controlled trial of community paramedicine in the Canadian health care system which addresses the shortcomings of the current literature is justified prior to widespread implementation.
- A needs assessment is required to understand the types of services that may constitute a community paramedic program as the intervention for the trial.
- Outcomes for community paramedicine studies should include clinical, operational, safety and patient satisfaction variables and may form the basis for developing quality and safety metrics post implementation.
- If community paramedicine is superior over the current standard of care, it may prompt curriculum change in college programs to ensure new graduates are well trained.

Conclusion

Community paramedicine research to date is lacking, but one randomized controlled trial showed that paramedics may safely practice with an expanded scope, improving patient outcomes and satisfaction. Further research is required to fully understand how expanding paramedic roles affect health outcomes, the system of care and the cost of health care delivery.
Expanding Paramedic Scope of Practice

Background

Health care demand is increasing around the world as populations grow and age\(^1\)\(^-\)\(^3\). Emergency Medical Services (EMS) have been impacted by the increasing need for their services with requests for emergency ambulances rising by as much as 8% annually\(^4\)\(^-\)\(^6\). Many of the patients for whom EMS is summoned do not require emergent interventions by prehospital care providers\(^6\),\(^7\) and may best be served by other health services through referral by prehospital care providers\(^8\).

Most EMS models only allow providers to treat and transport patients to an Emergency Department (ED) for further treatment although as many as 50% of patients transported to ED by EMS are discharged without significant treatment or referral\(^9\). It has been estimated that 31% of all ED visits are inappropriate\(^10\) and that some patients transported to the ED by EMS leave without ever being seen by a hospital-based health care professional\(^11\). In rural settings, a lack of health infrastructure makes health care delivery difficult, and the presence of paramedics especially valuable\(^3\),\(^12\). In EMS systems with low call volumes, paramedics may be utilized more effectively to provide community based care as well as traditional emergency response. Further, this comprehensive community care may reduce the need for unnecessary transport of patients. This is important in a rural setting as transport time can be long and this takes a vehicle out of service for the next emergency call.

While variable by region, paramedic scope of practice may include delegated medical acts such as; endotracheal intubation, needle thoracostomy, intravenous access, medication administration of antiarrythmics, narcotics, dextrose and inotropes, and electrical therapies including defibrillation, cardioversion and transcutaneous pacing. In recent years, the scope of practice may have expanded to include fibrinolytics in ST-elevation myocardial infarction (STEMI)\(^16\) and hospital bypass for STEMI\(^17\) and suspected ischemic stroke\(^18\). Less critical conditions including hypoglycaemia\(^19\), epistaxis, and falls\(^20\) may be managed exclusively by paramedics and often result in no transport to an ED. Some have suggested that, given the unique opportunities paramedics encounter in the field each day, health promotion and injury prevention should also be added to the scope\(^21\)\(^-\)\(^23\).

These observations have lead to a paradigm shift to increased use of allied health professionals to carry out assessments and treatments traditionally delivered by physicians\(^1\),\(^13\)\(^-\)\(^15\).

In light of this diverse scope of practice, many have suggested that paramedics may be well suited for treating patients with minor conditions in the field or referring them to non-ED health resources. This may potentially reduce EMS and ED workload, increase system capacity, improve patient satisfaction and improve clinical outcomes but must be done safely.

Many terms have been used to describe paramedics with an expanded scope of practice; emergency care practitioner\(^24\), extended skills paramedic\(^25\), community paramedic\(^26\) and paramedic practitioner\(^27\). The International Roundtable for Community Paramedicine\(^28\) (IRCP) is a network of EMS leaders pursuing the concept of expanding paramedic scope; given international participation in this organization, we have adopted the term “community paramedic” for the purposes of this report.
Our objective was to systematically review the international literature to identify scientific evidence related to community paramedics. This information is intended to inform physicians, EMS operators, policy-makers and researchers who design, manage and measure EMS and healthcare systems.
Methodology

Data Sources and Search Strategy

We conducted a systematic review of the English literature to identify scientific evidence regarding community paramedicine. Our process followed the Cochrane methodology. We searched Medline, Embase and CINAHL databases from January 1, 2000 to June 30, 2009 for all relevant articles. To find all relevant citations related to community paramedicine, we used a complex set of search strategies that combined medical subject headings and text words for terms related to emergency medical services, paramedics and community health. The search strategy was developed by the investigators in consultation with the Ontario Community Paramedicine Interest Group, the International Roundtable on Community Paramedicine (IRCP) and an information specialist. We identified additional articles by hand-searching bibliographies of all included articles and contacting experts in the field.

Data Selection

We included all research studies that measured an outcome (health, cost, safety, risk) related to paramedic provision of expanded scope of practice. We excluded opinion articles, commentaries, and letters to the editor; however, we hand reviewed bibliographies to ensure we had not missed eligible studies. Two authors reviewed all citations independently in a hierarchical manner; title, abstract, full article. Titles classified as “include” or “indeterminate” by at least one of the investigators were included in the next level of review. Disagreements at the full article level were resolved by consensus between the two authors.

Data Extraction

Two authors (BB, SK) independently abstracted the variables of interest using a data abstraction tool: the study design, the population demographics, the control and intervention, outcome data, the type of EMS provider and the EMS setting. Any abstraction differences were resolved by consensus.

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*a*: The Ontario Community Paramedicine Interest Group is comprised of representatives from municipal EMS services in Ontario that are exploring community paramedicine models.

*b*: The International Roundtable on Community Paramedicine (IRCP) can be found at www.irpc.info and includes EMS researchers and administrators in its membership who share an interest in pursuing community paramedicine.
Summary of Evidence

**How many articles were found?**

There were 9 papers relating to 7 studies that met including criteria 20, 25, 27, 30-35. Most studies were excluded because they were not related to community paramedicine or were narrative descriptions of community paramedicine programs without data.

**Where did the studies originate?**

Studies originated from North America, the United Kingdom and Australia. The studies from the United Kingdom were set in urban and suburban centres 20,25,27,30-33, while both the Canadian 34 and Australian 35 studies primarily focused on rural and remote areas where health services access is limited due to a lack of health human resources. In Canada, Australia and the United Kingdom, the impetus for expanding paramedic practice originated with government white papers exploring alternative models of health care delivery 1, 3, 36.

**What methods did the studies use?**

Only one study was a randomized controlled trial (RCT) which investigated the efficacy of community paramedicine in the UK, and the findings were supportive of community paramedicine 27. The remaining body of evidence was limited to case-control, observational studies, economic and safety studies, and surveys 20,25,30-35. To help advance research in this area the current evidence is summarized and we focus on the randomized controlled trial from the United Kingdom.

**What was the scope of practice of the community paramedics in the United Kingdom RCT?**

The scope of community paramedicine in the UK RCT was tailored to the needs of the community and all participating paramedics received enhanced training in assessing and managing minor or low acuity patients beyond the capability of a standard paramedic. This included the assessment of minor, acute illnesses and ailments, providing alternate pathways for further assessment, treatment and follow-up, and providing on-scene education in injury prevention and chronic illness surveillance 27.

Daytime care provided by community paramedics studied by Mason and others included alternate disposition pathways aside from the emergency department. These alternate pathways included protocol driven referrals to radiography clinics, general practitioners, district nurses, and social services. 20, 27 These community paramedics had enhanced skills (Figure 1) that allowed them to treat patients at home for minor illnesses or injuries (Figure 2) and then leave the patient at home without recommending transport to ED. The decisions were guided by protocols and skill development which enabled the provider to suggest self care, referral to an agency or transportation to an ED 20.
The role paramedics played varied across the other non randomized studies. In the UK, community paramedics also played a role in triaging calls to 999 (911) and were utilized in dispatch centres to enhance the capture rate of patients who would benefit from community paramedic care\textsuperscript{33}. Reeve observed that paramedics with additional training could help to fill the niche of service currently under resourced due to a lack of physicians in rural and remote areas of Queensland, Australia\textsuperscript{35}. Martin-Misener described a similar extended practice for the paramedics of Long and Briar Islands in Nova Scotia, Canada\textsuperscript{34}. Services of this model include expanded patient assessments, ordering screening tests for bone density and some cancers, chronic illness identification and surveillance, medication compliance monitoring, and health education.

Paramedics also provided injury prevention initiatives including falls prevention, first aid and safety training and car seat clinics.\textsuperscript{34}

**What impact did community paramedics have on clinical and health care system outcomes in the United Kingdom RCT?**

Community paramedics may have a positive effect on patients and the health care system, including a reduction in ED attendances and inpatient length of stay. The UK RCT by Mason (2007) found several potential benefits after conducting the randomized controlled trial of community paramedic care versus standard paramedic care: patients were less likely to attend the emergency department either at the initial episode or within the next 28 days (62\% vs 88\%, p<0.001); were less likely to require hospital admission for 28 days after the initial
 episode (40% vs 47%, P<0.001); and were more likely to receive some form of on-scene treatment including advice (81% vs 73%, p<0.001). Clinical outcome data showed no statistically significant difference in outcome: within 28 days of the index episode, there was no difference in self-reported deterioration or patient mortality between the two cohorts (21.7% vs 25.6%, p=0.13, 4.4% vs 5.0%, p=0.41). Mason states that community paramedics “conveyed considerable benefit for patients and the National Health System in terms of reduced overall attendances at an emergency department or hospital, shorter episode times and higher levels of satisfaction among patients.”

Patient satisfaction improved in each community paramedic model primarily as it gave the patient choice and access to services other than attending the ED. Mason’s RCT identified that patients reported being “very satisfied” more often when treated by community paramedics compared to standard paramedics (85.5% vs 73.8%, p<0.001). Other non randomized studies suggested similar success; Cooper suggested that when a community paramedic was dispatched to minor calls, they were able to successfully provide referrals to alternate care including general practitioners, minor injury units, district nurses, or a falls prevention group, transporting 38% of patients to the ED compared to a 68% transport rate by standard paramedics during the same time (comparison only, no p value). Martin-Misener attributed positive effects of the Nova Scotia community paramedic-nurse practitioner model to surveillance and self-reporting assessments. Martin-Misener concluded that more patients with chronic illness were identified and better managed as evidenced by fewer off-island travel expenses to medical assessment and care over time after implementation of the community paramedic model. The model improved patient access to health care and reduced costly visits to a general practitioner by 28% and to the emergency department by 40% (no p value reported).

Can community paramedics practice safely?

A post hoc substudy of Mason’s RCT specifically assessed the safety of not transporting patients by comparing the rate of unexpected ED visits 7 days after contact with the community paramedic and found no statistically significant difference in the rate that nontransported patients attended an emergency department for reasons related to their index case within 7 days of the index episode (8.9% vs 6.8%, p=0.052) but did find a difference in the rate of ED attendance within 7 days for any reason (11.9% vs 9.5%, p=0.049). There was no difference in the rate of suboptimal care as judged by a physician review panel (26.5% vs 27.1%, p=0.94). In the original RCT, retrospective chart review found no statistically significant difference in mortality (OR 0.87, CI 0.63 to 1.21).
The authors concluded that community paramedics with extended skills practice as safely as standard practice paramedics and that “their decisions to treat patients and leave them at home or transfer them to the ED appear to be…safe and did not lead to a significant increase in reattendance or death.” Further research is required to understand which interventions can safely be performed, and which alternate care pathways can safely be recommended, by community paramedics.

In a prospective cohort study of 797 patients receiving community paramedic care compared to standard paramedic care, Snooks identified that three patients in each cohort were left at scene inappropriately as deemed by a chart review conducted by physicians, although none sought medical care following the index episode. Snooks also identified that the community paramedics were more thorough documenting their cases, which allowed for more useful evaluation of care processes.

These studies are specific to UK paramedics; the safety of expanding paramedic scope in Canada is not well understood, and training and education differ substantially between the two jurisdictions. In Canada, paramedics may attend a paramedic education program as short as six months or as long as four years. In the UK, a baccalaureate degree must be held to be considered for expanded practice.

Are community paramedics cost effective?

The cost effectiveness of community paramedic programs was quantitatively assessed in two articles. The clustered randomized control trial conducted by Mason (2007) was assessed for cost-effectiveness by Dixon. Community paramedicine failed to show superiority for the EMS-phase of care. There was no significant difference in cost in a study that had the power to find a difference of at least 5% (beta 80%). However, when the QALY (quality of adjusted life) indicators were included in the model, the cost to treat a patient in the paramedic practitioner cohort was £680 ($1050 CAD) less (all figures from 2008). Training costs were included in the model, and may skew data against the community paramedic model. Also, missing data rates were high for these analyses and the actual cost savings realized by the intervention is unclear.

Mason identified a lower total episode time in the community paramedic cohort compared to the standard paramedic cohort (235 vs 278 minutes (p<0.001)), though this time was not specific to the EMS period. Neither study considered the many indirect costs that could be impacted by community paramedicine programs. These data are insufficient to allow understanding of how community paramedics affect EMS resource utilization and health system costs; rigorous cost analyses are lacking.

Martin-Misener’s nurse practitioner-community paramedic model in Nova Scotia produced several statistically significant cost savings for both the patient and the health care system, mostly due to decreased travel off of the small islands to the mainland hospital. Direct annual health care cost diminished from $2380 to $1375 per person over the three years of the study. Total visits to a general practitioner (who are not on the Islands) decreased from 5214 to 3759 during the study period, a 28% decrease. This was associated with significant travel expense savings (p=0.02) and reductions in prescription medication costs (p=0.02). A 40% reduction in emergency department visits was also realized between the first and final year of the study (no p value reported). The methods of the study do not assess to what degree the community paramedic presence contributed to these cost savings.

Rigorous research is required to understand if community paramedicine programs can contribute to health system cost savings.
Evidence-Based Recommendations

There is a paucity of evidence supporting or refuting the concept of community paramedicine and broad implementation of such programs is not justified by current scientific evidence. Only one European randomized controlled trial exists and its results favour community paramedicine but these successes have not been repeated elsewhere. Of the data available, it is reasonable to recommend that a randomized controlled trial of community paramedicine be undertaken in the Canadian health care system. The following recommendations are based on the single randomized controlled trial conducted in Britain and unique to the National Health System in the UK demonstrating decreased time on scene, patients being more likely to receive treatment in the field, and better patient satisfaction without demonstrating any significant impact on health outcomes.

- Lacking evidence in support of community medicine suggests that an RCT is required to further science in this area and ensure precious health care resources are targeted appropriately to improve health outcomes.

- Community paramedic programs described in the literature are for the most part (>80%) describing international experiences in the UK (4), Australia (1) and Canada (1). This body of work suggests that any community program should be tailored to local needs, and many allied health professionals are reported to be crucial to the design and operations of such programs. Interprofessional collaboration and an assessment of community needs are required to understand the types of services a community paramedic program should optimally provide.

- A needs assessment would allow the target community to define the scope of practice in advance of any interventional trial.

- Outcomes for community paramedicine research should include health outcomes, direct and indirect costs, clinical and operational outcomes, patient safety outcomes and patient satisfaction measurement. These metrics should continue to be measured if the program is implemented as a standard of care.

- If community paramedicine is superior over the current standard of care in the target region, it may prompt curriculum change in college programs to ensure new graduates are well trained.
Conclusion

There is a paucity of literature investigating the effectiveness of expanding the scope of paramedic practice and most of the current literature lacks strong methods to support community paramedicine; however, the evidence to date suggests that paramedics may be capable of learning and applying additional medical competencies. Current literature is mostly international and focuses on community paramedic roles either to supplement care in rural areas, or more appropriately treat and refer patients in high-density areas to lessen emergency department utilization. The model of expanded paramedic scope of practice in the United Kingdom is the only example in the world that has been well-studied, and its results are promising and may be applicable to the Canadian health care system. Further pragmatic research of community paramedicine is required to fully understand the potential benefits and risks for health systems and patients alike.
Bibliography

Community Paramedicine
Framework for Planning, Implementation and Evaluation

July 2017

Home and Community Care Branch
Ministry of Health and Long Term Care
**Purpose**

This Framework is intended to be used by LHINs and their health system partners as a tool for decision-making and program planning, implementation and evaluation when considering the role of Community Paramedicine in their communities and in the context of broader health system transformation.

The Framework was developed with the engagement of paramedics, LHINs, municipalities and District Social Services Administration Boards (DSSAB). The Framework benefits from their commitment to developing CP programs that meet shared values of improving access to care in the community, improving coordination of care and effectively managing health system resources. The Framework will be adapted over time based on new data, lessons learned and ongoing fit with provincial and LHIN initiatives.

**Background**

Ontario's health care system has been evolving and improving over time and is successfully shifting care delivery from hospitals and long-term care homes to people’s homes and the community.

However, health services, especially in the community, can be fragmented, uncoordinated and unevenly distributed across the province. As a result, patients and caregivers can experience difficulties finding the "right door" to the care and the supports they need in the community when they need them most. Some rely on calling ambulance services and seeking help in hospital emergency departments (EDs) for conditions that could be treated more effectively through primary or home and community care.

The Ministry of Health and Long-Term Care (ministry) is taking steps that are expected to reduce gaps in the health care system and therefore improve connections between patients and services in the community, while reducing the need for 911 calls and ED visits. They include:

- Transforming home and community care under *Patients First: A Roadmap to Strengthen Home and Community Care*;
- Expanding the mandate of the LHINs under the *Patients First Act, 2016* to enhance access to primary care services and home and community care and better integrate health care services and the care experience; and
- Improving home care services for high needs patients and caregivers as well as other supports for complex patients through increased funding for home and community care, bundled care, and Health Links.

Beginning in 2014, the ministry funded Community Paramedicine (CP) pilots in regions across Ontario, where paramedics applied their training and skills outside their traditional roles of providing ambulance services. Initial CP models focused primarily on reducing 911 calls for ambulance services and transports to emergency departments among non-urgent patients by proactively tracking frequent 911 callers and offering to connect them with the local Community Care Access Centre (CCACs), now the LHIN home care services. CP models have continued to evolve to include home visits and monitoring patients with complex needs, especially frail seniors living in isolation and often disconnected from the health system.

Through the investment in the pilots, the ministry has learned that CP can have a role to play in Ontario and, and that the success of each CP program is tied to local needs, services, and partnerships. In 2017/18 the government allocated $6.0 million in annual funding to support LHINs in implementing CP programs in their local communities in collaboration with municipalities, paramedic services providers and other local health care partners. Each LHIN has been provided a specific allocation, with terms and conditions about the use of the funds.
Benefits of Community Paramedicine

Lessons learned from the CP pilots, along with evidence from peer reviewed and other literature, support that CP can provide value to the local health care system and contribute to improved patient health outcomes in the community.

| Patients can benefit from increased access to health care in their homes or in the community as Paramedics identify patients who have unmet needs and connect them to the appropriate resources or provide services in collaboration with teams of professionals. |
| Community Paramedic/Emergency Medical Services can benefit from reduced 911 calls for ambulance services and transports to emergency departments, as patients are proactively connected to the care they need in the community. |
| Hospitals can benefit from reduced emergency department visits, and potentially hospital admissions, by patients who can be better managed in the community. |
| Community Agencies can benefit from increased integration with other care providers and increased supports for clients. |
| Primary care and other health care providers can benefit from a reduction in unnecessary office visits as Community Paramedics provide home visits in collaboration with other health care professionals to monitor patients’ conditions and provide interventions at home. |
| Paramedics involved in CP can benefit from an expanded role that brings opportunities for career growth and job satisfaction. |

Examples of studies to date include:

- The Community Health Assessment Program through the Emergency Medical Services project
- The Community Paramedicine Remote Patient Monitoring Program
- Community Paramedicine: Framework for program development (2017 CSA Group)
- Effectiveness of a community paramedic-led health assessment and education initiative in a seniors’ residence building: The Community Health Assessment Program through Emergency Medical Services (CHAP-EMS)
Ontario’s Paramedics

Paramedics are government-regulated health professionals who provide patient care under a paramedic/ambulance service, as part of the emergency response system. They are delegated the ability to perform controlled acts and other advanced medical procedures by physicians who work for a provincial network of Base Hospitals.

All paramedics are trained to provide patient care in the setting of acute medical and trauma conditions, including cardiac arrests. Patient care assessment and management may include: vital signs monitoring, history gathering, oxygen administration, hemorrhage control, and cardiopulmonary resuscitation (CPR).

Paramedics triage patients and participate in determining the most appropriate transport destination, depending on the patient’s condition and acuity level.

There are three practice levels in Ontario: Primary Care Paramedics, Advanced Care Paramedics, and Critical Care Paramedics. Each practice level progresses in its scope of practice.

- **Primary Care Paramedics (PCP)** are able to administer medications, including epinephrine, glucagon, and nitroglycerine, and perform advanced diagnostic procedures, such as 12-lead electrocardiograms. In some areas, PCPs can also perform intravenous therapy.
- **Advanced Care Paramedics (ACP)** are able to administer additional medications (e.g. morphine, midazolam), and are able to perform intravenous therapy, endotracheal intubation, and several other advanced medical procedures (e.g. cardioversion, intraosseous therapy).
- **Critical Care Paramedics (CCP)** are able to administer further medications, and perform further advanced medical procedures (e.g. blood product administration, urinary catheter insertion).

A paramedic from any practice level may be appropriate to participate in a Community Paramedicine program. Community Paramedicine is not included under the definition of ambulance service in the Ambulance Act nor is it a core activity under the current legislation that governs Emergency Medical Services programs and resources.

LHINs will ensure that Community Paramedicine does not duplicate existing resources and care delivery models and processes while assessing the costs of Community Paramedicine compared to other health care delivery options.
Community Paramedicine Program Delivery

Community Paramedicine program delivery is generally defined through the model of care. CP program and models of care in Ontario vary depending on the local needs. Models of care may include paramedics in expanded roles and/or with an extended scope of practice in non-traditional community environments through collaborative or differentiated practice. For example, some CP programs may aim to reduce the number of patients transported to ED either by re-directing them to service providers not located at a hospital or by providing the necessary care in place i.e. through a home visit or in a CP clinic setting. Examples of models drawn from the CP pilot programs and sample budgets are included as Appendix A.

Ontario's CP Programs have typically included an Assessment and Referral component, with referral to a home visit program and/or Community Paramedicine-led clinics.

Assessment and Referral

- Paramedics respond to frequent 911 callers conduct patient assessments and refer patients as needed to home and community services, including LHIN home care services (formerly CCAC services), Mobile Mental Health Response Teams, and Collaborative Care teams within Health Links.
- A specific model of assessment and referral that has been adopted by many Paramedic Services providers is known as Community Referrals by EMS (CREMS). CREMS has been established in most LHINs in the province.

Home Visits

- Community Paramedics provide in-person and virtual home visits to provide care and monitor seniors and other patients at risk of losing their independence to live at home. This is an integrated model where paramedics work closely with health care partners such as LHIN home care services, Geriatric Emergency Management (GEM) Nurses, and acute or primary care teams of professionals.
- Some models have embedded paramedics into Family Health Teams to support physicians in monitoring at-risk patients through more frequent home visits. Other models embedded paramedics into the Circle of Care led by the local acute care hospital to support early discharge of admitted patients and smooth transition from hospital to home, especially patients identified as high-risk for re-admission.
- Other models involve scheduling home visits with patients in the community during a paramedic’s downtime between 911 calls. Innovative remote monitoring technology such as Telemedicine and Telehomecare are also used by some models.

Community Paramedic-Led Clinics

- Community Paramedics provide flu shots, education about healthy living, chronic disease prevention education, blood pressure checks, blood glucose checks, and other services.
- Clinics are offered in geographic areas with limited access to health care providers, or in locations with high numbers of frail patients such as seniors’ buildings or shelters.

Community Paramedicine is a model of care whereby paramedics apply their training and skills in “non-traditional” community-based environments, often outside the usual emergency response and transportation model. (Ontario Association of Paramedic Chiefs, 2014)
Community Paramedicine Framework Program Parameters

As there are no nationally or internationally accepted guidelines for the development of CP programs and as CP is not captured under any legislative or regulatory framework, it is important to create a programmatic structure in order to address patient safety risks that may emerge while promoting high-quality services and the adoption of operational best practices. The Framework program parameters are based on the experiences and lessons learned from the CP pilots funded by the ministry beginning in 2015, and other literature and best practice. These elements are consistent those items deemed to the most critical in developing an effective CP program as noted in the recently released *Community paramedicine: Framework for program development.* (2017 CSA Group)

This Framework is made up of six program parameters that have been identified as important for successful and high-quality Community Paramedicine initiatives:

1. Program Overview
2. Program Goals
3. Partnerships and Collaboration
4. Accountability and Operational Guidelines
5. Quality Assurance Guideline
6. Performance Measurement

These six parameters are not in isolation from one another. Indeed, there is substantial overlap among them. Each parameter contains a description of key elements, with possible approaches or criteria.

1. **CP Program Overview**

The program proposal clearly demonstrates how it will address the needs of the community. The success of a CP program depends on how well it addresses specific community health care gaps and responds to local circumstances and conditions.

