PERSPECTIVES OF AN INTERVENTION: BRITISH COLUMBIA EMERGENCY HEALTH SERVICES COMMUNITY PARAMEDICS' PERSPECTIVES OF CHRONIC CONDITION MANAGEMENT IN RURAL AND REMOTE BRITISH COLUMBIA

by

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Abstract

Persistent challenges in delivering healthcare in rural and remote areas have resulted in healthcare inequities including increased rates of chronic conditions. Increased exacerbation, diminished healthspan, and poor quality of life are all markers of this inequity. To improve this, British Columbia Emergency Health Services (BCEHS) introduced their Community Paramedic program to bridge gaps in chronic condition management among rural and remote populations. This research was designed to understand the community paramedic's perspective of chronic condition management, program outcomes, and impact of the COVID-19 pandemic on community paramedic practice. Qualitative interviews were conducted with 15 practicing BCEHS community paramedics. Interpretive description methodology was used to guide thematic analysis with four primary themes emerging: community paramedics provide a unique approach to care delivery and offer a valuable perspective of the patient who they engage with, community paramedics introduce novel attributes of care including face-to-face engagements in patient homes, community paramedicine bridges health service delivery gaps and demonstrates improvements in chronic condition management, the COVID-19 pandemic affirmed the adaptability of community paramedics and the need to continue foundational care approaches. This study provided rich perspectives and insight into community paramedic practice across rural and remote British Columbia and the potential it holds to continue to bridge health service delivery gaps among a long-underserved population.

Keywords: community paramedic, rural, chronic conditions, COVID-19

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Glossary

Chronic Condition (CC) or Chronic Conditions (CCs). For this project, CCs include congestive heart failure, chronic obstructive pulmonary disease and other related respiratory conditions, hypertension, heart disease, and diabetes among others referenced (Woodman et al. 2019a).

Continuity of Care. Describes access to healthcare services, tools and supports necessary to effectively manage CCs, as well as the perceived patient experiences when accessing services, tools and supports.

Patient. Those enrolled in a community paramedic program or who engage in the care provided by community paramedic.

British Columbia Emergency Health Services (BCEHS). BCEHS stands as the lone ambulance service employed throughout the province of British Columbia (BC) offering pre-hospital emergency care, inter-facility transfers, and airvac services. BCEHS (formally BC Ambulance Service) functions under the jurisdiction of the Provincial Health Service Authority (Woodman et al. 2019a).

Rural and Remote Communities. Communities identified as '*A Communities*' or those with more than 20 isolation points assigned by the Rural Coordinating Centre of BC. The majority of the 99 communities selected for community paramedic services meet or exceed this criteria or were identified as eligible for BCEHS community paramedic services based on two objectives: 1. Contribute to the stabilization of paramedic staffing in rural and remote communities; 2. Bridge health service delivery gaps in the community, identified in collaboration with local interprofessional care teams (IPT). (Rural Coordinating Centre of British Columbia, 2020; Woodman et al. 2019a).

BCEHS Community Paramedicine (CP). This program was introduced to rural and remote communities of BC with the intention of offering services to older patients living with CCs and those with an increased risk of falls. This was designed to improve access to primary care services and increase access to basic healthcare services in non-urgent community-based settings (i.e. patients' homes or community centres) (Woodman et al. 2019a).

BCEHS Community Paramedics (CP or CPs). BCEHS CPs are specially trained primary care paramedics (PCP-IV) and advanced care paramedics (ACP) who offer five primary services to patients of rural and remote areas: community outreach and awareness, community and individual health promotion, in-home wellness checks, wellness clinics, and CP Home Health Monitoring (HHM) (Woodman et al. 2019a).

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Dedication

For my late aunt – Sharon Unger-Schulz whose dedication to providing the highest-quality paramedicine care and mentorship to future paramedics who hold her legacy in the care they provide.

For all the BCEHS Community Paramedics whose selflessness and dedication to supporting all patients whom they engage with inspired the completion of this project and my commitment to sharing the admirable work they perform everyday.

Chapter One: Background

1.1 Rural and Remote Healthcare Accessibility

Limited access to continuous, quality and sustainable healthcare services has plagued many rural and remote areas of British Columbia (BC), resulting in poorer health outcomes among people residing in these areas (Larson et al., 2017; Usuba et al., 2019). Though numerous strategies to stabilize primary healthcare in rural and remote areas of BC have been employed, many have fallen short of projected outcomes or have presented as unsustainable long-term solutions to a significant problem (BC Medical Association, 2012; Broemeling et al., 2005; Woermke et al., 2011; Larson et al., 2017). The lack of effective strategies to overcome primary healthcare sustainability issues are reflected in a variety of health metrics including: standardized patient health indicators, migration to larger centres as a result of limited service access, low recruitment and retention of healthcare providers in rural and remote areas, and frequency of diversion of healthcare services to larger communities (Ministry of Health, 2015; Larson et al., 2017). A general lack of healthcare services has resulted in an increased prevalence of chronic conditions (CCs) among rural and remote British Columbians in the last 15 years (Ministry of Health, 2015; Usuba et al., 2019; Woermke et al., 2011; Broemeling et al., 2005). The BC Ministry of Health (2015) recommends changes at three levels of the BC health service delivery model (practice level, organizational level, and provincial level) to improve health services in rural and remote areas. However, metrics since 2005 suggest minimal improvements in available services and supports, with patient health outcomes continuing to deteriorate (Usuba et al., 2019; Woodman et al. 2019a; Larson et al. 2017; Broemeling et al. 2005).

1.2 Chronic Condition Status and Management

Health reporting in BC has demonstrated that CCs are more prevalent among rural and remote residents, as well as accounting for the majority of disease prevalence burden. Among rural and remote British Columbians, diabetes, chronic obstructive pulmonary disease (COPD), heart disease and hypertension (HTN) are the most common diseases experienced, contributing to a higher risk of premature death compared to those with similar CCs in urban areas (Usuba et al. 2019; Ministry of Health, 2015; Larson et al. 2017; Woermke et al. 2011). Both Usuba et al. (2019) and the BC Ministry of Health (2015) suggest these conditions are not only the result of limited health services, but have also contributed to an increased demand for such services in areas outside urban healthcare centres. Rural and remote residents often feel abandoned by the healthcare system, and in some cases incur significant expenses for travel or opt out of services or supports due to other personal or systematic factors (Snadden, 2005; Baker, 2020). Historically, CCs in rural and remote BC have been managed through primary care provider encounters in the form of sporadic appointments with inconsistent primary care providers and group meetings offered intermittently. Telehealth has improved accessibility to services over recent years, however, this delivery method still lacks the consistency and continuity of care necessary to effectively manage CCs (Usuba et al. 2019; Larson et al. 2017). Due to the lack of equitable and sustainable services, the demands of unmet healthcare needs have been placed on other healthcare providers, such as Emergency Medical Services (EMS).

A downstream result of unmet healthcare needs is increased utilization of EMS and Emergency Department (ED) care, which as Haggerty et al. (2007) suggest, is a strain upon the medical system and service providers which can be prevented. Haggerty et al. (2007) suggests that increased utilization of EMS and ED services in rural areas has come as a result of inadequate availability or accessibility to primary care services. They add that increased utilization of ED and EMS services not only contributes to the strain already placed upon limited services but may also result in deterioration of the patients' condition, decreasing patient Quality of Life (QoL) and increasing the need for urgent and specialized health services. Put simply, a cascade of demand for healthcare services, exacerbation of poorer health, and further demand for services has been demonstrated in a cyclical pattern among rural and remote areas. ED wait times and crowding have become significant issues in Canadian hospitals, which, combined with a growing and ageing population, is expected to worsen (Haggerty et al. 2007; Larson et al. 2017; Woermke et al. 2011). Though increased EMS and ED utilization is a reminder of the work that must be done to improve the health service delivery model, continued evaluation of health service utilization (i.e., reason for encounter, assessment findings, treatment, and outcomes) can aid in understanding how service can be pivoted to a more sustainable, proactive model of care (Woermke et al. 2011; Larson et al. 2017).

1.3 Community Paramedicine

Creative programming has been introduced in attempts to overcome barriers to care, improve healthcare services offered, and reorient the healthcare service delivery model from a reactive to a proactive position. In 2015, BCEHS introduced the CP program (Woodman et al. 2019a). Nine prototype communities identified in partnership with regional health authorities across BC were selected to receive CP services based on two objectives.

1. Contribute to the stabilization of paramedic staffing in rural and remote communities.
2. Bridge health service delivery gaps in the community, identified in collaboration with local IPT.

With these guiding principles and successful prototype implementation, a total of 99 rural and remote BC communities are now served by 129 active community paramedics (CPs) filling 143 positions across BC (as of August 2021). CP positions are filled by specially trained PCP-IV paramedics who complete a nine-week training program oriented to developing skills in non-urgent, primary care settings, with a slightly expanded scope of practice. Of the communities served, 26 are in Northern Health, one in Fraser Health, 40 in Interior Health, 25 in Island Health and 7 in the Vancouver Coastal Health Authorities. Services offered by CPs include community outreach and awareness, health promotion, community engagement, wellness clinics, in-home wellness checks, and home health monitoring (Woodman et al. 2019a). Though the BCEHS CP program was primarily intended for patients over the age of 65 living alone with a CC(s), primarily CHF, COPD, and diabetes, the program has grown to include community engagement and training with a variety of individuals, including school-aged children and the general public. As of September 2020, nearly 3500 patients have participated in the program, with 65% living in communities of less than 3,500 residents, and 60% of patients over the age of 75 (Bassett, 2020).

An initial assessment of the BCEHS CP program was conducted between August 2016 and January 2018 by a contracted researcher company. Findings suggested improvements in several specific areas: patient healthcare experience, access to healthcare services, understanding of health and wellness, overall health, improved retention of paramedics in rural and remote posts and contribution to positive work-life balance and well-being (Woodman et al. 2019b). This assessment utilized a Pre/Post CP Orientation Survey (pre-survey N = 41 (36% response rate), post-survey N = 76 (20% response rate), when matched in pairs N = 15), CP Experience Survey (N = 94, response rate of 90%), Patient Experience Survey (N = 264, 197 patients in the program, 67 family members or caregivers on behalf of patients), Case Study Data Report (Hazelton (N = 14), Anahim Lake (N = 13), and Ucluelet (N = 11), with participants consisting of BCEHS CPs, community partners, health partners, patient sharing circle (only in Anahim Lake) and EQ-5D CP patient data gathered from the EQ-5D-5L assessment tool used by CPs (Woodman et al., 2019b). However, limitations of this initial review included small and varied sample sizes across the sources of data collected, limited access to data on specific topics (such as monetary metrics), and limited collection of key perspectives and program components, all of which hindered potential generalizability and enactment of optimization strategies suggested (Woodman et al. 2019a). A foundational perspective missed was that of active CPs who represent the 'boots on the ground' practitioners who understand their patients' chronic and acute conditions on a personal level, and have the ability to follow patients throughout their healthcare journey.

This knowledge gap has been recognized beyond the BCEHS CP program, with Brydges et al. (2016) suggesting that more work must be done to understand CPs' roles and perspectives to guide practice and policy towards bridging the gap in healthcare services. The research of Brydges et al. (2016) demonstrated the potential and strength in integrating CPs into the healthcare service delivery model and emphasized the value of collecting the perspectives of CPs to understand their role within the model. This not only ensures that the voices of CPs are heard and understood with regards to their practice and role, but also to understand the patient experiences from a perspective of CPs who have "on-the-ground" experience (Brydges et al. 2016, p. 3). With evidence of shortcomings of the current health service delivery model through a variety of health metrics, a suggestion of positive CP program outcomes, and literature to support the further investigation on the topic of CP practice and programming, more in-depth research is necessary to advance this field towards the delivery of sustainable and continuous healthcare services.

1.4 Problem Statement and Purpose

CP programs have presented as a beneficial addition to primary care services, extending care provided to patients into their homes. With various anecdotal and numerical measures of success, adding and advancing CP practice stands as a viable option to further stabilize continuity of care for patients and recruitment and retention of paramedics in rural and remote areas. However, current literature lacks a thorough understanding of the perspectives of those directly engaged within the system, CPs, who are delivering care to patients. More specifically, though many CP programs focus their care on CCs among patients who often face some barrier or challenge when accessing healthcare, limited research has been done to support the lived experience of those delivering this form of care to patients. In the specific context of BCEHS, Woodman et al. (2019a) presented data that lacked a broad collection of CP perspectives including their views on perceived patient needs, experiences, and outcomes, restricting the interpretations and recommendations that could be drawn from the data collected. Often, the end goal of healthcare interventions, programs or policies is to reduce the burden of disease for patients, improve the continuity of care and services offered, empower patients, and improve QoL. Though these goals represent broad objectives for patients, implementation of any health-related practice must also consider the providers delivering the care to patients, as this practice must also be meaningful, fulfilling, and sustainable. This means understanding the perspectives of all those involved in this process, which, when reflecting on much of the practice of CPs, has been missing in the literature presented. Though the data presented in the review of literature stands to inform and provide evidence for the continuation of support for and research on CP programs, numerous limitations in the scope and depth of questions, varied and small samples, along with a lack of CP perspectives on their practice, few conclusions and concrete recommendations could be drawn (Woodman et al. 2019a; Steeps et al. 2017; Martin & O'Meara, 2019). This has left a hole in our understanding of what CP practice is like in the 'real-world' and how this promising programming can be supported and advanced.

This project aims to explore the perceptions of 'on-the-ground' practitioners, CPs, who hold an intimate perspective of the current status of rural and remote health. In the midst of the Coronavirus disease 2019 (COVID-19) pandemic, CP practice has seen rapid adaptation to meet the needs of a variety of populations including the transition to virtual care and deployment into new roles (i.e. performing COVID-19 testing). Understanding the perspectives of those embedded within the system can shed light on where improvements and further adaptations can be made. This project aims to add to the rapidly growing body of evidence on the COVID-19 pandemic, bringing voice to the role of CPs and more broadly, paramedic services in the ongoing journey.

1.5 Research Questions

The purpose of this interpretive descriptive interview-based study is to gather the perceptions of practicing BCEHS CPs regarding the status of CC management, impact of the BCEHS CP program on CC management, and impact of COVID-19 on BCEHS CP practice in rural and remote BC. Three research questions will guide this investigation.

1. How do practicing BCEHS CPs perceive the status of CCs in rural and remote BC?
2. How has the BCEHS CP program affected CC management among patients in rural and remote areas of BC from the perspectives of practicing BCEHS CPs?

3. How has the COVID-19 pandemic impacted the practice of BCEHS CPs and what adaptations in care and delivery of services have been made?

Research questions have been informed by previous literature, including Woodman et al. (2019a), Brydges et al. (2016) and Dainty et al. (2018), as well as the lead researcher's (Schulz) experience and knowledge on the subject of investigation.

Chapter Two: Literature Review

2.1.0 Introduction to Literature Review

The following literature review was completed to develop an overview of evidence to describe the role of CPs, CP practice as it fits into healthcare delivery, and outcomes of CP programs in published literature. Particular attention was paid to these attributes in the context of rural and remote CP practice and programs. The purpose of this literature review was to establish a foundation of understanding on the status of CP practice, its potential outcomes, and identify gaps in the literature to support the development of this research.

2.1.1 Literature Search Strategy

This scoping review was conducted using methodological approaches described by Arksey and O'Malley (2005) using a five-stage approach: (A) identifying research questions, (B) identifying relevant studies, (C) selecting studies, (D) charting the data, (E) collecting, summarizing and reporting results. This methodology was used to assist in developing an understanding of existing literature relevant to the topic of this research, identify gaps in current knowledge, and summarize the understanding of CP impact and implementation across a variety of settings. This approach allows researchers to draw out themes on the current landscape of their research topic, while maintaining methodological rigor and allowing for the inclusion of a diversity of literature (Arksey & O'Malley, 2005). With CP representing a newly established form of care delivery and the infancy of research related to CP, this methodology is well suited to provide a comprehensive review of literature available.

Peer-reviewed, published literature was collected through the University of Northern British Columbia, Geoffery R. Weller Library online database access and included searches in: PubMed, Cumulative Index of Nursing and Allied Health Literature (CINAHL) Complete, PsycINFO, Academic Search Complete, MEDLINE, Biomedical Reference Collection: Comprehensive. Databases were selected to cover the breadth of aspects related to CP practice, and its outcomes as preliminary searches demonstrated a limited the quantity of published evidence, particularly regarding qualitative evaluations and perspectives gathered on CP programing, practice and outcomes. This was led by research questions; what is the status of rural and remote health in Canada, what is the role of CP practice, has CP practice bridged healthcare service delivery gaps, and how have CPs adapted to the COVID-19 pandemic. Search terms and keywords were developed to capture key attributes of interest of CP practice relevant to the goals of this literature review. Keywords and search terms included “rural”, “remote”, “community paramedicine”, “community paramedic”, “health service gaps”, “healthcare gaps”, “social determinants of health”, “COVID-19”, “COVID-19 pandemic”, “adaptations”, “EMS utilization”, “emergency department utilization”, and “exacerbation”.

The initial literature review was completed between September 2020 and January 2021, with an update of this literature review conducted June and July 2024. Literature collected was imported into NVIVO 12 and organised into preliminary categories of interest after a scan of titles and abstracts was completed. This also assessed articles for adherence to inclusion/exclusion criteria which is described in table 1.

Table 1

Inclusion/exclusion criteria

Inclusion	Exclusion	Rationale
English	Not available in English	Readability
All publication dates	No publication date exclusion	CP practice research relevant to research questions was not established until the late 2010s. Older research can provide understanding on the foundation of CP practice and early role characteristics
Comparability CP practice as defined in this project. Characteristics of patient population, CP model, context of delivery and delivery methods considered.	Delivery of EMS or emergency response paramedic services.	CP practice is delegated as separate from that of traditional emergency response paramedic services with a unique focus of care beyond acute response.
Providers delivery patient care trained as paramedics and functioning in this role.	Providers delivering patient care who are not licensed or trained paramedics functioning in the 'role' of a CP.	CP practice is delegated as to be performed by paramedics, or paramedics with specialty training.
CP practice during the time of the COVID-19 Pandemic, defined as starting in December 2020 until July 2024	CP practice including responses to pandemics or epidemics outside of COVID-19	Responses to pandemics and epidemics varies across event focus is on COVID-19 specifically for this research

Articles were charted by identifying keywords, or as in the case of using NVIVO 12, codes, which sorted material into key themes and topics (Arksey & O'Malley, 2005). This analysis identified key attributes relevant to research questions and the topic of investigation proposed for this study. Following the coding of topics and themes, summarization of literature review topics allowed for targeted reporting foundational to the research proposed. This allowed for the capture of a breadth of research pertinent to the topics aiming to be investigated. In following Arksey and O'Malley's (2005) approach, researchers are afforded the flexibility to tailor their summary and reporting to be informed by the status of research present and relevant to the topic of investigation, while maintaining methodological rigor and integrity.

The search strategy identified a total of 57 articles applicable to the research question of this literature review and met inclusion criteria. Unpublished grey literature including documents, reports, summary reports, audits, press releases, statistics reports, and podcasts were collected from the Government of BC, Government of Canada, World Health Organization, medical colleges and associations, health authorities, BCEHS, and Canadian Broadcast Corporation. These pieces of literature were considered applicable in the context of relation to research questions for this literature review and inclusion/exclusion criteria described in table 1. A total of 30 grey literature pieces were considered as applicable to this literature review and, in total with peer reviewed, academic literature represented 87 references for this literature review.

2.2.0 Rural and Remote Health Status

Limited access to continuous, quality and sustainable healthcare services has plagued many rural and remote areas of BC, resulting in poorer health outcomes among residents compared to that of urban areas. Though numerous strategies towards stabilizing primary healthcare in rural and remote areas of BC have been introduced, many have fallen short of projected outcomes or have presented as unsustainable long-term solutions to a significant problem (BC Medical Association, 2012; Broemeling et al. 2005; Woermke et al. 2011; Larson et al. 2017). The lack of effective strategies to overcome primary healthcare sustainability issues is reflected in a variety of health metrics, including standardized patient health indicators, migration to larger centres as a result of limited-service access, low recruitment and retention of healthcare providers in rural and remote areas, and frequency of closure and diversion of healthcare services to larger communities (Ministry of Health, 2015; Larson et al. 2017). Since the early 2000s, barriers to care have led to an increased prevalence of CCs, with evidence to suggest deficiencies in self-management and system levels of care among rural and remote populations (Ministry of Health, 2015; Usuba et al. 2019; Woermke et al. 2011; Broemeling et al. 2005). The BC Ministry of Health (2015) recommends that changes at three levels of the BC health service delivery model (practice level, organizational level, and provincial level) could positively impact healthcare services in these areas. However, standardized health metrics since 2005 do not suggest significant changes at these levels, and in fact, demonstrate a further deterioration in both services available and patient health outcomes (Usuba et al. 2019; Woodman et al. 2019a; Larson et al. 2017; Broemeling et al. 2005).

Though CCs account for the majority of the disease burden among Canadian populations, the present with greater prevalence among rural and remote residents (Ministry of Health, 2015; Usuba et al. 2019; Woermke et al. 2011; Broemeling et al. 2005). Populations residing in rural and remote regions have higher rates of diabetes, COPD, circulatory diseases (CHF, HTN), and mental health conditions, as well as lower self-perceived health compared to those residing in urban centres (Ministry of Health, 2015; Usuba et al. 2019; Rasali et al., 2016). Patients who live with multiple or poorly managed CCs can experience a negative impact on their QoL and day-to-day living as described by Woermke et al. (2011) and Walker (2007), with average life expectancies 5-10 years shorter among patients in rural communities as compared to their urban counterparts (Usuba et al. 2019; Ministry of Health, 2015; Larson et al. 2017; Woermke et al. 2011; Rasali et al. 2016). For those who grew up in rural areas, lower education attainment, higher risk of obesity, lower physical activity participation, and lower fruit and vegetable intake all contribute to a higher susceptibility of developing CCs, among other health concerns throughout the life course (Rasali et al. 2016). Both Usuba et al. (2019) and the BC Ministry of

Health (2015) suggest these conditions are not only the result of limited health services but have also contributed to an increased demand for such services in areas outside urban centres. However, due to the lack of equitable and sustainable services, the demand for healthcare has been placed onto other healthcare providers, such as EMS who have had to fill in the gaps left by the primary care system.

