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

MICHEL R RUEST
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 provide 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).

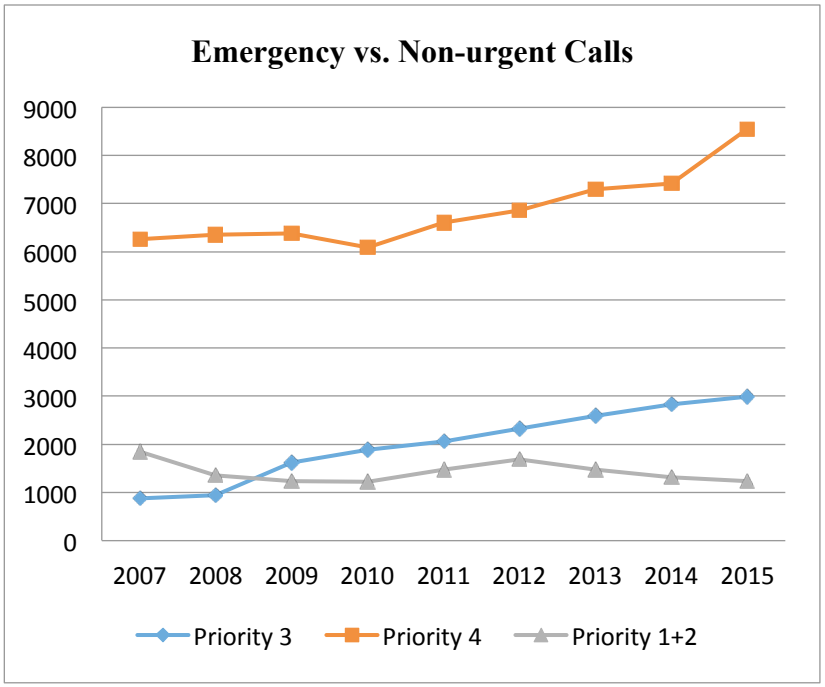
Service Context: Renfrew County, Ontario

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 km^2 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

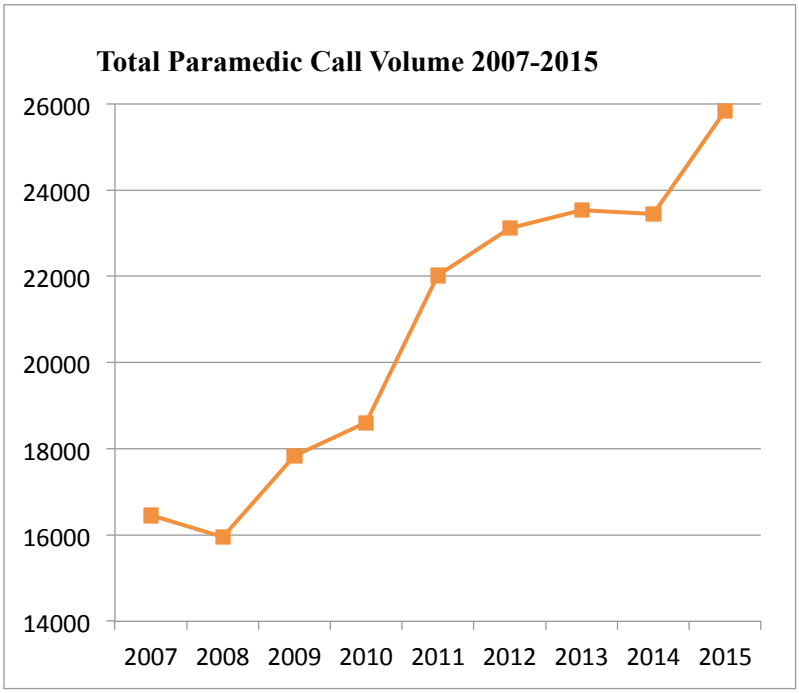


Source: Interdev, 2016

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 contributes to increased service demand and delivery challenges for the CORPS.

Figure 2
Total Paramedic Call Volume 2007-2015



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

Country / Province	Community Paramedic Program Description
United States – Red River CP & Mobile Integrated Health Care Program	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).
North East Ambulance Service NHS Trust, United Kingdom	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).