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<tr>
<th>Dimension</th>
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| **Demonstrated need/evidence of health care gaps** | Based on a community assessment, the program proposal identifies:  
  - Service gaps  
  - Defined cohort population that cannot be addressed through established resources/services  
  - Resource/capacity gaps, e.g. shortages of health human resources, such as home visit nurses or primary care physicians  
  - Support from local service providers and partners re: proposed intervention/activity | Data and evidence to consider for determining service utilization patterns and gaps, for example:  
  - Volume of repeat 911 calls and ambulance transfers  
  - Volume of ED visits for non-urgent needs  
  - Wait times for community services, including home care services  
  - Percentage of patients with no access to primary care  
  Cohort populations to consider for proposed initiative:  
  - Older adults with Chronic Obstructive Pulmonary Disease, Congestive Heart Failure, Diabetes  
  - Older adults being supported in the community as they wait for long-term care home placement  
  - Frequent users of 911 services  
  - Those experiencing frequent hospital readmissions  
  - Recently discharged patients who may... |
### Ministry of Health and Long-Term Care

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<td>be at risk of hospital re-admissions&lt;br&gt;• Those experiencing frequent/sub-optimal transitions of care&lt;br&gt;• Patients who have limited access to primary care and/or home care&lt;br&gt;• Patients living in unsafe conditions, who may not necessarily fit the criteria for home care services</td>
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<td>Relevant system partners</td>
<td>Demonstrates collaboration with system partners in development and implementation of community needs assessment, program planning and implementation.&lt;br&gt;The partners include providers and community representatives who have a stake in or will be impacted by the proposed initiative.&lt;br&gt;The key partners also include an entity that will be accountable to, receive funding from and report to the LHIN on behalf of the CP project lead.</td>
<td>Partners may include:&lt;br&gt;• Health Links&lt;br&gt;• LHIN&lt;br&gt;• Health Service Providers (HSPs)&lt;br&gt;• Municipality/DSSAB/Emergency Medical Services (EMS)&lt;br&gt;• Hospitals/Emergency Departments&lt;br&gt;• Family Health Team&lt;br&gt;• Primary care provider&lt;br&gt;Consider partners based on who they represent and how they will be engaged at different points and processes depending on the CP model, scope of services, readiness and capacity.&lt;br&gt;As local Paramedic/Emergency Medical Services providers are not Health Service Providers (HSPs) under the Local Health System Integration Act (LHSIA), LHINs may flow funding through HSPs that are providing clinical leadership as part of the Community Paramedicine programs, e.g. community health centres or hospitals.</td>
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<td>Cost benefit analysis</td>
<td>The LHIN undertakes a comprehensive cost-benefit analysis that assesses the availability of existing capacity, resources, and service delivery models when considering the development of new models staffed by paramedics.&lt;br&gt;The cost analysis assesses risks of paying twice for the same services, while obtaining similar outcomes.</td>
<td>The analysis includes potential opportunities for cost avoidance or future savings as a result of health system outcomes such as:&lt;br&gt;• Reduced 911 calls&lt;br&gt;• Reduced ED visits&lt;br&gt;• Reduced hospital and Long-Term Care Home admissions and readmissions&lt;br&gt;Benefit analysis can include:&lt;br&gt;• Number of new referrals to home and community care services&lt;br&gt;• Increased access to health care services for identified populations&lt;br&gt;• Increased quality of life for patients</td>
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2. Program Goals and Scope

The program proposal has a clear description of program goals, target population and scope of services.

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<tr>
<td>Program Goals</td>
<td>Goals and type of model/services relate to the specific gaps that the program will help to address. Goals and type of model/services relate to health system and regional priorities, such as integration of care/services. Measurable goals and objectives include implementation, intermediate (short-term) and long-term outcome goals. Clear description of the activities, processes and outcomes of the proposed CP program and includes services across one or more model of care: • Assessment and Referral • Home Visits • Community Paramedic Led Clinics • Other CP models Potential opportunities for cost avoidance or future savings as a result of health system outcomes and will ensure the cost of operationalizing a CP program will remain competitive compared to other available service options.</td>
<td>Key features of goals, program scope, model and services: • Should relate to identified gaps and available resources • Have support from local service providers and partners that will be stakeholders in the proposed CP activity • Offers best use of limited capacity • Defined catchment and target populations and scope of services that community paramedics will be performing, highlighting which services will need medical oversight • Should build on existing and established community linkages and partnerships • Clear criteria and processes differentiating roles of partners • Commitment, buy-in and support from paramedic service organization/EMS and municipality/DSSAB Depending on the model, the goals should aim to achieve the following outcomes: • Reduce 911 calls for ambulance services • Reduce emergency departments visits • Reduce hospital admissions • Increase access to home and community services for patients and caregivers with unmet needs • Improve coordination for patients undergoing transitions in care (e.g. hospital to home) • Improve inter-professional collaborations and partnerships • Improve the patient and caregiver experience and outcomes</td>
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### 3. Partnerships and Collaboration

The program proposal creates strong partnerships and collaborations.

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| **Planning and design of CP initiative** | Engagement of diverse representatives of both formal and informal partners such as providers and communities who have a stake in or will be affected by proposed initiative. | Proposal reflects collaboration with existing health, social service and medical communities and local populations to engage in:  
- Planning process to identify sub-sets of populations that have poor health outcomes relative to the general population and map out their unique needs and challenges  
- Use this information to develop a plan to address identified needs, including service pathways, identify roles of appropriate providers and organizations, including cross-sector partnerships  
- Work towards integrating or co-ordinating care across organizations  
- Clearly defining the circle of care and facilitating the sharing of patient information or Electronic Medical Record |
| **Delivery of the proposed CP activity and partner organization role/s** | A key partner is an entity that will be accountable to, receive funding from and report to the LHIN on behalf of the CP project lead.  
Formalized inter-provider agreements and common expectations, including policies and processes that ensure effective collaborations.  
Where organizations/partners are involved in the delivery of the proposed initiative, proposal identifies (where applicable):  
- Role/function of each partner with respect to the proposed CP activity  
- Plan for sharing of HHR resources among partner organizations, e.g. nursing, LHIN coordinators, paramedics experiencing down-time, etc.  
- Plan for shared care and resources e.g. Telehomecare, Nurse-Led Outreach Teams, Rapid Response Nurses, Nurse Practitioners, etc.  
- Role of the applicable Upper Tier Municipality (UTM) or DSSAB in the | Policies and procedures with boundaries around the program and roles, such as:  
- Formal agreements/MOUs especially for proposals that include CPs as extenders of an inter-professional team/primary care team for home visits/monitoring  
- Mechanisms/processes by which partner organizations stay connected throughout the lifecycle of the project (e.g. communicate, problem solve, reach consensus on key decisions, make decisions regarding improvements, etc.)  
- Timely ongoing communication among partner providers and patients (e.g. group meetings, committees, dispute resolution procedures) and use of technology that allows patient information sharing and timely updates  
- Information about how resources will be shared/leveraged |
**Ministry of Health and Long-Term Care**

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|           | development and sustainability of this CP program | • Clarity with respect to access points/processes for admission and discharge.  
• Clarity in terms of referral, transition processes and hands-offs between health care professionals |

### 4. Accountability and Operational Guidelines

The program proposal has clear structures and processes to ensure strategic, operational and accountability requirements are in place and working, and that these are consistent across similar programs in the province.

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| **Role of Municipality/District Social Service Administration Board** | Consistent with the municipal responsibility for ensuring the proper provision of land ambulance operations, the proposal includes a description of risks where CP activity may interfere with the core business of providing emergency response, and actions to mitigate these risks.  
Consistent with the province providing a grant to municipalities for 50 percent of the approved costs for providing ambulance services required under legislated standards (*Ambulance Act, 1990*), the proposal recognizes municipalities are not expected to assume funding for non-land ambulance programs such as CP. | To ensure that CP programs do not interfere with the proper provision of ambulance services, the program has appropriate accountabilities such as:  
• Formal agreements/MOUS, including the municipality/DSSAB, especially for proposals that include CPs as extenders of an inter-professional team/primary care team for home visits/monitoring  
• Clarity about the nature and activities that are included in the proposed CP program  
• Identification of how resources and funds are utilized and the sources of CP funding  
• Oversight, documentation/reporting if ambulance service resources are shared for the purposes of the CP program |
| **Accountability** | In recognition that CP is not included under the definition of ambulance service in the Ambulance Act nor is it a core activity under the current legislation that governs EMS programs and resources, the proposal and service agreement with the key partner/Health Service Provider:  
• Clarifies resources and funds that will be utilized and the sources of CP funding, beyond the LHIN funding, if required.  
• Defines the governance and oversight/reporting structure among the parties involved, including expectations of each  
• Explains how the governance and funding and service agreements to include terms, conditions and/provisions addressing:  
• Program oversight, governance and accountability structures, policies and processes  
• Model of care, scope of services, CP provider role and eligibility requirements  
• Budget details, financial management/oversight, etc.  
• Roles of partners, other sectors  
• Physician delegation/medical oversight, clinical appropriateness  
• Guidelines and/or tools to be used  
• Performance measurement and quality |
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<tr>
<td></td>
<td>accountability structures will ensure that all CP activities fall within current legislative or programmatic framework parameters</td>
<td>improvement reviews and reporting</td>
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<tr>
<td><strong>Budget</strong></td>
<td>Detailed budget includes:</td>
<td>The budget is:</td>
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<td></td>
<td>• Which items are one-time and which items will be ongoing operational costs</td>
<td>• Realistic</td>
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<td>• Funding commitments from other partners that could help sustain the proposed CP activity, where applicable, with explanation and details on these commitments</td>
<td>• Sustainable</td>
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<td></td>
<td>• Alternative funding sources that were explored</td>
<td>• Comprehensive</td>
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<td>• Risks and mitigation strategies to ensure sustainability of program</td>
<td>• Does not overlap with services covered by Emergency Medical Services, for example 911 caller assessments such as CREMS</td>
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<td>• All costs and their corresponding description</td>
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<td>• Resources (including staff, equipment and supplies) that are provided in-kind by partner agencies or local Emergency Health Services/Municipality and how they will be accounted for and/or reimbursed to the land ambulance operations budget</td>
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<td>• Approval from applicable UTM/ DSSAB</td>
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<tr>
<td><strong>Operational Policies</strong></td>
<td>Number and type of staff and responsibilities, co-ordinators, paramedics, etc.</td>
<td>CP roles to consider:</td>
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<td></td>
<td>Details on how paramedics are assigned to CP roles and schedule based on scope of program and objectives.</td>
<td>• Level of paramedic assigned to the CP initiative.</td>
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<td>Clarity of roles and responsibilities.</td>
<td>• Entire shift dedicated to CP</td>
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<td></td>
<td>Details on policies and standard operating procedures and applicable service related parameters and tools such as:</td>
<td>• Entire position(s) dedicated to CP</td>
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<td>• Patient/client selection, assessment, follow-up</td>
<td>• Paramedics in a dual role with CP activities during staff downtime while ensuring emergency services are the first priority</td>
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<td>• Decision support tools/procedures such as general physical assessments, home safety assessments and medication reviews</td>
<td>Description of any policies, procedures and/or tools that address the following:</td>
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<td></td>
<td></td>
<td>• How patients are enrolled</td>
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<td>• Who initiates the visit</td>
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<td>• What is the response time and process for receiving requests</td>
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<td>• Referral documents, tools (paper or electronic) to document/ track event</td>
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<td>• Requirements for patient consent for release of information?</td>
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<td>Defined conditions under which CP may practice:</td>
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<td>• Within a service area,</td>
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5. Quality Assurance and Patient Safety

The program proposal supports the delivery of consistent, safe, and high-quality care.

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<td>CP Provider Effectiveness – Competency and Training</td>
<td>Key qualifications and recruitment criteria for CP providers. Required knowledge and competencies for CP providers in terms of: • skill sets • practice setting • medical oversight Content/skills considered core and optional and customized to local needs. Education and training needs, if applicable, in any core/relevant areas such as medical care, referral practice and documentation. Initial and ongoing professional development that addresses clinical, social, physical and emotional demands of specific CP patient population, if applicable. How CP providers access education and training. Policies and processes that address co-ordination and/or integration with family and other social support structures. Processes and mechanisms for</td>
<td>Selection and recruitment criteria for CP providers: • Experience • Knowledge of community and relationship building skills with providers within the Circle of Care Additional or customized training may focus on the following, depending on the CP model: • Patient assessment of chronic, non-acute care conditions • Clinical governance, support and provision for clinical reporting • Relationship and working with other health care providers in areas such as leadership, management, and communication • Clinical referral pathways for patients and available community resources • Content in primary care and public health • Patient satisfaction/informed consent. Processes and mechanisms for • Appropriate documentation, reporting and quality performance review/analyses • Documentation and contributing to the patient's record • Patient and Paramedic safety.</td>
</tr>
<tr>
<td>Dimension</td>
<td>Key Elements</td>
<td>Approach/Criteria</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Determining ongoing supervision and assessment, including clinical supervision if appropriate.</td>
<td></td>
<td>Training options may include: • classroom, online or distance learning • self-directed learning through modules and/or patient simulation • peer-to-peer learning to promote sharing and exchange of best practices</td>
</tr>
<tr>
<td>Patient Safety, Medical Delegation</td>
<td>The model of care and/or Controlled/Delegated Acts in the proposal and the model of care the proposal fits into (e.g. defined CP service specific procedures – home safety, social support evaluation, clinical services - wound care, medication compliance and reconciliation). Activities/services expected of CP providers that may include a Controlled/Delegated Act. Level and nature of medical oversight required for services such as medical assessment, diagnosis, and/or treatment, particularity in rural communities that lack provider resources. The process of how this work will be delegated by a responsible physician. Communication channels between the CP and role of medical lead. Documentation, reporting, monitoring and review mechanisms, particularly those that ensure timely and appropriate care. If medical direction/oversight is assured through a formal agreement. Process for obtaining patient consent for treatment and release of medical information. Protocols and guidelines to be developed in consultation with physicians, nurses and other health care professionals, compliant with applicable paramedicine practice or</td>
<td>Processes to seek/obtain advice on necessary competency, training and education from medical oversight teams. Processes/protocols for contacting physicians preferably a family physician or one who has an ongoing relationship with the client/patient to direct/support CP provider for: • Home visit initiated by physician referral • Defined service specific procedures – patient history, review of chief complaint • Conferring with physician on next steps • Ensuring timely, ongoing communication between the CP and physician for assessment, follow-up, monitoring and/or advice on emerging issues/needs • Documentation/record keeping that is integrated into existing systems and real-time and/or electronic format Processes/protocols to address/ensure: • Adequate patient assessment • Appropriate care for the given patient condition • Adherence to clinical guidelines • Appropriate documentation • Appropriate communication • Appropriate follow-up post assessment and/or interventions Plan and processes for measuring and managing performance, provide feedback on case reviews (especially where controlled acts are delegated to the CP provider and the role of the medical lead), such as: • Quality assessment/assurance for service/s • Sharing and discussing evidence informed care with CP provider, helping him/her to recognize optimal care and</td>
</tr>
<tr>
<td>Dimension</td>
<td>Key Elements</td>
<td>Approach/Criteria</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Patient Safety Monitoring</td>
<td><strong>Key Elements</strong>: Legislative or regulatory frameworks.</td>
<td><strong>Approach/Criteria</strong>: Management of care at home&lt;br&gt;- Directing/overseeing education&lt;br&gt;- Flow sheets to prompt evidence-based discussion and care planning&lt;br&gt;- Chart reviews&lt;br&gt;- Error reporting, performance improvement&lt;br&gt;- Clinical handoffs&lt;br&gt;&lt;br&gt;Use of evidence-based protocols, guidelines and standardized assessment tools to provide safe and consistent care.&lt;br&gt;Use of policies/processes to proactively identify any patient safety risks and determine mitigation strategies that can be applied in a timely manner.</td>
</tr>
<tr>
<td>Managing Patient/Caregiver</td>
<td><strong>Dimensions</strong>: Understanding patient needs and experiences in receiving services from CP providers/program, including:&lt;br&gt;- Identifying patients who are eligible for the CP program&lt;br&gt;- Patient perspectives and choices&lt;br&gt;- Clarifying reason for visit, assessment process, findings and what needs to be done&lt;br&gt;- Involving patient/caregiver in decision-making&lt;br&gt;&lt;br&gt;Policies/processes and mechanisms to ensure that:&lt;br&gt;- CP providers are properly triaging patients to distinguish those who need a higher level of care&lt;br&gt;- Patients at home are safe and avoiding the risks of unnecessary hospitalizations, as well as hospital acquired infections&lt;br&gt;- Patient populations and conditions are identified for whom safety improvements can be made and as well as those for whom CP may cause harm.</td>
<td>Experience</td>
</tr>
</tbody>
</table>
### Dimension | Key Elements | Approach/Criteria
--- | --- | ---
 | • Taking/spending enough time with patient/caregiver • Seeking informed consent at appropriate points/steps | greater harm compared with usual care Patient and caregiver feedback is addressed, including any complaints • Patient expectations, perceptions, and satisfaction with CP services are understood and assessed • Timely communication within the team of care providers about issues relating to the patient/caregiver Policies/processes to ensure: • Respectful and sensitive approach to communication, information gathering • Medical information concepts are conveyed in a language and manner that easy to understand, and follow, • Patient/caregivers have an opportunity to ask questions • Patients/caregivers are aware of process to raise issues and file complaints.

Note: A Sample Patient/Caregiver survey developed as part of the PC pilot process is included as Appendix B.

### 6. Output and Outcome Measurement and Reporting

The program has processes in place to collect data for the measurement of processes, services and outcomes to understand and evaluate program functioning, and impacts. This includes mechanisms for tracking key performance metrics reflecting the contributions of the proposed CP activity to improved patient and system outcomes, and continued cost effectiveness in relation to other available service options. Mechanisms may include:

- Data collection methods, resources across multiple sectors (e.g. Emergency Medical Services, LHIN, other).
- Appropriate definitions, measures, and instruments —using existing ones wherever possible—to evaluate CP impacts on patient access, safety, health outcomes, experience, and overall healthcare costs.
- Common approaches to identifying patient population, establishing a baseline, tracking performance and progress using shared data, data linkages, quality improvement processes, reporting roles and responsibilities.
- Data/sources/indicators that identify target patient populations, conditions, and care settings where the use of CP providers can yield the greatest cost savings.
- Tools and resources that promote sharing of outcomes, quality metrics and integrated quality improvement processes.

Each LHIN is required to report annually within two months past year end (Q4) to the ministry on a set of indicators that include outcome and output measures. The preliminary set of indicators to be collected are identified in the table on page 15. These indicators may change over time. In addition, individual LHINs may choose to collect additional qualitative or quantitative measures depending on their needs for planning purposes.
<table>
<thead>
<tr>
<th>CP Activity</th>
<th>Indicator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessments &amp; Referrals</strong></td>
<td>Difference in number of 911 calls for emergency medical services received in 2016/17 fiscal year compared to 2017/18 fiscal year</td>
<td>The difference between the number of 911 calls for emergency medical services in 2016/17 and the number of 911 calls for emergency medical services in 2017/18, in areas in which CP services are offered</td>
</tr>
<tr>
<td></td>
<td>Number of calls resulting in referrals to local services/programs</td>
<td>Number of 911 calls for emergency medical services that resulted in a referral of the patient to services/programs in the area.</td>
</tr>
<tr>
<td><strong>Home Visits</strong></td>
<td>Number of patients enrolled in a CP Home Visits program</td>
<td>Number of individuals who have received home visits through a CP Home Visits program in the time period being reported.</td>
</tr>
<tr>
<td></td>
<td>Number of patients ≥ 75</td>
<td>Number of enrolled patients in the time period being reported who are aged 75 or older.</td>
</tr>
<tr>
<td></td>
<td>Number of patients with 3 or more ambulatory care sensitive chronic health issues</td>
<td>Number of enrolled patients in the time period being reported who have 3 or more of the following chronic conditions: COPD, asthma, epilepsy, diabetes, heart failure &amp; pulmonary edema, hypertension, angina.</td>
</tr>
<tr>
<td></td>
<td>Number of home visits</td>
<td>Number of CP home visits completed in the time period being reported.</td>
</tr>
<tr>
<td></td>
<td>Number of referrals</td>
<td>Number of referrals (for services through LHIN, Primary Care, Community Support Services, or other health, social or community services providers) completed for patients enrolled in the CP Home Visits program for the time period being reported.</td>
</tr>
<tr>
<td></td>
<td>Difference in number of 911 calls received from enrolled patients in 2016/17 fiscal year compared to 2017/18 fiscal year</td>
<td>The difference between the number of 911 calls being reported from patients enrolled in the CP Home Visits program in 2016/17 fiscal year compared to 2017/18 fiscal year.</td>
</tr>
<tr>
<td></td>
<td>Patient experience</td>
<td>% of enrolled patients who rated the CP service as excellent (or the top rating of experience based on the survey method/tool in use).</td>
</tr>
<tr>
<td><strong>Wellness Clinic</strong></td>
<td>Number of patients who attended one-to-one CP Clinic education sessions</td>
<td>Number of individuals who attended a one-on-one CP Clinic education session in the time period being reported. Each visit is counted separately (i.e. one individual who attends 3 separate sessions is counted as 3).</td>
</tr>
<tr>
<td></td>
<td>Number of patients who attended group CP Clinic education sessions</td>
<td>Number of individuals who attended a group CP Clinic education session in the time period/quarter being reported. Each visit is counted separately (i.e. one individual who attends 3 separate sessions is counted as 3).</td>
</tr>
<tr>
<td></td>
<td>Number of patients ≥ 75</td>
<td>Number of patients who attend a CP Clinic education session in the time period being reported who are aged 75 or older. Each visit is counted separately (i.e. one individual who attends 3 separate sessions is counted as 3).</td>
</tr>
<tr>
<td></td>
<td>Number of patients with 3 or more ambulatory care sensitive chronic health issues</td>
<td>Number of patients who attend a CP Clinic education session in the time period being reported who have 3 or more of the following chronic conditions: COPD, asthma, epilepsy, diabetes, heart failure &amp; pulmonary edema, hypertension, angina. Each visit is counted separately (i.e. one individual who attends 3 separate sessions is counted as 3).</td>
</tr>
<tr>
<td></td>
<td>Patient experience</td>
<td>% of enrolled patients who rated the CP service as excellent (or the top rating of experience based on the survey method/tool in use).</td>
</tr>
</tbody>
</table>
APPENDIX A Community Paramedicine Pilot Programs

In 2014/15 and 2015/16, the ministry supported the development of 30 Community Paramedicine pilots across the province. Although there are other emerging models for CP, the 30 pilots focused on three broad models:

Model 1: Assessment and Referral

Paramedics responding to frequent 911 callers for ambulance services conduct patient assessments and refer patients as needed to home and community services, including LHIN home care services, Mobile Mental Health Response Teams, and Collaborative Care teams within Health Links.

Key Features:

- Paramedic completes patient assessment and referral during a regular response to an emergency call to patients deemed to be living at risk.
- Assessment tool (PERIL), training modules and referral pathways (some electronic) have already been developed and are in use.
- Leverages on the paramedic's clinical experience to assess clients' needs for referral and, with consent, refers the patient to appropriate health agencies (e.g. LHIN home care services).
- As the assessment and referral is done during the regular work of the paramedic, there are no ongoing costs for staff or supplies.
- Paramedic Referrals (PR) were developed as a response to situations in which paramedics encountered patients with unmet needs. Such patients often presented as frequent callers to 911 whose core issues continued to go unresolved. Screening and referral are two features common to all PR models and can involve assessments based on general observations or the use of validated tools. Referrals are typically simply the act of informing the LHIN of a client's needs.

Example:

- Community Referrals by EMS program (CREMS) - Paramedics refer eligible patients to community-based care options after a brief assessment while responding to an emergency call.

<table>
<thead>
<tr>
<th>Sample budget (start-up funds only)</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Training Development</td>
<td>$2,500</td>
<td>$0</td>
</tr>
<tr>
<td>EMS Training</td>
<td>$57,300</td>
<td></td>
</tr>
<tr>
<td>Public Education/Outreach</td>
<td>$6,500</td>
<td>$0</td>
</tr>
<tr>
<td>Policy Development</td>
<td>$3,000</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$69,300.00</strong></td>
<td><strong>$0</strong></td>
</tr>
</tbody>
</table>

Results:

Over a period of nine months, one program trained 274 paramedics on the assessment and referral process, and completed 3,006 PERIL assessments. 98% of the patients assessed were over the age of 65. Out of these assessments, 458 referrals were made to the CCAC, 80% of which resulted in new services added to support the patient in their home.
Model 2: Home Visit – Including remote monitoring

Community Paramedics provide home visits and care to seniors and other patients at risk of losing their independence to live at home. Service delivery approaches include embedding paramedics into Family Health Teams, or utilizing paramedic “downtime” between 911 calls.

Model 2a: Home Visits during “Paramedic Downtime”

Key Features:
- Paramedics make home visits during “downtime” between emergency responses.
- Dependent on volume of calls the service receives.
- Paramedics may need training to fulfill Community Paramedic role.
- These visits may be ad hoc (when a paramedic is in the neighborhood) or scheduled. They may also result in additional referrals as needed.
- Programs in more urban or densely populated areas do not routinely have this type of time available.
- Cost should be minimal, as programs will only need start-up funding (i.e. training, training time).
- Training and education curriculums have already been developed, and can easily be replicated.

Examples:
- Both Renfrew and Niagara EMS leverage “down time” from paramedics who are “on station” awaiting 911 calls. In both cases the programs were started by advanced paramedics stationed in rural areas who had extra time available while waiting for 911 calls.
- Typically staffed by advanced care paramedics who, during regular shifts, visit at-risk seniors living in their homes in rural or remote areas.
- During a visit, paramedics provide a range of services to clients including monitoring vitals, fall risk assessments, etc.
- In the Niagara CP pilot, the Community Paramedicine Response Unit makes home visits to seniors with complex needs in the region, assesses their service needs and connects them with primary care physicians, local pharmacists, home care (previously CCAC) falls prevention and other community support services.

<table>
<thead>
<tr>
<th>Sample Budget:</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Coordination/Admin support (.8 FTE)</td>
<td>$61,000</td>
<td>$61,000</td>
</tr>
<tr>
<td>EMS Training</td>
<td>$17,000</td>
<td>$11,000</td>
</tr>
<tr>
<td>IT, Communications</td>
<td>$26,400</td>
<td>$26,400</td>
</tr>
<tr>
<td>Administrative Costs</td>
<td>$14,300</td>
<td>$14,300</td>
</tr>
<tr>
<td>Total</td>
<td>$118,700.00</td>
<td>$112,700.00</td>
</tr>
</tbody>
</table>

Results:
Over a period of 18 months, one of the programs enrolled 59 patients and completed 458 home visits. Most patients were over the age of 65 and had two or more chronic health issues. During the visits, point of care tests such as ECGs and Blood Glucose were conducted and education/coaching to help support the patient in their home was provided. Eighteen referrals to various home and community care services were completed, almost have of which resulted in new or increase services for the patients.
A 93% decrease in 911 calls and a 77% decrease in the number of ambulance transports to the ED by the patients enrolled in the program over the last 12 months was reported.
Model 2b: Home Visits by dedicated Community Paramedics

Key Features:

- In areas where call volumes do not allow for paramedic downtime, dedicated positions may need to be created.
- Home Visits: One dedicated paramedic may visit seniors in their homes for assessment and follow up for short term assistance or for long term monitoring.

Example:

- In the West Carleton Family Health Team (WCFHT) CP pilot, designated community paramedic staff completes home visits delegated by Family Health Team physicians. The community paramedic staff is available to respond as needed during the usual daytime hours.