A downstream result of unmet healthcare needs is the increased utilization of EMS and ED, which places an increased strain on the medical system and providers (Haggerty et al. 2007). ED wait times and crowding have become significant issues in Canadian hospitals, which, in combination with a growing and ageing population, is expected to worsen (Haggerty et al. 2007; Larson et al. 2017; Woermke et al. 2011). Re-evaluation of healthcare service utilization among patients, particularly that of EMS and ED, is necessary to decrease reliance on EMS and ED services as a way towards a more sustainable long-term solution to healthcare demands (Woermke et al. 2011; Larson et al. 2017). Increased utilization of EMS and ED services in rural areas poses a particular threat to the stability and sustainability of healthcare services in these areas given their often limited staffing pools (Woermke et al. 2011; Haggerty et al. 2007; Broemeling et al. 2005). Suggestions by Haggerty et al. (2007) recognize that demand and strain on healthcare services have come about in a cyclical pattern of increased demand for primary care services that are often inadequate to meet the demand, followed by a 'burnout' or overcapacity resulting in the breakdown of services, further diminishing limited resources. To add, Haggerty et al. (2007) suggest that this not only places strain on services, but could result in patients receiving sub-standard services, potentially resulting in further deterioration of the patient's condition, decreasing patient QoL, and increasing the need for urgent and specialized health services. Put simply, a cascade of demand for healthcare services, exacerbation, poorer health, and further demand for services has been demonstrated in a cyclical pattern among rural and remote patients.

2.2.1 Social Determinants of Health

As described by Mikkonen and Raphael (2010), the social determinants of health have been widely used in Canadian contexts as they were developed to include attributes specific to the Canadian population. In the context of rural and remote health, one is able to look to the numerous markers as ways of accounting for health status, including social safety net, income and income distribution, education, employment, food security, and gender (Mikkonen & Raphael, 2010). Health services, including availability, quality, and timeliness, also stand as determinants of a population's health, further supporting the need for sustainable, quality, and timely services. Many reports, including that of the BC Ministry of Health (2015), Larson et al. (2017) and Woermke et al. (2011) use social determinants of health to describe the health status of British Columbians and commonly observe poorer social determinant of health indicators in rural and remote areas as compared to urban centres. This is often related to the availability of services, lifestyle and personal health attributes (such as employment status, income, education, physical activity, and food security), timeliness of treatments and services available. Combined, these factors often account for a significant burden of disease (BC Ministry of Health, 2015; Rasali et al., 2016).

The social determinants of health have been used as a training tool for both healthcare practitioners and researchers, all of whom benefit from understanding the complex and multifaceted attributes that affect the health of individuals whom they may interact with, provide care to, and collaborate with. With BCEHS CPs focusing on CC management, health education, and care for vulnerable populations, the social determinants of health provide the foundation for understanding the population CPs engage with. BCEHS (2018) presents the social determinants of health in their Community Paramedic Orientation Workbook, using the World Health Organisation (2020) social determinants of health as a framework to understanding the factors that impact a patient's health and well-being. Though slightly different from those presented by Mikkonen and Raphael (2010), attributes used by BCEHS (2018) are applicable to rural and remote BC, including social exclusion, employment status and conditions, public health programming, health systems, and capacity. Throughout the BCEHS CP training, attributes surrounding social determinants of health are used to identify ways in which CPs are best able to meet the needs of their patients 'where they were at.' This means that BCEHS CPs are exposed to the concepts of the social determinants of health and apply them to 'real-world' practice through their assessments and treatment plan development to ensure care planning is suited to the patients' needs and capacity (BCEHS, 2018). Beyond BCEHS, the social determinants of health have been used across CP training, as demonstrated by Dainty et al. (2018).

Dainty et al. (2018) present an argument that through a biopsychosocial approach to care, a CP program in both urban and rural settings in Ontario held potential to improve QoL for individuals living with CCs. This approach included collecting and analyzing patients' subjective experience of care, CC management, and engagement with health services. Dainty et al. (2018) describe that focusing on these three factors through a biopsychosocial approach is an "essential contributor to more appropriate and holistic care, and ultimately better health outcomes" (Dainty et al. 2018, p. 3466). They describe that CPs, as opposed to primary care providers based in a healthcare centre, are better able to understand care from the viewpoint of patients in their home life, understanding how a patient can be best supported to manage their conditions effectively, and introduce supports suited to their specific needs (Dainty et al. 2018). This is further supported by Agarwal et al. (2019a), who described complex, social factors including loneliness, food insecurity, socioeconomic insecurity, and difficulties performing activities of daily living (e.g. self-care, mobility) all of which contributed to poorer Quality Adjusted Life Years (QALYs). In the BCEHS (2018) CP Orientation Workbook, specific attributes paramedics bring to understanding patient care beyond that of medical indicators and diagnostic tests are described, and take into account physical barriers and limitations, home life environment, both physical and virtual accessibility to care, and home-based supports and motivations to promote healthy living. Though these are only a few of the unique attributes CPs can bring to the care team and care planning for patients, they provide a glimpse into CP's perspective, and more broadly, paramedics. This ‘spatial awareness,’ as described by Watson et al. (2012) not only offers an opportunity for paramedics to describe the ‘lived experience’ of the patient, or ‘real-world’ understanding of the event they are responding to, but give a global sense of what factors one may consider when handing off to a higher level of care, or collaborating to develop a tailored care plan.

To extend upon this, Bigham et al. (2013) and Brydges et al. (2016) describe that many CP programs are based around the principles of paramedic practice and are uniquely informed by a perspective of the patient’s condition and context beyond that of a *traditional* biomedical approach. This, as Brydges et al. (2016) describe, stems from three components of a *paramedic role*: relationships shared between patients and paramedics, understanding of role within the context of other healthcare providers, the role of advocacy in optimizing patient care provided, and the concept that paramedics hold an ‘emergency expert’ identity related to practice in context. The understanding of context-informed practice is illustrated by Dainty et al. (2018), who took a biopsychosocial approach to care, accounting for patients’ subjective experiences and perspectives to tailor care that is the most appropriate and holistic for their healthcare needs. Dainty et al. (2018) viewed CP approaches from a partnership perspective, between both patients and paramedics, as well as paramedics and primary care physicians who coordinated care services through a collaborative approach (Dainty et al. 2018). Collaborative approaches to care provide the opportunity for paramedics, and in this case CPs, to share their perspectives at a patient level of understanding, as well as with higher-level providers who have a greater capacity to develop and implement care plans involving components beyond the scope of a CP (Pearson & Shaler, 2017; Lau et al. 2018; Fernandez, 2017). CPs provide a link between the patient's day to day living, and their care team, allowing care planning to be informed by a more holistic or realistic perspective of what the patient needs and what is achievable given their specific circumstances.

2.3.0 Community Paramedicine

2.3.1 Community Paramedic History

CP has a long history of an integrated approach to offering primary and acute care services in communities by utilizing specially trained paramedics (Lezzoni et al., 2016). Though CP practice and approaches have existed alongside traditional primary and acute care services for approximately 30 years, 2005 saw the first international integrated CP strategy. The International Roundtable on Community Paramedicine was established through a joint effort between EMS providers in Halifax, Nova Scotia and Lincoln, Nebraska to organize and coordinate CP programs, research, scope and understandings to optimize care services provided. This sparked an introduction of CP services in countries including Australia, Canada, England, Germany, Switzerland, United Arab Emirates, and the United States, all of which took a foundational concept which was then moulded to community and context-specific needs

(Wingrove et al., 2015). Though many of these initial programs were developed to best serve rural and remote areas within these countries, they soon became available to many marginalized and underserved populations within urban centres to reduce overall EMS and ED utilization (Martin & O'Meara, 2019; Martin et al., 2016; Lezzoni et al. 2016). At the core of many CP programs, better integration of EMS service providers and primary care services was a key goal and way to ensure a 'streamlining' of services between a variety of service providers (Wingrove et al. 2015; Guy, 2014). With success found through decreases in EMS and ED service utilization and improved continuity of care for patients, programs were expanded to include a broader range of services, including palliative care, prescription renewal privileges, additional diagnostic and lab-based testing performed in the patients' homes, and 'lone responder' emergency response ambulance vehicles staffed by an ACP or critical care CPs (Martin & O'Meara, 2019; Martin et al. 2016; Lezzoni et al. 2016). This provides an opportunity for paramedic services to improve the continuity of care for patients in and out of hospital settings and provide high quality field emergency care services.

2.3.2 Community Paramedic Role and Scope

As described by Martin and O'Meara (2019), Leyenaar et al. (2019), and Verma et al. (2018), paramedics represent a uniquely positioned point of contact for patients and providers and embodies a patient-centred care approach (Allan et al., 2017). This approach considers the patient's day to day living experience, through the delivery of in-home and community care, allowing paramedics to assess and identify unmet needs and care services patients could benefit from. A consideration that has been raised about the introduction of CP services is around challenging the professional identity of paramedics, and the core mission of *EMS* or *ambulance* services. Foundational principles including partner informed practice, preparation for transition to intensive care, and consideration of context and situation-specific factors have been impacted by this *emergent CP role* (O'Meara & Duthie, 2018; O'Meara et al., 2012). However, as demonstrated by O'Meara et al. (2012, 2018), if CP services are grounded in *paramedic* principles and emphasis is placed upon establishing interprofessional understanding and collaboration, advanced education, and integration among rural health providers, CP programs are more likely to be accepted and adopted by those providing the services in their community.

A point of contention that has emerged with the introduction of CP services is the standardization between CP programs as well as the role of a CP (O'Meara & Duthie, 2018). Particular attention in this area can be paid to standardized scope and training, which has proven to be difficult with 'fragmentation' represented by unique attributes and varied expectations between each EMS service provider offering CP services (Sawyer & Corburn, 2017; Shah et al. 2018; Wingrove et al. 2015). However, even with this lack of standardization, success with CP has been demonstrated across programs and contexts (Steeps et al., 2017). CPs position has yet to be clarified within the broader healthcare system as well, with examples such as Goldman (2020) describing CP services in rural Ontario as if they were a novel addition to the healthcare services. However, CP services have functioned in Ontario for nearly 15 years and have merely been pivoted to meet the needs of rural and remote during the COVID-19 pandemic**.** Having the ability to move beyond the core role of *paramedicine* while following clear and established objectives may be a strength of CP practice, allowing for greater flexibility in meeting the ever-changing needs of patients and the broader healthcare system (Nolan et al., 2018). Nolan et al. (2018) suggests that though much of the current research on CP practice has been focused on reduction in ED and EMS utilization, healthcare costs and improved health outcomes, developing evidence to support the importance of role clarity and recognition within the healthcare system is necessary to further CP practice.

When thinking about the continuation of programming, it is essential to consider the core objective and foundation of CP practice and how programming has grown to its current state. O'Meara et al. (2018) and Nolan et al. (2018) mention that as paramedic practise has evolved, so has the need for defining the scope of practice, policy, design of education, regulation and reimbursement. For most CP programs the CPs often stand as the "eyes and ears of family doctors," with the ability to perform a variety of assessments and diagnostic tests including collecting vital signs, drawing blood, collecting urine and stool samples, performing electrocardiograms (ECGs) and ultrasounds, providing Foley catheterization, administering IV drug infusions among other medications, performing a variety of fall, safety, and health risk screenings (i.e. CANRISK diabetes scores), accessing patients' electronic medical records, providing basic education on CC management, and basic wound care (i.e. dressing changes, stitch and staple removal) (Goldman, 2020, 14:08; Woodman et al. 2019a; Dainty et al. 2018; Montera, 2015; Choi et al., 2016; Pang et al. 2019; Abrashkin et al., 2016, 2019; Agarwal et al. 2017, 2018a, 2023; Bennett et al., 2017; Crockett et al., 2017; Kant et al. 2018; Shah et al. 2018; Verma et al. 2018; Leyenaar et al. 2019). The majority of CP programs utilize a referral system initiated by a primary care provider, with others such as Agarwal et al. (2017, 2018a) presenting CP-driven programs designed around CPs' initiation of care and delivery on a community level. Verma et al. (2018) describe a program based on CP referral to health and community care services, with CPs initiating services best suited to meeting the patients' specific needs. A summary of the range of CP programming is included in table 2**.** Though CP services and their delivery varies among programs, they often aim to achieve the similar objectives of improving continuity of care, reducing EMS and ED utilization, and improving the stability of staffing in rural and remote areas.

It has been well established that many rural and remote areas of BC face challenges when it comes to the recruitment and retention of healthcare providers, and paramedics are not excluded from this (Snadden, 2005; Manahan et al., 2009; Ministry of Health, 2015; Evashkevich & Fitzgerald, 2014). In their framework, Evashkevich & Fitzgerald (2014) describe the importance of developing programming that delivers high-quality care to patients, while also providing a stable and desirable employment opportunity for CPs. From initial development, BCEHS identified, "… stabilization of paramedic staffing in rural and remote communities" as one of two primary objectives the program sought to achieve (Woodman et al. 2019a, p. i). CP programs have been widely used to improve and/or stabilize paramedic staffing in rural and remote areas of Ontario, Nova Scotia, and Australia (O'Meara & Duthie, 2018, O'Meara et al. 2018, and Montera, 2015). Agarwal et al. (2017, 2018a, 2019b) mention that their program utilized paramedics who were on a modified work assignment due to injury, pregnancy, and other situations that may have limited their ability to work in an emergency response capacity. Utilizing paramedics on modified work assignments allowed them to more easily take part in training and focus on specific areas of care, which may aid in further expanding the care they are able to provide in emergencies, if they return to an EMS response position (Agarwal et al. 2017, 2018a, 2019b). O'Meara et al. (2016) used a traditional emergency paramedic model of care to provide a foundation to develop their RESPIGHT model of care, which added supplemental CP services in both urban and rural settings of Ontario.

CP services are designed to meet the context-specific needs relative to the community or context in which the program is being offered. Similar to the services offered by CPs, the diversity of ‘contexts’ in which CPs work is one that bridges both urban and rural settings, large scale province-wide to single community programs, and programs that focus on specific patients or deliver care at the community level. Through offering paramedic services, paramedics often become well acquainted with the community they serve, with community engagement naturally ‘part of the job’ (Woodman et al. 2019a; Evashkevich & Fitzgerald, 2014). Many CP programs emphasize engagement with the community, whether it is through home visitations, community-level practice, or general interaction in the community. This engagement offers CPs the unique perspective into both a comprehensive understanding of patients’ lives and home environment and ways in which healthcare services can be optimized to serve context-specific needs. As described by O’Meara et al. (2016), it is paramount that every delivery model offers a coherent yet unique model designed around the needs, policy and capacity of the program and context in which it is being delivered. In some situations, IPT have been introduced, which involved a pharmacist, social worker and community paramedic to target patients with CHF at high risk of hospital readmission (Crockett et al. 2017). BCEHS has also designed their program around a similar IPT concept, where CPs engage with a local IPT to discuss care patients are receiving, encounters with the healthcare system, services and supports that could be introduced, and any referrals primary care providers may have to the program (Woodman et al. 2019a). In these situations, as suggested by Steeps et al. (2017) and Brydges et al. (2016), it is imperative the CPs have a voice in this decision-making process, as this is an effective way of ensuring sustainability and continuity through understanding the perspective of the ‘boots on the ground’ providers engaging with patients outside traditional primary care settings.

2.3.3 Rural and Remote Community Paramedic Practice

For clarity throughout this project rural and remote communities have been defined as the 99 communities selected based on the BCEHS CP program objectives (1. Contribute to the stabilization of paramedic staffing in rural and remote communities; 2. Bridge health service delivery gaps in the community, identified in collaboration with local IPTs). Though BCEHS does not explicitly describe a detailed selection process for the communities receiving CP services, a list of these communities is provided publicly with contacts for each CP in the community. Most of the communities identified to receive CP services fall within the Rural Coordinating Centre of BC's (RCCBC) Rural Subsidiary Agreement (RSA) communities *A Communities*, or those identified as being the most rural across BC in accordance with their standardized scoring system. The RCCBC scoring system assigns *rurality* points based on the following factors: number of designated specialists within 70 km, number of general practitioners within 36km, community size, distance from major medical community, degrees of latitude, specialist centre within 35km, and location arc from Vancouver, BC (BCEHS, 2021). These factors allow for a ranking of communities on a four level scale: *A communities* or most rural communities with 20 or more points to *D communities* or the least rural communities with 0.5-5.9 points (Rural Coordinating Centre of British Columbia, 2020). For the purpose of this project, rural and remote communities will refer to those identified as *A communities* as defined by the RCCBC index of rurality.

As previously described, CP programs have been widely introduced to fill a variety of gaps in healthcare delivery models ranging from limited rural health services, hospital-to-home transitioning, and wellness check-ins for vulnerable populations. Though many of these services are not exclusive to rural and remote areas, their application in such regions often stands as a viable solution to improving access to healthcare services and QoL for residents. Lezzoni et al. (2016) describe the implementation of a CP model in rural and remote areas of Australia with the introduction of specially trained, advanced care paramedics who are able to offer basic primary care services. These services included blood and urine collection, analysis, and result interpretation, ultrasound administration and interpretation, ECG collection and interpretation, medication prescription renewals in collaboration with a physician or other allied health provider, and wound and catheter care. Similar to Lezzoni et al. (2016), Tomek (2012) describes a CP model in the USA where rural and remote CPs are able to provide basic health screenings, immunizations, and in-home visits and assessments for an *ageing population* not capable of engaging with healthcare providers in settings outside the patients community, or in some cases, outside of their home. Wilcox (2016) describes the utilization of CP in another rural USA setting and stresses that though many of the healthcare challenges experienced by rural areas are not unique, finding local solutions tailored to community-specific needs is critical to ensuring the stability and sustainability of CP programs. They mention that the unique nature of CP practice is its ability to expand to the scope dictated by the community members and patients they serve, often resulting in training for paramedics not only related to CP care, but also their *regular practice* as an emergency paramedic. Expanding upon this, O’Meara and Duthie (2018) describe the introduction of paramedic practitioner roles, where CPs are able to provide advanced care to patients who experience limited access to care, while still holding an emergency response role within the area they serve. For rural and remote areas often facing recruitment and retention challenges, this broader scope practitioner role may stand as a more desirable employment opportunity while also improving access to healthcare services in these areas (Woermke et al. 2011; Bilbey & Lalani, 2011; Broemeling et al. 2005). Though recruitment and retention are described in many CP program objectives, they may come as an unintended positive outcome such as that presented by O’Meara et al. (2016).

Collaborative practice with IPT members has the potential to bolster continuity of care and teamwork among those engaged in patient care (Wilcox, 2016; Rasku et al., 2019). In the case of rural Australia, the role of CPs has expanded to fill primary care provider gaps, to integrate with interdisciplinary healthcare teams, complimenting others’ skillsets to better address patient needs and ultimately improve patient QoL (Martin et al. 2016). Martin et al. (2016) mention community engagement, multi-agency collaboration, patient-centred prevention, and program outcomes (cost-effectiveness and patient experience) as core pillars of any CP practice. Though not exclusive to rural and remote CP, these attributes provide a strong representation of the foundation of many rural and remote CP programs, where the opportunity to meet community-specific needs is often more easily achievable due to the narrower breadth of needs among the population (Rasku et al. 2019).

As there are often limitations in access and capacity of healthcare services in rural areas, creative solutions involving collaboration among multiple groups and input from patients receiving the care is necessary to ensure the most applicable and meaningful services are offered. Rasku et al. (2019) suggest that though these principles and attributes can lead to positive outcomes for all those involved, the implementation of such programming has not come without its challenges. Challenges include coordinated collaborative practice and ensuring all stakeholders have a clear understanding of their role and position within the model of care. Through a patient-centred care approach, Choi et al. (2016) implemented interdisciplinary teams and CP services in rural Nova Scotia, focused on CC management, which integrated effective communication and cultural sensitivity relevant to the population of interest. Not only did this program demonstrate decreased CHF related patient hospital readmissions, an overall reduction in ED visits, and decreased EMS utilization among frequent users, they were able to bolster EMS providers (CPs) visibility in the community and tap into an underutilized resource of EMS providers. Ruest et al. (2017) demonstrated similar results to that of Choi et al. (2016) in regard to decreased ED utilization, decreased 911 activation and decreased admission rates, with patients self-reporting that they were *satisfied* or *very satisfied* with the care provided by CPs in rural Ontario.

2.3.4 Urban Community Paramedic Practice

Though many CP programs have been designed to serve rural and remote areas, other CP programs have been introduced to target older or marginalized populations facing a variety of chronic health and social conditions in urban areas. Leyenaar et al. (2021) present a large cumulative analysis on urban care delivery including CP care services among patients enrolled in the Common Assessment for Repeated Paramedic Encounters (CARPE) study and identified the majority of CP users as those living alone (47.8% of patients analysed), living with multiple CCs (87% of patients analysed), and a large proportion with mental health related conditions (43.4% of patients analysed). This represented a similar demographic to that of rural setting and across numerous CP programs described in this literature review. Included in this are the CP programs serving older populations in subsidized living complexes found in Ontario and are described by Agarwal et al. (2017, 2018a, 2019b). Agarwal et al. (2017) focused on the reduction of average blood pressure ratings, reducing diabetes risk (using the CANRISK assessment), and reducing EMS call volume among those who accessed CP services. Through the implementation of weekly one-on-one drop-in sessions, the Community Health Assessment Program through EMS (CHAP-EMS) focused on assessing seniors’ cardiovascular health, diabetes indicators and fall risk, as well as providing health education, and referring participants to local resources within the Hamilton, ON area where the program was based (Agarwal et al. 2017). This program utilized paramedics on modified work assignments (e.g. injured, pregnant), allowing them to stay active in their practice and develop a broader range of skills (Agarwal et al. 2017). After one year of implementation, 15% of participants dropped one or more CANRISK categories, and EMS call volume among building residents dropped 25% compared to that of the previous two years before the intervention (Agarwal et al. 2017).