Table 1, continued	
Queensland and South Australia	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).
Long and Brier Island Project, Nova Scotia	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 (Misener, 2005).
British Columbia	British Columbia has recently approved the creation of a provincial wide CP Program (Evashkevich and Fitzgerald, 2014).
Alberta	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).
Saskatchewan	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).

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

Program Name: Aging at Home	
Patient Focus	Supported by an interdisciplinary team in a small rural community so patients are able to remain safely in their homes.
Partners	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).
Program Description	Allow independent patients to stay at home as long as they are able, maintaining quality of life, while they await Long Term Care placement.
Program Name: Wellness Clinics	
Patient Focus	Provides opportunities for patients in underserviced areas of the county to have vital signs taken on a regular basis.
Partners	Community and social services, and Regionally Diabetic Outreach Team.
Program Description	Opportunity for residents to have their vital signs monitored and recorded at 13 countywide clinics scheduled on a monthly basis.
Program Name: Home Visit Program	
Patient Focus	Wellness checks, referrals as required, health and safety promotional initiatives that teach patients how to accident-proof their homes.
Partners	CCAC, Geriatric Emergency Manager (GEM) RN, Regional Diabetic Outreach Program, Mental Health Outreach Program, Meals on Wheels, Social Worker Professional, and Home Maintenance Services.
Program Description	Front-line paramedics visit isolated patients that could benefit from a Community Paramedic visit.

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

Program Name: Community Paramedic Response Unit	
Patient Focus	Isolated individuals with multiple chronic disease processes.
Partners	PCP, GEM, Community Health Centres (CHC), Regional Diabetic Outreach Team, Home support services.
Program Description	Contributes to patient health care with a focus on chronic disease management, health promotion and illness prevention, and advocacy.

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

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

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
Process and Outcome Indicators

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

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

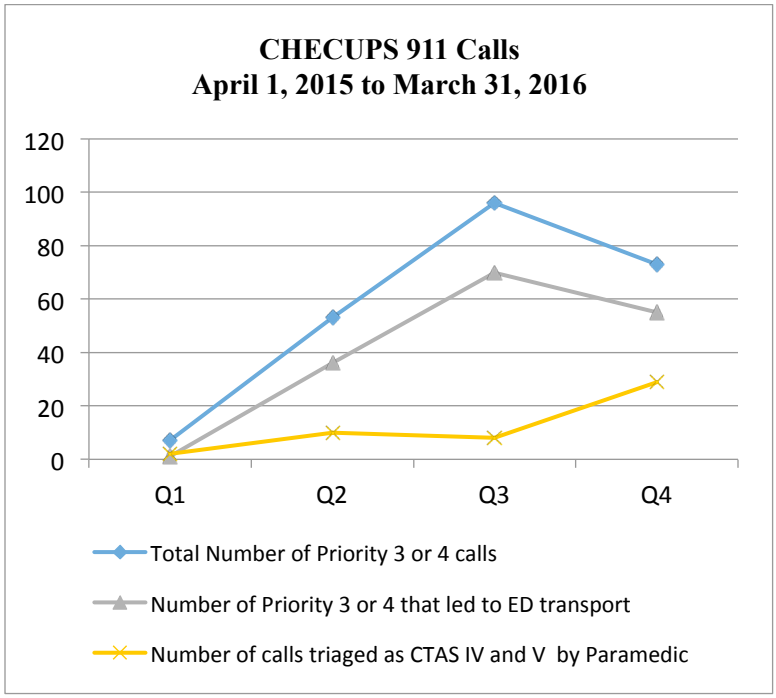
List of Services	Number
Total number of CHECUPS patients:	222
Total number of home visits completed:	1,186
Average number of home visits per patient:	5
Number of Point of Care tests performed (eg. Blood Glucose, INR):	908
Number of delegated acts performed under medical supervision/oversight:	735
Number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

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

contribute to the senior strategy plan and the Government of Ontario's Action Plan for Health Care.

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 on-going 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.

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