<table>
<thead>
<tr>
<th>Sample Budget</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 FTE Community Paramedic</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>EMS Training</td>
<td>$17,000</td>
<td>$11,000</td>
</tr>
<tr>
<td>IT, Communication equipment and maintenance</td>
<td>$19,000</td>
<td>$3,200</td>
</tr>
<tr>
<td>Supplies</td>
<td>$3,200</td>
<td>$3,200</td>
</tr>
<tr>
<td>Vehicle lease</td>
<td>$12,000</td>
<td>$12,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$151,200.00</strong></td>
<td><strong>$129,400.00</strong></td>
</tr>
</tbody>
</table>

Results:

Over 18 months, this program enrolled 155 patients and completed almost 700 home visits. The majority of patients were over the age of 65 and 60% had four or more chronic health issues. During the home visits, the paramedic staff performed over 500 point of care tests, about 50 education or coaching activities, and 190 referrals to home and community care services. Staff completed seven delegated acts during this time. A 30% decrease in 911 calls and 45% decrease in the number of ambulance transports to the ED by the patients enrolled in the program over the last 12 months was reported.

Specific Considerations:

- Strong consideration needs to be taken about adding new/additional paramedic staff to make home visits, versus utilizing downtime of current paramedics to expand access to home and community care and primary care, when other home visit services may be available (i.e. nursing).
- More data and additional research on the impact of the Home Visit model on 911 calls and ambulance transports to the ED would contribute to the body of knowledge supporting this community paramedicine model.
Model 3 –Community Paramedic Led Clinics

The goal of Community Paramedic Led Clinics is to provide early identification of health problems, referrals as well as health teaching and preventative interventions. These clinics can be run solely by CP practitioners or in partnership (e.g. with Public Health, Diabetes Outreach).

Key Features:

- Community paramedics provide chronic disease prevention education, blood pressure checks, blood glucose checks, general wellness assessments, flu shots, education about healthy living, and other services.
- Clinics are held in geographic areas with limited access to health care providers, or in locations with high numbers of frail patients, in settings such as community centres, pharmacies, senior centres, community housing complexes, shelters and local restaurants.
- Frequency of clinics ranges from regularly scheduled monthly events to seasonal or ad hoc.

Examples:

- In York Region, paramedics provide service to clients in shelters where two paramedics visit three shelters on a weekly or bi-weekly basis and offer vital checks, diagnosis, diabetes care, health teaching, system navigation, and referrals. No formal instruments are used for assessment.
- In Hamilton, a pilot research program provides primary care services to clients in a subsidized housing complex. The care provided include a variety of services such as a review of healthy lifestyles, risk assessment, measuring blood pressure, assessing diabetes risk and diabetes foot care.
- In Renfrew County, voluntary paramedics and students deliver Community Paramedic Led Clinics in the region where residents are welcome to drop in for staff to monitor vitals and blood glucose on a monthly basis. No formal assessment instruments are used.
- The CP program of the County of Brant includes clinics in identified municipally owned buildings providing subsidized rental accommodations for seniors and other vulnerable populations.
- The Algoma, Cochrane, Manitoulin-Sudbury EMS has established community paramedic-led clinics within social housing complexes in partnership with the DSSAB.

<table>
<thead>
<tr>
<th>Sample Budget</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 FTE Community Paramedic</td>
<td>$42,500</td>
<td>$92,900</td>
</tr>
<tr>
<td>Staff Co-ordination/Admin Support</td>
<td>$32,900</td>
<td>$71,400</td>
</tr>
<tr>
<td>Staff Training/Development</td>
<td>$10,000</td>
<td>$0</td>
</tr>
<tr>
<td>IT, Communication, Equipment &amp; Maintenance</td>
<td>$20,500</td>
<td>$6,900</td>
</tr>
<tr>
<td>Vehicle</td>
<td>$4,700</td>
<td>$10,000</td>
</tr>
<tr>
<td>Supplies</td>
<td>$34,000</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$144,600</strong></td>
<td><strong>$181,200</strong></td>
</tr>
</tbody>
</table>
Results:
Over a period of 18 months, one program has engaged with 120 patients (88% over the age of 65, 33% with 4 or more chronic conditions), and completed 393 assessments. The CP providers have completed point of care tests such as ECGs and Blood Glucose, and a number of health awareness/self-management assessments and coaching activities to help support the patient in their communities. They have completed 27 referrals to various home and community care services, 63% of which resulted in new or increase services for the patients. There has been a 93% decrease in 911 calls and a 77% decrease in the number of ambulance transports to the ED by the patients enrolled in the program over the last 12 months.

Specific considerations:
- Value for the Clinic model may be found in areas where there is a lack of other resources – particularly primary care and public health - available to provide the services.
- Initial research on the Community Health Assessment Program through Emergency Medical Services (CHAP-EMS) found that 15% of participants dropped one CANRISK category (e.g. high to moderate) during the intervention and EMS call volume decreased 25% during the intervention compared to previous two years.
- More data and additional research that would contribute to the body of knowledge supporting this model of community CP led clinic.
APPENDIX B Sample Patient/Caregiver Community Paramedicine Experience Survey

The survey questions below were developed by the Community Paramedicine Steering Committee to be used as part of the CP pilot. While this survey focusses on satisfaction as opposed to patient experience, it can be used as template from which patient experience can be measured.

**Community Paramedicine Program Patient / Caregiver Satisfaction Survey**

Instructions to Patients / Caregivers
- The purpose of this survey is to obtain feedback from patients / caregivers enrolled in Community Paramedicine programs for the purpose of determining how the programs could be improved.

This questionnaire is about the services and care you, or the person you care for, have received from the Community Paramedicine Program since your enrolment on [date]. Therefore, when answering the questions, please think only of your experiences with paramedics within the Community Paramedicine Program.

- The information you provide in this survey will be kept anonymous and private.
- It is your choice to take part in this survey. You are under no obligation to do so. The care you receive from the Community Paramedicine Program will not be affected in any way by whether you take part in this survey.
- Please do not write your name on the questionnaire, or include any other information that may identify you, so that your answers remain private and anonymous.
- By completing and submitting this survey, you are agreeing to these terms.

To answer a question, please put a check mark (V) in the box by the answer that is closest to the way you feel about the services and care provided to you, or if you are a caregiver, to the person you care for.

**Questionnaire items**

Please identify whether you are a:

- Patient
- Caregiver / Family Member

1. **The community paramedics provided me with helpful advice and information on how to maintain or improve my own health and well-being, or the health and well-being of the person I care for.**
   - Strongly agree
   - Agree
   - Disagree
   - Strongly disagree

2. **The community paramedics improved my knowledge about health and social services that are available.**
   - Strongly agree
   - Agree
   - Disagree
   - Strongly disagree

3. **I feel better prepared to deal with concerns I may have in the future about my own health and well-being, or the health and well-being of the person I care for.**
   - Strongly agree
   - Agree
   - Disagree
   - Strongly disagree

4. **The community paramedics gave me explanations that were easy to understand regarding my own health concerns, or the health concerns of the person I care for.**
   - Strongly agree
   - Agree
   - Disagree
   - Strongly disagree
5. The community paramedics listened to my concerns.
   Strongly agree  Agree  Disagree  Strongly disagree
   
6. The community paramedics took the time to answer my questions.
   Strongly agree  Agree  Disagree  Strongly disagree
   
7. The community paramedics were compassionate and sensitive to my health and well-being concerns, or to the health and well-being of the person I care for.
   Strongly agree  Agree  Disagree  Strongly disagree
   
8. The Community Paramedicine Program has aided my overall health and well-being, or the health and well-being of the person I care for.
   Yes
   No
   
9. Overall, how satisfied are you with the services and care provided by the community paramedic(s)?
   Very satisfied  Satisfied  Dissatisfied  Very dissatisfied
   
10. How would you rate your overall experience with the services provided by the community paramedic(s)?
    Poor  Good  Very Good  Excellent
    
11. Would you recommend this service to others?
    Yes  No
    
Your thoughts (Please do not include any information that can identify yourself, or if a caregiver, the person you care for).

12. What do you see as the overall benefits to this program?
    
13. Do you have suggestions for how this program could serve you better?
    
Economic Value of Community Paramedicine Study (CPS) Patient / Caregiver Satisfaction Survey

Instructions to Patients / Caregivers

- The purpose of this survey is to obtain feedback from patients / caregivers enrolled in the Community Paramedicine Study to determine how effective community paramedicine services were.
- The results of the survey will be summarized by the Program Evaluators and could be used in communications materials by the CPP research team and local, provincial and federal governments and healthcare organizations.

This questionnaire is about the services and care you, or the person you care for, have received from the Community Paramedicine Study since your enrolment on [date].

- The information you provide in this survey will be kept anonymous and private.
- It is your choice to take part in this survey. You are under no obligation to do so. The care you receive from the Community Paramedicine Study will not be affected in any way by whether you take part in this survey.
- Please do not write your name on the questionnaire, or include any other information that may identify you, so that your answers remain private and anonymous.

By completing and submitting this survey, you are agreeing to these terms.

To answer a question, please put a check mark (v) in the box by the answer that is closest to the way you feel about the services and care provided to you, or if you are a caregiver, to the person you care for.

Questionnaire items

Please identify whether you are a:

Patient  Caregiver / Family Member

□    □

1. The community paramedics provided me with helpful advice and information on how to maintain or improve my own health and well-being, or the health and well-being of the person I care for.
   Strongly agree    Agree    Disagree    Strongly disagree
   □    □    □    □

2. The community paramedics improved my knowledge about health and social services that are available to me.
   Strongly disagree    Disagree    Agree    Strongly Agree
   □    □    □    □

3. The community paramedics helped get more healthcare services in my home or in the home of the person I care for.
   Strongly agree    Agree    Disagree    Strongly disagree
   □    □    □    □
4. How prepared do you now feel to deal with concerns I may have in the future about my own health and well-being, or the health and well-being of the person I care for.
   - Not prepared □
   - A little prepared □
   - Prepared □
   - Very prepared □

5. The community paramedics gave me explanations that were easy to understand regarding my own health concerns, or the health concerns of the person I care for.
   - Strongly agree □
   - Agree □
   - Disagree □
   - Strongly disagree □

6. The community paramedics worked closely with other members of my healthcare team.
   - Strongly agree □
   - Agree □
   - Disagree □
   - Strongly disagree □

7. The community paramedics treated a condition at home that I would have otherwise gone to the Emergency Room for.
   - Never □
   - Once □
   - Often □
   - All the time □

8. The community paramedics helped me get healthcare assistance faster than before the Study.
   - Strongly agree □
   - Agree □
   - Disagree □
   - Strongly disagree □

9. The Community Paramedicine Study reduced the cost I have to pay for healthcare at my home or in the home of the person I care for.
   - Strongly agree □
   - Agree □
   - Disagree □
   - Strongly disagree □

10. Overall, how satisfied are you with the services and care provided by the community paramedic(s)?
    - Very satisfied □
    - Satisfied □
    - Dissatisfied □
    - Very dissatisfied □

11. The Community Paramedicine Program has aided my overall health and well-being, or the health and well-being of the person I care for.
    - Not at all □
    - Somewhat □
    - Very Much □

Care Giver Only Section

1. As a Caregiver, the community paramedics helped build my confidence to help the person I care for.
   - Strongly agree □
   - Agree □
   - Disagree □
   - Strongly disagree □

2. My stress level as a caregiver changed because of the assistance of community paramedics.
   - Much lower □
   - Lower □
   - Higher □
   - Much higher □
3. As a Caregiver, the community paramedics helped assist me in teaching the person I care for to self manage their conditions.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Your thoughts (Please do not include any information that can identify yourself, or if a caregiver, the person you care for).

What do you see as the overall benefits to this program?

Do you have suggestions for how this program could serve you better?
CREMS OVERVIEW

The purpose of this document is to provide an overview of the CREMS pilot and next steps in program rollout to the rest of the Toronto Central LHIN and Toronto EMS catchment.

Issue

Many 911 calls require ambulance dispatch but do not warrant transport to hospital. Even when they do, the hospital ED is often an expensive substitute for other health delivery options. In both instances, there may be opportunity for intervention and support to (1) improve the health-related quality of life of consumers and (2) reduce the incidence of avoidable ambulance dispatch and ED presentation.

Pilot

Community Referrals by EMS (CREMS) is a Solutions¹ pilot launched in the spring of 2006 with the participants shown right.

The objectives were to (1) improve the range and responsiveness of support available to healthcare consumers and (2) reduce EMS calls, and ED presentations and representations, by making referrals to community-based healthcare organizations.

<table>
<thead>
<tr>
<th>Provider</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS</td>
<td>Toronto EMS</td>
</tr>
<tr>
<td>HOSPITAL</td>
<td>Toronto East General Hospital</td>
</tr>
<tr>
<td>CCAC</td>
<td>Toronto CCAC</td>
</tr>
<tr>
<td></td>
<td>East York CCAC</td>
</tr>
<tr>
<td>CSS</td>
<td>Community Care East York Senior Link/Neighbourhood Link Woodgreen Community Services</td>
</tr>
<tr>
<td>OTHER</td>
<td>COTA</td>
</tr>
</tbody>
</table>

The pilot received the first ever Minister’s² Award in Innovation for Meeting Community Needs through Integrated Care in 2006.

¹Solutions is a voluntary healthcare collaborative. Member agencies include: Albany Clinic, Community Care East York, COTA, Flemingdon Health Centre, Neighbourhood Link/Senior Link, Nisbet Lodge, Partners for Health, SETo, Sherbourne Health Centre, South Riverdale Community Health Centre, Toronto East General Hospital, Toronto EMS, Toronto Public Health, Wellesley Central Health Corporation, Woodgreen Community Services, and the former East York and Toronto Community Care Access Centres (now both part of the Toronto Central Community Care Access Centre).

²The Innovations Expo was designed to highlight achievements, partnerships and innovations in Ontario that provide leading edge local solutions to specific health care delivery challenges. Minister Smitherman presented the award to the Solutions’ Community Referrals by EMS (CREMS) project, which was selected from 600 submissions to receive the award.
**Service Model**

The CREMS service model is predicated on the fact that referrals are a critical component of the health care system. While paramedics are an integral part of that system, they traditionally have not been recognized as a point of referral for the at-risk and in-need people who call 911 for EMS assistance.

The basic EMS response protocol is to administer medical treatment or provide some other type of assistance (i.e. a lift assist) and then either: 1. transport the individual to hospital or 2. leave them in their home.

This protocol was expanded in the pilot to include a third option: community referral if appropriate. The referral is made to the CCAC which coordinates an assessment of need and linkage to service (CCAC and/or community services). The pilot process is shown in the following poster created for Solutions by Toronto EMS.

The referral criteria was broad, and indicated that referrals could be made for people of all ages.

- Mobility/neurological issues (falls, non-acute gait disturbance)
- Orthopedic (back pain, joint swelling, casts affecting activities of daily living)
- Stabilized acute episode of chronic condition (diabetes, asthma, CHF, COPD)
- Skin conditions (dressing changes)
- Mental health (social isolation, depression)
- Frequent calls to EMS
- Problems with catheters, drains
- Palliative care
- Potential abuse
- General considerations: multiple/new meds, problems with activities of daily living (bathing, taking medications, preparing food, etc)
**Pilot scope**

The pilot catchment was Victoria Park Ave. to the east, the Don River to the west, Eglinton Ave. East to the north and Lake Ontario to the south; however, CREMS referrals made outside this area were accepted and included.

**Pilot results**

One key pilot indicator was to be a decrease in calls by frequent callers (as measured by a 6 month period before and after). Another important indicator was a decrease in time on task, ie time expenditure by EMS.

<table>
<thead>
<tr>
<th>Duration</th>
<th>Indicator</th>
<th>PRE-CREMS</th>
<th>POST-CREMS</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 MONTH RESULTS # Calls</td>
<td>215</td>
<td>162</td>
<td></td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Transports</td>
<td>147</td>
<td>110</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Non-transports</td>
<td>68</td>
<td>52</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Time on task</td>
<td>445h 15m 40s</td>
<td>244h 19m 28s</td>
<td>40.3%</td>
</tr>
<tr>
<td>12 MONTH RESULTS # Calls</td>
<td>360</td>
<td>294</td>
<td></td>
<td>18.3%</td>
</tr>
<tr>
<td></td>
<td>Transports</td>
<td>217</td>
<td>163</td>
<td>24.8%</td>
</tr>
<tr>
<td></td>
<td>Non-transports</td>
<td>143</td>
<td>131</td>
<td>8.4%</td>
</tr>
<tr>
<td></td>
<td>Time on task</td>
<td>662h 5m 11s</td>
<td>433h 10m 11s</td>
<td>34.6%</td>
</tr>
</tbody>
</table>

The reasons for the referrals were:

20  Mobility issues (frequent falls or fall safety concerns)
16  Failure to thrive
15  Substance abuse, social or psychiatric issues
   6  Dementia, confusion
   5  Frequent EMS calls
   3  Longterm care placement needed
   12 Other

CCAC coordinators developed service plans for these individuals which included nursing, personal support, occupational therapy and physiotherapy as appropriate.

<table>
<thead>
<tr>
<th>Service</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing</td>
<td>39</td>
</tr>
<tr>
<td>Occupational therapy</td>
<td>26</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>18</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>13</td>
</tr>
<tr>
<td>Personal support</td>
<td>4</td>
</tr>
</tbody>
</table>

The clients who received nursing services had a variety of clinical profiles with diagnoses ranging from trauma (fracture shoulder) and malignancies (CA Pancreas) to diabetic ketoacidosis and congestive heart failure. Clients who were provided with occupational therapy had conditions associated with trauma, mental illnesses and diseases of the central nervous system (cerebro-vascular accidents). Most of the rehabilitation clients had conditions arising from trauma and other conditions like Parkinson’s disease. Physiotherapy services were mostly provided for clients post non-surgical and surgical trauma.
Challenges

There were challenges in data collection and the feedback loop to EMS. However, participating partners are very positive about the results and the working relationships established, and believe the pilot demonstrated a successful referral model for expansion and enhancement across the province.

Next steps

1. Deploy CREMS across the rest of the Toronto Central LHIN and EMS Toronto catchment areas on January 7, 2008.

   In this next phase, the Toronto Central CCAC will act as the conduit for referrals to adjacent CCACs:
   - Mississauga/Halton
   - Central West
   - Central
   - Central East

2. Enhance CREMS in the Toronto Central LHIN by leveraging CCAC referral coordination to:
   a. Ensure explicit linkage with other identification and intervention initiatives such as ED notification which is being implemented in hospital emergency departments, to form a consistent LHIN-wide outreach framework which will help community networks of healthcare organizations provide more targeted support to the vulnerable and at-risk.
   b. Engage other community providers in the referral network and increase linkage of the vulnerable and at-risk to a range of services and support from mental health agencies, RGP for specialized geriatric services and outreach, community support services for seniors, non-traditional providers, etc.
   c. Further analyze and test referral criteria to improve effectiveness in targeting high frequency repeaters.
   d. Provide quarterly reporting.

Key contacts

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The geographic influence on delivery of community paramedicine programs to frequent users in the County of Renfrew, ON

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2County of Renfrew Paramedic Service, Pembroke, ON

Introduction
Spatial evaluation of accessibility to health care services typically generates scores that reflect a population’s ability to travel to health care resources (Guagliardo, 2004). Scores of spatial accessibility may be useful for comparing accessibility within a population but can overlook person-specific factors (Neutens, 2015). The lack of standardized metrics in the calculation of spatial accessibility can make interpretation difficult for policy makers (Guagliardo, 2004) and limits the comparison of these scores to other settings or other periods of time. Geographic profiling generates probabilities useful in identifying the location of specific cases (Le Comber et al., 2011). In criminal applications, geographic profiling maps present a probability surface that can be used to help locate serial offenders (Rossmo 1995). The value of a probability surface map is that it can present spatial data in a standardized manner (Wrigley, 1977).

This research draws on concepts of spatial accessibility and geographic profiling. First, as community paramedicine represents a mobile service delivery model, the traditional approach to assessing spatial accessibility based on a population’s ability to travel to a health resource does not apply. However, the cumulative opportunities for individuals to access services based on their location are still applicable. Second, rather than using geographic profiling to isolate one particular point of interest, the locations of multiple frequent users are of interest to service providers. Finally, using a predictive model as part of the analytical approach presents an opportunity to include individual-level factors. Considering individual and community needs through a combination of geographic profiling and measurement of spatial accessibility represents a novel approach in spatial analysis to present geographic profiles of health information that can be easily interpreted by decision makers to inform policy and delivery of services.

Objective
The objective of this analysis was to estimate spatially defined probabilities of paramedic service use by frequent users akin to the probability surface used in geographic profiling. Individual probabilities for repeated use were aggregated to spatially defined areas to indicate locations of successful intervention.

Methods
The process used to estimate spatially defined probabilities of paramedic service use by frequent users was comprised of three parts. Using data from electronic patient care records (ePCR), patients were classified as either frequent users or general users. First, a model was developed using logistic regression to identify individual level risk factors that predict frequent use patients. Second, the model was tested on independent subsets of data from subsequent years in order to determine the validity of the model. Third, the resulting probabilities generated through the modelling process were aggregated to two different spatial scales to create probability profiles of community need. Due to ongoing community paramedic programming within the region of study, the resultant community health profiles serve as an evaluation of the benefit of these programs in these locations. The community health profiles also can be used to assess community level probabilities of patient needs in future interventions.

Results
The results for model discrimination are summarized in the association of responses in Table 1. The analysis of concordant and discordant pairs presents adequate model performance. Table 2 shows the parameter estimates and their standard error with level of significance. It also reflects parameter odds ratios (OR) and OR confidence limits. The main figure (Figure 1) presents the resulting predicted probabilities of paramedic service use by frequent users.

The development dataset contained 8981 observations taken over three years. Of these, 295 patients were classified as frequent users of paramedic service. This represents an overall percentage of 3.4%. The validation datasets contained 9433 observations with 374 frequent use patients (3.66%) and 9155 observations with 348 frequent use patients (3.79%). Converting the percentage of frequent users to an

Discussion
Logistic regression was used to develop an explanatory model of individual characteristics that predicted frequent use patients who may benefit from improved accessibility offered through community paramedic programming. This model was validated in a variety of ways. Resulting probabilities were then aggregated to spatial grids in order to evaluate ongoing interventions as well as locations that may benefit from improvements in accessibility to health care services. At the individual level, the results presented important information regarding factors that are influential in patients at risk of becoming frequent users of paramedic services.

The findings respecting the communities of Deep River and Eganville are notable. In 2010, 16 patients were enrolled in the Aging at Home program in Deep River. It is unknown whether the 15 patients identified as frequent use patients in the development dataset coincided with these patients. However, in 2014, the program had grown in enrolment to 53 patients. Meanwhile, the number of frequent use patients identified in the validation dataset for 2014 was 9. In Eganville, similar results are seen. While the number of frequent use patients did not change greatly over time, the total number of paramedic service users increased thereby resulting in a drop of observed probabilities. These findings can serve to further validate other findings (Ruest, Stichman, & Day, 2012) regarding the positive influence these initiatives have had. The design of this research presented methodology that attempted to address limitations about generalizability of findings pertinent to research on spatial accessibility to health care.

Conclusion
This analysis can serve as a new way to assess spatial accessibility through the application of geographic profiling. This may allow communities to identify those areas with increased risk of frequent use of paramedic services. The resulting probabilities generated through the spatial model may be adapted to other settings. The results serve to validate ongoing community paramedic programming as marked decreases in risk were observed in communities where specific interventions occurred.

References
Living Longer, Living Well

Highlights and Key Recommendations
From the Report Submitted to the Minister of Health and Long-Term Care and the Minister Responsible for Seniors on recommendations to inform a Seniors Strategy for Ontario

Dr. Samir K. Sinha, MD, DPhil, FRCP C
Provincial Lead, Ontario’s Seniors Strategy
Introduction and Executive Summary

Ontario’s Coming of Age

While aging is inevitable, the proportion of Ontario’s population living longer and living well into their later years has never been greater. Our province is also aging faster than ever before. In 2011, there were 1,878,325 Ontarians aged 65 years and older, representing 14.6 per cent of the province’s overall population. However, as the boomers started turning 65 last year, this demographic imperative will continue well into the future. In fact, the number of older Ontarians, defined in this report as those 65 years and older, is expected to double over the next two decades.

Older Ontarians have helped to build our country and our province and remain a vital part of our society. They represent our grandparents, our parents, our uncles and aunts, our brothers and sisters, our neighbours, and our friends. They continuously help shape our society by sharing their experience, knowledge, expertise, and wisdom. They have been contributing to our economy longer than any other age group. Indeed, the contributions of older Ontarians continue to be wide-ranging and significant. They are volunteers, mentors, leaders, caregivers, and skilled workers who offer an abundance of experience to their families, workplaces, and communities. As such, the resilience and sustainability of our society will also depend on their continued contributions.

While older Ontarians are living longer and with less chronic illness or disability than generations before them, the vast majority of older adults have at least one chronic disease or condition. Indeed, as we age, our chances of living with chronic illness or disability will increase. While 77 per cent of older Ontarians recently reported being in good health, we know that there exists a minority who particularly struggle with multiple complex and often inter-related health and social care issues.

To put this in perspective, we know that the top 10 per cent of older Ontarians, characterized as having the most complex issues, accounts for 60 per cent of our annual spending on health care for this population. At the same time, the healthiest 50 per cent of our older population accounts for only 6 per cent of our overall annual spending on health care for older adults. It is clear, therefore, that the heterogeneity of our older population significantly affects their patterns of use of health, social, and community care services.

We know that older adults in general – and those with complex issues in particular – drive health care costs as they tend to use more expensive and intensive types of services, particularly in acute care settings. Indeed, while accounting for only 14.6 per cent of our current population, nearly half of our health care spending occurs on their behalf. While some warn against “apocalyptic demography,” few jurisdictions have grasped the complexity of illnesses and social challenges that too many older adults face, or the difficulties that this aging demographic will pose for our health, social, and community care delivery systems as they currently exist.
Living Longer, Living Well  Highlights and Key Recommendations

If left unaddressed, our demographic challenge could bankrupt the province. This means our demographic challenge should be seen as a demographic imperative, which amounts to an enormous opportunity for Ontario to better understand and meet the needs of its aging population. If we get this demographic imperative right, we will maintain the sustainability of our health, social, community, and other programs that have come to define us as Ontarians and Canadians, as well as the progressive society that we live in.