With success found in the CHAP-EMS program, Agarwal et al. (2018a) developed CP@Clinic, a one-year paramedic-led, community-based health promotion program targeted at preventing cardiovascular disease, diabetes, and falls among residents of a subsidized apartment building. A validated Health Awareness and Behaviour Tool, QALYs, and patient health and well-being assessments were used by Agarwal et al. (2018a) to assess changes in patient understandings of health and health-related QoL (HRQoL) (Agarwal et al., 2018a, 2018b). From the results gathered, a significant improvement in the ability to engage in usual activities was demonstrated along with improved HRQoL, including improved self-care and experiences of anxiety and depression when comparing those who did not attend the CP@Clinic programming (Agarwal et al. 2018a). Improvement to QALYs were amplified among those who showed improvements in CANRISK scores and HTN levels, suggesting that health and perceived wellbeing are inextricably linked (Agarwal et al. 2018a). From their intervention, Agarwal et al. (2018a) demonstrated an overall reduction of EMS utilization by 22% when comparing the intervention buildings to control buildings, with nearly 21% of the intervention sample living with undiagnosed diabetes, with another 20% of the population at a moderate to high risk of developing diabetes within ten years, and 38.7% of those who had HTN at the first visit returning to a normal blood pressure by their second visit (Agarwal et al. 2018a). An interesting finding drawn from Agarwal et al. (2018a) suggests that individuals who did not participate in the intervention or were included in the control group showed poorer health outcomes, including sustained higher ambulance call rates at nearly one extra 911 call per apartment unit/month, and generally poor health outcomes including persistent decreases in the ability to perform usual activities and self-care.

With results to support further implementation and investigation, Agarwal et al. (2019b) introduced the CP@Home program by way of a randomized control trial with parallel intervention and controls groups utilizing four southern Ontario paramedic services. Agarwal et al. (2019b) developed the CP@Home program to deliver health promoting care including health risk assessments, including CANRISK diabetes scores, fall risk assessments, healthy behaviour education, referrals to local resources, and communication with the patient's family physician to create and implement care plans best suited to the patient’s needs. This program was designed to target high frequency EMS users in their homes, with the measure of frequency of EMS encounters used to measure program success. Since the CP@Home proposal in 2019, Plishka et al. (2023) described significant challenges in recruiting frequent EMS users to the CP@Home program which has resulted in delays in the completion of the randomized control trial. Verma et al. (2018) provide further evidence to support the introduction of CP programming into an urban setting with their large retrospective cohort study in Toronto, ON, involving over 1800 participants with a mean age of 79 years who were considered eligible for referral into community care and home care services. The introduction of this program resulted in an overall 911 call reduction of 10%, with a 7% reduction in ambulance transports, demonstrating the long-term potential of referral programming. These programs illustrated the potential CP programming has to improve patient QoL while reducing the burden of unnecessary EMS and hospital encounters, ultimately reducing healthcare spending. These programs utilized paramedics who were on modified work assignments due to injury, pregnancy, and other situations that may have limited their ability to work in an emergency response role, yet hold the knowledge and capacity to perform CP related tasks.

Table 2 summarizes eleven CP programs, including their context and demographic of focus, CCs of focus, and quantitative and qualitative outcomes (depending on outcomes measured in each study). This summarizes programs in both rural and urban contexts and provides a reference point on which comparisons between program design and outcomes can be drawn.

Table 2

Summary of CP Programs

Author	CP Program Context & Age	Chronic Condition(s)
Abrashkin et al. (2016) *Providing Acute Care at Home: Community Paramedics Enhance an Advanced Illness Management Program—Preliminary Data*	Home-based emergency response/in-home treatment, Suburban-urban setting, Median age of 83	dementia, decubitus ulcers, diabetes, CHF, COPD
	Outcomes (quantitative): 78% of patients who received CP services were assessed, treated and remained at home, 82.2% who were transported to a hospital after a CP assessment were admitted as compared to 68.9% admitted after a traditional EMS assessment and transport, 1.7% of patients seen by a CP visited an ED within 24 hr from the CP encounter. Outcomes (qualitative): From the patient/caregiver satisfaction survey, 100% agreed or strongly agreed CPs delivered high-quality services and care, 97% would use CP services again, 91.4% would have sought EMS and ED care if a CP did not come.	
Abrashkin et al. (2019b) *Community paramedics treat high acuity conditions in the home: a*	Home-based emergency response/in-home treatment, Suburban-urban setting, Mean age of 86	dementia, CHF, diabetes, asthma, COPD, ulcers, cancer
	Outcomes (quantitative): 17.9% of CP patients were transported to the hospital, 6.9% were transported to a hospital within 48 hours post	

prospective observational study	CP encounter, 40.1% of calls responded to by CP were considered high acuity, 25.5% of calls were considered moderate acuity. Outcomes (qualitative): From the patient/caregiver satisfaction survey, 98% agreed/strongly agreed CP visit decreased burden/stress of the caregiver, 98% agreed/strongly agreed patient goals were accounted for in treatment planning, 95% agreed/strongly agreed CP services helped the patient stay safe at home, 98% agreed/strongly agreed they were satisfied, 100% agreed/strongly agreed they would use CP services again, 99% agreed/strongly agreed CP delivered high-quality care and services, 98% trusted the CP's medical evaluation.	
Agarwal et al. (2017) *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)*	Community health assessment and health education, Urban setting, Mean age of 72.2	HTN, cardiovascular disease, diabetes, falls
	Outcomes: 911 calls to the building where the intervention was implemented after one year were reduced by 25% (114 to 84), 40.7% of patients not diagnosed with HTN had elevated blood pressure, 41% of patients with HTN upon the start of the intervention had reduced their blood pressure to the normal range by the fifth visit with an additional 36% by the tenth visit, 15% of patients dropped from a high-risk to moderate risk or moderate risk to low-risk CANRISK diabetes risk score. Accounting for the cost of local EMS personnel and ambulance calls, a reduction of 20 EMS calls resulted in an average $32,520 reduction in healthcare costs. Most CPs were on a modified work assignment, online training was developed and CP training was delivered to paramedics free of charge.	
Agarwal et al. (2018a) *Evaluation of a community paramedicine health promotion and lifestyle risk assessment program for older adults who live in social housing: a cluster randomized trial*	Community-based health promotion program, Urban setting, Mean age of 72.3	HTN, cardiovascular disease, diabetes, falls
	Outcomes: Significant reduction in ambulance calls per apartment units per month between the intervention and control buildings, an additional 14 building residents were diagnosed with diabetes, 32.4% of participants who had no previous diagnosis of HTN demonstrated high blood pressure, 38.7% of participants with HTN reduced their blood pressure to a normal level across the intervention, statistically significant improvements were observed across quality of life measures, 10.1% reduction in CANRISK diabetes scores comparing the intervention to control participants.	
Bennett et al. (2017) *Community Paramedicine Applied in a Rural Community*	Home-based primary care, Rural setting, Mean age of 57.6 years	HTN, diabetes, COPD, CHF, asthma
	Outcomes: EMS calls decreased 48.5% among CP patients with calls made about their primary condition less often, a 100% reduction in	

	EMS transports for routine health issues, 22.1% reduction in return to service times increasing accessibility of EMS services. CP patients reduced ED visits by 58.7%, in-patient hospital admission by 68.8%, and length of in-patient stay by 15.7%, with the comparison group demonstrating a 4.0% increase in ED visits, 187.5% increase in in-patient admissions, and 162.5% increase in length of stay across the course of the study. 60% of participants receiving CP care were referred to a community resource, 41.2% reduction in hospital re-admission among CP patients (skewed by 1 participant, when not included this increased to an 83.1% reduction) compared to 35.9% increase among the comparison group. 85% of CP patients experienced a decreased fasting blood glucose, 70% of CP patients demonstrated a reduction in blood pressure values. An estimated financial return on investment of 20% compared to previous financial costs.	
Crockett et al. (2017) *Pharmacist Involvement in a Community Paramedicine Team*	Home-based primary care, Rural setting, Mean age of 59.5	CHF
	Outcomes (qualitative): Improved pharmacist understanding and integration into the care team, with a reduction in CHF related hospital admissions, improved understanding of medications and care planning among patients and caregivers, and improved dietary control and understanding to limit sodium intake and improve dietary choices among patients.	
Dainty et al. (2018) *Home Visit-Based Community Paramedicine and Its Potential Role in Improving Patient-Centered Primary Care: A Grounded Theory Study and Framework*	Home-based primary care, Rural/urban setting, Mean age of 72	COPD, CHF, diabetes
	Outcomes (qualitative): Improved recognition of patient vulnerabilities, providing a safety net in times of exacerbation and routine care, and improved health and accountability, subjectively improving the health status of patients who participated in the project. Anecdotal reduction in EMS and ED encounters was reported, which patients and caregivers described as reducing patient stress and likelihood of illness exacerbation. An attribute often overlooked is the bond built between the CP and patient, which patients and caregivers described as an essential aspect of the healthcare team's services, particularly during crises and vulnerable moments.	
Kant et al. (2018) *Outcomes and provider perspectives on geriatric care by a nurse practitioner-led community paramedicine program*	Home-based primary care, Urban setting, Mean age of 87.8	respiratory conditions, urinary tract infection, gastrointestinal conditions
	Outcomes (quantitative): 15% of patients had ED visits, 13% were hospitalized within two weeks of using CP services compared to a previous 100% of patients who would have sought ED services if CP was not available. Outcomes (Qualitative): The team members described improved access and scheduling to care, decreased ED visits and hospitalization	

	as patients described a desire to avoid these encounters as they were often associated with adverse events (hospital-acquired infection, delirium, etc.), and delivering care specific to patients and their caregivers such as considering frailty, mobility, and transportation. Enhanced care coordination and communication with other providers, including those in primary care roles located in local clinics, understanding the patients' home and social situation, and accounting and working around communication barriers. A final outcome was around the uncertain role of CPs in providing geriatric-focused care, integrating CP services in a primary care model, and fitting an on-call role into this model, all of which were primarily associated with a general feeling CP services were stepping beyond the traditional 'EMS' role.	
Shah et al. (2018) *Improving the ED-to-Home Transition: The Community Paramedic–Delivered Care Transitions Intervention—Preliminary Findings*	ED-to-home transition (care transition intervention), Median age of 70.7	heart disease, depression, asthma, COPD, diabetes, cancer, stroke, dementia
	Outcomes: CPs completed home visits among 83.9% of patients, planned follow-up phone calls with 92.7%, 90.9% and 85.8% of patients for each of the three phone call check-ins, respectively. Acceptability among participants at 76.2% and caregivers at 83.1%, reporting themselves likely or extremely likely to choose an ED with this ED-to-home transition service in the future. CPs also reported they delivered expected services 88% of the time, with 91.5% of CPs reporting that they felt a telephone call could not replace an initial in-home visit.	
Verma et al. (2018) *Paramedic-Initiated Home Care Referrals and Use of Home Care and Emergency Medical Services*	Paramedic-initiated home care referral post 911 encounter, Suburban setting, Mean age of 79	No specific conditions rather generalized referral to home care/personal support, care coordination, nursing, physiotherapy, and occupational therapy
	Outcomes: The proportion of CP patients receiving home care services increased from 18.2% to 42.5 % after CP referrals, 911 calls were reduced by 10% among CP patients, and the mean number of ambulance transports to the ED post-intervention was reduced by 7%.	
Woodman et al. (2019a) *Community Paramedicine Program Final Evaluation Report*	Home-based assessment, support, and referral, Rural setting, Minimum age of 65	Prevention/safety assessments, CHF, physical assessments, COPD, diabetes, palliative care.
	Outcomes: Results from this report were described as limited due to small and varied sample sizes, as well this report has not been peer-reviewed and was published internally by BCEHS. Of CP respondents, 95% agreed they were making a valuable contribution to health service delivery and emergency response services in their community, 100% of CP respondents described they had taken part in professional development training, 61% of respondents identified they would like more regional CP team meets to share experiences	

	and discuss ways to improve, 100% of CP respondents described they were able to support patients through providing health information and support medication self-management, 96% of CPs identified that they were able to support access to primary care, and 91% of CP respondents were able to support patients to avoid unplanned acute care visits.

2.3.5 Community Paramedic Health Conditions of Focus

Though CP programs and interventions vary across urban and rural settings, the majority focus their attention on three primary conditions: CHF, COPD and diabetes. As shown by Abrashkin et al. (2016), Agarwal et al. (2018a), and Shah et al. (2018), though the delivery of CP services varies in method and context of care delivery, patients often share similar characteristics across programs. For instance, Abrashkin et al. (2019) used an Advanced Medical Priority Dispatch System, similar to programs used by other EMS organizations, to assign resources and deliver care best suited to the patient's needs. However, with additional training in advanced illness management, CPs were able to evaluate and treat in the patient's home without the need to utilize additional or transport resources. The introduction of advanced illness management training and thoughtful allocation of resources decreased ED transports and admissions, and achieved high satisfaction rates among patients and their caregivers with 87% of patients strongly agreeing that the CP treatment plan accounted for their goals of care, with 89% of patients strongly agreeing that they would use CPs for future medical emergencies. In comparison, Agarwal et al. (2018a) utilized a community-based health promotion program designed around implementation in a subsidized older adult housing complex, using large group engagements with presentations on diabetes, cardiovascular disease and fall prevention, with a primary outcome of building-level mean monthly ambulance calls. The intended intervention outcomes were achieved with a statistically significant difference in mean ambulance call number between the intervention and non-intervention buildings (3.11 calls per 100 units/month vs 3.99 calls per 100 units/month) (Agarwal et al. 2018a). CP programs have demonstrated a variety of focuses and practice, but have globally shown improvements in health and wellness among the populations they serve.

Chellappa et al. (2018) describe that those enrolled in CP programming may have previously lacked the skills and supports necessary to effectively manage CCs, resulting in condition exacerbation and need to access acute healthcare services prior to accessing CP services. This emphasizes the need for prevention-based upstream programming working towards effective self-management, preventing EMS and ED utilization. As described by Verma et al. (2018), with the additional training and scope CPs often have, they are better equipped to treat patients on-scene, preventing transport to hospital and the need for additional treatments and interventions, that may be unnecessary if the core condition of concern is mitigated. With the ability to refer patients to the supports they require, CPs may be able to close the gap in care, provide a more continuous and often holistic healthcare experience for their patients.

2.3.6 Reduced Emergency Medical Services and Emergency Department Utilization

For the majority of CP programs in Canada, reduced EMS and ED utilization stands a key priority through the prevention-based upstream approach many CP programs are grounded in. The exacerbation of CCs and resulting increased use of EMS and ED services has presented as a challenge among an ageing population whose healthcare needs may not be effectively managed given a variety of factors, as mentioned previously (Chellappa et al. 2018; Usuba et al. 2019; Woermke et al. 2011; Broemeling et al. 2005). However, as CP programs have permeated across many geographical contexts, their success in reducing EMS and ED utilization has been demonstrated and supports the development and continuation of programming to best serve the population of interest. Included in the following section are a few examples of where this was demonstrated among CP programming and what lessons may be drawn to advance practice and procedure for CPs.

From their community-based health promotion program, Agarwal et al. (2018a) were able to significantly decrease mean monthly ambulance calls with their CP@Clinic program introduced to three intervention buildings in an urban Ontario setting. Their analysis included three paired intervention and control buildings both of which had previously lacked access to continuous care resulting in a reliance on EMS and ED services to access healthcare. CHAP-EMS, introduced by Agarwal et al. (2017), also demonstrated success in decreasing EMS call volume by 25% after one year of programming compared to that of the two previous years of data collected from the intervention buildings. Though a decrease of 7.1% was initially observed at the six-month mark of the intervention, the intervention's full effects were more prominently demonstrated after an entire year of implementation. Verma et al. (2018) demonstrated the potential of preventing EMS and ED through CP practice by introducing paramedic-led referrals to higher levels of care or supportive care services, post 911 or emergency care encounter. Verma et al. (2018) demonstrated a reduction in the mean number of ambulance calls by 10% from 1.44 calls per person to 1.20 calls per person, along with a 7% reduction in the mean number of ambulance transports to the ED among the cohort. Through collaborative in-home care planning and immediate treatments, patients did not require transport to the ED, reducing stress to patients and healthcare costs. Through their paramedic-led referral program, Verma et al. (2018) stood as a unique approach to CP practice while still ensuring that the patients' needs are being met. Martin-Misener et al. (2009) demonstrated 40% reduction in ED visits alongside a 28% reduction in family physician visits throughout the three-year intervention. Their program utilized nurse practitioner and paramedic services under a family physician's guidance to deliver care to residents in two rural regions of Nova Scotia. This program demonstrated success in measurable outcomes, general satisfaction among community members regarding the quality and continuity in the care they received, and positive collaborative experiences among the multidisciplinary health team members who worked to serve the patients' healthcare needs.

Outside of Canada, Cooper et al. (2004) demonstrated that CPs designated as Emergency Care Practitioners (ECP) were able to treat 28% of their patients on the scene as opposed to 18% of patients who were treated on scene by non-CP paramedics. Though this program was designed around the utilization of higher-level providers to respond to acute healthcare needs by patients, ECPs felt that they were able to provide care to patients that would prevent them from having to access ED services through developing a context-specific plan patients could follow through with their primary care team. Mason et al. (2007) also demonstrated a decreased likelihood of utilizing ED services the day of the EMS encounter as well as for 28 days after, with a difference of 62.2% among the intervention group, as compared to 87.5% among the control group. Patients were also more likely to be *very satisfied* with the services they received, with 85.5% in the intervention group versus 73.8% in the control group. For almost any program to be considered successful, demonstration of measurable outcomes among patients is critical for continued support and investment on behalf of the healthcare system (Butcher, 2016; Ruset et al. 2017; Picard, 2014). Within this comes the importance of defining standardized identifiers of patient engagements as candidates for CP care, as described by Agarwal et al. (2023). Agarwal et al. (2023) suggest that through defined measures such as their Ambulatory Care Sensitive Conditions, across contexts in both Canada and the United Kingdom, stronger analysis can be drawn and suggests areas of focus for future programming and research. This aims to further strengthen evidence presented on CP care and outcomes and look at ways in which we may be able to decrease *unnecessary* burden on the patient and healthcare system in the form of EMS and ED utilization, to ensure sustainability into the future (Kant et al. 2018).

2.3.7 Reduced Cost

As Gou et al. (2017) described, the significant burden of CCs among the general population is felt by those managing their conditions and our healthcare system, particularly when it comes to the economic expenditure. Through previous descriptions of the goals, attributes, and outcomes of CP programming, much success has been achieved, with many of these successes resulting in decreased costs to both the healthcare system and patients (Shah et al. 2018; Lau et al. 2018; Verma et al. 2018). Patterson et al. (2016) describe that of the 31 programs they reviewed, 26 mentioned that they were seeking to reduce EMS and healthcare costs, with 20 programs able to demonstrate a reduction in overall costs. Dixon et al. (2009) explored the cost-effectiveness of a UK-based paramedic practitioner program designed to care for individuals over the age of 60 who required ambulance services for conditions considered not immediately life-threatening. With outcomes measuring QALYs among patients who took part, it was demonstrated that not only did quality of life and overall satisfaction with the health system encounter improve, but there was also a 95% chance that the intervention was cost-effective compared to that of a *traditional* intervention.

Martin-Misener et al. (2009) demonstrated a decreased cost over the course of their three-year intervention with a cost reduction to health and social service utilization expenditures (i.e. direct cost and cash transfer) of 29.2%, and a 76.8% reduction in travels costs to patients. With the statistically significant decreases over the short intervention and a relatively small sample size of 50 patients, Martin-Misener et al. (2009) demonstrated clear advantages to implementing

CP services, particularly when strong collaboration exists or can be developed between the various health service organizations. Agarwal et al. (2020) described that through the deployment of their CP@Clinic program, previously described in table 2, over a one year intervention, QALY significantly improved, while also falling well below a standardized Canadian cost-utility threshold scale (Incremental Cost Effectiveness Ratio (ICER)), with the measure of EMS calls avoided based on historical data for the intervention group, accounting for double that of the cost of the intervention. Once again, these results support suggestions of decreased EMS and ED utilization, resulting in a reduction in spending, however, additional published evidence is required on this topic to understand the potential cost savings of such programming across the diverse context CP programs are delivered (Verma et al. 2018; Shah et al. 2018).

2.3.8 Community Paramedics Perspectives

When conducting an evaluation of a health intervention or program, it is often advisable to collect the perspectives of those directly engaged or involved in the delivery, particularly if a novel approach is being implemented (Creswell & Creswell, 2018; Creswell, 2014). As established, CP practice is a relatively novel approach to mitigate multiple challenges our healthcare system faces, particularly in rural and remote areas (Woodman et al. 2019a; Evashkevich & Fitzgerald, 2014). With this model comes the unique perspective CPs offer through their practice as an EMS service provider, *primary care extender* into patients' homes, and through their community engagement. Gathering these perspectives stands as a foundational component of better understanding how a system is working, what challenges persist, and how those working within it feel it could be improved to optimize care for patients and their work experience. In their evaluation, Steeps et al. (2017) surveyed 277 EMS professionals working in four American states regarding their understanding and perceptions of CP programming. From the paramedics interviewed, 70% described feeling knowledgeable about what CP programs involve, with 69% of eligible paramedics indicating a willingness to participate in a CP program if offered in their community. 75% of EMS professionals felt that their community would benefit from CP services allowing them to better meet patient needs and reduce ED and EMS utilization, alleviating strain and crowding in EDs (Steeps et al. 2017).

Though Steeps et al. (2017) presented a positive outlook and perspective among paramedics looking to engage with CP services, Martin and O'Meara (2019) present data suggesting that those immersed in CP practice may hold a contradicting view. Martin and O'Meara (2019) interviewed CPs from rural Ontario and Colorado through focus groups and fieldwork observations during practice. Though improved patient care and reduced utilization of EMS services for *non-emergencies* were discussed, CPs were often left feeling unsupported and misunderstood among paramedicine and primary care peers. In some cases, though CPs felt they were fostering collaborative partnerships with a variety of healthcare and related services with a shared interest in preventative care options for patients, systematic and organizational barriers (i.e. education for primary care providers on the role of CPs) left CPs feeling limited in their capacity to integrate their services with the broader healthcare system. CPs suggest that improved communication and education for staff and management within the paramedicine community as well as other stakeholders and care providers who work alongside CPs could provide an opportunity for more successful integration and delivery of services (Martin & O'Meara, 2019). Martin and O'Meara (2019) shed light on the idea that in many cases, particularly when CP programs are newly introduced, role clarity and boundary setting to navigate the development of an *untraditional role* would be a valuable tool to have for those entering such programs. Developing this clarity, as described by Martin and O’Meara (2019), offers a sense of control and understanding for providers within the CP program, which may also promote collaboration with healthcare partners, inevitably increasing the potential for more streamlined, integrated patient care, placing focus on patients’ healthcare needs and outcomes.