Over the past decade, the Government of Ontario and its ministries have introduced a number of progressive strategies and programs linked with significant investments through initiatives like its Aging at Home Strategy. These have allowed us to better support the needs of our oldest citizens.

Most recently, in 2012 Ontario set out a bold new vision to make the province the healthiest place in North America to grow up and grow old. In striving to better meet the needs of our aging population, we understand that this will be particularly challenging, given our current unprecedented fiscal and demographic challenges. Therefore, to establish the direction we want to take moving forward, we will undoubtedly be required to take stock and thoughtfully examine what we are currently doing, along with understanding where the current and future challenges and opportunities for the province now rest. This will be integral to make the best choices based on our needs, preferences, and values as Ontarians.

Never before have we had such compelling reasons to closely examine the ways in which we serve older Ontarians, their families, and their caregivers. Therefore, in January 2012, the province launched Ontario’s Action Plan for Health Care. It established a new direction for the province’s health care system, with a focus on equity, quality, access, value, and choice to ensure Ontarians receive the right care, in the right place, at the right time. The Action Plan highlighted the development of a Seniors Strategy as a way to establish sustainable best practices and policies at a provincial level that could in turn support the local delivery of health, social, and community care services with a focus on helping older Ontarians to stay healthy and stay at home longer.

The Minister of Health and Long-Term Care announced the appointment of Dr. Samir Sinha as the Provincial Seniors Strategy Expert Lead on May 24, 2012. His mandate was to lead the development and implementation of the Seniors Strategy with the help of a team of dedicated public servants. Our team’s first act was to establish and oversee a comprehensive provincial consultation process that would support the development of findings and recommendations. These would be submitted before the end of the year in the form of a comprehensive report to the Minister of Health and Long-Term Care and the Minister Responsible for Seniors.

In embarking on a journey, with the enormous responsibility to deliver a Seniors Strategy for the province, our team decided the best thing we could do was listen. This came out of a recognition that what Ontario was doing was unique, as no other jurisdiction in Canada had ever embarked on developing a strategy that dealt as broadly and in such depth with all of the issues related to aging.

As we travelled across the province this summer, we communicated with thousands of older Ontarians, their families and caregivers, municipal leaders and staff, and legions of dedicated health, social and community care providers, and volunteers who work hard to serve the growing needs of
older Ontarians every day. These engagements not only helped our team learn so much, but they also positively influenced our thinking on a number of occasions as we came to appreciate the full extent of both the challenges and opportunities that exist for this province and its people, especially given our current fiscal and demographic imperatives.

Through our early work, we quickly came to realize that the development of a Seniors Strategy would need to address issues beyond the health, social, and community care needs of older Ontarians. Indeed, we found those whom we engaged with were as interested in talking about housing, transportation, and social inclusion as they were in health care – most likely because all of these seemingly different areas are inextricably linked to one and other. We also came to appreciate that, despite our vast and diverse geography and peoples, Ontarians share a great deal of commonality in their thinking, values, and preferences related to the province we all aspire to grow up and grow old within. Furthermore, we learned that most older Ontarians today preferred to be addressed as “older adults” or “elders” rather than “seniors.” So what started as an initiative of the Ministry of Health and Long-Term Care quickly evolved into an interministerial effort that was overwhelmingly met with great enthusiasm and support.

We need to continually recognize the aging of Ontario as a success story, but at the same time we need to work towards identifying and addressing the ways we can do better as the needs of older Ontarians continue to evolve over the coming years. Through our engagements, just like the Senate Committee on Aging, we heard a clear call to recognize and support the place of older Ontarians as active, healthy, and engaged citizens in our society; a call to afford more older Ontarians the opportunity to age in the place of their choice; and a call to place as much importance on adding life to years, as we do on adding years to life. Above all, we heard a call to recognize our aging population not as a challenge, but rather as an opportunity for Ontario.7

In the pages that follow, this Seniors Strategy seeks to lay out the findings and recommendations that we believe will help to define and shape, in the most sustainable ways possible, Ontario’s opportunity to achieve its vision to be the healthiest place in North America to grow up and grow old.
Approach Towards Developing Ontario’s Seniors Strategy

Information Gathering

A team to lead the development of the Seniors Strategy was established in the Implementation Branch of the Ministry of Health and Long-Term Care and received additional support from the Ontario Seniors’ Secretariat. The team started its work by conducting a jurisdictional review of the evidence on strategies, approaches, and practices towards meeting the needs of an aging population.

Sources included published and unpublished reports, briefs, data, and analyses from Ontario and beyond, particularly from jurisdictions demonstrating leadership in these areas of focus. In particular, the work of developing the Seniors Strategy was seen as an opportunity to build upon previous ministry and other expert reports that included, in particular:

- *Public Services for Ontarians: A Path to Sustainability and Excellence*
- *Caring for Our Aging Population and Addressing Alternate Level of Care*
- *Enhancing the Continuum of Care*
- *Healthy Aging in Canada: A New Vision, A Vital Investment*
- *Canada’s Aging Population: Seizing the Opportunity*

During the subsequent consultation process, a number of additional published and unpublished reports, briefs, data, and analyses were shared with and reviewed by our team.

Stakeholder Consultations

Our team consulted broadly with a wide range of stakeholders over a six-month period to inform the overall findings and recommendations that would support a Seniors Strategy.

Interministerial Consultations

Within the Ministry of Health and Long-Term Care, over 20 branches were consulted for specific input. Ministries across the Government of Ontario were also consulted for feedback on interministerial issues of relevance to older Ontarians, including:

- Ministry of Aboriginal Affairs
- Ministry of Training, Colleges and Universities
- Ministry of Community and Social Services
- Ontario Seniors’ Secretariat
- Ministry of Finance
- Ministry of Labour
- Ministry of Municipal Affairs and Housing
- Ministry of Transportation
Provincial Tour and Stakeholder Engagements

As part of our mandate to consult broadly, we embarked on a provincial tour supported by all 14 Local Health Integration Networks (LHINs) that took us to 19 communities over the months of July, August, September, and October 2012. The goal of the tour was to obtain a better understanding of how local contexts have influenced our common challenges and opportunities to meet the needs of older Ontarians. The tour was equally invaluable in allowing for common and unique issues, priorities, and themes to be identified. It also provided an opportunity to further identify, observe, and understand best practices that currently exist.

Each LHIN visit took place over one or two days, often with multiple site visits in each region. The visits included targeted discussions with LHIN leadership, as well as lead and front-line administrators and health, social, and community care providers who may be working with:

- Community Support Services (CSS)
- Community Care Access Centres (CCACs)
- Long-Term Care (LTC) Homes
- Hospitals
- Community Health Centres
- Aboriginal Health Access Centres (AHACs)
- Family Health Teams (FHTs)
- Nurse Practitioner-Led Clinics (NPLCs) and other primary care models
- Public Health Units
- Emergency Medical Services (EMS).

Municipal officials and members of the public – including patients, caregivers, and advocates – also took part in these engagements or other public forums that provided more of a town-hall format.

The range of viewpoints represented in these engagements allowed a broad set of issues to be examined and explored around how best to address the issues most pertinent to older Ontarians. These discussions also allowed our team to account for and consider important rural, urban, geographical, and cultural nuances related to the themes they explored.

Our team further worked with over 95 provincial, national and international stakeholder groups representing older Ontarians, caregivers, provider organizations and agencies, professional bodies, and private for-profit and not-for-profit corporations through face-to-face meetings or through written submissions or both. Our team also cultivated relationships with existing expert panels and committees supporting the work of the government in ways that are related to the needs of older Ontarians. These included:

- Ontario Seniors’ Secretariat Liaison Committee
- Ontario Emergency Department (ED) LHIN Leads Committee
- Ontario Primary Care Physician LHIN Leads Committee
- Ontario Emergency Room/Alternate Level Care (ER/ALC) Expert Panel.

Our team was also able to consult with experts from around the world who gave generously of their time to explain their innovative approaches to care.
To further ensure that every voice possible in Ontario was heard as part of a thoughtful consultation process, a public questionnaire was distributed over the summer. Close to 5,000 people responded. Lastly, to ensure the views of caregivers were understood, the ministry conducted in-depth, structured interviews with 800 caregivers across the province.

In total, it is conservatively estimated that over 5,000 older Ontarians, over 2,500 health, social, and community care providers and municipal officials, and over 1,000 caregivers participated in providing views that were invaluable to shaping the findings and recommendations contained in this report.
Five Principles for a Seniors Strategy

As the Seniors Strategy moves forward to help build a province that values, encourages and promotes the wellness and independence of older Ontarians, it will be vital to ensure that any proposed policies, programs, and services adhere to the five principles that Ontarians told us mattered most to them.

1. Access

We are spending more on health, social, and community services than ever before, yet older Ontarians, their families, and their caregivers still find it challenging at times to access the right care, in the right place, at the right time. Therefore, when planning, reviewing, and delivering services we need to ask ourselves whether we are ensuring that older Ontarians, their families, and their caregivers can easily access the services and supports they need in a timely and efficient way.

2. Equity

We recognize that one of our greatest assets is our diversity as a province. Given that diversity is both visible and invisible, we need to ensure that not only are the needs of older Ontarians from different ethnocultural groups acknowledged, but also:

- those from our lesbian, gay, bisexual, transsexual and queer (LGBTQ) communities
- those whose abilities are limited
- those with special needs, such as the homebound.

Therefore, when planning, reviewing, and delivering services, we need to ask ourselves whether we are ensuring, where possible, that older Ontarians from diverse backgrounds are having their needs met in a way that acknowledges their unique needs.

3. Choice

We offer an incredible variety of supports and services for older Ontarians, yet their ability to understand their options and express their choices is not always as fully realized as it should be. Older Ontarians have the right to know what their options are and, when capable, make informed decisions with which they are comfortable. We never question a younger adult’s right to make good or poor decisions, so we also need to appreciate and acknowledge that older Ontarians should still be supported even if they make informed decisions that allow them to live at risk. Therefore, when planning, reviewing, and delivering services to them, we need to ask ourselves whether we are ensuring that older Ontarians, their families, and their caregivers have as many choices as is reasonable and possible, and whether they are also supported and empowered with the best information to make informed choices.
4. Value

With our current and future fiscal and demographic imperatives, we need to ensure we are spending our tax dollars in the most effective and efficient ways to help ensure the future sustainability of our systems, programs, and services. Therefore, when planning, reviewing, and delivering services, we need to ask ourselves whether we are ensuring that every dollar we spend is providing the best value possible.

5. Quality

Within our mandate to control current and future costs, we need to ensure that we never do this at the cost of quality. We are increasingly understanding that better quality care in many cases doesn’t actually cost more; it will not only meet our expectations, but also deliver desired outcomes that governments, services providers, and the public all value. Therefore, when planning, reviewing, and delivering services, we need to ask ourselves whether we are ensuring that a focus on quality is central to the work at hand.
Summary of Our Overall Findings and Key Recommendations

Promoting Health and Wellness

Through our consultations, we learned that while older Ontarians are living longer and with less chronic illness or disability than the generations before them, they and their families and caregivers want improved access to information and services that can allow them to stay healthy and stay at home longer. While the Government of Ontario and its LHINs and municipalities provide an incredible range of health, social, and community services, too many Ontarians remain unaware of their existence and or how to access them in ways that are most convenient to them, such as in their language of choice.

We also learned through our consultations how poverty can limit the ability of our poorest older Ontarians to stay healthy and stay independent. While Ontario has done much to reduce poverty levels in older adults to well below national levels, we need to continue to recognize that people have different access to income and wealth and that this can often influence decisions that allow them to stay healthy and stay at home longer. Living longer and living well will also mean that we need to do all that we can to ensure that Ontarians should not be allowed to age in poverty.

We must also put an increased focus on providing more services that promote staying healthy, active, and well-connected with others in ways that are respectful of changing societal needs and preferences and our overall diversity.

Key Recommendations:

- The Government of Ontario, through the Ontario Seniors’ Secretariat, should actively portray and promote healthy aging and the benefits of staying active in one’s older age through physical activity, volunteer work, continuous learning, and meaningful employment.
- The Government of Ontario should encourage and support the development of communication systems to ensure that older Ontarians, their families, and their caregivers are aware of the diverse range of programs and services available within their communities and can access information in accessible ways.
- The Ministry of Health and Long-Term Care should support its Local Health Integration Networks (LHINs) to develop more positive and collaborative relationships with their respective municipal councils to increase the number of and strengthen the role of Elderly Person Centres (EPCs) in Ontario.
- The Ministry of Health and Long-Term Care should increase the availability of accessible exercise, falls prevention, and health promotion classes across the province.
- The Government of Ontario should support efforts to ensure all eligible older Ontarians receive the retirement and age-related benefits to which they are entitled by maintaining its current and future commitments to financially support low- and moderate-income older Ontarians.
Strengthening Primary Care for Older Ontarians

Through our consultations, we learned that strengthening the provision of primary care will be essential to securing the health of older Ontarians. As they are likely to have more complex and often inter-related health and social care issues, they will often benefit from a team-based approach to primary care that prioritizes continuous quality improvement. We also learned through our consultations that communication among primary care providers, hospitals, and community care co-ordinators in particular, is not currently required. This often can create care gaps that everyone agrees should not exist.

We also learned that there still are older Ontarians who cannot easily find a primary care provider. This is especially the case for those who are homebound and would benefit from house calls. We need to do more to improve primary care for older Ontarians by building models of care that deliver high quality care and best serve their needs, while ensuring that every older Ontarian who wants a primary care provider can get one.

Key Recommendations:

• The Ministry of Health and Long-Term Care should promote and develop mechanisms in accordance with legislative/regulatory frameworks to advance the goal that all older Ontarians who want a primary care provider will have one.

• The Ministry of Health and Long-Term Care should ensure that its development of Quality Improvement Plans in Primary Care and Health Links support a core focus around the care of older Ontarians – with an emphasis on supporting primary care access for older adults and focusing attention on areas of care that influence the health and well-being of older adults.

• The Ministry of Health and Long-Term Care should mandate that care co-ordinators from Community Care Access Centres (CCACs), Community Support Services (CSS), and community mental health agencies providing care or service co-ordination support must identify and notify a patient’s primary care provider of their name, their role, their contact details, and the services being co-ordinated for the patient/client.

• The Ministry of Health and Long-Term Care should maintain and improve funding levels to support the provision of house calls by primary care providers.
Enhancing the Provision of Home and Community Care Services

Through our consultations, we learned that providing the right care, in the right place, at the right time means that we will have to strengthen and invest more in our home care and community support services sectors. Providing a wider range of home care, community support services, and affordable housing options will enable us to offer the care and support that will allow more people to remain independent and age in the place of their choice, rather than requiring more costly and sometimes less desirable care or living options.

Ontario’s Aging at Home Strategy was the current government’s first major attempt to invest in a wider range of programs and services that could support the development of a more integrated continuum of care. Continuing and strengthening this commitment to invest more in home care and community services will do much to support Ontarians staying healthy and staying at home longer.

Finally, the development of more progressive, fairer, and sustainable financing systems should be welcomed to support our future care needs, while not only preserving but enhancing overall access, equity, quality, value, and choice around the provision of services. In following the learnings of other provinces, we may identify clear ways that will likely not only allow us to enhance the overall sustainability of our home and community care sector, but also enable us to serve more people as well.

Key Recommendations:

• The Ministry of Health and Long-Term Care should at least maintain its commitment to increase home and community sector funding by 4 per cent for this current year and the next two years and is encouraged to invest future budget increases and savings achieved through efficiency gains into its home and community care sector.

• The Ministry of Health and Long-Term Care should support the LHINs, their CCACs and CSS agencies to formalize a Standardized Collaborative Care Model that can allow acuity-based waitlist and care co-ordination assignments between CCACs and select CSS agencies. This will allow both sectors to provide publicly-funded personal support services in each LHIN. This will allow both sector organizations to play to their strengths and better address client needs.

• The Ministry of Health and Long-Term Care should explore the implications of developing an income-based system towards the provision of home care and community support services based on the experiences and learnings of other jurisdictions. Framing this exploration with the goal of a system that can prioritize the principles of access, equity, choice, quality, and value will be integral to this process.

• The Ministry of Health and Long-Term Care should enhance access to clinic-based physiotherapy services in every LHIN, especially for those on limited incomes who often forgo this therapy when prescribed due to their financial means.

• The Ministry of Health and Long-Term Care, in partnership with the Ministry of Municipal Affairs and Housing and the Ministry of Community and Social Services, should encourage the development of more Assisted Living and Supportive Housing Units as alternatives to Long-Term Care Home placement for those who would benefit most from these environments.
Improving Acute Care for Elders

Through our consultations, we learned that we could do more to ensure that our hospitals are providing the care older Ontarians need, and only when they need it. While older Ontarians account for over half of our hospital care costs, and therefore represent the sector’s greatest users, our hospitals need to do more to prioritize their care. Every hospital in Ontario needs to be a Senior Friendly Hospital and we need to do more to promote the fact that the adoption of elder friendly care processes and models can deliver better patient, provider, and system outcomes, including lower Alternate Level of Care (ALC) rates. Hospitals also told us that they want and need to be better supported on this journey with access to the expertise that will allow them to achieve their goals. Furthermore, advancing innovative process and models that allow us to help older adults stay out of the hospital or return home as soon as possible, when appropriate, with seamless transitions of care, will ensure hospitals can remain effective and efficient parts of our overall health care system.

Key Recommendations:

• The Ministry of Health and Long-Term Care, in collaboration with Local Health Integration Networks (LHINs) and local municipal Emergency Medical Services (EMS) programs should explore the development and expansion of Community Paramedicine programs across Ontario, especially in northern and rural communities. These programs could better support high-users of EMS to avoid emergency department (ED) visits and hospitalizations and potentially delay entry into a long-term care home as well.
• The Ministry of Health and Long-Term Care, with LHINs’ collaboration, should support the development and launch of the Hospital at Home model in Ontario. A successful proof of concept of this model in Ontario will provide the information required to further implement this model across the province if deemed successful.
• The Ministry of Health and Long-Term Care, in partnership with the LHINs, should continue to promote the adoption of Senior Friendly Hospital principles through its accountability agreements with hospitals to aid them in the development of more enhanced care environments for hospitalized older adults that deliver better patient provider and system outcomes.
• The Ministry of Health and Long-Term Care and its LHINs should support hospitals across the province to adopt, implement, and strengthen models and processes of care that deliver better patient and system outcomes for older adults through the implementation of a collaborative coaching program model in partnership with leading hospitals, based on peer support and knowledge transfer and exchange.
• The Ministry of Health and Long-Term Care should continue to work with Health Quality Ontario (HQO) to expedite the implementation of the care transitions standards and processes and their associated outcome and process indicators, as recommended in the Avoidable Hospitalization Advisory Panel’s report Enhancing the Continuum of Care.
Living Longer, Living Well  Highlights and Key Recommendations

Enhancing Ontario’s Long-Term Care Home Environments

Through our consultations, we learned that we can do more to support our long-term care (LTC) homes in evolving to meet the changing needs of older Ontarians. Our long-term care homes provide care to some of the most vulnerable older adults in our society whose care needs require a safe and highly supportive care environment.

We also learned that while a LTC home used to be a one-way destination for persons entering them, more of them are starting to provide a variety of short-term care services that are allowing a greater number of older Ontarians to eventually return home to the community as well.

As the needs and care preferences of older Ontarians evolve, we will need to better understand what types of care and care environments we will require. Furthermore, we will need to ensure that LTC home staff are equipped with the right combination of knowledge and skills to ensure they can provide the best possible care to their residents at all times.

Key Recommendations:

- The Ministry of Health and Long-Term Care should undertake the development of an evidence-informed capacity planning process to meet the needs of current and future eligible long-term care (LTC) populations and others who could be better supported in supportive housing, in assisted living residential environments, or in their own homes with home care.

- The Ministry of Health and Long-Term Care should develop new LTC home-based service models to maximize capacity, increase programs to support older adults living in the community longer, and enhance programs to meet the needs of short- and long-stay residents. This could be more specifically accomplished by:
  a) Increasing short-stay respite and convalescent-care program capacity in LTC homes.
  b) Enabling LTC homes to provide higher levels of care to individuals with complex care needs.
  c) Exploring the ability of LTC homes to serve as community-care hubs that could provide community-oriented services, including home care, that may further assist local residents to age in place.

- The Ministry of Health and Long-Term Care should improve flow to and from LTC home long-stay and short-stay services by reviewing the existing application and transfer processes and policies to:
  a) considering increasing the number and type of homes selected; and
  b) better support potential residents – and when necessary, their substitute decision-makers and care co-ordinators – in the selection process.

- The Ministry of Health and Long-Term Care should support mechanisms to maximize the knowledge and skills of LTC home staff with additional training opportunities and support them in releasing their time to care through quality and process improvement initiatives through programs such as Residents First, the Behavioural Supports Ontario (BSO) Initiative, the Long-Term Care Best Practice Guideline Coordinator Initiative, and the new Centres for Learning Research and Innovation and Long-Term Care.
The Ministry of Health and Long-Term Care should enhance the utilization of Nurse-Led Outreach Teams into LTC homes to expand the capability of these homes to effectively meet the care of patients with more complex conditions and proactively identify emerging acute or sub-acute health issues that could subsequently lead to an unscheduled transfer to an emergency department (ED) and hospital admission.

Addressing the Specialized Care Needs of Older Ontarians

Through our consultations, we learned that specialists in geriatric medicine, psychiatry, and palliative medicine prove their worth on a daily basis in supporting older Ontarians, their families, their caregivers, and health, social, and community care providers to better address complex and often inter-related health and social care issues that often threaten one’s ability to age in place and die with dignity.

We also learned that our last organized commitment to supporting the development of specialized geriatric services in Ontario came decades ago. While the current unequal provision of funding to support the provision of specialized geriatric, mental health, and palliative care services across Ontario’s Local Health Integration Networks (LHINs) is limiting the access of older Ontarians to the care they deserve, it is also limiting our ability to attract and recruit geriatricians, geriatric psychiatrists, and specialists in palliative care. We do have clear opportunities in front of us to optimize our resources to address these issues. Furthermore, we should also pursue opportunities to raise awareness amongst those working with older adults of other unique needs shared by older Ontarians in order to enhance the overall care we provide.

Key Recommendations:

- The Ministry of Health and Long-Term Care and its LHINs should establish a provincial working group of geriatricians, care of the elderly family physicians and specialist nurses, allied health professionals, and others to help develop a common provincial vision for the delivery of geriatric services and a prioritization plan to guide local staffing and funding of care models as resources become available.
- The Ministry of Health and Long-Term Care should support its LHINs to leverage the partnerships, momentum, and successes of their Behavioural Supports Ontario (BSO) Initiative to help define what core community geriatric mental health and addictions services need to be funded and delivered. Additionally, a standard approach to assessment, referral, and service delivery models needs to be developed and implemented within and across LHINs.
- The Ministry of Health and Long-Term Care should continue to support its LHINs in broadening the range of palliative care settings available in their regions, including within a patient’s home, hospice, and institutional care settings as well.
- The Ministry of Health and Long-Term Care should encourage the inclusion of questions regarding continence, sexual, oral and nutritional health, and the frequency of falls in all informal and formal tools used to assess the health of older adults.
Medications and Older Ontarians

Through our consultations, we learned that we need to do more to support older Ontarians, as the greatest users of medication in our society, to manage their medication needs. The need of older Ontarians to often take more than one medication each day – and often many each day – puts them at increased risk of adverse medication events due to side effects or medication interactions. We therefore need to do more to improve the knowledge of older Ontarians taking medication, to support safer prescribing practices, and the administration and review of an older person’s medication. We also have to start thinking about how to develop fairer and sustainable financing systems that can still allow us to ensure all Ontarians can access the pharmaceutical therapies they need, regardless of their ability to pay for them.

Key Recommendations:

• The Ministry of Health and Long-Term Care should identify trends regarding inappropriate combinations of drugs and develop best practice guidelines and knowledge transfer mechanisms to improve prescribing practices and reduce the harmful effects of medication interactions in older adults.

• The Ministry of Health and Long-Term Care should conduct a full review of its MedsCheck Program to understand how effective it has been and how this service can be improved to:
  a) better support patients managing with multiple medications; and
  b) provide more added value.

• The Ministry of Health and Long-Term Care should continue its work of reforming the Ontario Drug Benefit (ODB) Program to more directly link benefits to income rather than age, and thereby consider expanding this coverage for all Ontarians.

Caring for Caregivers

Through our consultations, we learned that we need to do more to support caregivers across our province, especially when their presence is the reason why so many older Ontarians have been – and will remain – able to age in their places of choice for as long as possible. However, it should also be noted that while older Ontarians are the greatest recipients of support from a caregiver, they are more likely to be serving as unpaid caregivers as well to both family members and friends. Although caregiving can be personally rewarding, it can also be stressful and expensive and can take an enormous toll on a caregiver’s health and well-being. All Ontarians stand to benefit when caregivers can be supported with information and access to a range of supports which will allow them to continue assisting those they care about.
Key Recommendations:

- The Ministry of Health and Long-Term Care should improve the awareness of services and supports available to unpaid caregivers with improved single points of access. In particular, the ministry should ensure that these single points of access recognize the unique identity and needs of unpaid caregivers that may require information to be presented differently.
- The Ministry of Health and Long-Term Care, in conjunction with the Ministry of Finance and the Ontario Seniors’ Secretariat, should promote the awareness and uptake of various programs (for example, financial benefits and tax credits supporting the financial burdens of unpaid caregiving).
- The Ministry of Health and Long-Term Care should encourage the standardization of services and supports offered through the Alzheimer Society’s First Link program and fully support the implementation of this program in every LHIN across Ontario. This will help ensure that this vital support program and service for older adults and unpaid caregivers affected by dementia is available to all.

Addressing Ageism and Elder Abuse

Through our consultations, we learned that, as a society, we don’t tend to value aging, and hence older Ontarians, as we should. While we have built a progressive society in many ways, overt forms of ageism and even “self-adopted ageism” amongst older Ontarians themselves, are still present. This restricts the options of some to lead healthy and productive lives.

We also learned that while the province has made combating elder abuse a priority, too many older Ontarians remain victims of abuse each year. Better educating Ontarians about what elder abuse is, how to prevent it and how to better support victims can ensure more older Ontarians can live longer and well with the dignity and respect they deserve.

Key Recommendations:

- The Government of Ontario, through the Ontario Seniors’ Secretariat, should adopt a process to ensure that legislation or policies which permit age to influence the access of older Ontarians to any specific service should be identified and reviewed in liaison with older user groups.
- The Government of Ontario should continue its current commitments to its Strategy to Combat Elder Abuse through the supporting partnership of the Ontario Seniors’ Secretariat, Ontario Victim Services Secretariat, Ministry of the Attorney General, and the Ontario Network for the Prevention of Elder Abuse (ONPEA) to support work that
  a) Seeks to raise public awareness about the abuse and neglect of older adults;
  b) Provides training for front-line staff; and
  c) Co-ordinates community services to better assist victims of elder abuse in communities across the province.
Living Longer, Living Well  Highlights and Key Recommendations

Addressing the Unique Needs of Older Aboriginal Peoples in Ontario

Through our consultations, we learned that older Aboriginal Peoples have unique needs that need to be addressed. The management of chronic diseases coupled with aging has proved to be challenging for Aboriginal Peoples living across Ontario. Aboriginal Peoples in Ontario start to struggle with geriatric issues at younger ages than the rest of our society. They also have more challenges to accessing culturally appropriate care and services like other Ontarians from diverse backgrounds as well. We need to make a commitment to better understand and address the unique needs of older Aboriginal Peoples in Ontario.

**Key Recommendation:**

- The Ministry of Health and Long-Term Care, in partnership with the Ontario Seniors’ Secretariat and the Ministry of Aboriginal Affairs, should commit to a process to meaningfully engage on- and off-reserve Aboriginal Peoples and their organizations across Ontario in the development of an Aboriginal Seniors Strategy.

Supporting the Development of Elder Friendly Communities

Through our consultations, we learned that our communities need to be the foundation of a Seniors Strategy. Therefore, to fulfil the government’s mission to make Ontario the best place to grow up and grow old, we will need to foster the development of elder friendly communities that recognize the great diversity amongst older persons, promotes their inclusion and contributions in all areas of community life, respects their decisions and lifestyle choices, and anticipates and responds flexibly to aging-related needs and preferences.

We also learned that building the strong communities that we desire will require partnerships between municipal governments and the province, especially around the provision of accessible and affordable housing, transportation and health care options that will support more Ontarians to age in the place of their choice.

**Key Recommendations:**

- The Government of Ontario should support its communities and citizens to ensure they have access to a variety of programs and supports that will enable them to adapt their residences to accommodate their evolving functional needs so that they can continue to age in place whenever possible and for as long as they desire.
- The Ministry of Health and Long-Term Care, in partnership with the Ministry of Transportation and through partnerships with Local Health Integration Networks (LHINs), Municipalities and Community Support Sector agencies, needs to further enhance the development and availability of non-profit, safe, dignified, and consumer-oriented transportation systems for older Ontarians across urban and, wherever possible, rural communities as well.
Necessary Enablers to Support a Seniors Strategy for Ontario

Through our consultations, we learned that Ontario’s health, social, and community human resources need to be better prepared and supported to meet the needs of our aging population. The fact that we don’t require any of our schools in Ontario that train our future health, social, and community care providers to formally teach content related to caring for older adults is concerning. Those who are not exposed to caring for or working with older adults will be less confident in their knowledge and skills working with these patients and less prepared to meet their needs or even to choose these areas as a career. A strategy that provides the right education and training opportunities will ensure that Ontario gains an informed workforce that will have the necessary knowledge, skills, and confidence to identify issues of need amongst older adults while delivering them the right care, in the right place, at the right time.

We also learned that research and technology is providing new opportunities to deliver care more efficiently, while enabling increasing numbers of Ontarians to remain more independently at home. Advancing the use of technologies that permit care closer to, or even in the home, and that strengthen the development of integrated assessment, information and referral systems, should be prioritized.

Key Recommendations:

- The Ministry of Health and Long-Term Care, in collaboration with the Ministry of Training, Colleges and Universities, should support the preparedness of all future health and social care providers to meet the evolving care needs of older Ontarians by requiring that core training programs in Ontario for physicians, nurses, occupational therapists, physiotherapists, social workers, pharmacists, physician assistants, paramedics, personal support workers, and other relevant health and social care providers should include relevant content and clinical training opportunities in geriatrics.

- The Ministry of Health and Long-Term Care should finalize the development of its recently introduced Alternate Funding Plan (AFP) to support geriatricians in Ontario in a way that doesn’t restrict their numbers, or provide disincentives to those wishing to practice geriatrics.

- The Ministry of Health and Long-Term Care should provide more support to its Personal Support Worker (PSW) workforce by strengthening its new PSW Registry by requiring mandatory registration, requiring a common educational standard for all future registrants, and developing a complaints process that can protect the public and the profession.

- The Ministry of Health and Long-Term Care and its Local Health Integration Networks (LHINs) should require that health, social, and community services providers streamline their assessment and referral processes to:
  a) avoid duplication and burden for patients and clients, and
  b) to promote greater efficiency in the delivery of services.
Establishing the Mandate, Implementing the Strategy

Through our consultations, we learned that Ontario’s coming of age will undoubtedly change the way we do things and force us to make choices as a society as to how best meet the needs of our aging population. As our team sees it, we can react passively to the change ahead of us, or we can proactively anticipate and address these challenges as opportunities to do better. Ontario can be the best place to grow up and grow old, and its commitment to developing its first comprehensive Seniors Strategy can at least provide an initial direction forward based on our current needs, values, and preferences.

To realize a society free of ageism, where older Ontarians, their families, and their caregivers can access the right supports and services, in the right place, at the right time, and where no older Ontarian’s income limits their access to basic services, we need to come together as a province and recognize our opportunity to do better.

We learned through our consultations that the Ontario government and its ministries can play a greater leadership role in advancing the needs of older Ontarians. In advancing a Seniors Strategy, there are many things that will require intra- and interministerial co-ordination. There are other things that Ontario will need to work on with its municipal, federal, provincial, and territorial partners to also help advance the needs of older Ontarians and Canadians.

Governments can play a powerful role in setting up leadership and governance structures and establishing the rules of engagement that align incentives and accountabilities to allow and encourage different levels of government and sectoral providers to advance common interests. Given that we all have a vested interest in being better able to meet the needs of our aging populations, uniting around the development of a Seniors Strategy will represent an excellent opportunity to do so.

Adequate funding will be a critical enabler to support the successful implementation and ensure long-term sustainability of the strategic recommendations and goals outlined in this report. At the same time, it was clear during the development of these recommendations that they are being made during a period of enormous fiscal restraint. The Government of Ontario, however, is equally committed to ensuring the sustainability and efficiency of its health care system. To this end, each of the recommendations put forward have been applied against the principle of achieving value for Ontarians, and in some areas cost-savings through targeted investments that achieve process improvements, reduce inequities, and ultimately achieve better patient and system outcomes. Most importantly, the recommendations being made in this report have all been conceived with the notion that they can be achieved within existing budgets and resources.

The findings and recommendations presented in this report are but the first step. Indeed, from here the real work will begin. The next step will require direction from the Government of Ontario on its support towards implementing the recommendations outlined in this report. This should then lead to the establishment of clearly articulated implementation timelines and a monitoring system to ensure progress continues to be made.
**Key Recommendations:**

- The Ministry of Health and Long-Term Care’s Implementation Branch, in partnership with the Ontario Seniors’ Secretariat, should hold overall responsibility to oversee the implementation of the government’s Seniors Strategy. It should be required to report to the ministers quarterly on the progress, challenges, and opportunities being seen through the implementation of the Strategy and develop an annual report that can be shared with the public.

- The Ministry of Health and Long-Term Care should require each Local Health Integration Network (LHIN) to
  
  a) appoint a member of its executive team to oversee the implementation of the Seniors Strategy; and
  
  b) establish a steering committee with a broad base of representation from local health, social, and community care providers, including public health and paramedical providers, local municipal officials, designated French Language Health Planning entities, patients, and caregivers, to help discuss and plan opportunities to further develop and implement services for older Ontarians in their regions.

The full report will present considerably more detailed findings and recommendations that will enable the government to expand upon and provide some specific means of implementing the themes and recommendations set out in this Highlights and Key Recommendations document.


January 2013
Sample Selection Protocol:
Rationale for Approach:
- The EV-CP Study will be a Random Control Trial (RCT) to examine the economic and related health care value of Community Paramedicine, both longitudinally (over time/"before and after" intervention), and between two Study Areas (Hastings-Quinte and Renfrew County). Normally, this would call for at least four (4) study groups or sample blocks (two experimental/study groups and two control groups). The parts of the healthcare system on which the EV-CP study will focus is on economic value to EMS services and to Emergency Departments at local hospitals. In addition, it is recognized that there may well be economic value to other parts of the local health care system, such as family health teams/family physicians or community-based agencies and the Community Care Access Centres (CCACs) that coordinate their services.
- The two Study Areas are also participants in the FutureHealth-Canada Health Infoway (CHI) study evaluating the longitudinal impact of Remote Patient Monitoring (RPM) in combination with EMS and Community Paramedicine. The FutureHealth-CHI study is being conducted in eight Areas of Southern Ontario (mostly rural) and will have a field study period of 18 months (as compared to the EV-CP study's 12 months. The recommendation for Hastings-Quinte and Renfrew County is that participation in the RPM study be focused on the opportunity to contribute to understanding of RPM-CP research by running two more sample blocks (one each in Hastings-Quinte and Renfrew) that would be an EMS-RPM model. This would allow both the federal EV-CP study and the FutureHealth-CHI study to better understand the economic value of Community Paramedicine with or without Remote Patient Monitoring.

Description of the Sample Structure:
- It is proposed that the EV-CP study have six (6) blocks, three (3) each in Hastings-Quinte and Renfrew County. Two of the Hastings-Quinte blocks would be selected from the urban areas in the southern part of the Area – the cities of Belleville and Quinte West. The third block (EMS+RPM) would be focused on the northern, rural part of the Area. All three (3) of the Renfrew blocks would be focused on the rural areas (insert names of communities).

<table>
<thead>
<tr>
<th>Hastings-Quinte</th>
<th>Renfrew County</th>
<th>Timeframe in Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban – CP Service (Study/Experimental Group) N = 60</td>
<td>Rural – CP Service (Study/Experimental Group) N = 40</td>
<td>Up to 1 year depending on timing of enrolment</td>
</tr>
<tr>
<td>Urban – EMS Service Only (Control Group) N = 60</td>
<td>Rural – EMS Service Only (Control Group) N = 40</td>
<td>Up to 1 year depending on timing of enrolment</td>
</tr>
<tr>
<td>Rural – EMS+RPM Service (Study/Experimental Group) N = 40 x 3 sampling periods</td>
<td>Rural – EMS+RPM Service (Study/Experimental Group) N = 40 x 3 sampling periods</td>
<td>Up to 6 months depending on timing of enrolment; three sampling periods</td>
</tr>
<tr>
<td>Rural – EMS Service Only (Control Group) N = 40 x 3 sampling periods</td>
<td>Rural – EMS Service Only (Control Group) N = 40 x 3 sampling periods</td>
<td>Up to 6 months depending on timing of enrolment; three sampling periods</td>
</tr>
<tr>
<td>Total = 360</td>
<td>Total = 320</td>
<td>Two-County Total = 620</td>
</tr>
</tbody>
</table>

**Acronyms:** CP Service = Community Paramedicine Service; EMS Service = Emergency Medical Service; RPM Service = Remote Patient Monitoring (Technology) Service; N = sub-sample size
Sample Selection and Assignment Protocol:

1. For each of the two Areas (Hastings-Quinte and Renfrew), generate a list of all clients of 911-EMS services who used that service three (3) times or more in the preceding year. Note that in Hastings-Quinte, this will require a separate list for each of the urban and rural (North Hastings) sub-areas. Frequent clients of EMS Services in Prince Edward County are not included because they are not part of any of the Area’s sample blocks.

2. Sort the list by frequency of use of 911-EMS service (e.g. highest frequency clients first, declining to lowest frequent clients).

3. Remove from the list any clients who:
   a) Live in a long-term care facility (individuals living in a retirement residence in either independent living or assisted living accommodations are eligible for participation)
   b) Were visiting in the area at the time but do not live there permanently.
   c) Were living in the area at the time but have since moved to another municipality.
   d) Have no available local retrospective data for the year prior to the first use of 911-EMS
   e) Do not have any of the following four chronic conditions (diabetes, hypertension, COPD, risk of stroke) [What have I missed? Is mental health in or out? Does this include or exclude dementia or early Alzheimer’s patients?]
   f) Are deceased.

Note that high-frequency EMS service clients are eligible to participate in the study whether or not they:
   • Have a family doctor/physician
   • Are receiving services in the home from community-based services via CCAC (e.g. Meals on Wheels, Personal Support Worker, Nursing support etc.)
   • Have caregiver support
   • Have in-home technology supports such as Lifeline or OTN/Telus RPM.

Although not used as filters for participation, these characteristics will be noted on the client record for later use in aggregated data analysis.

4. Provide the filtered lists to relevant hospital authorities and work with them to cross-check the list of potential study participants against high-frequency users of the hospital’s Emergency Department(s). Consultation with the hospitals is required to determine if they are comfortable with a three-or-more visits a year threshold for definition of high-frequency users or would prefer a different threshold for ER visits. It is expected that all of the high frequency users of EMS will also be high frequency users of Emergency Departments. This study is focused on the client group that uses both services with high frequency.

5. Sort the lists by Area; there should be four (4) “master” lists:
   • Hastings-Quinte – CP “urban”
   • Hastings-Quinte – RPM “rural”
   • Renfrew – CP “rural”
   • Renfrew – RPM “rural”.
Economic Value of Community Paramedicine  Sample Selection Protocol

6. For each master list, divide the total number of clients by the desired sample size for each block. For example: $\frac{317}{120} = 2.64$ or $\frac{237}{80} = 2.96$ for CP study where 317 and 237 are the (speculative) number of clients on the master list and 120 and 80 are the numbers of study participants needed for Hastings-Quinte and Renfrew respectively for the CP Study. For the RPM study, the speculative number of clients on the lists might be, say 192 and 123, in which case the calculations are $\frac{192}{40} = 4.8$ and $\frac{123}{40} = 3.07$. Round off the number to a single digit, (say 3, 3, 5 and 3) and designate this as your sample sequencing number (“S”). This means every third person on a list would be selected for participation in either the experimental/study group (intervention) or the control group (no intervention). Note that if the RPM study requires selection of a new sample every six months, this process will need to be repeated after six months and again after 12 months.

7. Pick a random starting point between 1 and 6, say 4, and go to the fourth name on each list. Select that client and then count down every “Sth” client to identify the next client to be selected (say every 3rd client for example purposes) for contact to participate in the Study. This should generate a list that is both random (random starting point and every “Sth person”) and slightly larger than the sample size (to allow for refusals and exclusions from the study for other reasons not apparent at the time of sample selection). If the list has been generated with declining frequency of use in mind, this random selection process should also yield a sample list of prospective participants that is similar in composition to the total population of high frequency clients.

8. Sort each list into two sub-lists, one for the experimental/study group (e.g. a group that receives CP service) and a control group (e.g. a group that continues to use the existing 911/EMS approach. For the RPM group, the experimental group gets EMS plus RPM, the control group uses the existing 911/EMS approach). The easiest way to do this is to alternate the allocation of clients.... the first name goes in the study group, the second name goes in the control group, the third name goes in the study group, the fourth name goes in the control group... and so on.

9. These lists must now be turned over to the Community Paramedicine team (for the CP study component) and the EMS team (for the RPM study component) to make contact with the individuals proposed for the CP study and RPM (intervention) lists. The paramedics will be expected to recruit the identified individuals into the study and must obtain a signed, witnessed consent form. The consent form must allow the study team to obtain retrospective data from other health care providers, especially the hospital. Ethics clearance must be obtained for at least the experimental/study groups, and possibly for the control groups as well.

10. Prospective clients for the either the CP or RPM study (intervention) are permitted to refuse. In this case, the paramedic must note the refusal and report same back to the coordinator of data collection. [We need to discuss three issues: first, can someone refuse to be on the intervention group but ask to be in the control group? Second, can the paramedic invite someone who has refused to be in the intervention group to be in the control group? Generally, this would not be recommended. Third, if refusals make it impossible to secure the required number for either the
11. Once a client has signed the consent form to participate in the study, the form should be channelled to the coordinator or data collection for use in entering the client’s information into the database and for securing retrospective data.

[We need to discuss two other issues: a) how do we handle clients that give their consent to be part of the study but have significant gaps in their medical data over the past 12 months. And b) how do we handle the situation when a client enters the study, then quits for whatever reason, moves away or moves into long term care, or is deceased. Could we replace these individuals as long as there is at least say 30, 60 or 90 days remaining before the end of the study period? Would the exiting individual still be a valid study participant – assuming they have not revoked consent – if they are in the study for a majority of the period, say 8 of 12 months?]
Identifying sepsis in the community

Prepared by:
Shawn Doyle

For:
Renfrew County Emergency Medical Services

March 2016
Through my career as a paramedic in a rural setting, I have witnessed clients that present with little to no signs or symptoms of illness, yet, these clients are extremely ill. I am speaking of clients with sepsis; a life threat that is very difficult to identify in the prehospital setting. Not identifying sepsis early can lead to a delay with treatment and this delay places the client’s life at risk. Sepsis is on the rise: it’s an undeniable reality. We are seeing an unmistakable increase among all age groups. To help alleviate this situation in our communities, I am proposing a pilot project to assist community paramedics in identifying sepsis in the prehospital setting with the use of technology. My goal with this project is that identifying markers for sepsis by the paramedics will lead to assisting the receiving hospital with making the diagnosis and therefore starting treatment earlier in order to benefit the client. I also wish to see the development of a “Code Sepsis” protocol and a new medical directive arising from this project.

In this proposal, you will further become aware of my motivation for this endeavor. You will also find additional information on sepsis and you will find details about the proposed project. In conclusion, you will read about the expected outcomes.

**Motivation**

Sepsis is a very challenging illness to identify in the prehospital setting. Sepsis presents differently based on the underlying cause, as well as the progression of the condition. As paramedics, we have to rely on observation skills, history taking as well as the ability to interpret vitals, and assess behavioral changes in order to diagnoses sepsis. This large number of variables contributes to the difficulty with identifying sepsis. Septic patients are often critically ill, but they don’t present as such. A septic patient is not always easy to identify. Early signs and symptoms can be subtle, often mimicking non-life threatening illnesses such as the common cold or flu. These patients are often dispatched at a lower priority and are triaged at a lower acuity by hospital staff as well. These patients are often seen by a physician hours after being admitted to a hospital.

Sepsis is frequently misdiagnosed in the community as well as in the hospital setting. This makes it an interesting condition to research and to try and overcome. The lack of objective data in the prehospital setting is a significant contributor to the difficulty identifying the condition. Sepsis and septic shock are the end points of an extremely intricate process that is not precisely understood. Good prehospital management can make a profound difference in a septic patient. As well, early identification and treatment can significantly decrease patients ICU stays, and mortality.

With our aging population that is fearful of having to leave their home, we often see seniors who start with a simple infection such as a urinary tract infection, a chest infection or a skin wound and don’t seek treatment. By the time we assess these clients they are often confused and dehydrated and are often septic. According to Dr. Oltermann, age by itself is a risk factor for sepsis, even without underlying medical conditions. We are expecting a huge increase in people over 65 in the upcoming years simply from the aging Canadian population, and with that increase, we will automatically also see an increase in septic patients.

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1 Oltermann, Mark H., The coming “sepsis boom...” and the available but underutilized diagnostic tools that could avert it.
At present, clients are mainly diagnosed with sepsis at the hospital once blood work has been completed. Sometimes several hours are required to confirm this diagnosis. In the field, we can hypothesize that a client presents with sepsis, but this diagnosis is only confirmed once we get to a hospital. According to EMS world, an American online medical journal, it is estimated that more than 500,000 emergency department visits occur annually as a result of sepsis or severe sepsis, with respiratory and genitourinary infections being the most common causes of this sepsis. Not having the Canadian data to compare to these American statistics, we can just assume that we would have the same range of high occurrence of incidence for sepsis in our hospitals. It is estimated that sepsis will increase by 1.5% each year until 2020 according to Dr. Oltermann in his article on managing the sepsis boom. This is a situation that is best managed if we prepare prior to being faced with the problem, early identification can lead to early intervention and quicker discharge from hospital. The shortest hospital stay is best in regards to cost saving and also in regards to the lowest incidence of comorbid conditions that result from the inactivity while admitted. For a senior, hospitalization and bed rest superimpose the typical aging processes such as loss of muscle strength, and can create a state of irreversible functional decline².

**Project Summary**

My proposal is to achieve a method of diagnosing sepsis in the prehospital setting with the aid of technology. Furthermore, I foresee being able to implement a code sepsis protocol (similar to a code STEMI and a code STROKE) and start treatment sooner with this early diagnosis. A new approach is needed in the prehospital environment for septic patients in order to decrease mortality and morbidity. Traditionally, paramedics manage patients with suspected sepsis by addressing issues related to airway, breathing, and circulation. These patients are treated like a routine patient, unlike a stroke or heart attack patient that by comparison are quite aggressively assessed to identify and treat their conditions.

**Project Details**

**Medical factors**

The epoc blood analyzer is the device that is at the center of this project. This is the device I am proposing for purchase. The device works by analyzing various biomarkers in the blood stream that are strong indicators of sepsis. For our purposes, we will be measuring lactate, pH, glucose, and electrolyte levels. Lactate (elevated lactate) is related to tissue profusion and can tell you how well the tissues are being oxygenated. For our purposes, finding hyperlactatemia will indicate that the cells are not receiving enough oxygen. This finding alone leads us to the other biomarkers that we will be measuring. Since, cells that do not receive enough oxygen revert to anaerobic metabolism. The byproduct of anaerobic metabolism is equal parts lactate and hydrogen ions. When anaerobic metabolism continues in the body, we see many changes with certain biomarkers. For example, hydrogen ions build up leading to acidosis that is where the change in pH comes in that we will be tracking. We will also expect an electrolyte imbalance, as well as elevated glucose levels. These changes in the body lead to metabolic changes to vital

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organs and systems. Another marker that we will be interpreting is the glucose level. Hyperglycemia in the presence of sepsis is not only a marker of the severity of the illness but also a predictor of a poor outcome. As sepsis continues to progress, third-spacing of fluids contributes to a decrease in circulating blood volume, cardiac output, and preload. Tachycardia and tachypnea develop as the patient attempts to compensate for increased acids and low blood volume. Therefore, by measuring lactate, glucose and electrolytes with the epoc device, we will definitely be able to obtain objective findings helping us determine if the patient presents with sepsis.

Many of the conditions that seniors can present with or medications they take can mislead us during a physical assessment as the client may not have obvious inflammatory responses in the body leading us to think that they have sepsis. The epoc device works very quickly (within minutes.) and involves only a small amount of blood, similar to a finger prick like the types used with glucometers for diabetes. I strongly feel that using the epoc device will help save many lives.

Use of the epoc device

In order to use the device, you must insert a card as well as a new lancet for each patient. A card allows us to analyze the specific biomarkers. These cards can be disposed of in regular garbage, as no special precautions are required. The cards come in packages of 50 and have a shelf life of 6 months once opened. In order to ensure the proper function of the device, a calibration card is needed for each of the epoc devices. This calibration process should be completed monthly and is a very quick and efficient process.

Cost

I estimate that 6 devices will be required for our initial trials. One for each of the 6 paramedics selected to be part of this project. The manufacturer of this device offers a “train the trainer” system. The team leader would receive direct training from them and then train the local paramedics. The provider is also available for troubleshooting if required post purchase. As seen below, the chart illustrates estimated costs related to our project.
This project is unique as this type of intervention in the prehospital setting has never been done in Ontario. At present, only paramedics in Yukon as well as British Columbia are using the epoc device but they are not using it to identify sepsis. The Renfrew County EMS will join both of these paramedic services as leaders in the use of the epoc device, but distinctively, our service would lead the way in regards to identifying sepsis in the prehospital setting. I foresee paramedics using their skills to identify possible patients with sepsis, and then using the device to analyze a sample of blood. With the results of the analysis, paramedics will be able to share this information with the receiving team in the hospital and save precious time in starting treatment as previously mentioned.

**Implementation Issues**

I do anticipate challenges with financing this project, the devices are costly and therefore, there is a large initial investment required to complete this pilot project. I have attached a quote for the devices as well as the required supplies. Please consult Appendix I for details. I also anticipate a significant investment in time required to train all the selected paramedics.

Very important team members for this project will be the various receiving hospitals, without their feedback, we won’t know if our efforts to identify sepsis in the prehospital setting were effective. We may face obstacles in terms of consents for sharing medical information. We will also need a project manager to overlook the follow ups with hospitals, nursing homes or patients in order to confirm the presence of sepsis after our intervention was carried out.

Regardless of the possibility of obstacles, this project aims to bridge a gap in identifying a condition that is often deadly for patients. Sepsis would be so easy to identify with the use of the epoc device for us. Analyzing a sample of blood is a very quick way of doing this and will not increase our time on scene as the device can be used while in route. Renfrew County Emergency Services has an opportunity to lead the way and complete the ground work that may lead to a
new medical directive being created for identifying sepsis in Ontario. This would be an excellent way for our service to be recognized and promoted.

**Timeline**

I estimate this project will take a year from the planning stage to the implementation of the new initiative. We must plan to have the costs of this project in the operation budget for our service. This provides ample time to coordinate efforts with the supplier for dispensing the devices as well as organize training. Once the project is started, I aim to measure success at the 6-month mark as well as after one year of implementation. This will allow us to have a good sample of patients from which we can measure our success from.