Two publications have emerged collecting the qualitative experiences and perspectives of CPs and those working within paramedic organisations delivering CP services within Ontario, Canada. Paramalingam et al. (2024), used a short five question opened-ended survey that reached out to all paramedics working within the Ontario Paramedic Association and CP@Clinic program, but only used data from those indicating they were working within a CP role. This identified three important themes: CP programs are filling gaps of the healthcare system, CP practice provides an opportunity for career changes for paramedics where they can develop deeper patient connections, and that CP created a shift within the traditional scope and definitions of paramedicine practice. This was supported through generally positive experiences with CP practice and ability to engage in care *untraditional* but important in delivering well rounded healthcare services (Paramalingam et al. 2024). Agarwal et al. (2022) explored similar topics through a discussion forum where paramedics and paramedic stakeholders explored the integration of CP services with primary care, developing five core themes from their engagements: the need for role definition of CPs, integration of CP with other services, developing support for CP practice, and standardization across administration and oversight of CP programs. Though focus on these outcomes represented structural and administrative attributes, perspectives from CPs and stakeholder shed light on key areas of CP practice that have yet to be defined, explored and standardized, to allow for a clearer picture on the perspective and experiences of delivering care through a novel approach (Agarwal et al. 2022).

Though both these studies used qualitative approaches, outcomes lacked exclusive, deep CP perspectives, limiting their administration to inform and provide foundational understanding of this practice. This speaks not only to the importance of gathering CP perspectives from those directly engaged in care, but also the limited current understanding on this critical topic.

Though anecdotal evidence including perspectives shared by Goldman (2020) and internal documents such as Woodman et al. (2019a), its comparability to published evidence is lacking, limiting the capacity one has to develop a solid understanding of real-world CP perspectives of their practice, care delivered to patients, and outcomes among the population they serve. If we look to work such as that presented by Martin et al. (2016), we can observe that though strong anecdotes of support are provided by patients, once again, the perspectives of CPs were not included. Patients involved in the Martin et al. (2016) investigation described the acceptance of CPs as frontline primary care providers and the importance of further developing and expanding CP programming. Though patients can provide a suggestion based on their experiences with CP programs, patients often lack a thorough understanding of healthcare service organization, which limits their capacity to offer specific and attainable recommendations for program advancement (Martin et al. 2016). Without a thorough understanding of practice, policy and capacity, a patient does not have the ability to suggest realistic changes or developments for the program. This emphasizes the need to further investigate CP programs and practice through an application-based, context-specific lens, best suited to understand meaningful and applicable perspectives of what CPs are doing, and how programming may be optimized.

2.4.0 BCEHS Community Paramedicine History and Context

In 2015, British Columbia Emergency Health Services (BCEHS) introduced their CP program to nine rural prototype communities across the province to assess the sustainability and impact a CP program would have. With widespread acceptance and positive patient feedback, a larger rollout to 76 communities was completed in 2016 with community selection based upon two primary objectives; contribute to the stabilization of paramedic staffing in rural and remote communities, and bridge health service delivery gaps in the community, identified in collaboration with local IPT (Woodman et al. 2019a). 99 communities are mandated to receive CP services, with 184 CPs working in 94 of these communities. This program, similar to many other CP programs, came to fruition as a call to meet the challenges regarding access to care in rural areas of BC with an ever-increasing demand for services. This is particularly relevant when considering the challenges presented around CC management, where Usuba et al. (2019) and Woermke (2011) described deficiencies in patients' abilities to effectively self-manage and understand the importance of following management recommendations provided by healthcare professionals. When looking toward the future needs of the ageing population in BC, this is often associated with an increase in CCs, which as Calderone et al. (2017) and Guy (2014) suggest is one of the core reasons why a CP program should be and was introduced. For the healthcare system in BC, it is paramount to maintain manageable healthcare utilization to ensure that those who require healthcare services can receive them (Ministry of Health, 2015). It has become apparent that challenges around delivering sustainable and continuous healthcare to rural and remote areas exist, however continuing to expand and develop services to resolve this issue is the only way forward (Calderone et al. 2017; Ministry of Health, 2015; Guy, 2014).

The BCEHS CP program has been built upon two core objectives: contribute to the stabilization of paramedic staffing in rural and remote communities and bridge health service delivery gaps in communities. This is extended by a goal to "deliver care consistent with [the] quadruple aim" and improve four areas; patient experience, health of population, reduced cost, and provider work-life balance and well-being (Woodman et al. 2019a, p.2). To meet these goals, BCEHS utilized PCP-IV paramedics who attend a specialized orientation training program which includes education on community engagement and cultural sensitivity, social determinants of health, health promotion and community-level training (i.e. cardiopulmonary resuscitation (CPR) training, automatic external defibrillator (AED) training, Narcan (naloxone) training, Stop The Bleed Training), performing patient assessments (i.e. fall risk assessments, home safety assessments, vitals checks), understanding CCs (i.e. COPD, CHF, diabetes), and managing palliative patients and end-of-life care. Another significant component beyond that of direct patient care is patient confidentiality, and patient charting as CPs are often directly involved in patient care planning and hold access to sensitive patient information beyond that of a non-CP paramedic (Woodman et al. 2019a). The work of BCEHS CPs primarily involves six services as listed in table 3 and is summarized from BCEHS (2018) and Woodman et al. (2019a).

In addition to the standard PCP-IV level CP program, BCEHS introduced Rural Advanced Care CP (ACP-CP) roles, which primarily offer services in larger rural communities (i.e. Prince Rupert) as ACP-CPs have a broader clinical scope allowing them additional clinical privileges. Services included assessing and treating higher acuity patients, supporting primary care providers in clinical settings, supporting local clinicians in emergency patient transfers, providing clinical mentorship, and responding to high acuity 911 calls to support ambulance paramedic crews (BCEHS, 2018; BCEHS, 2019). Currently, this program is in its early stages with ongoing evaluation underway. As described by Calderone et al. (2017) and Woodman et al. (2019a), the BCEHS CP program was designed as a staged rollout, adaptable and expandable given the impact and evidence, availability of resources, staffing needs of the CP program, and broader needs of the paramedicine care delivery program in BC. An example of this could be expanded mental health and addictions training for CPs to offer in their communities (Woodman et al. 2019a). A news release by Bassett (2020) in EMS World quoted BCEHS Project Manager for Strategic and Process Initiatives, Michelle Brittain, describing favourable results demonstrating a 40% reduction in 911 calls, 46% reduction in 911 calls for *selected chief complaints*, and a 47% reduction in the number of low-acuity 911 calls. Though details of these figures' context and timeline were not provided, early suggestions lean towards an effective delivery model that has demonstrated changes in 911 utilization in BC.

Table 3

BCEHS CP Program Services Offered

Service Offered	Service Details
Community Outreach and Awareness	Engaging in their community and surrounding areas. This includes working with healthcare providers to identify service gaps and potential solutions.
Health Promotion	Encouraging patients to take responsibility for managing their own care and treatment. Community engagement (below) supplements this.
Community Engagement	Engaging with communities through providing CPR and AED training, Naloxone (Narcan) training, and early health screening.
Wellness Clinics	Community engagement includes wellness clinics providing early screening, diabetes education, men’s health education, grief and loss education, and healthy eating classes.
Wellness Checks	Offering in-home check-ins for patients living on their own or who may require extra assistance, reducing reliance on medically unnecessary 911 calls, allowing patients to connect with healthcare providers outside of hospitals.
Home Health Monitoring	Through telehealth services, patients are able to track key health indicators in-home while the CP, among other primary care providers, can monitor these indicators for abnormalities and trends.

BCEHS is uniquely positioned to deliver CP services through a large-scale program set in a variety of rural and remote contexts across BC, and with suggestions towards positive outcomes, further program analysis and investigation is warranted. Woodman et al. (2019a) described some challenges encountered in their initial assessment, including small and variable responses from CPs (i.e. n = 15 for one question vs n = 41 vs n = 76), which they described as limiting recommendations and interpretations drawn. 911 call volume and call type data per region were not available at the time of the assessment, limiting objective numerical outcome data presentation. As responses to surveys were varied, the CP experience data collected was limited in the scope of findings and was only able to represent a small proportion of views and perspectives of CPs across BC (Woodman et al. 2019b). With a lack of data to suggest strong outcomes or recommendations, a gap in knowledge surrounding CP practice in BC was left, particularly that of CPs' perspectives of the current status of health among rural and remote British Columbians. This literature review has further shed light on this issue, with a general lack of understanding and presentation of data on the topics of CP perspectives and the health status of the patients they serve. This limits the general understanding of CP practice and perspectives and the ability to build support for programming continuation and expansion. The research conducted in this project aims to overcome these barriers and fill a knowledge gap by providing a comprehensive view of the BCEHS CP program from the perspectives of CPs.

Understanding programs from the perspective of those immersed in it must be collected to ensure that outcomes and suggestions are meaningful and applicable to practice (Nolan et al. 2018; O'Meara et al. 2018b). It is clear that rural and remote contexts of BC present unique challenges and barriers to care, as presented by the Ministry of Health (2015), BC Medical Association (2012), Woermke et al. (2011) and Larson et al. (2017), thus developing a context-specific understanding is crucial in further developing CP programming. Informed by recommendations and an understanding of current positions in the broader healthcare system, CP programs demonstrate potential in moving towards delivering equitable, sustainable, and continuous healthcare services for all residents of BC and abroad. This ensures optimal outcomes for patients, and sustainable working structures for CPs, to achieve a sense of belonging in the broader healthcare system and among community health partners, as well as foster a sense of positive contribution towards delivering high quality, patient-centred care. This starts with an understanding of practice from CPs' perspectives, encompassing perceived patient experiences, needs, and outcomes to inform future practice and programming, optimizing care for rural and remote residents.

2.5.0 Community Paramedic Role in COVID-19 Pandemic

As of January 2021, Canada was still in the midst of the COVID-19 pandemic, and though the body of research on COVID-19 is rapidly expanding, formal research regarding the role of CPs during the pandemic has yet to be established. As described by Brittain et al. (2020), the BCEHS CP program had seen a transition away from in-home visits towards the use of telehealth services, including virtual video meetings using Zoom Healthcare and Facetime, as well as telephone check-ins for patients. At the beginning of the pandemic, as community engagement and home-visit engagements by CPs were being suspended, the BCEHS CP program saw a sharp increase in patient referrals, with 424 new patients enrolled, bringing the total number of patients to 1341 in March 2020. This resulted in CPs completing 3897 virtual consultations by March 23, 2020, despite challenges in coordinating and delivering telehealth in certain rural areas with limited internet connections or lack of patient accessibility to a virtual connection (Brittian et al., 2020). Previous research on the integration of telehealth services into paramedic practice has demonstrated similar outcomes, with challenges regarding connectivity standing as the primary roadblock to streamlined integration of this delivery method (Simon et al., 2020). Despite challenges, virtual care has become a way forward during this pandemic, as described by Brittain et al. (2020) and further understanding of this delivery model is necessary for ensuring its usability and sustainability in the future.

This dovetails into informal reports of CP practice transitioning to new tasks and duties, including the completion of COVID-19 risk assessments, diagnostic testing for COVID-19, collection of diagnostic tests for home-bound patients, and patient check-ins to be the “eyes and ears” of primary care providers (Cebollero, 2020; Master et al., 2020; MHealth, 2020; Burnett et al. 2020; Eastern Ontario Health Unit, 2020; Brittain et al. 2020). CP services, also referred to as Mobile Integrated Healthcare in numerous settings, have ensured vulnerable patients are able to continue receiving treatments including IV antibiotic therapy, blood transfusions and urinary catheterization, while not having to leave their home, further reducing the risk of exposure to COVID-19 (Dornerm, 2020; Orillia Matters, 2020; Gates, 2020). Though the idea of CPs performing these tasks amid a pandemic seems novel, many organizations and CPs have always performed these tasks, with the addition of the pandemic offering an opportunity to merely highlight the role CPs play within the healthcare system. This is exemplified with the previous Goldman (2020) example, where CP has long stood as a key service within the Ontario health service delivery model, with the pandemic merely acting as a catalyst for further awareness of CP practice. It is necessary to collect the perspectives of CPs who have emerged as a critical link between patients and their primary care providers. As there is currently a lack of broader evidence on CP perspectives, this research stands as a step forward in further understanding and evolving CP practice.

Chapter Three: Methods

3.1 Problem Statement

CP programs have presented as a beneficial addition to primary care services, extending care provided to patients into their homes (Woodman et al. 2019a; Steeps et al. 2017; Martin & O'Meara, 2019). Though patient outcomes are often a key measure of success in healthcare evaluation, perspectives of providers delivering care can ensure their practice is meaningful, fulfilling, and sustainable. Understanding the qualitative perspectives of CPs regarding their practice and patient outcomes has gone largely neglected, limiting the potential and expansion of CP programming. This research aimed to capture the perspectives of those immersed in the care of patients in rural and remote BC, and develop a foundational understanding of the work and outcomes CP is having in these areas. This investigation also aimed to build upon a growing body of research understanding the impacts of COVID-19 on BCEHS CP practice and care delivered to patients enrolled in the program. This aims to establish a solid foundation to understand CP practice from the real-world perspectives of BCEHS CPs immersed in the program.

3.2 Research Questions

The purpose of this interpretive descriptive interview-based study was to gather the perceptions of practicing BCEHS CPs regarding the status of CC management, impact of the BCEHS CP program on CC management, and impact of COVID-19 on BCEHS CP practice in rural and remote BC. Three research questions guided this investigation.

1. How do practicing BCEHS CPs perceive the status of CCs in rural and remote BC?
2. How has the BCEHS CP program affected CC management among patients in rural and remote areas of BC from the perspectives of practicing BCEHS CPs?

3. How has the COVID-19 Pandemic impacted the practice of BCEHS CPs, and what adaptations in care and delivery of services have been made?

3.3.0 Theoretical Orientation

3.3.1 Positioning Statement

As someone who grew up in the rural community of Fraser Lake, BC, works as a paramedic for BCEHS and has performed research in rural health settings, I feel it is important to situate myself in this research. My interest in rural health has been largely informed by personal experience and the experiences of individuals close to me. Previous research I performed and participated in has investigated CC management among Indigenous populations and Nurse Practitioner perspectives of primary care provided in northern BC. Through my previous research and current position as a paramedic for BCEHS, I became interested in the potential of CP to improve healthcare continuity in rural and remote areas of BC.

When considering ontology and epistemology, the interpretive description approach of this project considers that numerous perspectives or realities exist and that these are created through societal experiences and norms and are merely interpretable by others. This constructivist lens, founded on the premise of multiple perspectives and realities, allows the researcher to develop a deep, meaningful understanding of a topic while not limiting them from interpreting and presenting the data from their perspective (Thorne et al., 2004). Traditional qualitative methodologies, such as phenomenology, attempts to uncover the essential meaning or understanding of a topic or phenomenon. This is achieved by the researcher removing all preconceived worldviews, knowledge, and perspectives of their own to ensure the true meaning of the human experience of the participant is exclusively presented (van Manen, 1990; Kleiman, 2004). Though relevant in many applications, given the complexities in methodological and philosophical understanding necessary to use a traditional phenomenological approach, phenomenology stands as an unsuitable option for this project, given my limited experience as a researcher and time constraints. With the underpinning of developing a deeper understanding of the human experience while still allowing for flexibility in analysis and interpretation of findings, interpretive description was selected as the methodological approach and is described in the following section (Thorne et al. 2004).

3.3.2 Research Methodology

This project utilized a qualitative semi-structured interview approach grounded in interpretive description methodology, as presented by Thorne et al. (1997). This methodological approach was selected as it intends to develop an understanding of complex phenomena and experience within the field of applied sciences, providing insight into the concept of investigation whilst maintaining theoretical and methodological integrity (Thorne et al. 1997). Thorne et al. (1997) present the use of interpretive description in the context of nursing research to approach "qualitative inquiry into human health and illness experiences for the purpose of developing nursing knowledge" (Thorne et al. 1997, p. 173). With this methodology supporting an inductive approach, relying on the interpretation of data on behalf of the researcher, an interpretive dynamic is established between the researcher and data while still ensuring credibility and rigor within the field of investigation (Thorne et al. 2004; Morse, 2015). This draws upon the flexible nature of data collection methods, data sources and analytical methods to capture and present the lived experiences of individuals, particularly those immersed in their field of investigation, while maintaining methodological and analytical integrity through explicit description and justification for research design decisions. This permits the reader or audience their own credibility evaluation, often presenting as a more valuable way of disseminating the data to those within the field of investigation, as their experiences and expertise within the field can be drawn upon (Thorne et al. 2004).

When considering the foundations of healthcare as an applied science, both the subjective experience of the patient and caregiver, alongside the objective science-based care that is being provided, the theoretical underpinnings align directly with a constructivist lens at the core of interpretive description. This constructivist perspective acknowledges that the experiences of humans are constructed by society and its norms, asserting that multiple realities, and foundationally, perspectives, exist and should be considered valuable (Thorne, 2008, 2016; Thorne et al. 2004). Though Thorne et al. (2004) presents interpretive description in the context of nursing research, its applicability to practice in other applied science fields, particularly those within the healthcare sector, has been widely demonstrated, such as in Dainty et al. (2017), Lam et al. (2020) and Chan et al. (2017).

With interpretive description able to explore and understand complex topics or phenomena and then develop and disseminate knowledge, it provides value to both understanding the topic and its application in practice. With these factors in mind, and the intentions of this project which focus on gathering and interpreting multiple perspectives, this methodological approach is well suited.

3.4.0 Sampling and Recruitment

3.4.1 Target Population

This project engaged BCEHS CPs actively practising in rural and remote communities served by the BCEHS CP program. Inclusion criteria for this project were set to those who have completed the BCEHS CP Training Program, BCEHS CPs with more than six months of practice in their role as a CP, those who are licenced and registered BCEHS CPs, and who actively hold a

CP position in one of the 99 rural or remote communities served by the program. Those holding managerial, administrative, supervisory or other positions providing leadership or oversight in the BCEHS CP program were considered ineligible due to the potential conflict of interest.

Hennink et al. (2017), Saunders et al. (2018), Morse (1995) and Malterud et al. (2016) suggest that code or theoretical saturation is often reached with 8-12 interviews, and inductive thematic or meaning saturation requires 15-26 interviews be complete ensuring that researchers have not only "heard it all," but more importantly "understood it all" (Hennink et al. 2017, p. 591). This was further explored by Hennink and Kaiser (2022) in their systematic review to assess elements of saturation within qualitative research. Across evidence collected, there was a clear notation of thematic saturation reached in a narrow range of 9-17 interviews conducted among a homogenous study population. With the defined, common characteristics of BCEHS CPs interviewed in this research, the pool of potential CP participants drawn from is representative of a *homogenous population*, and thematic saturation therefore could be reached in as few as nine interviews. However, as identified in the foundation and aims for this research, as the understanding of CPs' perspectives is poorly represented in the existing limited pool of evidence on CP, capturing the breadth of perspectives within the population was paramount in establishing the foundation this project set out to achieve. In the interest of ensuring saturation a target sample of 25 practising BCEHS CPs was selected as it is anticipated that this will allow for a diversity of perspectives in the data collected, while also ensuring data oversaturation does not impact the interpretability of results (Creswell & Creswell, 2018; Morse, 1995).

3.4.2 Participant Recruitment Strategy

This project used a staged recruitment strategy following ethics review and approval. This included a project introduction email sent by BCEHS CP leadership to all practicing BCEHS CPs with an invitation to participate or ask any questions about the project. Following a response from the CPs, the researcher (AS) sent a follow-up email providing further detail on the project and attached the Information Letter and Consent Form, Positioning Statement, and Detailed Project Summary. Once the Informed Consent Form had been completed and returned, a meeting time was established, a meeting request and Zoom Link was sent to the CP. Prior to the interview starting, participants were asked if any questions had arisen or if they had any concerns prior to starting the interview.

A month into the recruitment strategy, a newsletter article was included in an internal 'BCEHS Ops' newsletter distributed to all BCEHS staff. The researcher (AS) attended four BCEHS CP Community of Practice (COP) meetings hosted by BCEHS CPs to provide a brief overview of the project and provide contact information if CPs were interested in participating. Initially, this project sought to recruit participants from the North Central, Northwest, and Northeast districts, who meet the inclusion criteria, however, due to the limited number of active BCEHS CPs (108 at the time of recruitment), it was not feasible to meet the target participant sample with this limited population. As all BCEHS CPs practice in rural communities as classified by the Rural Coordinating Centre of BC, all CP recruited fit inclusion criteria and the rural focus of this study.

3.5 Interview Proceedings

Interviews were scheduled over May and June 2021, utilizing virtual meetings via Zoom Videoconferencing software licensed by UNBC. This secure video-conference platform, and similar software, have been widely supported for its use in qualitative interview-based research such as in Archibald et al. (2019) and Deakin and Wakefield (2013). Though the majority of BCEHS stations have access to an internet connection, the strength of this connection may be variable or poor, therefore participants were given the option to complete the interview at their station or their home if the internet connection was adequate or over the phone if the internet was inadequate. The telephone interview option was also available for participants who did not feel comfortable using Zoom or engaging with the researcher (AS) via a video stream. Interview audio was recorded using a personal password-protected voice recorder (Sony ICD-PX370) for transcription and analysis, both of which were completed by the researcher (AS). At the time of the interview starting, participants were given the option to have live video on or off and were once again offered the opportunity to complete the interviews via phone if they were more comfortable with that form of interaction.

Interviews followed a script (Appendix A), allowing for probing and discussions based on the response provided by the participant and their comfort with elaborating on responses. Questions were designed to be non-leading, open-ended, and focused on specific topics relevant to this study's research questions and objectives. At both the beginning and end of each interview, open conversation with participants was conducted as a way of establishing trust and rapport with participants, as well as to answer any questions they may have about the project. Interviews included five demographic questions and nine primary interview questions, with prompts if additional or deeper information was sought on the primary question topic or if participants requested clarity on what the question was asking. Interviews took an average of 56 minutes (25-77 minutes), with all interviews including probing and conversation around the topic of the question.