**Conclusion**

As clearly stated in this proposal, there is an increasing need for early identification and management of sepsis in the prehospital setting. Many patients go undiagnosed with sepsis in the field, and this further compounds limitations that they experience. With our aging population, I foresee the need to address sepsis in the prehospital setting to become greater. Therefore, by having the motivation to innovate and create a solution for this urgent need, we can be the first paramedic service to use technology to identify markers for sepsis and create a new medical directive to treat it. In order to succeed with this project, we must first believe that we can, and then, we must allow our determination to be successful and gain strength as we work towards this goal. As a paramedic service, we are strong enough to overcome all obstacles as we strive for success with this innovative plan.
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Integrating a community paramedicine program with local health, aged care and social services: An observational ethnographic study

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Integrating a community paramedicine program with local health, aged care and social services:
An observational ethnographic study

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Abstract

We used an observational, ethnographic research approach to identify the nature of the relationship between public engagement and the successful integration of a community paramedicine program with local health, aged care and social services in rural Ontario, Canada. Data were collected through a combination of direct observations of practice, informal discussions, interviews and focus groups. We found evidence of public engagement during the planning and implementation stages of the program, with strong participatory processes evident. There was some evidence of a culture of inclusiveness, despite the strength of the command and control heritage in emergency health services. The community paramedicine model is well placed to facilitate greater integration between paramedic services and health, aged and social services. Public engagement incorporating both participation and inclusiveness can lead to a closer alignment and integration between paramedic services and other services. This ‘grass-roots’ approach to interacting with local communities has the potential to better integrate paramedic services as part of a less-fragmented system across the health, aged care and social service sectors.

Keywords:
research, rural; ethnography; health care administration; health care, interprofessional; qualitative research; health care, remote/rural

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Introduction

Community paramedicine (CP) is an emerging model of health care where paramedics apply their training and skills in ‘non-traditional’ community-based environments (1-3). The genesis of the CP model is generally credited to the long established and well evaluated Long and Brier Island project in Nova Scotia, Canada (4,5) where inspiration was drawn from the 1996 EMS Agenda for the Future from the United States (6). Since then, a broad range of locally-led paramedic projects have emerged to fill service gaps and produce systems that are more responsive to changing demographics (7,8).

A feature of CP programs is their potential to integrate existing paramedicine models with other health care agencies and health professionals. In Ontario, there are at least 48 CP programs in operation, with more programs planned and supported by the Ontario Ministry of Health and Long-Term Care (9). The organisation of paramedic services in the Province of Ontario is based on local government areas, making the system open to the concept of engaging local communities in the planning and delivery of paramedic services (10). An Australian conceptual model sees paramedics undertaking activities within four broad domains of practice: community engagement, emergency response, situated practice, and primary health care (1,11). This model encompasses extended roles for paramedics in health and emergency service planning and development, along with a more active community role for paramedics in primary health care. For these enriched roles to succeed, paramedics require enhanced knowledge and broader understanding of health issues while still having the skills to deal with specific paramedic service challenges, including the leadership, management and support of volunteers (12).

The specific domain of paramedic practice relevant to this case study was community or public engagement. While there is anecdotal evidence of paramedic service and paramedic engagement with communities, few instances have been reported in the literature (13-17). Our intent was to identify and describe the nature of the relationship between public engagement and the integration of CP with local health, aged care and social services. These observations have the potential to inform other paramedic services who are considering the use of community or public engagement strategies to integrate and work more closely with other agencies and professional providers.

Methods

We undertook this observational ethnographic case study in Ontario, Canada where a number of CP programs have emerged in response to demographic changes and broader health system reform. The paramedic service selected for the study has operated a CP program since 2010 (18) and was therefore able to provide strong and consistent information related to the research question (19). Ethnographic research methods were used because of their ability to explore social phenomenon through a small number of cases with unstructured data. Analysis of those data involved explicit interpretation of the meanings and functions of human actions, with the product of this analysis primarily taking the form of verbal descriptions and explanations (20).

We collected data through a combination of focus groups, interviews, direct observation of practice and informal discussions, during the summers of 2012 and 2013. This qualitative approach was adopted because of its capacity to capture the richness and diversity of the community paramedic role within a natural setting that allowed issues to be studied in depth. It placed paramedic practice within the wider community context (21). Three focus groups of between 10 and 20 participants and 34 interviews were conducted using purposive sampling to draw in a range of expert informants, including paramedic service managers, paramedics, educators, physicians, nurses, other health professionals, patients and community members. Roughly half the participants were employed within the case study organisation in one rural county, with the remainder employed in a wide range of other organisations. Focus groups and interviews were used because of their ability to encourage detailed, emotive responses, unconstrained by the specific questions of a survey.

We used the Australian paramedic domains of practice to locate the elements of the CP program within a conceptual framework and to develop the focus group and interview questions (13). Focus group discussions and the expert informant interviews were recorded and transcribed, with each transcript being coded and analysed using classic thematic analysis techniques through manual methods (22). This approach enabled identification of common themes within the data, without the constraint of having to establish how these themes link together or explain all facets of the data.

Complementing the focus groups and interviews were the researchers’ field observations of community paramedics in this county. This involved two external research team members accompanying community paramedics on calls and talking with other health professionals, patients, families and carers one year apart. This provided the opportunity to observe the nature and authenticity of the paramedics’ engagement and integration with the local health and aged care and social services (23).

Informal discussions with participants formed an important component of this observational phase of the data collection process and helped establish the general pattern of perception of the CP program in this county (21). The advantage of using this observational approach was that it shone a light on any discrepancies between rhetoric and reality, while validating
those data that had been gathered from other sources. During the field observation phases, two researchers independently noted a record of community paramedics’ practice, along with their own feelings and responses. These notes were recorded during or immediately after events occurred (23). Our analysis of the field notes was commenced during the respective data collection phases through content analysis, an iterative process of developing categories from the notes, testing them against concepts and other data, and refining them.

Ethics

Latrobe University Ethics Committee granted institutional ethics approval (FHEC12/8) and the participating paramedic service accepted this approval.

Results

The CP model that we investigated has emerged from existing structures and local needs, with some of our participants describing a population in need, or at a near crisis status. According to one participant, the leaders of the paramedic service ‘saw the opportunity to take ideas and programs that exist around the world … and tailor them to this community’s needs.’ The resulting program was built on strong partnerships between the paramedic service and other health, aged care and social services with a wide range of disparate community health initiatives evolving into a program consisting of four key elements: Aging at Home Program; Paramedic Wellness Clinics; Ad hoc Home Visiting Program; and Community Paramedic Response Unit Program. Each of these elements include some level of direct engagement with local community members, health, aged care and social services.

We found evidence of community and public engagement during the planning and implementation stages of the program, with strong participatory processes evident. Participants linked this engagement with the successful integration of the CP program with other services. An associated issue identified was the need to avoid service duplication and any unnecessarily damaging professional boundary issues that could undermine the potential success and sustainability of the CP program. It was evident that the future self-regulation of the paramedic profession in Canada and elsewhere has the potential to redraw professional boundaries between paramedics, medical officers and other professions (24,25).

Many of the participants noted that the longer term sustainability of the CP program is highly reliant on strong integration with existing services. Within the provincial regulatory and funding system the objective of achieving greater integration with other services is challenging. In Ontario, paramedic services are accountable to and funded by both provincial and local government, with service delivery and clinical standards being regulated through the provincial health system. Despite this regulatory link, paramedic services are separated from most of the health system. For example, they are not members of the Local Integrated Health Networks that are responsible for the delivery of almost all health care in the province (26).

‘Around 20 years ago there was downloading of paramedic services to the communities, so there was a complete divorce between the rest of healthcare and paramedics. Paramedics belong to a city or region, the rest of healthcare belongs to the Ministry of Health and because of that it is difficult to break down those barriers to get them to work together, the major barriers as you can see are not the interest or prejudice or whatever it’s more the structure, the infrastructure that we are working with right now.’

For many in the health system, paramedic services are outside their immediate point of reference unless they are facing a medical emergency. An example of this ‘blind spot’ is a recent report from the Ontario Hospital Association showcasing innovations in small, rural and northern hospitals to enhance access through integration. Despite some of these showcased hospitals having formal partnerships with the paramedic service we studied, there is no mention of their CP program in the report (27). At a grass-roots level there was considerable evidence of engagement during the planning and implementation stages of the CP program, with the paramedic service conducting ‘town hall’ meetings and participating in numerous activities with other agencies. They recognised the value of ‘networking’ within the health, aged care and social service networks.

‘The benefit is that we were invited to participate; the networking that I have been able to forge there has been tremendous from the perspective of learning what is already in the community and what services are provided.’

Community paramedics in the field are encouraged to ‘drop in’ on patients, community facilities and businesses to determine local health care needs and identify service gaps.

‘We have what [a named community paramedic] does. Drive around and drink tea and be nice to people … there’s a whole lot more to that obviously, but the general sentiment is about increasing people’s well-being, their sense of safety and security and educating them at the same time.’

These and other observed activities demonstrate a strong commitment to public engagement and a desire for stronger and more sustainable integration, while we acknowledge that the initial establishment of CP programs is the first step in sustained community engagement and health system integration. One participant made the point that the Paramedic Wellness Clinics might have been even more successful if a formal referral system for sub-acute and chronic patients had been established at the onset. Others highlighted the value of inclusive teamwork.
‘If we are going to talk about patient centred care then it is a team event and we need to bring everybody in … from the physician all the way to the paramedic and everybody in-between. We all have to play together to make sure that this patient is dealt with in the most cost effective way, in the most appropriate way to get them into the hospital healthy enough to be discharged back home and make sure that home support is there for them.’

Participants recognised the important role that the paramedic service has in integrating different services for patients and helping them and their families navigate through the health, aged care and social service systems. The community paramedic participants particularly understood that part of their role was to connect patients and families to the resources they need in order to avoid medical emergencies in the future. Many participants expressed concern that patients and clients would fall through the gaps if services were not integrated and people became caught up in professional boundary issues.

‘Because resources are getting much more limited in the community, there’s lots of people that have fallen through the cracks just because they don’t have a real acute situation and maybe they don’t qualify for the support that they actually need. They are in that grey zone.’

The paramedic service has worked closely with the Local Integrated Health Network to ensure that the Ad hoc Home Visiting Program uses the skills and availability of paramedics to assess and monitor patients in their own homes without running into conflict with other agencies or health professionals. This network is organised and mandated by the Province of Ontario to coordinate all of the activities in the health system within the area to identify different initiatives that would allow the elderly to remain in the community if possible and decrease the impact on long term and acute care services. Despite these efforts, it was not always obvious to some participants how the CP program is integrated with the local health system. For instance, one participant noted the integration of the Aging at Home Program, while being unaware that the Wellness Clinics had linkages with the Regional Diabetes Network.

‘It depends on which particular piece that you are looking at … the Aging at Home Program is very well integrated as it was designed that way, it was a partnership between the long term care facility and the paramedic service … I believe that the community paramedic program works very, very closely with homecare in that situation as well, so they are part of a team for the individual who is remaining in their home. … As far as the Wellness Clinics go it’s a service that is offered in communities so it is not particularly integrated into anything.’

One of the hallmarks of the county’s CP program is the willingness of the paramedic service to play a variety of roles. While willing to offer services to meet local needs, such as the Paramedic Wellness Clinics, they are not insistent on always taking the lead role. An example of this is the Aging at Home program, which is a sub-component of a much larger program. It was cited as an example where the CP program had knitted programs together through a willingness and capacity to engage with the community and integrate with other health, aged care and social services.

At least in part, one of the strengths of the community paramedic program is that because it’s sometimes rightly or wrongly not seen as part of the traditional health system, people see them as non-traditional partners and you can actually consider doing things that are a bit more innovative. So it is sort of the flip side to being outside the system.

There was a demonstrated awareness that expanding paramedic services could duplicate existing services and lead to conflict with other health professionals unless integration was well managed. To this end, Canadian paramedicine leaders have undertaken high level discussions with medicine and nursing bodies, and made a presentation to the Nation’s Standing Committee on Health outlining the role of community paramedics (28). While aware of the danger of duplication and the associated professional boundary sensitivities, most participants had few concerns about duplication of services in a region with limited health care resources.

‘It’s funny you know, there is always this mythology that nurses will be afraid that their jobs will be taken away from them. Well there is a huge shortage of nurses and we are not going to get any more nurses coming in. [Paramedics] … scope of practice is similar to nurses but not identical. Therefore there are some areas where paramedics would do a fantastic job and would be perfectly suited, it is just a matter of moving the behemoth of infrastructure, administration and alliances.’

Some participants expressed the view that physicians would be the most likely group to impede the integration of paramedic services into the health system.

‘Physicians are less open to those kinds of partnerships and anything that they feel might impact on their scope or where they essentially don’t have direct control over a situation. It depends on the physician, but sometimes that happens and also the physician having trust on what the paramedic is doing, trust in the skills of the paramedic, being able to rely on what the paramedic’s interpretation is. I think that that might be a bit of a barrier.’

This argument seemed of little concern to the paramedic participants who did not raise this as an issue. Perhaps the fact that they conceived and implemented this CP model with the strong support of their local managers and other health professionals had diffused this potential area of conflict. In the same way, the issue of medical oversight or clinical governance was rarely raised. During one of the focus groups one of the three physicians in the group suggested that many emergency medicine physicians might not have appropriate backgrounds...
and relevant experience to provide medical oversight of community paramedics who would be dealing with patients suffering from chronic diseases and confronting a wide range of social problems impacting on their health status. One paramedic participant suggested that those undertaking community paramedic roles should be self-regulated through their own professional college, arguing that because the majority of primary care or advanced care paramedics activities and interventions require no medical oversight, only adherence to established standards of practice.

Discussion

In this study we set out to identify and describe the nature of the relationship between public engagement and the integration of a community paramedicine program with other services. The county paramedic service that we examined demonstrated that they used a range of engagement strategies to plan and implement key elements of their CP program and they continue to use them while they develop and seek to sustain a more integrated relationship with their local health, aged care and social services. Our observation that participants rarely discussed public or community engagement strategies during the focus groups or interviews raises the question of how engagement can be understood in this context.

At one level, it can be described as the opportunity to have input into the content and policies of the CP program through public meetings, committee membership, consumer surveys and the like (30). The paramedic service has used a number of these participatory processes to gain the support and trust of key stakeholders during the planning, implementation and ongoing management phases of their CP program. At a another level, public engagement comprises inclusive processes that allow citizens, clients and others the opportunity to coproduce the processes, policies and programs that address their concerns (30). Our field observations and interviews point to the CP program developing elements of inclusiveness thorough community paramedic interactions with clients, families and carers in public and home settings.

These interactions are characterised by more equal power relationships than often found in the health care sector despite calls for patients to be partners instead of passive receivers of care (31). We directly observed examples of inclusive public engagement during the field research, with paramedics, other health and social service professional, clients and carers interacting with each other as equals in ways that are not commonly seen in institutional clinical settings because of the formal settings and power differentials (30).

The relatively early development of this level of inclusiveness was somewhat surprising given the prevalence and strength of the command and control culture in emergency health services that has been cited as an impediment to culture change in paramedic services (32, 33). This cultural inheritance might partly account for the lack of discussion from participants directly addressing inclusiveness within the CP program. It may also account for the lack of any suggested strategies to measure inclusiveness as part of the paramedic service performance management system to complement traditional performance measures such as cardiac arrest survival rates (34). Even without clear performance measures in place, we suggest that the CP model is well placed to engage with communities and to facilitate greater integration between paramedic services, their communities and health, aged care and social services.

Limitations of this study

In this study we confronted the limitations of ethnographic research, including the time consuming nature of the research. Despite the relatively large number of participants it remains difficult to generalise the specific findings to other settings because they are based on the cultural responses of participants and the subjective interpretation of the researchers (29). On the other hand, CP programs are by design designed to fill service gaps and respond to community needs in a flexible manner.

Conclusion

The community paramedicine model is well placed to facilitate greater integration between paramedic services and health, aged and social services. Public engagement incorporating both participation and inclusiveness can lead to a closer alignment and integration between paramedic services and other services. This ‘grass-roots’ approach to interacting with local communities has the potential to better integrate paramedic services as part of a less-fragmented system across the health, aged care and social service sectors.

Conflict of interest

Peter O’Meara and Angela Martin have no financial or other conflicts of interest relating to this manuscript. Michel Ruest is an employee and senior manager of the County of Renfrew Paramedic Services. Peter O’Meara is an Associate Editor of the Australasian Journal of Paramedicine.
References


A Survey of Community Paramedic Programs in Ontario

April 9, 2013

Conducted by DEC Services

Sponsored by Chief Michael Nolan, County of Renfrew Paramedic Service
Table of Contents

Introduction .................................................................................................................................................. 2
Methodology................................................................................................................................................. 3
Survey results ................................................................................................................................................ 3
I. Population Coverage .................................................................................................................................. 4
II. Geographic Coverage ................................................................................................................................ 5
III. Paramedic Staffing Hours ........................................................................................................................ 7
IV. Specific Community Paramedic Program Skills and Procedures .............................................................. 7
Appendices .................................................................................................................................................. 13
A.i. Ontario Municipalities and Paramedic Services ....................................................................................... 13
A.ii. Current and Planned Skills and Procedures of Paramedic Services in Ontario already delivering Community Paramedic Programs .................................................................................................................. 15
A.iii. Planned Skills and Procedures of Paramedic Services in Ontario intending to implement Community Paramedic Programs ........................................................................................................................................ 16
A.iv EMS in Ontario with no Current or Planned Community Paramedic Services ................................. 18
A.v. Description of Current Community Paramedic Programs in Ontario ...................................................... 19
A.vi. Description of Planned Community Paramedic Programs in Ontario .................................................... 21

Introduction

This survey was conducted to gather the data required for an overview of the level of Community Paramedic Program activity in Ontario. Such programs have become common only fairly recently, as paramedics start to be further integrated into the primary health care system and the widespread applicability of their training and skills is recognized. There is growing interest amongst policy makers in how this new approach could help address health issues associated with aging populations, and enhance the quality of life of seniors and those with chronic care needs.

Sound data are required for good policy. This survey aims to fill an information gap in the current knowledge of Community Paramedic Programs in Ontario, namely, the extent to which these are now or soon will be implemented.

The survey was carried out by DrL Services, Ottawa, and was sponsored by Michael Nolan, Chief, Paramedic Services, County of Renfrew.
Methodology

A census of all 51 Chiefs of Emergency Medical Services in Ontario, as determined from the listings on the Association of Municipal Emergency Medical Services of Ontario/Ontario Association of Paramedic Chiefs website (www.emsontario.ca)\(^1\) was conducted between November 1, 2012 and March 1, 2013, using an online survey tool (FluidSurveys, Chide.it Inc., Ottawa, Canada).

The survey questions were devised by the principal investigator, in conjunction with the client supervisor, and were piloted by five senior paramedics between October 25 and 29. The survey was then revised to incorporate additional procedures and skills, and to attenuate time-series data. An email was sent to each EMS on November 1 using FluidSurveys’ deployment tool, requesting a response by November 8, with a reminder to those who had not yet completed the survey sent out on November 6. Thirty-three responses were received by the requested deadline. Additional reminders were sent between November 13 and December 13 to those who had not yet responded, along with phone calls to determine if there had been technical issues (such as failure to receive the email).

By the end of December, 45 responses accounting for almost 99% of the population had been collected, including one submitted during the pilot phase that contained valid information. It was therefore determined that follow up contact with the few Paramedic Services that had still not responded was warranted, to obtain coverage of the entire Ontario population. After telephone contact, further email invitations were sent out. These, combined with telephone follow-up calls that took place from January to February, 2013, ensured that responses were eventually received from all 51 EMS.

Data were exported into Microsoft Excel (Redwood, CA, USA) for validation, analysis and formatting, and tables and charts were constructed using all data. As this was a census with 100% response, statistical analyses were not required.

Survey results

The survey first asked for general information about the respondent’s Paramedic Services, including contact population in the service area, call volume, and the total number of paramedic staffing hours. The second section asked about current Community Paramedic Programs. A list of 45 skills and procedures was provided as well as space to indicate others not included in the list. Respondents were also asked to describe their programs (as distinct from skills and procedures, although these were not distinguished in every case).

\(^1\) The specific webpage URLs, accessed on October 30, 2012, are as follows:
https://emsontario.ca/cms/index.php?option=com_content&view=article&id=135&Itemid=115 (Central Zone),
https://emsontario.ca/cms/index.php?option=com_content&view=article&id=136&Itemid=115 (Eastern Zone),
https://emsontario.ca/cms/index.php?option=com_content&view=article&id=137&Itemid=115 (Northern Zone),
https://emsontario.ca/cms/index.php?option=com_content&view=article&id=138&Itemid=115 (SouthWest Zone)
The third section was identical to the second but asked about planned Community Paramedic Programs. Finally, the fourth section asked for information on particular aspects of current Community Paramedic Programs, including the level of staffing hours dedicated, the number of clients served in 2011, and opinions as to whether these programs had had an impact on access to health care services, health care system finances, and 911 call volumes. Respondents were invited to provide comments on any aspect of the survey.

Twelve Paramedic Services indicated that they currently have Community Paramedic Programs, nine of which plan to provide additional skills and procedures. Seventeen Paramedic Services have no current programs, but intend to implement some within the next year or so. The remaining 22 have neither current nor planned Community Paramedic Programs.

1. Population Coverage

The data collected show that currently over 50% of Ontario residents have access to one or more community paramedic programs and that by 2014, as planned programs are implemented, this is expected to rise to more than 80% (Figure 1). It was beyond the scope of this research to evaluate whether the current programs in each service area are meeting the demand for the various skills and procedures provided.

![Figure 1. Access of Ontario Population to Community Paramedic Programs](image-url)
II. Geographic Coverage

The map in Figure 2 shows the Ontario coverage of current Community Paramedic Programs by municipality or district. Ontario’s far north is not included, as the area has no paramedic service.
Figure 2. Geographic Coverage of Current Community Paramedic Programs in Ontario
III. Paramedic Staffing Hours

Of the 12 Paramedic Services in Ontario that currently have Community Paramedic Programs, only six provided information on the number of staffing hours dedicated to these programs. With one exception, such hours amounted to a small percentage of total staffing hours (i.e., less than 1%) (Table 1).

Table 1. Total paramedic service staffing hours compared to hours dedicated to Community Paramedic Programs

<table>
<thead>
<tr>
<th>Paramedic Service</th>
<th>Total staffing hours</th>
<th>Staffing hours dedicated to Community Paramedic Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>York Region Emergency Medical Services</td>
<td>291630</td>
<td>2500</td>
</tr>
<tr>
<td>Greater Sudbury Emergency Services</td>
<td>137,280</td>
<td>300-400</td>
</tr>
<tr>
<td>Toronto EMS</td>
<td>1,200,000</td>
<td>&gt;3000</td>
</tr>
<tr>
<td>Hamilton Paramedic Service</td>
<td>376000</td>
<td>2000</td>
</tr>
<tr>
<td>Niagara EMS</td>
<td>366000</td>
<td>2184</td>
</tr>
<tr>
<td>County of Renfrew Paramedic Service</td>
<td>170000</td>
<td>17000</td>
</tr>
</tbody>
</table>

IV. Specific Community Paramedic Program Skills and Procedures

Tables 2-4 provide data on which skills and procedures Ontario’s Paramedic Services currently provide (Table 2), are planning to implement (Table 3), and the total of current and planned (Table 4). These are sorted by frequency. Each table also gives the percentage of the population covered by the skills and procedures.

Of the 45 skills and procedures the survey specifically asked about, 29 are offered by one or more of 11 Paramedic Services currently providing Community Paramedic Programs, the most prevalent being Referral Services and Blood Pressure Screening.
### Table 2. Current Ontario Community Paramedic Program Skills and Procedures, and Percentage of Population with Access

<table>
<thead>
<tr>
<th>Community Paramedic Program Skills and Procedures</th>
<th>Number of Paramedic Services Providing</th>
<th>Percentage of Population with Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referral Services</td>
<td>11</td>
<td>52.3%</td>
</tr>
<tr>
<td>Patient History / Physical Assessment</td>
<td>7</td>
<td>46.7%</td>
</tr>
<tr>
<td>Blood Pressure Screening</td>
<td>6</td>
<td>45.7%</td>
</tr>
<tr>
<td>Blood Glucose Checks</td>
<td>6</td>
<td>39.3%</td>
</tr>
<tr>
<td>Vital Signs</td>
<td>6</td>
<td>38.5%</td>
</tr>
<tr>
<td>In-Home Lifestyle / Safety Evaluations</td>
<td>5</td>
<td>37.5%</td>
</tr>
<tr>
<td>Medication Monitoring / Reconciliation</td>
<td>5</td>
<td>37.5%</td>
</tr>
<tr>
<td>Immunizations</td>
<td>5</td>
<td>35.5%</td>
</tr>
<tr>
<td>Pulse Ox Monitoring</td>
<td>5</td>
<td>34.7%</td>
</tr>
<tr>
<td>Education Sessions in Fall Prevention</td>
<td>4</td>
<td>33.7%</td>
</tr>
<tr>
<td>Chronic Disease Management</td>
<td>3</td>
<td>33.7%</td>
</tr>
<tr>
<td>Super-user Management</td>
<td>3</td>
<td>30.5%</td>
</tr>
<tr>
<td>Treatment of Minor Injuries</td>
<td>3</td>
<td>26.3%</td>
</tr>
<tr>
<td>Routine Follow-up 12 Lead EKG</td>
<td>3</td>
<td>26.3%</td>
</tr>
<tr>
<td>Neurological Assessment</td>
<td>3</td>
<td>11.4%</td>
</tr>
<tr>
<td>Alternate Transport Destinations</td>
<td>2</td>
<td>25.5%</td>
</tr>
<tr>
<td>Post Stroke Assessment</td>
<td>2</td>
<td>25.5%</td>
</tr>
<tr>
<td>End of Life Counselling</td>
<td>2</td>
<td>23.0%</td>
</tr>
<tr>
<td>Wound Care</td>
<td>2</td>
<td>4.0%</td>
</tr>
<tr>
<td>Peripheral Intravenous Lines</td>
<td>2</td>
<td>4.0%</td>
</tr>
<tr>
<td>Dispatch Triage and Response Diversion</td>
<td>1</td>
<td>3.2%</td>
</tr>
<tr>
<td>Set Up CPAP</td>
<td>1</td>
<td>3.2%</td>
</tr>
<tr>
<td>IV Catheters Changes</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Managing Catheters</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Weight Checks – Adult and Pediatric</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Lab Specimen Testing (Inc. I-STAT)</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Managing Surgical Drains</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Managing PICC Lines</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Extended Care Nursing Home Primary Care</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Antibiotic Infusions</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Suture Removal</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Lab Specimen Collections</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Managing Tracheostomies</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Post-operative Follow-up in the Home</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Infusion Therapies</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
More than half of Ontario’s Paramedic Services have plans to implement eight specific Community Paramedic skills and procedures in the near future, and a total of 40 new skills and procedures will be implemented in one or more Paramedic Services across the province (Table 3).

### Table 3. Planned Ontario Community Paramedic Program Services and Skills and Percentage of the Population with Access

<table>
<thead>
<tr>
<th>Community Paramedic Program Skills and Procedures</th>
<th>Number of Paramedic Services Planning to Provide</th>
<th>Percentage of Ontario Population with Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood Pressure Screening</td>
<td>18</td>
<td>16.4%</td>
</tr>
<tr>
<td>Vital Signs</td>
<td>16</td>
<td>21.8%</td>
</tr>
<tr>
<td>Education Sessions in Fall Prevention</td>
<td>15</td>
<td>22.3%</td>
</tr>
<tr>
<td>Referral Services</td>
<td>15</td>
<td>16.8%</td>
</tr>
<tr>
<td>Blood Glucose Checks</td>
<td>14</td>
<td>11.8%</td>
</tr>
<tr>
<td>Patient History / Physical Assessment</td>
<td>14</td>
<td>11.4%</td>
</tr>
<tr>
<td>In-Home Lifestyle / Safety Evaluations</td>
<td>13</td>
<td>20.8%</td>
</tr>
<tr>
<td>Pulse Ox Monitoring</td>
<td>11</td>
<td>10.5%</td>
</tr>
<tr>
<td>Alternate Transport Destinations</td>
<td>9</td>
<td>23.4%</td>
</tr>
<tr>
<td>Routine Follow-up 12 Lead EKG</td>
<td>9</td>
<td>7.8%</td>
</tr>
<tr>
<td>Treatment of Minor Injuries</td>
<td>8</td>
<td>16.5%</td>
</tr>
<tr>
<td>Immunizations</td>
<td>8</td>
<td>11.3%</td>
</tr>
<tr>
<td>Peripheral Intravenous Lines</td>
<td>7</td>
<td>39.6%</td>
</tr>
<tr>
<td>IV Catheters Changes</td>
<td>7</td>
<td>37.0%</td>
</tr>
<tr>
<td>Suture Removal</td>
<td>7</td>
<td>34.3%</td>
</tr>
<tr>
<td>Chronic Disease Management</td>
<td>6</td>
<td>36.3%</td>
</tr>
<tr>
<td>Community Paramedic Program Skills and Procedures</td>
<td>Number of Paramedic Services Planning to Provide</td>
<td>Percentage of Ontario Population with Access</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Wound Care</td>
<td>6</td>
<td>33.8%</td>
</tr>
<tr>
<td>Antibiotic Infusions</td>
<td>6</td>
<td>33.6%</td>
</tr>
<tr>
<td>Medication Monitoring / Reconciliation</td>
<td>6</td>
<td>6.5%</td>
</tr>
<tr>
<td>Weight Checks – Adult and Pediatric</td>
<td>6</td>
<td>4.1%</td>
</tr>
<tr>
<td>Dispatch Triage and Response Diversion</td>
<td>4</td>
<td>13.1%</td>
</tr>
<tr>
<td>Extended Care Nursing Home Primary Care</td>
<td>4</td>
<td>5.4%</td>
</tr>
<tr>
<td>Post Stroke Assessment</td>
<td>4</td>
<td>5.2%</td>
</tr>
<tr>
<td>Neurological Assessment</td>
<td>4</td>
<td>3.1%</td>
</tr>
<tr>
<td>Lab Specimen Collections</td>
<td>3</td>
<td>24.1%</td>
</tr>
<tr>
<td>Infusion Therapies</td>
<td>3</td>
<td>23.5%</td>
</tr>
<tr>
<td>Post-operative Follow-up in the Home</td>
<td>3</td>
<td>2.3%</td>
</tr>
<tr>
<td>Cholesterol Screening</td>
<td>3</td>
<td>2.0%</td>
</tr>
<tr>
<td>Set Up CPAP</td>
<td>3</td>
<td>1.9%</td>
</tr>
<tr>
<td>Managing Catheters</td>
<td>2</td>
<td>30.5%</td>
</tr>
<tr>
<td>Managing Surgical Drains</td>
<td>2</td>
<td>23.1%</td>
</tr>
<tr>
<td>Managing Tracheostomies</td>
<td>2</td>
<td>23.0%</td>
</tr>
<tr>
<td>Managing PICC Lines</td>
<td>2</td>
<td>22.9%</td>
</tr>
<tr>
<td>Post-Partum Home Visits</td>
<td>2</td>
<td>4.2%</td>
</tr>
<tr>
<td>Lab Specimen Testing (Inc. I-STAT)</td>
<td>1</td>
<td>22.3%</td>
</tr>
<tr>
<td>End of Life Counselling</td>
<td>1</td>
<td>1.2%</td>
</tr>
<tr>
<td>Maternal Care</td>
<td>1</td>
<td>0.8%</td>
</tr>
<tr>
<td>Sexual Health Services: Pregnancy Testing</td>
<td>1</td>
<td>0.8%</td>
</tr>
<tr>
<td>Super-user Management</td>
<td>1</td>
<td>0.6%</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>1</td>
<td>0.6%</td>
</tr>
<tr>
<td>Fluoride Varnish for Children</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Ophthalmoscope</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Sexual Health Services: Birth Control</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Sexual Health Services: STI Testing</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Wound Vacuum</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Table 4 shows the percentage of Ontario’s population covered by a specific Community Paramedic Program skill or procedure, which ranges from 70.0% to 0.6%. Note that these numbers differ from the aggregates presented in Figure 1, as not all skills and procedures are offered in all areas.
Table 4. Current and Planned Ontario Community Paramedic Program Services and Skills and Percentage of the Population with Access

<table>
<thead>
<tr>
<th>Current and Planned Community Paramedic Program Skills and Procedures</th>
<th>Number of Paramedic Services Currently Providing</th>
<th>Number of Paramedic Services Planning to Provide</th>
<th>Total</th>
<th>Percentage of Ontario Population with Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referral Services</td>
<td>11</td>
<td>15</td>
<td>26</td>
<td>69.1%</td>
</tr>
<tr>
<td>Blood Pressure Screening</td>
<td>6</td>
<td>18</td>
<td>24</td>
<td>62.1%</td>
</tr>
<tr>
<td>Vital Signs</td>
<td>6</td>
<td>16</td>
<td>22</td>
<td>60.4%</td>
</tr>
<tr>
<td>Patient History / Physical Assessment</td>
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## Appendices

### A.i. Ontario Municipalities and Paramedic Services

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A.ii. Current and Planned Skills and Procedures of Paramedic Services in Ontario already delivering Community Paramedic Programs

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A.iv  EMS in Ontario with no Current or Planned Community Paramedic Services

Beausoleil First Nation EMS*
Bruce County Emergency Medical Services
Chippewas of Rama First Nation EMS*
City Of Kawartha Lakes EMS
County of Lambton EMS
County of Simcoe Paramedic Services
Dufferin County Paramedic Service
Durham Region EMS
Haldimand County EMS
Halton Region EMS
Kenora District, NWEMS
Lanark County Ambulance Service
Leeds Grenville Emergency Medical Service
Lennox & Addington County EMS
Manitoulin-Sudbury DSB EMS
Norfolk County EMS
Parry Sound Ambulance Service*
Perth County EMS
Peterborough County/City Paramedics
Rainy River District EMS
Sault Ste Marie Fire Services - EMS Division
Timiskaming District EMS

*Information provided orally in follow-up calls.
# A.v. Description of Current Community Paramedic Programs in Ontario

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<th>Municipality</th>
<th>Description of Current Community Paramedic Programs</th>
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<td>CHATHAM-KENT</td>
<td>CREMS - direct referral to local CCAC for patients who do not currently have services.</td>
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<td>ESSEX</td>
<td>Community Referral by EMS (CREMS) - CREMS allows our paramedics to make a referral to the Community Care Access Centre (CACC) on behalf of the patient with their consent. This program has a positive impact as some patients may not be aware of the services that CACC provides and others do not recognize that they are in need or could benefit from CACC assistance. While this program is relatively new to our service, we are finding that in many cases a CACC referral is the first step in providing patients with the opportunity to receive valuable health care supports in their homes, improving their quality of life and maintaining their independence. By connecting patients with care and support, CREMS helps to address and resolve some chronic or developing issues in a person’s life. It is our hope that following a CREMS referral, patients will receive supportive services and no longer rely on EMS to respond to their chronic care issues. This could result in a positive impact on both EMS operations and hospitals in freeing resources for more appropriate situations.</td>
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<tr>
<td>GREY</td>
<td>CREMS - referral program through CCAC since 2009. Good success in reducing repeat patients. Program is linked to ePCR (electronic patient care report) program with special code triggering automated form generation and follow-up.</td>
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<tr>
<td>HAMILTON</td>
<td>CREMS community referral EMS - paramedic on each patient refusal do a PERIL like assessment and refer patients to other health care or social service agencies. Social Navigator - a paramedic assigned to police services and connects with frequent uses of police and mental services to other community agencies to address root causes of the behaviors that are contributing to reliance on emergency services to resolve their matters. Home safety visits in city subsidized housing to connect persons to primary care and identify high risk emerging health problems before they are acute crisis state.</td>
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<tr>
<td>HASTINGS</td>
<td>Community Referral to Community Care Access Centre. High school CPR training programs. Off load delay in the ER program.</td>
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<tr>
<td>NIAGARA</td>
<td>CREMS, Community ALS Paramedic (Rural), OMEGA/PSIAM study on patient deferrals at point of contact in dispatch. Alternate pathways for patients other than ED as well as alternate transportation.</td>
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<tr>
<td>OTTAWA</td>
<td>Managing frequent callers - meeting with frequent callers to determine which health needs can be met outside of the emergency health care system. PERIL (Paramedics assessing Elders at Risk for Independence Loss) - referral of vulnerable patient who may be at risk of independence loss.</td>
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<tr>
<td>RENFREW</td>
<td>Aging at Home (Deep River) Home Visits - improving quality of life by preventing emergency calls by identifying and removing hazards, ensuring medications are being taken correctly as prescribed by the client’s family physicians, taking monthly vitals, collecting medical histories and educating the clients on their medical conditions. Wellness Clinics - an opportunity for residents to have their blood glucose,</td>
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<td>Municipality</td>
<td>Description of Current Community Paramedic Programs</td>
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<td>temperatures, heart rates and blood pressures monitored and recorded on a monthly basis. It allows these patients to bring their vitals to their family physicians so that health problems can be caught early. It also gives them a chance to ask any medical questions they may have.</td>
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<td>Heart Wise Exercise Program – in partnership with the Ottawa Heart Institute, the purpose of the program is to identify community exercise programs that are suitable for individuals with heart disease and the implementation of AED’s in our rural communities.</td>
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<td>CPR/AED Program - the goal of the program is to introduce the skills of resuscitation and use of AED; increase the knowledge of healthy diet choices, and encourages increased levels of activity.</td>
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<td>Adhoc Home Visits - this program’s goal is to identify clients in the community that could benefit from the program parameters outlined in the Wellness Clinics as well as refer to supportive programs offered by other agencies.</td>
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<td>Paramedic and Community Care Team Program - the PACCT program is designed to target the population of the elderly and vulnerable clients living at risk in the communities of the County of Renfrew. First the goal is to identify clients in the community who would benefit from CCAC services and then provide an easy referral mechanism for referral of those clients identified by paramedics.</td>
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<td>Community Paramedic Response Unit - the County of Renfrew Paramedic Service has recognized an opportunity to integrate with other health care providers when they are not responding to emergency calls. Our paramedics can contribute to health care when not participating in emergency responses, improving integration with community stakeholders, by focusing on health promotion and illness prevention.</td>
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<tr>
<td>SUDbury</td>
<td>Education - Care Link Medical Information Files, Public Access Defibrillation and education, member of committees for seniors, mental health, behavioral support initiatives currently working on alternate site for assessments and treatment of mental health patients. Follow up on multiple call users - (often have mental health addiction issues therefore focus on strengthening partnerships with mental health community care programs - goal to decrease use of EMS and transport to the ED that is not always the best place to service people with mental crisis. Developing a program that meets the most pressing needs of the community.</td>
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<tr>
<td>TORONTO</td>
<td>Community Agency Notification - Partnership with Senior’s Agencies to develop a notification tool to notify them of client transfer to hospital and wellness checks during enrolment. Integrate Client Care Program (ICCP) - a partnership with CCAC to develop a transfer package for the most medically complex Senior’s within the city. A strategy to assess these patients, get them the care they need at home and monitor their use of 911 and/or other services in order to mitigate further hospital visits. Influenza vaccination program - annual influenza vaccination programs for marginalized citizens, senior’s, health care workers, shut-in seniors and other vulnerable residents (shelters, etc.) XCREMS - Paramedic referrals for patients requiring services at home to potentially mitigate future calls to 911 and/or hospital usage.</td>
</tr>
</tbody>
</table>
### A.vi. Description of Planned Community Paramedic Programs in Ontario

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Description of Planned Community Paramedic Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHATHAM-KENT</td>
<td>Check in services (health and wellness checks, fall prevention) for at risk seniors in rural communities.</td>
</tr>
<tr>
<td>COCHRANE</td>
<td>All programs will fall into the same Community Paramedicine Program and will focus predominantly on seniors in our Social Housing facilities. Services likely to be done in conjunction with CCAC or other home care organizations. Other community residents in need, based upon the opinion of paramedics, will result in referral through the receiving facilities or ER.</td>
</tr>
<tr>
<td>FRONTENAC</td>
<td>Wellness Clinic on Wolfe Island pilot project has been approved by County Council.</td>
</tr>
<tr>
<td>GREY</td>
<td>Fall Prevention - in house follow-up for patients identified as having fall risk through ePCR generated risk potential form. Patient Follow Up - patients captured through CREMS would receive follow-up visits by paramedics to ensure that services are still accessed.</td>
</tr>
<tr>
<td>GUELPH WELlington</td>
<td>CREMS - referrals to available community services to patients with identified needs. OUTREACH Program - vital signs assessments, fall prevention counseling, home safety counseling and wellness checks at seniors' residences.</td>
</tr>
<tr>
<td>HALIBURTON</td>
<td>Falls prevention for seniors and regularly scheduled &quot;open house&quot; sessions in remote areas for items checked on previous page.</td>
</tr>
<tr>
<td>HASTINGS</td>
<td>I am currently doing my master in arts in leadership through RRU. My question at this time is how may HQEMS develop a community paramedicine program. The results of that study will help align our future direction.</td>
</tr>
<tr>
<td>MIDDLESEX</td>
<td>TBD</td>
</tr>
<tr>
<td>MUSKOKA</td>
<td>We are unclear at this point, we just got approval on Friday to investigate and come back with a program for Muskoka.</td>
</tr>
<tr>
<td>NIPISSING</td>
<td>Unknown at this time we would like to investigate what is out there and what works without reinventing the wheel.</td>
</tr>
<tr>
<td>NORTHUMBERLAND</td>
<td>Beginning in 2013 - building community partnerships and identifying programs already available. Then a gap analysis to determine what patient needs are still not being met by current services. Follow this with an analysis of the ability of paramedics to address gaps. Once the most appropriate programs and services are identified, secure sustainable funding for programs and begin delivery in 2014.</td>
</tr>
<tr>
<td>Municipality</td>
<td>Description of Planned Community Paramedic Programs</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>OXFORD</td>
<td>CREMS primarily, as well as education to paramedics of services available within community. Pamphlets for distribution to clients where client refuses treatment / transport.</td>
</tr>
<tr>
<td>WATERLOO</td>
<td>Community Referrals EMS - Referral Services to other Community or Health Services - provide others options to patients you do not necessarily require going to the ED, e.g. patient may require &quot;Meals on Wheels&quot; to visit - to provide a hot meal or require some other form of service provided in the community.</td>
</tr>
<tr>
<td>YORK</td>
<td>Triage Referrals, Alternate Transport, Community Referrals, Facilitated Transports, Physician Assistant Paramedics.</td>
</tr>
</tbody>
</table>
Bad Medicine

I am old school. I think that craft beers taste like urine, tofu tastes like polystyrene, and that posting your life all over social media is tasteless. I feel lucky to be a doctor; it’s a privilege not a burden. I also don’t buy into the idea that doctors are the most gifted and caring people in our society, because it just isn’t true. Becoming a doctor is much more about privilege than ability. The attributes of care, intelligence, and commitment are common among the wider population — which brings me to the GP recruitment crisis. Most doctors don’t want to be GPs because of the profession’s low status — and this is not going to change any time soon. In fact, the workforce crisis is only going to get worse. A twister of change is coming; it’s just that the profession hasn’t seen it yet. And this is a good thing, as for too long doctors have had a stranglehold over change in primary care.

Currently I am involved in supporting a large practice that is in difficulties, and I have had an epiphany. The new reality is that other professionals are going to do the work of GPs, for example, paramedics can do GP house calls. I have done thousands of house calls and been involved in every conceivable situation: been through the doors with police holding riot shields; persuaded a patient to come away from their balcony; seen all manner of deaths; dished out antibiotics; conducted mouth-to-mouth resuscitation; and visited patients night and day in all weathers. I’m not fazed by house calls. But I am the exception. Young doctors often have limited exposure to house calls, don’t like doing them, and struggle with the uncertainty of it all. Instead, telephone advice is commonplace, because GPs are becoming avoidant of house calls. You cannot teach doctors about house calls; learning comes from that most underrated aspect of medical training: experience.

Paramedics are highly trained, degree-level professionals who are, above all, experienced — my stories of house calls seem tame in comparison... They also see the same types of patients as GPs.

… paramedics can do GP house calls...

Paramedics are highly trained, degree-level professionals who are, above all, experienced — my stories of house calls seem tame in comparison... They also see the same types of patients as GPs.

Good medicine — the GP paramedic

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Paramedics are highly trained, degree-level professionals who are, above all, experienced — my stories of house calls seem tame in comparison. They have been first responders in every situation, a calm shelter in the howling chaos that can ensue in domestic emergencies. They also see the same types of patients as GPs, and are experts at keeping them at home and linked to various community teams. And, as practices often run on-call systems with different doctors visiting on different days, there is currently limited continuity in house visiting.

So, employing a paramedic in primary care seems like a no-brainer, providing an experienced professional and cohesion, in a continuity-free NHS. There are issues around prescribing, but, just as nurses are now prescribing, paramedics will soon follow suit. Modern technology means they can link via video to a GP if need be. To employ a GP paramedic there is a critical mass of patient numbers, likely in excess of 10,000 patients. Employing GP paramedics frees up GP time because patients are no longer having to constantly come to and from the surgery, enabling GPs to focus on other aspects of the unscheduled work. And, of course, GPs can still visit in situations like palliative care.

At the practice I am supporting we are exploring language and titles too. We need a long overdue professional mash-up and to start to merge and blur the boundaries between us all. Here is an idea to consider: let’s refer to our health professionals as ‘GP doctor’, ‘GP nurse’, and ‘GP paramedic’, with all primary care clinical staff wearing the same simple uniform like a scrub top.

On this note, my practice has just employed a GP paramedic as a start to the coming storm of change.

Des Spence,
GP, Maryhill Health Centre, Glasgow.

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314
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COMMUNITY HEALTH EVALUATIONS COMPLETED USING PARAMEDIC SERVICE (CHECUPS): DESIGN AND IMPLEMENTATION OF A NEW COMMUNITY-BASED HEALTH PROGRAM

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County of Renfrew Paramedic Service

CHRIS W ASHTON
Harbourfront Health Group Inc.

JEFFREY MILLAR
County of Renfrew Paramedic Service

ABSTRACT

The Government of Ontario established a one-time funding program intended to create a Community Paramedicine best practice in support of its Action Plan for Health Care. The County of Renfrew Community Resilience Program responded with the creation of the CHECUPS program. The study was conducted in the County of Renfrew, Ontario, Canada where a Community Resilience Program expanded to include the CHECUPS Program. The evaluation of the CHECUPS program has addressed impacts to three domains: 1) patient overall health and satisfaction; 2) primary care integration; and 3) paramedic resource utilization. The results included a total of 222 patients that demonstrated a 24% reduction in 911 activation; 20% reduction in repeat ED visits; 55% decrease in patients that were admitted post ED visits; and all patients indicated that they were either “satisfied” or “very satisfied” with the care provided by community paramedics. The CHECUPS Community Paramedic Program is in an excellent position to support the Province of Ontario Action Plan for Health Care by responding to the increasing emergency response demands, chronic pressures within the health care system, and need to provide a more sustainable, integrated, patient-centred system.

Key Words: Community Paramedicine, integration, primary care, health care, rural health, model of care
INTRODUCTION

Community paramedicine programs are becoming increasingly better positioned to integrate with existing community services to assist with moving towards a more patient and community-based health care system. The health system in the Province of Ontario, Canada is facing extraordinary challenges, including increased financial pressures, and increased demand for paramedic services. At the same time, the Government of Ontario is moving the health care system to be more patient and community-based. The origins of this community paramedicine program are in a report entitled “Living Longer, Living Well” (Sinha, 2013). This report is a seniors’ strategy action plan aimed to promote better care and health outcomes for older Ontarians. In order to improve the quality of life for seniors, issues such as chronic disease and the provision of health services in the community, is required. Sinha (2013) noted that developing Community Paramedicine (CP) Programs could assist in supporting the needs of seniors living in the community, while contributing to broader health system goals. As a result of the Sinha Report, the Government of Ontario established a one-time funding program intended to create a best practice in CP for the Province of Ontario.

While there is a growing recognition that CP can contribute to the health care system, the Ontario government is attempting to determine an effective delivery model to: “ensure seniors and other high needs patients can access the right care, at the right time, in the right place, supporting Ontario’s Action Plan for Health Care” (Government of Ontario, 2014). This article will review the “Community Health Evaluations Completed Using Paramedic Service” (CHECUPS) Program, a response to the Government of Ontario’s desire to evaluate how CP can
contribute to the health care system in the Province of Ontario.

**An Emerging Model of Care**

CP Programs have emerged throughout the Province of Ontario in an effort to maximize efficiencies in patient care and resources. These programs provide an innovative model of care that helps to improve access to additional support services for patients with chronic health and social issues. CP is an emerging model of care, where paramedics apply their training and skills in “non-traditional” community-based environments to address the challenges of aging populations, overstretched health care system, and increasing paramedic service demands (Lurie, et al, 2013, O’Meara, et al, 2012, PCC, 2006, Cooper, et al, 2004). Community paramedics may practice within an expanded scope by applying specialized skills/protocols beyond that which he/she was originally trained for or may practice in an expanded role, working in non-traditional roles using existing skills (IRCP, 2011).

A feature of CP Programs is their potential to integrate paramedicine with other health care agencies and health professionals (O’Meara, Ruest, Martin, 2015; Ruest, Stitchman, Day, 2012). By integrating with community stakeholders, paramedics are able to contribute to population health care by collaborating in patient centred care-coordination plans as well as contributing to health promotion and illness prevention (Stirling, et al, 2007). The County of Renfrew Paramedic Service created a Community Resilience Program in response to the increasing emergency response demands, chronic pressures within the health care system, and need to provide a more sustainable, integrated, patient-centred system (Community Paramedic, 2015).
Service Context: Renfrew County, Ontario

The County of Renfrew Paramedic Service, located in Eastern Ontario, Canada is challenged by its vast geography and unique population settlement patterns and demographics. The catchment area is over 9000 km² with a population of 120,000; a figure that expands to 150,000 for the summer cottage season (Statistics Canada, 2011). Approximately 48% of the population of the County of Renfrew lives in a rural setting (Renfrew County & District Health Unit, 2016). Between 2010 and 2015, the population increased by 5.2% and has a projected growth rate of 12.4% for the years 2015-2025 (Champlain LIHN, 2015).

Because the population tends to be older in rural areas, the rates of chronic disease, disability and mortality tend to be higher than what is seen in urban areas (Gamm, 2003 Burgess, 2012). In Renfrew County, the proportion of the population for 65 years of age and older was 19% in 2013 (19,740), up from 17% in 2008 (RCDHU, 2016). This is projected to increase further to 33% (35,982 individuals) by 2041 (Government of Ontario, 2013).

The County of Renfrew Paramedic Service (CORPS) responded to 12,786 emergencies in 2015, of which 8,566 (67%) were high priority (“priority 4”) emergencies (see Figure 1) (Interdev: iMedic, 2016). Priority 4 calls include resuscitation, and emergent conditions that are threats or potential threats to life and limb. Priority 3 calls are urgent in nature and can potentially progress to a serious problem and would benefit from intervention within 1-2 hours, while priority 1 and 2 calls are non-urgent in nature and are conditions that are chronic in nature (Dallaire, et al, 2010).
Figure 1
Emergency vs. Non-urgent Calls

Approximately 58% percent, or just over 7,400 calls, were in response to patients over 60 years of age; about 33% of calls, or close to 4,225 emergencies, were in response to patients over the age of 80 years of age (Interdev: iMedic, 2016). The total call volume for paramedics (see Figure 2) indicates the increase in call volume between the years 2007 and 2015. There was an increase of 39.2%, or 10,127 emergency responses, from 2007 to 2015, an average of 5.6% increase per year. Annual strategic adjustments of the deployment model have allowed CORPS to maintain emergency response times in many areas of the county, however remote areas with very low call volumes are trending toward longer response times.
(County of Renfrew, 2011). The aging population and long response times contribute to increased service demand and delivery challenges for the CORPS.

**Figure 2**
*Total Paramedic Call Volume 2007-2015*

![Total Paramedic Call Volume 2007-2015](chart.png)

*Source: Interdev (2016)*

**Literature Review**

The ability of CORPS to sustain emergency response in a timely fashion to the all regions of the County of Renfrew depends in part on the continued development of the CP programs. The development of the existing CP programs was the result of an environmental scan of operational CP programs around the world. Table 1 highlights a few of the many new CP programs being established each year.
in both domestic and international setting. The CP programs illustrate how CORPS responded to the needs of their communities. In the County of Renfrew, four interrelated Community Paramedic Resilient programs including the Aging at Home Program, Wellness Clinics, Adhoc Home Visits, and Community Paramedic Response Unit Program were created to meet the needs of the community.