After the completion of each interview, audio files were immediately saved to the researcher's (AS) personal biometrically protected computer, with two backup copies kept for the duration of this project. All audio files were transcribed into encrypted, password-protected Microsoft Word documents for redaction and review by the participants. Though each participant's gender was kept the same, no other identifiable information was used throughout the project. A master list of participant identity and contact information was kept by the researcher (AS), but no one else had access to this list, minimizing the risk of a breach in privacy. As participants' practice was closely tied to the community where they deliver CP services, communities will be identified based on their approximate population sizes (communities under 500 residents, 500-1500 residents, 1500-5000 residents, and 5000 residents or more).

Once the researcher (AS) reviewed and redacted any identifiable information from the transcripts, participants were emailed a copy of their transcripts for review and given the opportunity to redact any component of their interview or their entire interview. While reviewing their transcript, participants were also given the option to add any amendments to their interview but were requested to identify these additions through highlighting and underlining added material.

As a token of appreciation for their time, participants were provided with an Honorarium gift of a UNBC coffee mug ($8.75) and a $15 Tim Hortons/Starbucks/Subway/McDonalds gift card, which was purchased using the funds provided by the BC SUPPORT Unit Northern Centre Studentship Award received by the researcher (AS).

3.6 Data Analysis and Dissemination

Data analysis during this project followed the interpretive descriptive methodology through the use of techniques presented by Tracy (2013), Creswell (2014), and Creswell and

Creswell (2018), following a constructivist approach (Thorne, 2008). Through analysis and the perspective of relevance to practice and meaningfulness in the 'real world' as postulated by a constructivist approach, the development of knowledge out of the data analyzed emphasized transparency throughout collection and analysis, description of logic and perspective used to analyze and present data, and flexibility to follow data and themes arising during this process (Thorne et al. 2004). As this project was designed around semi-structured interviews, without changing or adapting the interview throughout the data collection process, data was analyzed following the review and return of all transcripts. This foundation fell back to an understanding and acknowledgement of the researcher's position external to this research and minimizing the potential risk of undue influence or taint data by specific topics raised during interviews conducted. However, this also meant that for the researcher (AS) to become emersed in the data to best understand and present themes, transparency and description of data collection and analysis processed were tracked through reflective journaling.

As presented by Tracy (2013), Creswell and Creswell (2018) and Thorne et al. (2004), transparency and accountability are most often achieved through a reflective journaling process. This included recording field notes and thoughts following interviews, journaling and disclosures throughout the research process, and regular reflection on the principles of epistemology, ontology and position of the researcher (AS) as a researcher and paramedic in this project. Reflective journaling provided an opportunity to explore and identify themes and insights encountered, identify and develop a relationship with the data to understand where the researcher's (AS) interpretation of the data stood, and aid in clarifying themes or areas requiring deeper reflection and thought. Foundationally, this process upheld a commitment to transparency throughout the research process, ensuring that the process and logic followed during the creation of knowledge were credible and trustworthy for the readers and users (Thorne et al. 2004; Carcary, 2009). This was of particular importance during the analysis of data when it was imperative that the researcher (AS) remain cognizant of his role and position as a researcher limiting the influence of other roles, gender, biases, social constructs followed, judgement and societal position and power to ensure these factors did not unduly influence interpretations. With the goal of this research to provide relevance to practice, and Thorne et al. (2004) emphasis on developing and inform clinical processes and understanding, ensuring transparency through an "explicit awareness of the investigator as an interpreter" would optimize the credibility and coherence in findings and interpretations presented (Thorne et al. 2004, p. 6).

For a researcher seeking to create knowledge from data, interpretation stands as a foundational factor. This presents challenges in understanding where a researcher's interpretation is grounded and how this may influence the data presented (Thorne, 2008). As previously described, numerous actions were taken to minimize any undue influence or biased interpretation, however when working with qualitative data, one must accept that interpretation is inevitable. To most accurately represent views and opinions shared during the interviews, a researcher should seek to immerse themselves in the data, developing a deep and holistic understanding of data. This began with multiple, detailed reviews of the transcripts to familiarize the researcher (AS) with the data, explore primary themes uncovered, and develop a 'global' perspective of what the data collected was saying in relation to the research questions of this project. This process involved reflection on themes and patterns identified, developing and, at times, challenging an interpretation of attribute or theme. This process was largely completed as part of the transcribing proceedings as the researcher (AS) completed all 15 transcripts for this project and during the transcript review stage when participants were provided with the opportunity to review and redact transcripts prior to analysis. Though this process was not explicitly analyzed, it provided a foundation for deep and meaningful analysis.

This project utilized NVIVO 12 Plus and NVIVO (mid-project update resulting from a subscription renewal) as this software offered a data management package a researcher can use to "aid in the analysis process, which the researcher must always remain in control of" (Zamawe, 2015, p.13). Data were analyzed using a multistage approach, firstly following an expected/explicit code analysis to identify themes anticipated to arise in the interview or those emerging while data reflection and emersion were ongoing. Secondly, a surprising/secondary code analysis was conducted to identify emerging themes in the data. Data was coded using node (reference) identification to organize attributes into larger project themes, identified as core areas of interest across participants interviewed (Tracy, 2013). With codes identified into primary themes, a secondary analysis was completed on nodes, and themes parse out threads across themes and data, provide evidence for areas of focus when disseminating recommendations, and provide support of theme organization in this thesis and subsequent publications and presentations. This analysis was grounded in the idea of sensitizing concepts as presented by Bowen (2006), with this approach aligning with the flexibility allowed within interpretive description through its support of the inductive analytic process. This process allows for codes and themes to be used as a guide for knowledge development in the findings rather than deduced from previous knowledge or theories, which within the theme and topic of this project, were limited or lacked relevancy in the field of CP practice (Bowen, 2006).

3.7 Rigor

For this research project and qualitative research generally, establishing credibility, trustworthiness and authenticity of results is paramount to ensure acceptance among the community of researchers in the field of interest (Thorne, 2016; Cypress, 2017). Though trustworthiness and rigor are often described as analogous terms, Cypress (2017) describes them as two unique factors. Rigor is defined as the precision data is able to maintain, determined by the accuracy and thoroughness of the collection process (Cypress, 2017). Trustworthiness is described as the quality, authenticity, and truthfulness of research findings to establish trust and confidence in the results among the readers of the community of research (Cypress, 2017). For these factors to be established and maintained throughout this project, a number of factors in methodological and analysis approaches needed to be considered, well documented, and justified. When assessing the foundations of these considerations, qualitative research often looks to the work of Lincoln and Guba (1985), who use four rigor criteria for qualitative research work, including credibility, dependability, confirmability and transferability. The work of Forero et al. (2018) adapted and analyzed the relevance and appropriateness of these criteria and strategies in modern emergency medicine research, confirming their importance and relevancy. This provided a foundation on which rigor for this project was assessed and maintained.

When considering rigor and trustworthiness at a foundational level, the attributes of validity and reliability must be acknowledged, though their value in qualitative research has long been debated (Cypress, 2017). As described by Black and Champion (1976), establishing reliability within qualitative research presents as problematic as methodological approaches, such as interpretive description, acknowledge that multiple realities or perspectives exist among participants. In the case of naturalistic inquiry, the foundation of interpretive description, the goal of establishing understanding around a phenomenon from multiple, often differing perspectives, stands in contrast to the replicability and consistency reliability seeks to achieve (Cypress, 2017; Morse, 1999; Morse, 2015). For reliability to be established, Cypress (2017) described that consistency in research practices, including transparency throughout the research process alongside justification and reflection on position in the research, are best practices to achieve and maintain reliability.

Considering validity in qualitative research, though achievable in project development using reasonable, relevant, and justifiable foundations and methodology, establishing validity in analysis and dissemination can be far more challenging (Creswell, 2007; Morse, 1998). The premise of naturalistic inquiry does not align with tenants of traditional validity assessments that seek sound data and credible conclusions grounded in constant, validated methods and sources, potentially discrediting the purpose and foundation of qualitative research (Creswell, 2007). For validity to be established, one must ensure that methods and results presented have been founded in sound research methodology, collection techniques and be able to justify decisions and rationale for results presented. Though not ensuring validity in a traditional sense, this standard of testing draws upon traditional principles and data presented on the topic of validity to ensure data is scientifically legitimate and relevant to the community of research and practice it may be read by or used in (Morse, 1998; Morse, 1999).

To consider findings and recommendations accurate and representative of data collected, the credibility of the researcher presenting such findings must be established. This is based upon the agreeability between the representation of finding on behalf of the researcher and the data or understandings of the participants involved in the project, foundationally considering the study's internal validity (Forero et al. 2018; Schwandt, 2001; Creswell and Creswell, 2018; Morse, 1998). This was developed through recognition and understanding of analytic integrity and ensuring findings of the project are directly correlated with the perspectives and realities of participants' understandings of the topics of study. Throughout the recruitment, redaction and following analysis and dissemination, a relationship with participants grounded in trust provided the opportunity for participants to not only share a thick and rich perspective on their practice and status of rural and remote health in BC but also trust that the researcher (AS) was going to accurately and holistically represent their stories and perspectives (Morse, 2015: Forero et al. 2018). This relationship was established through full disclosure of position, qualifications and intentions through a positioning statement and thorough project description provided prior to participation, and fostering comfortable engagements with participants through practices including easy access to contact information if questions arose, unlimited time to complete interviews, and flexibility for participants to complete interviews either by phone or video conference depending on comfortability and convenience. Throughout the interview process, the researcher (AS) had weekly meetings with supervisors to ensure any questions or concerns that arose throughout the interview process were answered and provide a debrief to discuss themes or topics of interest (Forero et al. 2018). This process was strengthened by a secondary analysis of data as supported by Ziebland and Hunt (2014), who postulate that it is through a process of secondary analysis, comparison and reflection that one can optimize their representation of data collected. After completing this analysis and reflecting upon interviews conducted in this project, confidence was established that true theoretical and thematic saturation was reached through the thick and rich data collected, and though additional or broader viewpoints may exist among CPs within the BCEHS program or abroad, this project stands on a foundation of representation to build the current understanding of CP perspectives and practice.

As a foundation in an emerging field of research or understanding on a topic, transferability, or the ability of the researcher to provide justification grounded in the data collected to meet reasonable congruency for potential users or readers of this work, stands as another core criteria for rigor (Lincoln and Guba, 1985; Forero et al. 2018; Morse, 2015). This project represents an early investigation into the perspectives of CPs in the context of rural and remote BC, particularly communities historical facing challenges of accessing quality and continuous care. For this to be applicable and provide a basis onto which further research in this field could be built, detailed description, while considering confidentiality and anonymity, is provided, including population size served by participants, length of time as a CP, length of time working as a paramedic, gender, and how many CP partners they interact within their place of work. Some interviews included participants sharing additional current or previous occupations or experiences both relevant and, from the surface, disconnected to their practice. These factors showed to be invaluable when considering the context and work of CPs and are described in the following sections. With the consideration of the population of focus and saturation of data within the sample size gathered, confidence was established that a broad diversity of perspectives was gathered and corroborate with suggestions made by Hennink et al. (2017), Saunders et al. (2018) and Malterud et al. (2016) when considering requirements of theoretical and thematic saturation (Forero et al. 2018; Morse, 1995).

For dependability to be upheld, one must consider the foundation upon which a project is built, the study methodology (Forero et al. 2018). The development of this project was grounded in a broad review of literature covering the diverse attributes and focuses CP programs hold in a variety of contexts and settings. This, alongside the selection of interpretive description in consultation with the project committee following a discussion regarding the methodological framework to best fit the project's objectives, resulting in a rich understanding and foundation on which the methodology was developed (Forero et al. 2018; Thorne et al. 1997). Through data collection and analysis, consultation was sought with project committee members to ensure accuracy following methodological and theoretical foundations. Throughout the data collection and analysis process, field notes and reflective journaling provided an opportunity for the researcher (AS) to self-audit adherence to methodological proceedings, also serving as a log to check in with supervisors. Throughout the analysis, consultation with the project committee was sought on the organization and presentation of data with coding and analysis available for review by project supervisors while upholding confidentiality. Finally, prior to the completion of findings summary and recommendations, consultation with the project committee was completed as a way of ensuring findings and recommendations fit within the scope and summary of data while not overstepping the role, experience or position of the researcher (AS) or this project in the field of research on CP practice.

Attributes of dependability are deeply tied to the final attribute of Lincoln and Guba (1985) and Forero et al. (2018) rigor criteria of confirmability, postulating confidence or corroboration on behalf of other researchers. Dependability techniques stand as a litmus test in ensuring data followed a solid and well-founded research process alongside ongoing auditing and that reflexivity was conducted throughout the research process. The process of self-reflection and self-auditing are inextricably linked and allow the researcher to remain cognizant of the potential influences their personal interpretations can make on the data or analysis and permit self-reflection on the depth of the topic of study. This often provides a focus grounded in the foundations of the project and check-in to provide a holistic understanding of why and how interpretations and analyses were made for the reader and knowledge users. This process links directly back to the foundations of credibility and transferability, further supporting the usability of Forero et al.'s (2018) framework for rigor and ensuring this project stands as a foundation to establish a deeper understanding of CP practice and rural and remote health in BC.

3.8.0 Ethical Considerations

As part of completing requirements for performing ethical research involving humans in Canada, Tri-Council Policy Statement – 2 (TCPS-2) guidelines were used as the foundations of ethical proceedings for this project. Research ethics approval for this project was granted by the UNBC REB under project E2021.0317.007.00 (Appendix B) as well as BCEHS Management and BCEHS Research and Evaluation Subcommittee approval File #: 51500-01 and CLIFF: 1062489 (Appendix C). If participants had questions or concerns in regard to the project, researcher, or information shared during the interviews, they are asked to contact the researcher (AS) to mitigate the issue. If the participants do not feel comfortable contacting the researcher (AS) or research supervisors, they may reach out to the UNBC REB using the contact information provided in the Information Letter and Consent Form.

3.8.1 Potential Conflict of Interest

As the researcher (AS) works as a BCEHS Paramedic and could be considered a peer or co-worker of the BCEHS CPs interviewed in this project, there is a potential for a perceived conflict of interest that might affect the integrity of this research. However, as the researcher (AS) does not work as a CP, hold a CP license, or work in a supervisorial or managerial role within both the BCEHS CP Program and broader BCEHS organization, the potential conflict of interest is considered minimal. To minimize the potential of this conflict of interest, at the time of data collection with each participant in this project, the researcher (AS) was not actively working for BCEHS. During some of the interviews, participants would provide explanations such as 'you get it' or 'you know what it is like' with the researcher (AS) asking for clarification for the research project. As the researcher (AS) wanted to minimize the potential compromise in rigor or integrity, these comments by participants provided an opportunity for conversation and clarity around the point or situation they were sharing.

This project has received financial support in the form of a $10,000 BC SUPPORT Unit Northern Centre Graduate Studentship Award. This award does not carry any financial incentive or adjustment in regard to results found, does not place any restriction on the reporting of findings or review of data, and only requires that the student acknowledge the support of the BC SUPPORT Unit Northern Centre in any presentation, publication or thesis and provide a final summary report at the time of project completion.

3.9 Knowledge Translation

When considering the knowledge translation proceedings for this project, four primary groups of interest were identified: BCEHS and BCEHS CP Management and Leadership, BCEHS CPs, primary care providers, and BCEHS CP patients and the public. These groups were identified as they represent key stakeholders in the management, guidance, delivery and reception of CP services in BC. At the time of writing this report, engagements have already included a presentation of findings at the 2021 Northern BC Research and Quality Conference, which covered preliminary themes identified and was well engaged and received by those attending the conference. Engagements range from the delivery of recommendations to BCEHS and BCEHS CP Management and Leadership to outcome data and reporting on program offering to primary care providers and CP patients and BC residents, and CPs practicing in BC, with presentations offering the opportunity to provide context to the role of CPs in the healthcare system and the perspectives of CPs working within the system. This perspective offers a picture of the potential of the programming and the efforts healthcare decision-makers and leadership are making to improve rural and remote healthcare services and patient outcomes for the residents of BC.

Further knowledge translation aims to include a presentation at a Brown Bag Lunch Session presented by Northern Health and UNBC HRI Seminar Series Presentation. This, alongside the intention of publishing two peer-reviewed Journal Articles and summary reports distributed throughout BCEHS and other health authority facilities, will share the data gathered in this project and provide a launching point for further research on CP perspectives and practice. Knowledge translation is intended to be conducted through virtual presentations and engagements with the intention of sharing summary reports and findings in person in BC healthcare facilities and BCEHS stations.

3.10 Patient Partner Engagement

Attributes of Patient-Oriented Research (POR) have been included in this project to ensure project objectives and topics to be covered are informed by application-based practice and real-world experiences with the BCEHS CP program. As a recipient of the BC SUPPORT Unit Northern Centre Graduate Studentship Award, it was expected that the researcher (AS) would complete POR training and include patient-oriented research attributes in this project, training completion was not possible due to the COVID-19 pandemic restrictions. The researcher (AS) had completed two of the four POR training modules prior to beginning this project and, through the support of project supervisors, was able to include two POR attributes in this project: stakeholder engagement during the project and question development, and patient engagement during knowledge translation planning and delivery (BC Support Unit, 2018). This engagement was performed as a way of exploring the use and application of POR in qualitative health research while not overstepping the researcher's (AS) knowledge, understanding and qualifications to perform POR ethically and responsibly.

For the first attribute, during the development of project objectives and research questions, two CP mentors were consulted to ensure project objectives aligned with the BCEHS CP program objectives and practices. Though diverse literature was reviewed and used in this project's development, the researcher (AS) wanted to ensure theoretical underpinnings and understandings aligned with practice and application of CP guidelines, protocols and theories. The CP mentors consulted, along with other CP mentors within the program, will not be interviewed in this project as they hold a supervisory role within the BCEHS CP program. This consultation provided an opportunity to collect input from stakeholders who have extensive CP experience and who hold active CP roles without reducing the number of potential participants.

The second attribute of POR included in this project intends to be consultation with a current or previous CP patient, identified by a CP interviewed, who will voluntarily participate in discussions around what information should be delivered to patients and how findings of the project align with their understanding of and experiences with the CP program. This will ensure that knowledge translation proceedings align with patient understandings and experiences to optimize the applicability and relevance of outcomes to patients. Though information in relation to the patients' experiences will not be used in data reporting or summary, it will be used to inform the delivery of information to patients, targeting key messages and considerations. Though this project has not utilized all attributes of POR, the researcher (AS) intends to complete training in POR and further explore this research approach in future research projects.

Chapter Four: Findings

4.1.0 Introduction

This study explored the perspectives of BCEHS CPs working in rural and remote BC, exploring the status of CCs, practice of CPs, and impacts of COVID-19 on CP practice. Three research questions lead theme identification and data analysis.

1. How do practicing BCEHS CPs perceive the status of CCs in rural and remote BC?
2. How has the BCEHS CP program affected CC management among patients in rural and remote areas of BC, from the perspectives of practicing BCEHS CPs?
3. How has the COVID-19 pandemic impacted the practice of BCEHS CPs, and what adaptations in care and delivery of services have been made?

In total, 15 interviews with BCEHS CPs were completed, ranging in length from 25-77 minutes, averaging 56 minutes. Interviews were conducted May and June 2021 with ten interviews completed over Zoom videoconferencing and five competed over the phone. Throughout the interview and transcript review process, no ethical or emotional impacts arose, and all participants allowed for the use of their transcripts, representing a 100 percent (n=15) participation rate.

Data analysis was guided by the principles of interpretive description as presented by Thorne et al. (1997) and Thorne et al. (2004), with four primary themes standing as sensitizing concepts, established through the research questions proposed. These themes were however clarified and strongly supported through the findings of the interviews conducted. An example of this is demonstrated by theme three, *Improved Chronic Condition Management,* in which the sensitizing concept of identifying an affect of the BCEHS CP program on CC management was known, but the emergence of improved CC management was identified. Within these primary themes, nine sub-themes were identified within the data and represented both sensitizing concepts congruent with previous literature and concepts within the research questions, and others emerging from the interview data throughout the analysis. These elements stand to provide strong support for well established concepts such as poor CC management among rural and remote populations, the social determinants of health playing a role in CC management, and the role of IPT within CP practice in BC. Whereas emergent elements, including the importance of face-to-face engagements, neglect and denial around CC and CC management among CP patients, and elements of adaptability to meet community and population specific needs surfaced throughout the analysis process. The following sections have been organised as to represent a story through the care pathway BCEHS CPs encounter and have worked through, including elements of the COVID-19 pandemic that CPs shared as evidence for the importance of key elements of practice foundational to their ability to provide meaningful and truly patient-centered care.

4.1.1 Participants

Following the inclusion criteria for this project, all 15 BCEHS CPs recruited to this study were actively working as a BCEHS CP, did not hold a management or leadership position within the BCEHS CP program, were PCP-IV qualified CPs, and were out of their six-month probation. Six male and nine female participants came forward to engage in the study with participant experience as a CP ranging from one year to five years, and experience as a paramedic (including CP) ranging from four years to 30 years, with an average of 17 years. At the time of interviews, participants were still re-introducing home visits with patients and community events, with these practices becoming more common nearing the end of the interview period. A summary list of participants, their experience, size of community served and status of a ‘CP partner’ in their community is shared in table 4.

Table 4

Summary of Study Participants

Participant #	Gender	Years as a Paramedic	Years as a CP	Community Size	CP Positions in Community
1	Female	30	4	2500-5000	1
2	Male	8	4	2500-5000	1
3	Female	25	3	2500-5000	2
4	Female	18	3	2500-5000	1
5	Female	10	5	1500-2500	2
6	Female	4	3	1500-2500	2
7	Female	29	3	5000+	1
8	Male	5.5	1	500-1500	1
9	Male	25	4	1500-2500	2
10	Male	6	3	500-1500	2
11	Female	7	4	2500-5000	2
12	Female	18.5	5	1500-2500	2
13	Male	15	2.5	2500-5000	2
14	Female	29	4	2500-5000	2
15	Male	23	2	5000+	1

In reflection of the attributes considered for saturation, both theoretical and thematic saturation as presented by Hennink and Kaiser (2022) and Hennink et al. (2017), was achieved in the data collected. Across interviews conducted, thematic analysis demonstrated a saturation of core themes and codes with common attributes shared multiple times. This solidified evidence and guided the identification and presentation of themes throughout the following sections of this report. Theoretical saturation was also achieved with CPs detailing rich and deep insights on core themes, ensuring a holistic description of the themes presented. This met the suggestion by Hennink et al. (2017, p.591) that this research both “heard it all” and “understood it all.”

4.1.2 Structure of Findings

Findings gathered in this study are presented under four primary themes following the research questions explored and themes emerging throughout the analysis process. These four primary themes include: exploration of the status of CC from the CPs perspective, effect of the CP program on CC management, improved CC management, impact of COVID-19 on the BCEHS CP program. Throughout interviews, participants were asked to discuss topics in detail, with examples if they felt comfortable, to elicit deep and rich perspectives of the program, patients it serves, impacts of the care CPs provide, and presentation of work performed. As data analysis occurred after all data was collected, primary and sub-themes were identified using multistage analysis approach as described in the methods section of this report. Participant quotes and interview data are referenced as ‘P’ for participant and associated number (e.g. P5 for participant 5).

4.2.0 Community Paramedics Perspective of the Status of Chronic Conditions

Participants identified poor CC management among rural and remote patients as previously established in the literature review. Factors contributing to poorer CC management identified by CPs interviewed align with the well established and supported social determinants of health. The social determinants of health have long stood as a consistent measure of a patient’s ability to achieve a healthy lifestyle and maintain their health throughout their lifespan. Leading into this analysis of data, the sensitizing concept of known challenges meeting the social determinants of health among rural and remote populations in BC can be correlated with limitations in ability to manage health and CCs and was well supported through the interviews in this research. The exploration of CPs perspectives on the status of CC management and factors involved in the process of management, offer congruency with the known importance of the social determinants of health, and unique attributes from BCEHS CPs interviewed that emerged through this analysis.

4.2.1 Social Determinants Limiting Effective Chronic Condition Management

Across CPs interviewed, four social determinants of health were identified as influencing a patients' ability to effectively manage their CC. First to emerge from the data was socioeconomic status and access to subsistence resources in a patient's community. P15 identified challenges surrounding the socioeconomic ability of patients to be able to access day-to-day resources they need, while another (P13) added that a lack of available healthy food options in the community has contributed to patients resorting to lower quality options poorly suited for CC management. Another CP described the added element of remoteness, "they should move, go to a bigger place with more resources" (P5). Without the socioeconomic status to support a healthy lifestyle, motivation towards pursing healthy choices, including accessing healthy foods, is greatly diminished and was shared by numerous CPs interviewed. For example, one participant described this as "a huge gap. There's a huge, huge, gap" in patients' ability to make healthy decisions based on the context specific limitations related to rurality (P4). This sentiment was shared across CPs interviewed, with rurality, and lack of socioeconomic ability along side limitations in access to subsistence resources standing as barriers faced by patients they encounter.

When considering the target population of the BCEHS CP program, the patient's support system was noted as a key contributor in the success of patient's ability to manage their condition outside of a healthcare setting by numerous CPs interviewed. Though support systems were identified by CPs as providing assistance to patients who may face accessibility challenges or require basic care and support, when patients are facing significant health needs, as described by P5, limited support systems restrict the patient's ability to access the healthcare services they need to effectively manage their condition. P1 shared that there can be significant challenges for patients living on their own and those without a support system, describing one patient with complex care needing motivation from a support system the CP was able to establish a relationship to motivate them to complete physician ordered tests and work towards managing their condition. Without support, a cyclical pattern of poor health, spiralling the patient towards an exacerbation and further diminishing their potential of control is inevitable (P5). From other CPs interviewed (P15, P3), outcomes of patients with supports were far more favorable including managing activities of daily living, their CC, medication management, and improved overall QoL. Once established, as P1 described, maintenance of a robust support system and the integration of care services is far more achievable but takes considerable investment to establish.

Access to health care services, a sensitizing concept, is the foundation of any healthcare program. However, access to services in rural and remote areas has historically been challenging and has required creative development and gap-filling solutions. CPs shared that most patients they engage with have access to a primary care provider but these appointments were often limited in time, and patients did not feel they had an adequate opportunity to discuss their health, develop plans, ask questions, and leave with a holistic understanding of what their primary care provider was aiming to achieve. P1 described, "The doctor gives you ten minutes, I've got an hour with my patient. … So I'm listening to them, I'm watching them, I'm encouraging their learning, teaching them how to breathe" (P1). For patients, time is critical in developing understanding of their condition and goals of care and P10 described that when engaging with a primary care provider patients feel as though they are in a "crash course to chronic condition management" (P10), and not able to understand their condition, how best to manage it, and the value in putting in the work for effective management. For patients discharged from hospital, they may feel as though they do not remember any information from their visit, with P10 describing engagements as too much information, too fast, resulting in no retention, and in some cases, added confusion with what their care plan is. Both P2 and P15 directly referenced the education necessary in understanding the reasons for and use of puffers among patients with COPD, and how patients felt lost in not only how to use their puffer, but when to use it, actions they should be taking to prevent its use, and when additional help should be summoned to support an exacerbation event. For patients living with a CC, understanding is paramount to their successful management, and the path towards understanding starts with meaningful engagements with their primary care providers. P2 described, patients often encounter primary care providers and allied health professionals with limited time available, a lack of holistic understanding of the patients' condition, and no emotionality which limits patients comfort to clarify the "orders" (P2) they are being given.

4.2.1.1 Health Behaviours. The social determinants of health, a foundational sensitizing concept, describe health behaviours as a key determinant in guiding patients' actions and activities, contributing to their overall ability to manage CC. CPs interviewed identified numerous behaviours which contributed to poor CC management, and a progression in CC. Two health behaviours emerged in the interviews with BCEHS CPs and included limited patient understanding of their condition, and denial or neglect of their care needs.

Patient understanding of their condition was noted by several CPs as directly contributing to engagement with healthy behaviours and attempts to manage CCs. Among the patients P13 engaged with, patients’ level of education contributed to their ability to understand the importance of CC management, and how best to manage. This can result in the patient being “arrested with pain or a chronic condition” (P13) and further push them towards a lifestyle incompatible with effective CC management. P13 described that among patients, limited understanding of the associations between a docile lifestyle, increased food intake, and risk of developing obesity stood as a common barrier patients were unable to overcome. P3 provides support for this sharing that patients who lack motivation rooted in limited support from and time with primary care providers, do not understand the progression of their CC(s). This restricts patients’ ability to manage even basic aspects of care, such as fluid intake and types of food chosen. This is also compounded by the previously mentioned limitations in rural and remote areas regarding the access to healthy choices or services that may support a CC management journey. From limited knowledge, discouragement may arise and without an understanding of the “process or how to and why to care for themselves, they aren’t going to doing well” (P14). Several CPs shared this same sentiment and that without an intervention of support and motivation, patients are likely to continue their progression of poor CC management and health.

4.2.1.2 Neglect and Denial Among Patients. Neglect and denial of patient health status emerged from the interviews as contributing to worsening CC management. P10 described that neglect and denial encompasses numerous elements including patient’s decision making throughout their lifetime (e.g. diet, exercise), family history and personal habits, and learned behaviours they have incorporated into their lifestyle. “They are just on a collision course with one of these chronic diseases” (P10) adding that these decisions of neglect and ignorance to their condition compound throughout the lifespan and worsen the conditions patients are often already poorly managing. P11 summarised the multiple factors that can contribute to one's neglect or denial,

> There's a lot of neglect that happens with one's own care. So, I think a lot of people tend to go into a sense of denial, and then just kind of truck along thinking they're managing their care when in reality, there's more they could be doing to manage their care. And either for a lack of motivation, lack of caring, or lack of feeling like they can control it. I think a lot of people have a sense of like, well, this is where I am and this is what's happening to me, and there's nothing I can do about it, instead of really taking the reins and driving the horse. (P11)

Considering this, patients can find themselves in a situation where "they're not equipped to deal with life or their challenges" (P13), perpetuating their condition towards poorer health and feeling as though nothing can help them recover. Sense of denial as shared by P8 is a key contributor towards poorer health outcomes, higher risk of exacerbation and need to access reactive care services. In some cases, this progression can take decades to build, but in others, can progress rapidly, with deterioration towards exacerbation noticeably brewing, but patients "grin and bear it for as long as they can" (P8). In some cases, as shared by several CPs, this can go as far as not wanting or feeling the need to go to a hospital, further progressing this cascade towards exacerbation and potential irreversible impacts on health.

4.2.1.3 Escalating Obstacles of Progressing Chronic Condition. Across CPs interviewed, there was a noted pathway observed that as a patient's health deteriorated as a result of the aforementioned attributes, so does their ability to cope with their CC, and prioritize their health and CC management, leaving them with a feeling as though stopping the spiral of poor health seems impossible (P1, P8, P11, P14, P15). This pathway emerged through the interviews and provided a glimpse from the perspective of CPs embedded in patient care into the nuances of how patients' conditions were progressing and ending up worse if intervention was not initiated to reroute the pathway.

The first factor to consider was patients' understanding of their CC, how CCs may escalate, contribute to related conditions, and the severity of consequences if management or treatment is not sought. P14 describes that without an understanding of the process of disease progression, how and why they should be managing their condition, patients do not fair well, resulting in a higher likelihood of patients giving up on themselves. Two CPs (P4 and P11) described the compounding affect of ineffective CC management and poor health that leads to an "inability to change" behaviours (P11) or seek assistance in understanding what patients have to manage. Instead, discouragement may build, and a loss of control result in feeling that efforts towards management are done in vain (P11). Though not for all patients, these factors may stand as an "excuse not to do what they're supposed to" (P1) despite, in some cases knowing what they should be doing, or reaching a point where they understand the potential outcome, but do not take action to change the trajectory they are facing. Though not overtly self-malice, as an outsider to the situation, CPs described patient behaviour as a self-guided condition and result of the accruing situations patients find themselves in.

Another factor CPs shared in the escalation of obstacles among progressing CC, is the theme of patients feeling they are a burden and find their health and ability to manage CC worsening. Often described as being led by fear and the unknowns of their condition, needs, and potential of progression, CPs shared that patients often find it challenging to seek help, or know where to look for it (P8, P15). As P15 describes, patients may feel as though they are "a burden… (and) don't want to be a bother" to those who may be able to offer support. Numerous

CPs described this in regard to the prevention of exacerbation and how the escalation and severity of exacerbation is a far greater burden on the healthcare system, patients, and anyone who may be involved in the patients' care. This results in patients not seeking the care they need and encountering obstacles they feel they cannot overcome. Without active pursuance of care, regardless of whether it is associated with self-motivation, feelings of burden, anxiety around the unknown, and the progression of their CC, there is an inevitable continued progression in these factors, with their ability to manage their CC the core component in this pathway (P10). The idiom of 'throwing in the towel' stands to summarize these factors or escalating barriers in effective management and for patients facing further deterioration, as CPs interviewed described, it is harder to steer away from this feeling and work towards improving one's condition, as opposed to giving up.

4.2.2 Progression of Chronic Conditions, Exacerbation, and Management Through Emergency Medical Services and Emergency Departments

CPs described, as a result of poorly managed conditions, a lack of accessing supports and services, deterioration in morale and ability to lead a healthy lifestyle and work towards effective CC management, patients often end up living with progressed CC, higher risk of exacerbations, and management through EMS and ED services. This emerged from the data and CPs shared that though each of these factors stand on their own as significant contributors to a decreased QoL, increased care needs, and a progressive deterioration in the healthspan of the patient, their compounding effects can catalyse the others, progressing poorer outcomes exponentially.

Numerous CPs interviewed described that as CCs including diabetes, COPD, HTN, and CHF progress, the potential of patients to be able to effectively manage them becomes more challenging and requires services, supports, and interventions beyond those patients are able to do themselves. This may include regular medications, hospital out-patient or in-patient services, surgical interventions, regular primary care provider appointments to guide care, and specialist appointments when specialty services are needed (P5, P6, P7, P8, P9, P11, P12). However, for these factors to be initiated, it often starts with the aforementioned deterioration in a condition that results in an emergency or exacerbation encounter with EMS and ED visit. P2, P8 and P15 describe this as a cyclical pattern of progressed conditions, exacerbation, 'corrective' treatment, discharge, limited to no follow up resulting in progression, exacerbation and another encounter. P8 described "911 is how a lot of people manage their conditions," and for the patients they engage with, this has become a standard procedure, to call EMS, and initiate treatment in the ED. From this comes a pattern described by P2, who mentions that even for patients who may have a primary care provider,

> Most of them do not have flare up plans, the doctor has never taken the time to sit down with them to introduce them to … written information that they can interpret themselves and see what to watch out for and be able to manage when they have flare ups. (P2)

CPs described patients without a primary care provider, or primary care providers who are not deeply involved in the patient's care, the intricacies of the patient's lived experiences is not understood or considered (P5, P6, P7, P13). CPs describe the lack of understanding on the patients' overall condition, "doctors only get a very small glimpse, they're not in their homes, they're not seeing … the dishes piling up in the sink, and that they haven't got off the couch in four days" (P7). P7 described numerous situations where physicians sporadically visited their community, limiting appointments with patients, resulting in medication reviews not being completed. As P7 describes, "lots of people … fall through the cracks." P6 extends upon continuity of care, describing that though not a fault of the physician, the continuity of care for patients with complex and often multiple CCs is not adequate. Complex patients require complex and consistent care and without it, condition deterioration occurs and “I will call an ambulance and send them to emerg” (P6). Patients try to manage on their own, but as P15 describes, ultimately end up in the ED as they do not have the supports and treatments available to be able to manage an exacerbation independently, so EMS and ED services are the only pathway.

Several CPs interviewed described that as a result of emergency encounters with inconsistent, often multiple emergency care providers who may not function in a primary care role, there is a lack of follow up and continuity of care for patients. P7 described that with consistent primary care provider engagement, planning care beyond an active exacerbation can occur, and there is a much greater chance that a patient is able to manage their condition and prevent exacerbations. P4 mentions that in order for patients to have meaningful engagements, feel valued, and become equipped with the tools needed to manage, they need to be prevented from “crashing and being taken to the ER,” (P4) and instead fill the gaps, provide the information patients need, and offer an opportunity to motivate them into managing their condition effectively.

4.3.0 Community Paramedic Practice and Effect on Chronic Condition Management

From CP interviews, there emerged a strong suggestion that CC management requires ongoing, tailored, and consistent care planning involving a primary care provider, and ideally a team to identify factors that can be managed to optimise patient care and condition. CP engagements with patients stand to inform actions and planning with the healthcare team and are necessary to capture the real-world understanding of the patient’s condition and abilities. This can facilitate care planning that the patient has a vested interest in, fostering the potential of active participation. This section identifies and describes these factors, and the healthcare pathway along which CPs are engaged in to assist in providing truly patient oriented care.

4.3.1 Collaborative Care Services for Patients

Along the pathway of CC management, CPs stand as critical providers, offering their own set of skills and services to the IPT and patient care planning. The CP becomes woven into the team-based care model, to support activities and provide input to prevent exacerbation events, ensure care planning is based on patient specific needs, and support the patient on their CC management journey. This model starts with patients being referred to the program through a primary care provider, nurse, care team managing the patient's case, or acute event, often through an ED. As shared by CPs, though referral to the program is not a self-admission process, patients who engage with primary care providers may be admitted into the program through a request or interest in what may be offered as supportive services, beyond traditional primary or acute care. For patients in these positions, the importance of collaboration was an explicit factor mentioned by all CPs with care planning, IPTs, and a holistic approach to care necessary to the management of CCs.

4.3.1.1 Referral to the Program. For patients encountering the healthcare system as a result of a poor CC management, exacerbation event, and the need for EMS and ED care, this may be a starting point for them to be woven into a care plan but requires an understanding of the CP program from the primary or acute care providers as described by CPs. An initial encounter with the healthcare system often involves and exacerbation event, as described by P4 and P5. Patients attempting to manage CCs on their own, even if they are engaging with a primary care provider, are more prone to falling into a cycle of going home with little information or more questions than answers, lacking the supports and understanding to manage their condition, and end up back in EMS and ED services with an exacerbation event. This turns into a cyclical pattern, “They’re still sick. Either they end up dying, or they just go back and forth. So that puts a strain on the emergency department, the doctors, and EMS” (P5).

For this cycle to be broken, CPs identified that primary care providers can work to intervene in care upstream, and with an understanding of the CP program, refer patients who could be supported by CPs. Primary care providers have varying levels of knowledge of the CP program, understanding of how to refer patients to the CP program, and willingness to refer patients to the CP program (P13). P13 described, with increased ED encounters in rural and remote settings, there is an increased likelihood of referral to the CP program by a primary care provider, as in many of these contexts, EDs are staffed by primary care providers. P5 and P7 noted gaps in the referral process describing ways they had to go around traditional referral pathways to admit patients into their care. This was a result of a lack of a pathway for paramedics working in an EMS role to be able to refer patients they encounter during a 911 call, to the CP program (P5 and P7). As described by P3, this may start with the CP working in an EMS role, identifying patients who could be candidates for the CP program, having to share this with a primary care provider or IPT to get them into the program, due to the lack of a paramedic referral pathway. As mentioned by P5, once the patient is referred to the program and the CP is able to arrange a consultation to understand patient care needs, in collaboration with the IPT, decisions on who is needed to meet the patient’s particular care needs can be made. P5 and P7 support the optimization of referral pathways, opening additional pathways, and further developing the IPT offerings among all communities across the province.

For referral and the identification of care needs to be adequate, an understanding of patient care needs must be made by all providers involved in the IPT (P7). This group effort approach to care ensures that patients are viewed in a holistic way, working as an allied team of providers to ensure that each care need is met to the best ability of the team (P7). This approach allows for advocacy for specific needs, particularly by the CP, who is more likely to have a deeper understanding of the patient's living condition, ability to manage, and understanding of their condition. This is informed through CPs' often longer and dedicated attention paid to the patient and ability to see the firsthand results and outcomes of interventions the care team is employing (P13).

4.3.1.2 Collaborative Care Planning with Interprofessional Teams. A hallmark of the CP program, as noted by CPs interviewed, is its approach to care through collaborative planning, and the integration of an IPT with a variety of providers all specialized to offer specific, yet interworking services. This ally-based approach allows for the patient to not only receive the most tailored and appropriate care possible, but ensures that healthcare providers and the system at large are not burdened in one direction or another (P4). This places providers back into their intended role, not overextended their capacity, as they support the patient in their pathway towards management (P4). Though care planning and team meetings have long stood in healthcare practice, by including CPs in this process, they felt they were able to offer a unique, first-hand perspective on the patient status outside of the care facilities, understand basic needs relevant to their daily functioning, and identify where gaps exist and who within the team is best positioned to support them (P4, P7, P11). Liaising patients with others within the care team was identified by P5, P7, P8, P11, P12, and P13 explicitly, describing numerous instances where patients were directly connected with providers, resources, and in some cases speciality care services to best meet their care needs. P13 mentioned,

> So when we notice them (friendly faces) on car [emergency ambulance]or the hospital staff notices them coming in the ER a lot, that's where the CP can have some value, we jump in, and we can work with these people to manage their CCs and link them up. That's one of our superpowers as a CP is to link them up with several different agencies (P13).

This linking of services, bringing a patient into a "community circle of care" (P4) and working in a "team-based approach to care" (P5) was an effective intervention as mentioned by nearly all CPs interviewed, in being able to truly identify and meet the needs of patients. Numerous programs including Better at Home, local food banks, medication drop off programs, community and in home nursing, and social services, were all identified as contributors to the success of the patient in their home and ability to manage their CC (P3, P4, P7, P12). This creates a sense of accountability to ensure that if an aspect of care needs is not met, the team together will work towards meeting it, ensuring the patient is satisfied and feels supported (P4, P12). Consideration should be given to available community resources, and if a CP or other member of the team may be able to work through alternative connection methods such as Zoom, telephone and other remote patient services (P4, P8). Though some patients may lack resources to easily engage, CPs described being positioned to be able to fill these gaps, be creative in finding solutions, and support in any way they are able to (P4, P7).

4.3.2 Face-to-Face Engagement

Across interviews conducted, all CPs identified face-to-face engagement as one of the most important factors in developing an understanding of the patient's condition, their living conditions, and how they interact with those around them. These factors, along with health focused assessments by all those involved in patient care, can holistically inform care decisions and how to best support the patient. This understanding extends to the importance of developing trust with patients, building a relationship to support them in a meaningful and genuine way. These were identified by CPs as significantly contributing to the outcomes of a patient in their CC management, overall health, and patients' willingness to work with and act upon care plans developed with them.

4.3.2.1 Foundations of Face-to-Face Care. Across CPs interviewed, face-to-face engagement stood as one of the most important factors they felt contributed to effective, meaningful, and fruitful engagements with patients (P2, P4, P5, P6, P7, P8, P9, P11, P12, P14, P15). This not only assisted CPs in developing a trustworthy relationship and understand the intricacies of how a patient can be best supported in their CC management journey (P7, P9, P14). As mentioned by P7, "I'm seeing clients on a regular basis, she (doctor) cannot go put eyes on these people as often as I can. That's been really, super beneficial, and has really avoided hospitalizations" (P7). The sentiment of being the 'eyes' of the healthcare system was also shared by P11 and P14, describing that CPs are able to spend more time than a primary care provider and truly understand the patients' condition and abilities through the flexibility of their deployment. P11 described,

> I think there's a sense of oversight that we can provide to the community (interprofessional team) that we wouldn't otherwise see because healthcare teams are so busy, and they are so stuck in their little boxes, … and they only have so much time for this (P11).

Taking time to build relationships, understand the situation, help the patient understand what is going on, how they can be supported, and what steps may be necessary supports the positive care implementation (P2, P3, P5. P8, P12). P3 summarized,

> But the time, what an incredible thing, being able to sit down with people and figure out what it is with them in particular that makes it difficult for them to understand or want to do some of the things they need to in order to mitigate their ongoing disease process (P3).