Table 1

**Domestic and International Community Paramedic Programs**

<table>
<thead>
<tr>
<th>Country / Province</th>
<th>Community Paramedic Program Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States – Red River CP &amp; Mobile Integrated Health Care Program</td>
<td>The best-known program is the Red River, New Mexico CP and Mobile Integrated Health Care program. Due to the rural setting of the community and limited access to medical services, the paramedic service began a health promotion and illness prevention program that included chronic disease surveillance, community health education, and injury and disease prevention programs (Hauswald, 2005).</td>
</tr>
<tr>
<td>North East Ambulance Service NHS Trust, United Kingdom</td>
<td>A common illustration across the UK, Community paramedics work closely with General Practitioners and nurses, to avoid unnecessary admissions to hospital when appropriate. Includes assisting the primary care team to keep patients in their home (Association of Ambulance Chief Executives, 2011).</td>
</tr>
<tr>
<td>Location</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Queensland and South Australia</strong></td>
<td>Via a Primary Health Care Model, Australia utilizes an expanded scope paramedic programs to address chronic diseases, including diabetes, respiratory infections, and coronary heart disease due to social and health determinants. Health promotion and illness prevention include home visits, health education, and diabetes management (Raven et al, 2006).</td>
</tr>
<tr>
<td><strong>Long and Brier Island Project, Nova Scotia</strong></td>
<td>The first known Canadian example of an expanded paramedic role, the Long and Brier Island Project in the Province of Nova Scotia, which established a community partnership between the ambulance service and primary care agencies, dramatically altered the traditional work of paramedics (Martin-Misener, et al, 2009). With a community of 1240, 50% over the age of 65, closest hospital one-hour away, and recognized aging population with increasing healthcare requirements, a CP Program was developed. Health promotion and illness prevention programs included fall assessment, adopt-a-patient program, safety programs and community health fairs (Misen er, 2005).</td>
</tr>
<tr>
<td><strong>British Columbia</strong></td>
<td>British Columbia has recently approved the creation of a provincial wide CP Program (Evashkevich and Fitzgerald, 2014).</td>
</tr>
<tr>
<td><strong>Alberta</strong></td>
<td>During the transition from municipal government to provincial government responsibility, the creation of strategic plan that includes integrating Emergency Medical Services (EMS) with health services across the care continuum, has a focus on positively impacting senior’s health and home care, mental health, and public health initiatives (AHS, 2009).</td>
</tr>
<tr>
<td><strong>Saskatchewan</strong></td>
<td>The Saskatchewan Provincial government implemented the transition of EMS to a Mobile Health Services (MHS) system. The new MHS will continue to provide emergency response but also provide opportunities for integrated, collaborative health promotion initiatives focused on geographically, socially, economically, culturally isolated access to health care services (Nolan, Hillier, D’Angelo, 2012).</td>
</tr>
</tbody>
</table>
The Ontario Government stated that the health care system, including CP Programs, must be designed to support patients in preventing injury and illness while contributing to the improvement in health of the population (Ontario Senior’s Secretariat, 2015, AMC, 2015, Government of Ontario, 2014, Ministers Responsible for Seniors, 2011). This strategy was echoed in a number of countries around the world. In England, Wales, Australia, New Zealand, United States, and Canada, paramedics provide urgent scene care, averting unnecessary transports to the local Emergency Department (ED) (NHS, 2001, EMSCC, 2006, O’Meara, 2006, Choi, et al, 2015).

In 2012, the United Kingdom spent over $5.5 Million researching new approaches that allowed Paramedics to safely care for patients who called 999 [the equivalent of 911] (Snooks, et al, 2013). The result of the implementation saw a reduction in transport from 90% of the 999 calls in 2000 to 58% of the 999 calls (Snooks, et al, 2013). In the United States (US), it was recognized that there was a need to meet the diverse needs of the communities and therefore include community based health management that is fully integrated with the overall health care system with the goal of improving community health (NHTSA, 1996). By 2012, CP Programs had expanded from the underservices rural regions to non-rural areas (Choi, et al, 2015). And again in 2015, a report entitled “Mobile Integrated Healthcare and Community Paramedicine: A National Survey” indicated that CP, by definition, means an integrated healthcare approach that impacts patient care and wellness. In December of 2014, “a new paradigm for mobile healthcare emerged from the two-day meeting of EMS thought leaders held in Chicago” (Tan, 2015). One of the outcomes of this two-day meeting was the recognition that mobile healthcare and community paramedicine needed to identify a number of, “unique components to the approach to patient care” (Tan, 2015).
Of the components identified by Tan (2015), the County of Renfrew’s CHECUPS program focused on improving (a) coordinating communication, (b) integrated medical records, (c) health monitoring, (d) navigation capacity, and (e) performance measurements.

**Community Resilience Program:**  
*Early Community Paramedicine Programs in Ontario*

As stated previously, CORPS created a Community Resilience Program in response to the increasing emergency response demands, chronic pressures within the health care system, and need to provide a more sustainable, integrated, patient-centred system. Each of the programs (See Table 2) are designed to identify individuals in the community that can benefit from the programs. For example, the Aging at Home Program supports individuals with the necessary services, so they can remain safely in their homes while they waited for a long-term care home bed. The Wellness Clinics were introduced when the only two physicians working in a small rural community retired, leaving a number of residents without a primary care provider. The Wellness Clinic provides a monthly check-in for the residents and allows for the identification of potential health risks. The Home Visit Program provides opportunities for paramedics to identify individuals in the community who are isolated and have limited access to social or health services. The Home Visit Program links patients with the local hospital’s Geriatric Emergency Medicine (GEM) RN who is able to determine what available hospital services can be provided to the individual. A paramedic follow-up visit ensures that the patients continue to receive the services they require (Community Paramedic, 2015).

The programs are designed as a unidirectional referral mechanism, specifically from the paramedic to the community social and health stakeholders. Except for the
Aging at Home program, all of the CP programs are designed to utilize either paramedics on their down time between emergency call assignments or paramedics on leave from their regular front line duties.

### Table 2
**County of Renfrew Community Paramedic Programs**

<table>
<thead>
<tr>
<th>Program Name: Aging at Home</th>
<th>Patient Focus</th>
<th>Program Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supported by an interdisciplinary team in a small rural community so patients are able to remain safely in their homes.</td>
<td>Allow independent patients to stay at home as long as they are able, maintaining quality of life, while they await Long Term Care placement.</td>
</tr>
<tr>
<td></td>
<td>North Renfrew Long Term Care (NRLTC), Primary Care Providers (PCP), Community Care Access Center (CCAC), Deep River and District Hospital (DRDH), Family Health Team (FHT).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program Name: Wellness Clinics</th>
<th>Patient Focus</th>
<th>Program Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Provides opportunities for patients in underserviced areas of the county to have vital signs taken on a regular basis.</td>
<td>Opportunity for residents to have their vital signs monitored and recorded at 13 countywide clinics scheduled on a monthly basis.</td>
</tr>
<tr>
<td></td>
<td>Community and social services, and Regionally Diabetic Outreach Team.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program Name: Home Visit Program</th>
<th>Patient Focus</th>
<th>Program Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wellness checks, referrals as required, health and safety promotional initiatives that teach patients how to accident-proof their homes.</td>
<td>Front-line paramedics visit isolated patients that could benefit from a Community Paramedic visit.</td>
</tr>
<tr>
<td></td>
<td>CCAC, Geriatric Emergency Manager (GEM) RN, Regional Diabetic Outreach Program, Mental Health Outreach Program, Meals on Wheels, Social Worker Professional, and Home Maintenance Services.</td>
<td></td>
</tr>
</tbody>
</table>
Although the CP programs are generating interest from both the community, and social and health care providers in the community, emergency call volume continues to rise in the remote regions of the county. The creation of the Community Paramedic Response Unit (CPRU) program is to specifically address remote emergency response times and to add an additional Community Resilience Program to assist patients in those communities (Ruest, 2012; O’Meara, Ruest, Martin, 2014). The CPRU CP program (See Table 3) is staffed with two full time paramedics working 12-hour day shifts, 7 days a week. The two goals of the program are to address the emergency call volume, and response time challenges in the remote areas of the county as well as continue to identify isolated, at risk individuals that can be assisted by the social and health care services available in the community.

Table 3
Community Paramedic Response Unit Program

<table>
<thead>
<tr>
<th>Program Name: Community Paramedic Response Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Focus</td>
</tr>
<tr>
<td>Partners</td>
</tr>
<tr>
<td>Program Description</td>
</tr>
</tbody>
</table>

DEVELOPING A NEW COMMUNITY PARAMEDICINE PROGRAM

The Government of Ontario’s funding of the CHECUPS Program provides an additional opportunity to build upon the existing CP programs being delivered in the
County of Renfrew. The CHECUPS program is designed to assist “at risk” individuals in the community as well as patients discharged from local hospitals. By providing in-home assessment to these patients, both unnecessary transports to the ED and hospital readmissions can be avoided. Paramedics provide ongoing assessment of these complex patients on an as needed basis.

**Target Population**

The Province of Ontario defined the target population for the CHECUPS program as being the patients who “struggle with multiple complex and often inter-related health and social care issues” (Sinha, 2013). As a result, the CHECUPS program expanded the CP assessment, intervention, and referral to a new population that includes:

- Medically complex seniors and other patients with a fragile health status, who are dependent on others for care or are dependent on life sustaining equipment and have limited or no family support;
- Medically complex seniors discharged from the hospital; and
- Medically complex patients where a rapid response nurse identifies an ongoing need for assessment and intervention to prevent readmission to acute care.

Medically complex patients are defined as individuals suffering from chronic disease, including: cardiovascular disease including hypertension and congestive heart disease, chronic respiratory disease including asthma and chronic obstructive pulmonary disease, diabetes, mental illnesses including dementia, delirium, and depression.

**Coordinating Communication**

The CHECUPS Program established a connection with family physician group practices in the region and
continued to work with the community support services providers associated with the other Community Resilient Programs. The CHECUPS Program includes the Champlain Community Care Access Centre (CCAC) Care Coordinators located in the hospital and the community, a “rapid response nurse,” who provides a brief intervention immediately after a hospital discharge, and a community paramedic who completes initial assessments and follow-up visits. These formal connections allow for communication among a number of key partners in the delivery of complex patient care in varied settings.

**Health Monitoring**

The CHECUPS program involved paramedics in a full scope of activities including assessment, intervention, and referral. The program utilizes the skills of paramedics in assessing the medical status of patients, and supplement the frequency of assessments where access to in-home health care assessment is limited. This service allows for early identification of medical problems, and provides appropriate care in the community with a goal of preventing patient decline, thus reducing the need for paramedics to respond on an emergency basis, the need for treatment in an ED, or admission to the local hospital.

In addition to the skills, knowledge, and experience obtained in the management of the four existing Community Resilient Programs, the community paramedics also looked to the Knowledge, Skills and Attitudes (KSA) Inventory for possible expansion of CP services. The KSA Inventory was derived from the Canadian National Occupancy Competency Profile that outlines the multiple competencies a paramedic must possess in order to perform their duties efficiently (PAC, 2016). The CHECUPS Program paramedics utilize the entire “KSA Currently Deemed Useful” inventory list found in Table 4 below. In addition, Table 4 identifies useful KSAs that require
training, which was evaluated for appropriateness for the patients involved in the CHECUPS program.

Table 4
Community Paramedic Knowledge, Skills and Attitudes Inventory

<table>
<thead>
<tr>
<th>KSAs Currently Deemed Useful</th>
<th>KSAs Deemed Useful Requiring Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of responsiveness</td>
<td>Fall risk assessment &amp; prevention</td>
</tr>
<tr>
<td>Level of awareness</td>
<td>Get up and go assessment</td>
</tr>
<tr>
<td>Glasgow Coma Scale</td>
<td>Safe home mobility assessment</td>
</tr>
<tr>
<td>Pupillary response</td>
<td>Post fall assessment</td>
</tr>
<tr>
<td>Skin condition</td>
<td>Patient Interview (building and maintaining rapport)</td>
</tr>
<tr>
<td>Temperature</td>
<td>Dealing with death and dying (patient attachment)</td>
</tr>
<tr>
<td>Heart rate, rhythm, quality</td>
<td>Influenza Vaccinations</td>
</tr>
<tr>
<td>Respiratory rate, regularity, quality</td>
<td>Advanced wound care</td>
</tr>
<tr>
<td>12-Lead interpretation</td>
<td>Weight monitoring</td>
</tr>
<tr>
<td>Lung sounds</td>
<td>Urine dip test</td>
</tr>
<tr>
<td>ECG interpretation</td>
<td>Mini mental health assessment</td>
</tr>
<tr>
<td>Blood Glucometer</td>
<td>Mental Health status assessment</td>
</tr>
<tr>
<td>Venipuncture (draw &amp; catheterize)</td>
<td>Urinary Catheterization</td>
</tr>
<tr>
<td>Saturation of peripheral oxygen</td>
<td>Antibiotic therapy</td>
</tr>
<tr>
<td>History assessment</td>
<td>Foot assessment and foot care</td>
</tr>
<tr>
<td>Medication compliance</td>
<td>ISTAT blood analysis</td>
</tr>
<tr>
<td>Health literacy &amp; education</td>
<td></td>
</tr>
<tr>
<td>Subcutaneous injections</td>
<td></td>
</tr>
<tr>
<td>Intramuscular injections</td>
<td></td>
</tr>
<tr>
<td>Emergency ALS care</td>
<td></td>
</tr>
</tbody>
</table>

Education
A review of the KSA “Inventory Deemed Useful Requiring Training” list revealed that the CHECUPS community paramedics had received training in all KSAs except urinary catheterization, antibiotic therapy, foot
assessment and foot care, and iSTAT blood analysis (items bolded in Table 4), which were deemed to be unnecessary for the patients being served by the CHECUPS program. However, there was a need to accurately assess for dementia, delirium, and depression. Paramedics augmented the KSA mini mental health and status assessment skills with the “geriatric giants” training provided by the Champlain CCAC and Regional Geriatric Program of Eastern Ontario.

**Patient Navigation**

Each patient discharged from local hospitals is assigned to a Champlain CCAC Care Coordinator who worked with a community paramedic, primary care physician, rapid response nursing service, and other community support services associated with each patient. The Champlain CCAC’s Rapid Response Nursing Program serves to reduce the risk of readmission of seniors with complex and chronic medical conditions by providing a nursing visit within 24-48 hours of hospital discharge. The Rapid Response Nursing Program provides an ideal connection within CHECUPS, and creates a natural linkage from the hospital to the community paramedic for those patients who require long-term support and monitoring aimed at preventing hospital readmission. In many cases, community paramedics supplemented the Rapid Response Nursing Program by fulfilling the required first home visit within 24-48 hours of hospital discharge. In this process the community paramedics completed a number of critical first-steps, including the initial assessment, medication reconciliation, post-discharge education, promotion of chronic disease self-management, illness prevention, and ensured a connection to the patients’ primary care practitioner.
**Integrated Medical Records**

CHECUPS moved from a paper-based to an electronic referral process between paramedic service and CCAC. The CHECUPS program leveraged provincial work and added a two-way electronic communication interface between community paramedics and care coordinators facilitating earlier and appropriate intervention for patients at risk. As a result of the provincial work, the CHECUPS program was able to promote communication between Champlain CCAC discharge planners, community paramedics, rapid response nurse, and the patient in three ways:

- Providing an electronic method of real-time two-way communication amongst core team members;
- Leveraging the connection that Champlain CCAC Care Coordinators have with primary care physicians and other community service sector and community providers to coordinator services; and
- Reducing the burden on patients to repeat their story.

The Champlain CCAC’s current electronic clinical information system, Client and Health Related Information System (CHRIS), and its externally available and secure Health Partner Gateway (HPG) is used to provide two-way communication between CCAC Care Coordinators and Paramedics (OACCAC, 2016). When specific patients are identified for the program, referrals are sent electronically to a Renfrew County Paramedic “inbox.” The HPG also provided an electronic return communications path from the community paramedic in the field to the care coordinator. These include the ability to upload a completed “visit record” into the CHRIS clinical document management system or the development of full “automated report” functionality with the information system used by the paramedics.
**CHECUPS and Performance Measurement**

The evaluation of CHECUPS program has addressed impacts in three domains: 1) patient, including overall health and satisfaction with program; 2) primary care integration, including access and timely follow-up; and 3) resource utilization, including impacts to paramedicine and acute care services. Post-implementation performance was measured from April 1, 2015 to March 31, 2016. A total of five process indicators and six outcome process were identified for the CHECUPS program. Table 5 identifies the process and outcome indicators by the CHECUPS Program for the program duration.

**Table 5**

<table>
<thead>
<tr>
<th>Process Indicators</th>
<th>Outcome Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reduction in the number of 911 calls from frequent callers</td>
<td>1. Decrease in the proportion of patients returning to ED within 90 days of discharge</td>
</tr>
<tr>
<td>2. Reduction in the number of transports to EDs</td>
<td>2. Reduction in the number of 30-day readmissions to hospital</td>
</tr>
<tr>
<td>3. Decrease of the proportion of CTAS 4/5 by 2%</td>
<td>3. Satisfaction of enrolled patients with paramedicine program</td>
</tr>
<tr>
<td>4. Decrease the number of high service users with more than 5 ED visits by 2%</td>
<td>4. Improvement in overall health of enrolled patients</td>
</tr>
<tr>
<td>5. Decrease the number of high users with &lt; 30-day repeat visits to ED by 2%</td>
<td>5. Improvement in patient understanding of emerging crisis plan</td>
</tr>
<tr>
<td></td>
<td>6. Improvement in overall patient satisfaction with care</td>
</tr>
</tbody>
</table>
RESULTS

Table 6 provides a descriptive list of services performed by community paramedics in association with the CHECUPS project. The CHECUPS Program recruited 222 medically complex patients who are dependent on others for care or have limited or no family support. A total of 106 patients lived alone, and all of the patients suffered from two or more chronic health issues. Of the total, 162 had four or more chronic health issues.

Robust coordinated communication was demonstrated by the 36 patient care plans created in collaboration with the Champlain CCAC case manager and rapid response nurse. In addition, a total of 119 referrals from the community paramedics to both social and health care providers in the community demonstrated the important function of navigation capacity. This navigation capacity, as well as integrated medical records management, was illustrated by the community paramedics receiving 309 referrals from the CCAC discharge planner, rapid response nurse, and other community stakeholders. Health monitoring activities were also demonstrably important: 222 patients had 3,717 assessments and 3,286 general health and wellness monitoring completed during the 1,186 home visits. In addition, point of care testing (908), delegated acts (735), education and teaching (519), the number of patients and family member participants in the education and teaching (478), mobility assessments (139), and cognitive assessments (47) were completed. Each of these assessments were the result of the development and implementation of the coordinated care plan.
Table 6
Descriptive Statistics for Community Paramedic Services

<table>
<thead>
<tr>
<th>List of Services</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of CHECUPS patients:</td>
<td>222</td>
</tr>
<tr>
<td>Total number of home visits completed:</td>
<td>1,186</td>
</tr>
<tr>
<td>Average number of home visits per patient:</td>
<td>5</td>
</tr>
<tr>
<td>Number of Point of Care tests performed (eg. Blood Glucose, INR):</td>
<td>908</td>
</tr>
<tr>
<td>Number of delegated acts performed under medical supervision/oversight:</td>
<td>735</td>
</tr>
<tr>
<td>Number of education/coaching activities performed (specify topics, e.g., Falls</td>
<td>519</td>
</tr>
<tr>
<td>Prevention, Heart Disease, Nutrition, Diabetes, other):</td>
<td></td>
</tr>
<tr>
<td>Number of education/coaching participants:</td>
<td>478</td>
</tr>
<tr>
<td>Number of patient care plans developed by the Community Paramedic or in</td>
<td>36</td>
</tr>
<tr>
<td>partnership with others and shared with other health, social and community</td>
<td></td>
</tr>
<tr>
<td>care team members:</td>
<td></td>
</tr>
<tr>
<td>Total Number of Assessments Completed:</td>
<td>3,717</td>
</tr>
<tr>
<td>General Health and Wellness (i.e., BP, general health concerns):</td>
<td>3,286</td>
</tr>
<tr>
<td>Mobility Assessments i.e. TUG, other:</td>
<td>139</td>
</tr>
<tr>
<td>Cognitive Assessment i.e. Mini-Mental (MMSE), Mini-Cog:</td>
<td>47</td>
</tr>
<tr>
<td>Total number of referrals from CHECUPS to community stakeholders:</td>
<td>119</td>
</tr>
<tr>
<td>Total number of referrals directed to CHECUPS from CCAC and other community</td>
<td>309</td>
</tr>
<tr>
<td>stakeholders:</td>
<td></td>
</tr>
</tbody>
</table>

Process and outcome indicators were measured during the same 1-year period. After CHECUPS program implementation there was a 20% reduction in repeat ED visits of five (5) or more instances, a 55% decrease in patients that were admitted to the hospital post-ED visit, and a 1% reduction in overall ED utilization. Outcome indicators revealed that, of the 222 patients involved in the
program, only one returned to the ED within 90 days of discharge. In addition the number of readmissions after 60 days rate was reduced from 15 to 3 and the number of 30-day readmissions was reduced from 29 to 5.

Figure 3 illustrates the 222 instances of patient utilization of the County of Renfrew 911 system. Recruiting the 222 patients took almost 9 months to complete, and was illustrated with an increased 911 utilization up to Q3 of 2015.

**Figure 3**
**CHECUPS 911 Calls**

Once all of the patients were recruited and engaged into the CHECUPS Program, priority 3 or 4 calls in Q4 of 2015 reduced from 96 to 73 calls or 24%. The number of priority 3 or 4 calls from Q3 to Q4 that lead to ED transport
was reduced by 21.5%. The number of Priority 3 or 4 calls from Q3 to Q4 triaged by community paramedics as level IV and V on the “Canadian Triage and Acuity Scale” (CTAS), the lowest level of acuity or severity, increased from 8 to 29 calls, or approximately 360%. During Q3, 8 of the 96 priority 3 or 4 calls, 8% of calls, were triaged by community paramedics as CTAS IV and V. That improved in Q4, where 29 of 55 Priority 3 or 4 calls, approximately 40%, were triaged by community paramedics as CTAS IV or V calls.

A survey was sent to each of the patients in an effort to determine the satisfaction levels of the individuals enrolled in the CHECUPS Program. A total of 78% of patients were “very satisfied” with their overall results. Approximately 82% felt that their overall health improved, and 99% felt that their understanding of their medical conditions allowed them to better manage their conditions. All patients treated by community paramedics stated that they were either “very satisfied” or “satisfied” with the care provide by those community paramedics.

DISCUSSION

Sinha (2013) outlined a seniors’ strategy action plan to promote better care and health outcomes for older Ontarians, noting that developing CP programs could assist in supporting the needs of seniors living in the community, while contributing to broader health system goals. The Government of Ontario recognized the importance of integration of health providers in the attaining Ontario’s Action Plan for Health Care. The CHECUPS Program focused on demonstrating results in the three domains overall patient health and satisfaction, integration of primary care, and improved resource utilization as a means of demonstrating that the CHECUPS Program could

Program Successes

Patients were clear in the articulation of their satisfaction with the CHECUPS program. The patients indicated that they are very satisfied overall, understood their medical conditions allowing them to better manage their conditions, and that they were satisfied with the care provided by the community paramedic. Data collected during the CHECUPS operations revealed a number of successes including the ability to contribute and engage community partners in creation of care-coordination plans as well as actively assessing and treating patients on an ongoing basis. Both coordinated communication and health monitoring was facilitated by the hospital discharge planner, community paramedic, and rapid response nurse established a formal working relationship, thus creating an unique case management system that assured the right care was offered at the right time by the right provider.

The number of bi-directional referrals between the community paramedics, hospital discharge planner, CCAC case manager, rapid response nurse, and other community stakeholders demonstrated CHECUPS navigation capacity. The previous four CP Programs established in Renfrew, Ontario were predominantly unidirectional referral pattern that saw the community paramedic referring to social and health care partners, thus indicating the important role that CHECUPS plays in the broader provision of services.

The grass-root initiatives of the four previous CP programs prior to the CHECUPS program implementation did not prioritize performance measurement or management processes including key performance indicator (KPI) definitions, tracking and analysis. The CHECUPS Program provided a number of process and outcome indicators, which allows the paramedic service to
more clearly demonstrate the value of the service to the community as well as demonstrating to the Government of Ontario that CP programs could potentially contribute to the Action Plan for Health Care. Future CP programs should be encouraged to ensure that a bi-directional referral mechanism is created, patient and stakeholder satisfaction survey tools as well as KPI definitions, tracking, and analysis are established to demonstrate the value of the program.

**Challenges in Program Design**

One of the goals of the CHECUPS program was to demonstrate an electronic communication interface between the County of Renfrew Paramedics and the local Champlain CCAC. This was facilitated by the common use of the CHRIS electronic medical record system for all Community Care Access Centres across the Province of Ontario. However, community paramedics experienced technological challenges with access limitations to CHRIS; documentation had to be completed and then scanned into the patients’ record, increasing the time required to complete the documentation for each patient interaction. However, the goal of having an integrated medical record was accomplished. Future CP Programs may want to explore opportunities of real-time integrated medical records that allow all agencies to both contribute as well as review medical information of the patient being cared for.

**CONCLUSION**

The Province of Ontario health care system continues to face increased financial pressure while also attempting to become more patient and community-based. CP Programs are well positioned to integrate with existing community services to assist with this goal. The County of Renfrew developed and implemented the CHECUPS Program as a
response to these challenges, and the results of reductions in emergency response demands, reductions in local health care demands, and helped to provide a more sustainable, integrated, patient-centred system are promising.

The CHECUPS Program was designed in response to the Government of Ontario’s desire to determine whether a CP delivery model could ensure seniors and other high needs patients can access the right care, at the right time, in the right place. In March 2016, The Government of Ontario Health Minister Dr. Eric Hoskins stated that, to ensure that Ontarians continue to have access to these services, the government will work to develop a long-term plan that provides CP services to as many Ontarians as possible (Government of Ontario, 2014, The Star, 2016). CP Programs are in an excellent position to provide continued support of the Province of Ontario’s Action Plan for Health Care.
REFERENCES