For patients who have not been able to develop and an understanding of their condition, get questions answered, or have time to develop questions to ask before their 10-minute appointment with their primary care provider is over is critical in understanding how to move forward in the management of a condition (P2, P3). Within this also comes the development of trust and connection, framing a CP as a trustworthy, reliable, and caring provider, whose goal is to support the patient, assist them in understanding, and be there when questions arise. P9 described this as a way of engaging in positive interactions, validating efforts, and ensuring patients are comfortable with their care planning. P2 described that ensuring care plans are reasonable and sustainable for the patients is the only avenue on which patients can find success in this process. Valuing patients in this way ensures they have a trustworthy resource and supportive provider and are holistically viewed beyond the CC they are trying to manage (P5, P8). Developing an understanding of a patient's day-to-day life challenges and validating their experiences, as described by P12, can ensure patients are safe and have the resources they need to support their management. P12 stated "it's absolutely life changing" (P12).

For effective engagement, patients need to be understood, acknowledged, and valued in their engagement, perspectives, and way of life though these may look different for each patient, it is critical to have eyes on this and understand how these function in a patient's life (P8). Identifying factors to ensure patient's safety including home heating, telephone access, internet access, and in some cases limited engagement with people outside of their home, should not limit patient's opportunity to pursue the life they wish to live (P12). Though this extended beyond the medical goals of the program, these factors play into the healthspan and daily abilities of the patients to be able to function, and without them, CPs feel they cannot offer the best services possible (P2, P5, P12). These factors have been observed as key contributors in patients' ability to engage in effective management, feel that someone cares about them, and understands their situation to best tailor a plan for their health (P2, P7, P12).

4.3.3 Improved Chronic Condition Understanding

Assisting patients in understanding their CCs involved interpretation of primary care providers' information on about patients' CCs, fostering active participation in the care planning process, establishing accountability measures for patients, and engaging an IPT to support CC management efforts through ongoing monitoring and assessment. These attributes, particularly on-going engagements with patients and helping them to develop a deeper understanding of their CCs were identified by all CPs interviewed as key contributors to successful CC management and improvement in patient condition.

4.3.3.1 Community Paramedics as an Interpreter for Chronic Conditions. As CPs engage with patients, understanding of a patient's CC, interpretation of information from primary care and specialist providers, and understanding medical language and jargon were identified a foundational role in a patient's ability to effectively manage CC (P2, P3, P4, P13). P13 describes CPs as filling the role of an interpreter for information passed along to patients from their primary care provider and how, patients may not have the knowledge or capacity to understand this information. This may lead to confusion among patients who are managing a "big pack of medication" (P13), not understanding what it is for, what they are on, and the importance of it for their health and condition management. For patients in this position, a lack of understanding may discourage them from wanting to take action toward understanding the management strategies provided, and importance of completing them (P2). P2 described the importance of informing patients of their care planning and allow them to contribute in this process, with some patients appreciating this, and working to proactively manage their CCs. Others, as P2 described, have become discouraged by previous experiences, have given up on the possibility of effectively managing their condition and “really don’t care” (P2). As P2 described this may be rooted in the perception of a lack of caring by the primary care provider, with an example of puffer utilization if a patient experienced shortness of breath as a result of their COPD, and not knowing how, when or why to use their puffer. This was also noted by P15 who described a general lack of understanding they were able to overcome with multiple patients, particularly those with COPD who often have multiple medications to manage their condition, and puffers to be used in time of shortness of breath or other exacerbatory symptoms. P15 credited multiple, preventable exacerbation events involving EMS and ED encounters to this lack of understanding and feels that with basic education and taking time to explain the importance of medication and puffers, they observed a noticeable reduction in exacerbation events and acute healthcare encounters.

With time can come change in perspective, understanding and willingness to engage, and P3 suggested that, though a slow process, working through each aspect of their care in a way patients understand can be an effective way to improve management. P3 used the example of a patient who was a mechanic and brought terminology in from that they would understand in relation to medication and condition management. P4 described,

> “You’re not stressed out about having to go somewhere and only spend 15 minutes with someone to just have a bunch of medical jargon thrown at them. They feel seen, I think that inspires them. I think they feel like they matter. And I think with just a little bit of

> effort, some time and, just small changes, that inspires and motivates them to just say, yeah, I can do this." (P4)

P13 described, healthcare providers cannot expect patients to understand the pathology of their condition, and why medical treatments and care planning is directed they way it is. The CP can fill in the gaps of understanding their condition, provide education, inform the patient, and both develop and support "solutions for managing their quality of life" (P13). It is important to recognize that in order to effectively manage CCs, working to educate patients, interpret information, and supporting patient driven management, are factors that are simultaneously independently but also deeply intertwined (P11). These foster a deeper understanding of the condition and management strategy for the patient, and support CP work towards continually tailoring care to patient needs and understanding.

4.3.3.2 Fostering Active Participation in Chronic Condition Management. In motivating patients towards managing CCs, CPs and the IPT seek active participation in care planning, consultation with patients for care optimization, and creating accountability for patients through tools such as HHM (P10, P13, P14). Consistent, unrushed, and thoughtful engagements focused on truly and deeply informing patients of their care provides an opportunity to understand the baseline of the patient's condition (P5). This foundation and socialization can assist in patients feeling supported, validated, and understood, motivating them to be more open to support and seek to answer questions or concerns they may have with their condition or care being received (P5). Patient mindset can shift to feel motivated and accountable, allow patients to see the potential to improve their CC and not seek excuses to why they are not engaging in the care they know could help them (P5, P10). Accountability and motivation, though important, may also become overbearing, as noted by P13 and P14, both of whom identified the importance of patient driven care and problem solving, but also seeking a balance in care driven engagements and nurturing the relationship CPs are able to establish through the care delivery model. This also allows for tracking of outcomes among patients as their care is being documented, to tailor care at all stages of their management journey (P12). P12 shared,

> I think we're breaking those barriers down, and they (patients) are beginning to see the benefits of taking care of themselves. Some patients refuse but for the most part, I see them finding it necessary, they find it useful, and they can enjoy life better with less hospitalizations (P12).

Empowering patients has demonstrated to be an effective measure of improving CC management engagement and opens a pathway for patients to not only be accountable but also advocate for their care (P15). P6 described:

> I think the self- management of chronic conditions has improved, dramatically. They've asked me the questions, and I've given them the information, and if I don't have the information, I go find it and bring it back to them. If I don't have the answer, I'm going to get you the answer, I'm going to find you the answer. I have gone to the point of being with my clients, phoning whoever I need to phone, put them on speaker phone, so we can hear the conversation, ask those questions for them and gotten those answers (P6).

Providing accountability for patients engaged with CPs often involved HHM services where patients were provided with basic vitals collection tools (blood pressure cuff, pulse oximeter, scale, and pedometer) which automatically and remotely synced vitals collected by patients (P1, P2). These attributes allowed patients and providers to look for trends, catch developing issues and potential exacerbations, and be accountable to their care plans. This motivates patients towards healthy behaviours, understanding the impacts of their actions, and support the work of the CP and IPT (P1). These activities seemed to be a tactile way of engaging patients with care, avoiding the continued progression of their condition, and develop an understanding of how they may be able to contribute to their health and outcomes (P2, P5). By engaging patients with these activities earlier in their CC management journey, P5 described CPs are able to work with the care team in preventative, upstream approaches to care, and even for patients with multiple conditions and a higher potential for exacerbation, early detection contributed to the prevention of severe exacerbations. P7 described three instances where exacerbations, which would have likely resulted in hospitalizations, were avoided because of HHM, while also provided a tangible representation of the patient's health status to them, and established motivation to improve their CC management and overall health trajectories. Data collection can also be valuable when establishing a holistic picture of the patient's CCs, with P11 sharing an instance of a diagnosis being established though HHM data, that would have likely been missed if tracking was not performed. Though internet and telephone access were available for many patients served by the program, as mentioned by P12, limited accessibility was a consideration in more remote areas, and though this was not necessary for HHM to function, it limited its remote useability and tracking capabilities. However, for the small population this may affect, the potential benefits of HHM were not overshadowed, as described by P12 or any other CP interviewed.

4.4.0 Improved Chronic Condition Management

Through the interventions delivered to patients by CPs engaged with IPTs, improved CC management was noted by all CPs interviewed. Through qualitative anecdotes and descriptions, a reduction in encounters with EMS and ED services, often as a result of decreased exacerbations, improved patient understanding, number of patients engaged in both care planning and execution, and improvements in patient status were noted. These factors were all noted as reducing patient reliance on reactive care services and shifted care to proactive engagements, upstream from exacerbation and worsening overall health.

4.4.1 Reduction in Encounters with Reactive Care Services

The BCEHS CP program was established with the goal to bridge healthcare service delivery gaps in rural and remote communities across BC. This statement, though general in presentation represented a number of components, all of which have been mentioned in this report and the interviews conducted with CPs. This gap is represented by numerous CC exacerbations resulting in encounters with reactive care services including EMS and EDs, progressing CC, lack of primary or supportive care services, and a lack of understand surrounding CC management and overall health. These attributes all contribute to a poorer healthspan, diminished ability or desire to engage with healthy behaviours, care planning, or treatments to manage progressing CC, and a lack of trust in healthcare services in relation to the ability to provide the care patients needs. CPs shared a noticeable shift, identifying numerous cases where increased support and time spent with patients, improved understanding, and positive engagements with the healthcare system demonstrated noticeable improvements in preventing exacerbations, managing conditions, and holistically improving patient outcomes and healthspan. These attributes along with supporting evidence CPs shared for why these have occurred are included in the following sections.

4.4.1.1 Catching and Preventing Exacerbations. As CPs work with patients to execute care planning and CC management, there were numerous examples shared where CPs caught escalating conditions, and potential exacerbations. There are numerous compounding elements that play into the potential of a patient to find success in their CC management and an element of this is working to prevent acute exacerbations, and identify when additional resources or interventions are necessary. P9 described the foundation of this by having an established plan with the patient, identify patient specific needs, building a strong relationship over time, and taking action towards stabilizing care and CC management. P14 described that understanding comorbidities and the significance of their potential complication in effective CC management can assist in understanding what is realistic to achieve in the prevention of exacerbations and worsening overall patient condition. Informing patients of the complexities of CCs, and clarifying information from a primary care provider can build trust with the medical system, and assist with achievable care planning and execution. This care planning towards prevention of exacerbation can also involve the patients primary care provider, with CP providing a link between the IPT and patient and able to spend more time with the patient in their home, information relayed to the primary care provider can paint a clear picture of the patient (P3). P12 described engagement with the patient's primary care providers likely prevented multiple exacerbation events, as measured by their regular engagements with patients in the community. Adaptations to care can promptly be made based on regular vitals signs and trends monitored by the CP, relayed to the primary care provider, and acted upon with medication and lifestyle changes (P12). P3 described the importance of engagement with an IPT approach so expertise can be used to suggest adaptations based on the information and observations of the CP. P4 caught a medication error that, once relayed to the IPT and primary care provider, was corrected, and established trust with the group. P4 credits knowing their community, understanding how to engage with patients and knowing who to contact to enact change and provide guidance as the key in delivering the best patient care possible. In considering these factors, P9 summarized the importance of these consistent engagements, “100%, there are less exacerbations going to the hospital… You know, it takes a lot of work, but I see a reduction for sure, because we catch things a lot sooner” (P9).

4.4.1.2 Decreased Emergency Department and 911 Encounters. Among CPs interviewed, a notable observation was made regarding EMS and ED utilization by patients enrolled in the CP program. As described by P15, “the frequent fliers become less frequent” as patients are better equipped to avoid exacerbations and necessary encounters with acute care services. Similar sentiments were shared by numerous CPs in this project, with P7 describing a patient who called for an EMS visit 33 times in a month, burning the patient out of available services, building resentment among providers, and unnecessarily burdening the healthcare system in that rural community. However, with the introduction of CP services, within a month this had been reduced to 20 EMS visits. After building rapport and establishing that the foundation of her calls was loneliness and a lack of understanding of the importance of condition management, it was decided that the CP would call everyday at 10 am. If the CP was out of town, or on a day off, another nearby CP or member of the IPT would do this, and with time, encounters with acute care services were nearly eliminated. P9 described a similar situation where a patient called for EMS 40 times in two months for falls, and after CP intervention, catching multiple potential exacerbations, encounters with EMS and ED services significantly diminished, and the patient’s condition notably improved. P9 described, if the CP is able to build a relationship with the patient, take time to identify and work to solve care needs, which are often complex and interplaying comorbidities, patient outcomes will improve, and less acute encounters will occur.

Though all attributes are related, as described by P13, for patients to have a consistent source of information, socialization, and motivation, patients are able to rely upon the CP, reducing the burden of exacerbation, and rather working to prevent them and use alternative resources such as CP care or HealthLinkBC (811) where an RN (Registered Nurse) can be consulted on questions or concerns. P13 mentioned that they often recommend that if a patient is unable to contact a member of their care team, including the CP, there are resources such as HealthLinkBC, as an alternative to immediately calling 911 for EMS care. P1 described, a decrease in exacerbation encounters and increased time spent with patients, can also facilitate more meaningful encounters with primary care providers, focusing on areas of long-term planning, identifying larger barriers, and motivating the patient to manage. These are just a few of the numerous attributes and factors that contribute to decreased ED and EMS encounters.

4.4.2 Contributing Factors to Reduced Encounters

Across CPs interviewed, the importance of consistency in patient visits, and time spent with patients was central to the success of care planning and patient outcomes. P8 describes this as having a cup of coffee and hanging out with a patient for an hour, rather than going to the hospital, describing that their management plan prior to CP care was a 911 call and hospital visit. Though regular emergency encounters may not always be the reason a patient is admitted into the CP program, numerous exacerbation encounters can be a catalyst for recommendation to the program, and offer an opportunity for an alternative intervention. P8 explains the most notable barrier for their patients is inconsistency in quality, non-rushed visits, allowing patients the time to ask question, deeply understand, and build a plan best suited to their needs and abilities. P1 describes that a primary care provider normally has only 10 or 15 minutes, whereas a CP has an hour to discuss needs, listen to the patient’s perspective, observe their behaviours and abilities, encourage the work they are doing, and guide them towards healthier behaviours and improved CC management. P4 mentions that patients often share feelings of being stressed about the limited 15 minutes they have with their primary care provider, and making sure they are using their time as affectively as possible, but become lost in understanding care plans, jargon, and other ‘medicalized’ attributes they are not familiar with. However, with adequate time spent, and attention given, all CPs mentioned the potential of improving understanding, motivation and overall CC management.

CPs identified connecting patients with appropriate members of the care team as also contributing to improved CC management. Through CP engagements with the patient, they can identify and coordination additional services and supports (P13). This can be extended to an advocacy role CPs fill in some cases, where they work to advocate for the patient seeking care, needing supports, and wanting services, and through an IPT approach, the outcomes of such advocacy have been more fruitful with the CP involved (P8, P11, P12). P11 describes that improvements may be small such as remember to take medication, or large such as enrolling with a primary care provider, but all represent positive movement towards effective management, and reduced exacerbations. CPs describe the potential for patients to move away from “disaster management” (P9) to meaningful engagements and care centered on the patient’s capacity, needs and goals maximizing the healthspan of all patients across BC.

4.5.0 COVID-19 and the BCEHS Community Paramedic Program

Across the healthcare system, the COVID-19 pandemic introduced significant challenges in almost every aspect of healthcare and care delivery. The BCEHS CP program was not immune to this, and the delivery of CP services across BC were adapted to align with community and patient needs, recommendations and guidelines, and availability of services and resources. CPs shared that a noticeable deterioration in CC management and patient condition across the entire province was observed and raised significant concerns among care teams working to support patients to the best of their abilities. CPs shared numerous adaptations and changes in their delivery of care, and the subsequent impacts of these changes, most of which were towards a deterioration in ability to provide care and outcomes among patients. For CPs who worked hard to establish the program, support patients holistically, and work towards improving care across BC, feelings of despair, frustration, and inadequacy in the care they were able to provide emerged (P7, P13). This challenged the core of CP practice and approach in BC, but also exposed the potential of the CP program, approaches to care, and value in delivery that stand as the foundation of the BCEHS CP program, and the need shared by CPs to return to practice they knew was working to improve care and CC management across BC.

4.5.1 Changes in Service Delivery

As COVID-19 restrictions and guidelines swept across the healthcare system, CP practice transitioned from in-person to virtual care with CPs sharing that their ability to understand the patient and their condition, build the relationship necessary to delivery effective care, and foster a sense of active participation, was significantly diminished (P13, P15). P13 described, without in-person engagements, there was limited value in the program, deteriorating the potential of improving care and management, and continuing the work CPs had done with patients in their communities. P13 extends on this, describing that the longer patients went without in-person engagements, the lonelier they became, further deteriorating their condition and ability to stay motivated and focused on their care and self-management. P15 describes similar sentiments with the quality of care diminishing significantly before CPs were able to go back to in person engagements, demonstrating the value of the importance of face-to-face engagements. This factor will be revisited near the end of this section with the following sections sharing multiple factors identified by CPs as markers of a deterioration of patient condition and care delivery as a result of adaptations made through COVID-19.

4.5.1.1 Comparison Markers to Pre-COVID Practices. As a result of the COVID-19 pandemic, all engagements CPs had with patients transitioned to virtual care through telephone meetings, Zoom, and HHM, presenting unique and often significant barriers to engage in meaningful care. Challenges arose around accessing and using virtual care services, reluctance by patients to want to share information through virtual care, lack of understanding of the patients' broader environment, accessibility to services and basic needs, and supporting them to achieve care goals.

A concern raised by all CPs interviewed was the use of virtual care among the target demographic of the program often being older people, those who fall into a lower income bracket, and who are more likely to be unfamiliar with virtual connection methods (P4, P6, P14). P6 describes this as patients in their area not only lack the technological literacy to participate in virtual meetings, but also due to the rurality of their location lacking internet access to be able to support Zoom or Facetime. P12 described some patients still using rotary phones, and lacked any internet access or cellular service to support virtual care or remote HHM. P2, P4 and P11 described the aforementioned considerations on top of financial constraints, limiting patients' ability to invest in technology to support their care, and resulting in frustration with the overall delivery and management of care. Described by P3, P4 and P5, telephone check-in with patients, sometimes on a daily basis was helpful in providing some continuity of care, but again, was not nearly as affective as face-to-face, in person care where the CP could observe the patient in their environment. P15 described,

> I had to do phone calls, and I did video calls. And it just didn't feel right. But it had to be done. It was just not conducive to good care in my mind, and the doctors didn't like it either because they weren't getting that set of eyes and ears to the patient, getting vitals and stuff like that (P15).

This similar sentiment was shared by P14,

> I hated it. I felt like I lost connection with people. This is going to be a hard one for me … One of my patients passed away, and if I had eyes on them … We knew she was going to pass away at some time, but she didn't even have a cell phone. So, when the weather got warmer, it would have been nice to be able to go and keep your distance and still be able to see them because what you can't see, what I don't see can hurt them (P14).

Virtual care presented challenges for CPs' professional practice and feeling of satisfaction with the care they were providing. P11 described these challenges as trying to do a EMS call over the phone, describing the numerous challenges one would face in trying to gather the information needed in an accurate, effective, and meaningful way to inform treatment and transport decisions. With this lack of control in developing understanding and delivering care, P11 describes a sense of languishing, and having to work through numerous struggles in everyday practice to come back the next day and have to face even more. As some patients did not trust virtual care, sharing concerns around security and privacy, as described by P5, others sometimes wanted regular and frequent check-ins, or as described by P3, irregular check-ins. If expectations of each individual patient were not met, frustrations built and considering the stress of the overarching COVID-19 pandemic, tempers flared and the patience of all involved faded (P5, P15). Though many CPs attempted to find ways around restrictions, and in times when certain restrictions were lifted offering outdoor wellness checks, community outdoor walks, and virtual wellness groups, all describe in section 4.5.2.1, P2, P5 and P7 summarized the need for face-to-face contact as without it, exacerbations were missed, patients' CCs worsened, and the potential for degradation of investments in care were inevitable.

4.5.1.2 No Face-to-Face Contact. Though virtual care was introduced as a way of contacting patients, continuing with care planning, and supporting them through an unprecedented event, CPs shared a significant loss in capacity and capability to deliver care comparable to that delivered through face-to-face engagements. All CPs interviewed identified this as the most significant factor contributing to poorer patient outcomes, increased frequency of exacerbation, and for some, death among the patients they served (P3, P14). As previously mentioned, P14 attributed not being able to see a patient in-person, and know what was going on, to the cause of their death, representing a significant burden of guilt for the CP. P3 extended upon this mentioning multiple patients ended up in hospital with exacerbations and worsening CCs, because of the diminished quality of care they were able to provide. In their community, P3 identified multiple patients that, though they cannot directly correlate, ended up deceased post prolonged hospitalization as a result of CC exacerbations, and/or an acute condition that worsened and resulted in an exacerbation (P3). CPs attributed this to a lack of truly understanding how patients were doing with P13 describing,

> That's one of the hallmarks of a paramedic, 'LLS' Factor. Looks like shit, then you're going to raise the alarm bells and get them to the hospital. But in this scenario, you're calling them up and I imagined myself in a cave, feeling around (P13).

Or P6 describing,

> So, if you can’t lay eyes on your patient, how can you know how they’re actually doing? Because on the phone, they’d be like, oh, yeah, I’m doing fine. Meanwhile, the dog is chewing on their leg. Like, you don’t know (P6).

For CPs who are trained as emergency paramedics and transitioned towards CP work, as P15 described, it is critical to have eyes and ears on the patient, and understand what it truly going on. Without this there is no capacity to provide quality care (P15). Patients were left feeling as though they were not cared about, and that any work they were putting in was not helping their management and overall condition, resulting in them give up on their own care (P15).

4.5.1.3 Fallout of Virtual Care Transition. CPs identified multiple fallout impacts as a result of the transition away from face-to-face engagements. Though not isolated to P4, they identified a feeling of patients mourning the loss of the life and support they once knew, shutting down of their social network, and a loss of the consistency and quality of care they were engaged in. Across CPs interviewed, they observed patients falling through the cracks of the healthcare system, unable to avoid exacerbation, and a lack of understanding on the patients’ true condition in a holistic way (P7). Among patients and their families, concern for their welfare built as patients were not managing their health on their own without the in-person support they once had. P6 described a family that decided to move a patient back home with them to offer in-person care. P5 and P6 described situations where after a phone conversation with patients, identifying that accessing primary care was not possible in a reasonable time frame, that it would be best for patient to seek emergency care, and the CPs activated EMS to transport the patients to the hospital. This was in direct contradiction to the CP programs goals, and work CPs were engaged in to support patients through their care, but also stood as a way that CPs could assist in care knowing when it was best for patients to seek help, preventing further deterioration or death

(P4, P5, P6). As described by P14, CPs shared a feeling of loss, hopelessness, and defeat for the care they offered and patients they engaged with, and that without the foundational elements of CP practice, the potential to make a meaningful difference in patient outcome severely deteriorated.

4.5.2 Adaptability of BCEHS Community Paramedic Program to COVID-19

Though the COVID-19 pandemic introduced numerous challenges and poorer outcomes for patients, it also provided support for numerous core attributes of the CP program. CPs across BC knew their communities and patients, understood what they needed, adapted to meet the needs to the best of their abilities, and identified specific attributes of the program that should be reinstated to optimize service delivery in rural and remote BC. The following section discuss the adaptation made to serve their patients and the frustrations associated with adaptations, supporting the return to specific hallmark pre-COVID-19 CP practices.

4.5.2.1 Adaptability of Services. CPs described numerous unique and tailored programs to engage patients and their community in healthy living, engagement with the healthcare system, and promote upstream approaches to health. This work was done collaboratively with patients and community members, identifying, establishing, and utilizing resources they know will best suit needs, and place patients as the central focus of any program or effort the CPs make (P13). The adaptability of both CPs and BCEHS CP program stands as a feature of CP practice, allowing care and services to be tailored to specific needs (P13). As CPs stand as a trustworthy, caring, and educated source of information and services, in times of needs, patients and community members can turn to them for support and understanding, especially during the uncertainty of a global pandemic (P8). The relationships CPs had built with patients and their communities prior to COVID-19 set a strong foundation on which adaptations could established, and information and services could be delivered (P8). As P3 and P6 described, they opened opportunities for groups of patients and community members to connect through Zoom events, with P6 describing the COPD support group they opened virtually to anyone across the province who was enrolled in CP care. This offered an opportunity for people to connect, seek trustworthy information, and find support in their CC management. P3 expanded on this and worked with patients to establish virtual connection in their homes though HHM equipment or find alternative ways patients could connect with specialty care services without having to visit hospitals. P3 described establishing walking groups in their communities to participate together outdoors while following recommendations to preventing the spread of COVID-19. P6, P7 and P11 mentioned, a concern for their patients involved food security and patients' ability to source their food, pick up medication, and participate in COVID-19 testing and vaccine campaigns. P6 described that their patients felt more comfortable and safer at home, but with flexibility in the CP program, P6 was able to pick up the patient's food and medication, deliver it to them, provide them with COVID-19 testing and vaccines in their home under guidelines for wearing personal protective equipment (PPE) and exposure time constraints. P7 and P11 also described picking up food for patients and being able to drop it off at their home, have a visit outside wearing appropriate PPE and, though not ideal, getting eyes on how patients were doing, and if they required services or supports the CP could link them to.

Across BC, both testing for COVID-19 and administering COVID-19 vaccines became a priority for the healthcare system to prevent the spread of the disease and protect those who were most vulnerable to it. CPs were identified as a more vulnerable group, at a higher risk of catching COVID-19, and experience worse outcomes as a result of an infection (P13). This opened an opportunity for an expanded scope of practice for CPs to perform COVID-19 testing and deliver the COVID-19 vaccines (P1). CPs engaged in COVID-19 vaccine clinics, targeted COVID-19 immunizations, and completed COVID-19 testing across their community to inform public health measures and assist in developing a true understanding of the active status of COVID-19 (P3, P13). As P11 described "we considered it to be very beneficial that everyone gets a vaccine, and we wanted to support our healthcare staff, because this is a priority for our community right now" (P13). This patient centered care and focusing on the priority of the healthcare system was paramount during COVID-19, and CPs were well suited to be able to meet these needs and ensure patients received the best care they could at that time.

4.5.2.2 Frustration with COVID-19 Response and Adaptations. CPs presented a unique group of healthcare providers as uncovered through these interviews, and their ability to identify patient specific needs and attributes, adapt to meet those needs, and their willingness to support patients through their care, are all hallmarks of what makes the CP program so valuable. P15 describe,

> "A client is a client, and you do your best for them in the moment, and I'm not going to change that. And if I have to wear more PPE or less PPE based on what's going on in the world, we roll with that, but its not going to change how I do my patients' care and how I approach my patients" (P15).

This resolve to serve under any circumstances stands as a testament to the commitment CPs have to ensure the care they provide is the best it can be. Significant adaptation to care did not come without challenges to the personal practice of CPs, and numerous areas of frustration arose throughout the COVID-19 response to strongly support the return of CP services back to a delivery more similar to pre-COVID-19 times (P1, P5, P8, P9, P10). As CPs were tasked with new duties, having to expand their scope of practice, and for those who held part-time CP positions, time was very limited, and there was a general lack of flexibility to adjust this limited time to fulfill their duties (P9). P9 described feelings of loneliness and isolation among fellow CPs, and feelings of a diminishing morale as there were limitations in their capacity to tailor their services and time to meet the needs of their community. Though outside of the control of the program, and due to the broader COVID-19 restrictions, P9 described a situation where they were unable to visit a patient who was terminally ill with cancer and for whom they had set up a MAID (medical assistance in dying) death at their home. P9 was unable to attend this, nor see the patient prior to their death, and they describe a feeling of unrest saying "I'll never be able to make that right in my head" (P9). P7 described a sense of abandonment of autonomy to tailor time and care, and limiting their potential to perform the foundations of their role within the healthcare system. Across the healthcare system, P1 described significant limitations in resources and services, both in material and knowledge as many priorities within healthcare had shifted, and ultimately left CPs with less to meet the needs of their patients and communities.

As COVID-19 restrictions were lifted and CPs were able to return to home visits, there were feelings that the BCEHS CP program may stray from these in-home, face-to-face visits in favor of virtual care services (P1, P8). P5 described a significant reduction in the quality of care they were able to provide along with a deterioration in their mental health and capacity as they felt they were unable to do their job and perform the tasks they felt were core to their practice. P1 described an outright fear of a transition to virtual care, as many of their patients were more elderly, did not have access to a computer or technology, and lived remotely where access to connection services was limited. P10 extended upon this mentioning that it is important to tailor care and visits to patient needs, but not closing the door on the option to have a face-to-face visit with patients if that was best suited to their needs. As previously discussed, face-to-face care is well supported as a foundational activity of the CP program as described by the CPs engaged in it, and in the midst of COVID-19, P8 said,

> “Being able to go and actually get the face-to-face conversation was the only way to really break through that shell and see the benefit of the program” (P8).

This attribute stood as the single most mentioned aspect of CP care in BC across this research and stands to represent a core attribute of how CPs are able to deliver the tailored patient-oriented care they do. As P8 described, CPs felt as though without it, the CP program would not represent the care and goals of delivery on which it was built.

Chapter Five: Discussion and Interpretation

5.1.0 Interpretation of Findings

The interpretation of findings has been organised into four primary themes based upon the research questions of this project; the unique approach and perspectives of CP practice; CPs introducing novel attributes to inform and deliver primary care; positive outcomes of CP program delivery; impacts and lessons learned from the COVID-19 pandemic. In reflection of these interpretations, key implications for clinical practice and systemic and operational policy have been presented and discussed to provide action items CP leadership and management can use to guide and orient the program to best serve rural and remote areas. Five core recommendations are based upon these implications and interpretations to offer direction for future program developments and ensure the program bases expansions and delivery on the key attributes CPs, those with the deepest understanding of the program, have identified through this research.

5.1.1 Unique Approach and Perspectives of Community Paramedic Practice

CPs stand as the eyes of the healthcare system, with a unique perspective of the patients' lived experiences and ability to enact healthy behaviours. This perspective, as mentioned by Watson et al. (2012) is grounded in a *spatial awareness*, described as an inherent trait of paramedic practice, informing decisions paramedics make, considering the lived experiences of the patient and context they are involved in. Through the information collected and training paramedics have, they can deduce appropriate treatments to formulate a tailored care plan. Though generalized across paramedic practice as a hallmark feature, limited published evidence exists to identify the significance of CPs being the eyes of the healthcare system. This factor, however, was explicitly shared among CPs interviewed in this project, and stood as a foundational aspect deserving attention as to demonstrate the credibility of CPs working in BC, and the importance of their approach to care. In-person, patient-oriented care services delivered by BCEHS CPs in the homes and communities they serve stand to provide deeply valuable information on the status of patients and communities, the outcomes of efforts made to improve this status, and evolve to continually meet care needs. Through a dual-faceted perspective with the foundational knowledge and ability to deliver healthcare services and identify real-world factors within patients' living situation, CPs are well positioned to inform the planning, delivery and evaluation of healthcare services.

The rich perspective of CPs interviewed identified the known fact of generally poorer CC management among those who live in the rural and remote areas of BC (Usuba et al. 2019; Ministry of Health, 2015; Larson et al. 2017). Within this persistent health challenge, lies the importance of identifying factors associated with poorer CC management and struggles with overall health. Through the data collected, a variety of factors, both congruent to previous evidence, and novel, were identified through CPs' unique approach to the delivery of care and stand as an important foundation onto which the delivery of primary care, and by extension, the CP care is built. CPs identified numerous factors patients struggle with when attempting to manage CCs: lack of understanding CCs, techniques and strategies to manage, and treatments (e.g. medications). These factors often resulted in poorer overall management, diminished health, condition progression, and the feeling of hopelessness leading to a lack of motivation. These were often compounded by challenges in accessing primary care or supportive services, feeling as though primary care providers are not invested in patient care due to short appointment times, limited information provided on treatments, and patients being able to understand the numerous complex attributes involved in CC management. These factors were shared by CPs as contributing to further poor decision making and a progressive worsening in condition among patients, with some patients not wanting to ask for help, or knowing where to look for it. Among all these factors can come the identification of numerous social determinants of health, as shared by Mikkonen and Raphael (2010), which are well supported as contributing to one's ability to live a healthy and rewarding life. Factors including access to and choices of quality food, social safety net and supports, access to healthcare services, education and literacy, income and social status, physical environment, and healthy behaviours were all identified by BCEHS CPs as the challenges patients face (Government of Canada, 2024; Mikkonen & Raphael, 2010; Rasali et al. 2016). This positions patients on a collision course with CCs or the worsening of their existing CCs, potentially reducing their healthspan and QoL.

As a result of poor CC management, and the aforementioned factors contributing to the ongoing progression of CCs, CPs identified a pattern of progressed conditions, exacerbation, reactive corrective treatment, limited follow-up or management planning, lack of understanding and motivation, and exacerbation resulting in repeated encounters with reactive care services. The same pattern is noted in other contexts and locations, where EMS and ED services are chronically relied upon to manage preventable exacerbations (Larson et al. 2017; Agarwal et al. 2019b, 2022). For patients enrolled in the BCEHS CP program, a trend towards managing through EMS and ED services was noted by CPs as concerning, with patient's health status worsening, but also increased pressure on already taxed healthcare services. Martin and O'Meara (2019) and Martin et al. (2016) share the same sentiment, explaining the importance of developing programs to be able to serve communities, particularly those in rural and remote areas, with a higher utilization of EMS and ED services, and work towards equitable care among the population their health authority serves. Martin and O'Meara (2019) recommend that, in the best interest of paramedic services and policy makers, investment into CP programing and incentivizing career pathways in CP be made, as the return on investment has a demonstratable impact on populations whom programming serves and the healthcare system generally. Further, with positive patient reflection on CP engagements and perceptions of rural CP, CP practice stands to aid in a resolution to improving access to rural and remote healthcare (Martin et al. 2016). Equity of care in Canada extends to all residents, and ensuring all patients have access to the services and supports they need is critical to meaningfully deliver on this promise.

Through the lens of CPs, engaged in *boots on the ground*, real-world care, the healthcare system has the opportunity to identify and react to the true issues and challenges faced by patients. It is through the credibility CPs have built by sharing and identifying factors that both patients and providers can use to guide care towards meaningful improvements in CC management. Chellappa et al. (2018) identifies these factors, describing that it is within the duty of the CP program to provide this deeply informed perspective, and focus attention on the importance of building a robust intervention strategy for each patient, based upon the perspectives CPs share. In recognising the congruence of previous evidence shared in published literature with the perspectives of BCEHS CPs shared in this research, CPs stand to truly inform care delivery to patients, and work within the care system to provide care that patients managing CCs require to break the cycle of exacerbation and acute encounters.

5.1.2 Community Paramedics Introduce Novel Attributes in the Delivery of Primary Care Services

In the process of directing care upstream and preventing exacerbations resulting in EMS and ED encounters, three key attributes were identified by CPs as contributing to the success of connecting with patients and improving CC management. These factors were: engaging in face-to-face care and building trust; holistic approach to care; working in an IPT and connecting patients with services and supports. With these factors woven into the foundation of all patient interactions with the CP program and ensuring CPs are provided the opportunity to follow through with these attributes, the CP program holds integrity to its goals of delivering meaningful care to a despondent population.

In developing and delivering care that is truly patient-oriented and guided by factors identified for each patient, CPs represent the eyes of the healthcare system, offering an in-person look into the patient's life, ability to manage their care, and sustain improved CC management. Watson et al. (2012) identified that as CPs stand to capture the lived experience of the patient, and deeply understand the factors to consider when developing a care plan, face-to-face care is the foundational aspect to paramedic practice. This perspective outside *traditional* biomedical settings, uniquely informs the understanding of the patient's condition and context, to develop achievable and realistic plans that primary care providers would not have the insight to consider (Bigham et al., 2013; Brydges et al. 2016). Face-to-face care was shared by all CPs interviewed as the single most important practice, and allows CPs to develop deep, meaningful, and trusting relationships with patients in their environment, optimizing the potential for successful execution of care planning and interventions.

Developing this understanding takes time and patience. Building trust and relationships with patients solidifies the potential to understand what is going on, what supports patients need, and perspective on the direction of care they want. This fosters a sense of support and genuine attention paid to the care being provided, building accountability to care planning developed through this collaborative approach (Dainty et al. 2018). As a CP becomes involved with patients, the relationship has the potential to ensure trust in care planning and the support provided by the IPT (Woodman et al. 2019a). Patients have historically shared feelings of frustration with traditional medical engagements, but with a novel approach, there is the opportunity for this to be rewritten and relationships rebuilt (Abrashkin et al. 2016; Abrashkin et al. 2019). Though providing consistent, unrushed, thoughtful engagements focused on deeply understanding patients, while also providing answers to questions patients may have, CPs have a unique opportunity to build trust and relationships.

Though CP programs are rooted in medical practice, understanding patients through a holistic approach uniquely informs care planning and delivery to improve CC management. As Dainty et al. (2019) described, this can be summarized by taking a biopsychosocial approach and has demonstrated better health outcomes for patients who were involved in it. Through tracking vitals signs and key health indicators, coordinating a variety of practitioner services, and engaging with IPTs, CPs demonstrated their consideration for biomedical attributes relevant to care delivery. Understanding the patient's living condition, capacity to improve, and supporting behaviours that promote health and CC management, can lend themselves to foster motivation towards a healthful life. Socializing with patients, discussing life beyond medical topics, and fostering a community of support through the IPT can influence patient's willingness to implement healthy behaviours. Empowering patients can contribute to improved CC management, opening pathways to advocate for their care and understanding, while also being accountable for acting and implementing changes towards a healthier life.

BCEHS CPs interviewed shared how they have become woven into a team-based model of care, where a variety of providers each bring their unique strengths and abilities to be able to support patient care in a holistic way. Martin et al. (2016) described this in Australia, where CPs worked among an interdisciplinary healthcare team, with complimenting skillsets, identifying specific attributes of patient care needs, and working together to improve patient QoL. This same sentiment was share by BCEHS CPs who described ally-based care, focused on supporting patients, acknowledging the struggles they are facing, and building solutions together, to foster investment in working towards a common goal of improved health outcomes and wellbeing. Through the work of CPs identifying real world attributes relevant to care planning and delivery, each member of the IPT can be deeply informed by this unique perspective and work to identify and fulfil a role of best fit for the patient. As shared in Goldman (2020, 14:08), CPs are the "eyes and ears of family doctors". Information collected through face-to-face engagements includes ongoing, consistent, and accurate health indicators and vital signs such as through HHM, is used by the IPT to constantly review and amend care plans for patients. These practices increase the potential of accountability of patients to the care team as consistent, meaningful care planning and engagement through the CP are being performed. Through the unique lens in which CPs view patients and their care needs, identify the holistic elements of care patients need to support management, and working though a team-based approach, demonstrated improvements in feelings of support, acknowledgement and value and can further motivate patients on a path to managing CCs.

5.1.3 Outcomes of the Community Paramedic Program

In consideration of the unique attributes of the CP program, support for such attributes must be drawn from evidence captures on patient outcome and factors associated with care delivery identified as improving the ability to provide truly patient oriented care. Five attributes have been identified through this qualitative work and stand in agreement with existing quantitative evidence on CP program outcomes and measures of success. These are: correlation of CP engagement and patient trust and outcomes, factors to move care upstream, decreased

EMS and ED utilization, referral pathways to reduce exacerbation encounters, and reduced reliance on EMS and ED services. A shift in care from patient reliance on reactive, acute care services to proactive engagements upstream of exacerbation and worsening health stand as the critical outcomes on which CP program success, among other healthcare interventions, can be measured and optimized.

The previously mentioned attributes have demonstrated CPs ability to inform and deliver care and engage patients in a meaningful and pertinent way. As described by numerous CPs in this research, as CP care was delivered and established itself as a legitimate care model, patient outcomes and improvements in specific patient care indicators was noted. CPs identified that as engagements progressed, and patients became woven into the care circle, their understanding of their condition, importance of implementing care strategies, and seeking support when needed were all indicators that actions by CPs were making a meaningful difference. Trust in care providers and the planning in which they recommend can also be a strong indicator of program success, and through consistent in-person visits, adequate time to discuss all aspects of care patients want to know, and identifying improvements and successes in the care pathway towards management can further stand to support CP service delivery models (Abrashkin et al. 2019). As identified in Paramalingam et al. (2024), CPs who responded to their survey identified that CP program have been able to fill critical gaps in healthcare services. By identifying that a CP intervention closed healthcare service gaps, comes the direct linkage of CP action and integration on an identified issue, to improvements noted as legitimate outcomes of such actions. By identifying this linkage, and the numerous outcomes of CP care including improved trust and patient understanding, CP practice stands as a credible healthcare service with the capability to meet real-world patient needs.

CP care represents an upstream approach, managing conditions to prevent exacerbations and catching exacerbations earlier to support patients in their care, rather than having to react to it. CPs interviewed described numerous aspects of upstream approaches, identifying the necessity to engage patients in active participation throughout all stages of the development and execution of CC management. CPs worked to identify factors that may result in discouragement, frustration, or confusion on CC management, and support patients in the complex process of developing a management strategy. The correlation of actions to outcomes presents an arduous investment of time and effort, however the potential for a patient to be able to engage in successful management is detrimentally limited without it (Dainty et al. 2018). Resulting from this comes the potential for a self-feeding system, where patients become self-aware of the attributes contributing to their health and seek the support and care they need, placing them up the stream of CC management, further away from the potential of an exacerbation event (Bouraoui et al., 2022). This places both patients, and the healthcare system, in a position where resources are more appropriately tailored to care needs, ensuring sustainability of the healthspan of the patient.

A key marker of CP program effectiveness is the utilization of EMS and ED services. Across literature reviewed for this research, reduced EMS and ED encounters was a standardized marker of successful programming and represented the potential of CPs to support patients in managing their conditions. In the eleven studies summarized in table 2, all focused their attention on the management of CC, with nine of these studies demonstrating a reduction in EMS and ED utilization after the CP program intervention had been implemented. Among these was Martin-Misener et al. (2009) who demonstrated a 40% reduction in ED visits, and 28% reduction in family physician visits over a three-year intervention period. Choi et al. (2016) identified a significant reduction in ED visits, decreased EMS utilization among frequent users, and decrease CC related hospital readmissions during the enrollment period of the CP program. The research conducted for this report did not investigate quantitative measures of EMS and ED use within BC related to the BCEHS CP program. However, all interviews conducted with CPs included mention to reduced patient encounters with ED and EMS services, reduced exacerbations among those enrolled in the CP program, and multiple instances of identifying progressing or acutely exacerbating conditions, catching them earlier and preventing significant exacerbations, longer hospitalisations and poorer health outcomes.

For the cycle of exacerbation to be broken, an intervention in the process must be made, and often starts with the point of first contact with EMS or ED. Though most EMS and ED encounters involve an exacerbation event, with knowledge of the CP program and ability to refer patient into the program, those involved in reactive care are initiating the pathway towards improved CC management. Mason et al. (2007) identifies the potential of immediate reduction in reactive care utilization, if services are able to be delivered as proactively as possible. This identifies patients who are most vulnerable and at risk of an exacerbation event, potentially breaking the cycle before detrimental health outcomes develop. This is further supported by Verma et al. (2018) who highlight the importance of multiple streams of referral to identify patients who could benefit from CP services, and demonstrated a significant reduction in re-encounters once CP services were introduced. CPs in this project shared their frustrations with a lack of pathways within the BCEHS CP program, where there is currently no protocol for an emergency paramedic to refer patient for consideration to the program, or CPs to directly refer patients into their care. In some cases, informal channels such as emergency paramedics sharing patient information with CPs, and CPs bringing these patients among others they have identified, to the attention of the IPT for consideration to the program.

By transitioning focus directly on the prevention of ED and EMS encounter, and providing avenues of referral to CPs, there exists a potential to alleviate the pressures faced by EMS and ED services. Gou et al. (2017) identify this as a key benefit of CP programs, shifting attention away from expensive, acute care and towards consistent long-term management presenting the opportunity to preserve and assist in rebuild the overburdened acute care system. For healthcare to measure it success, an analysis on patient outcomes must be guided through evidence such as Agarwal et al. (2018a), who demonstrated statistically significant reductions in mean ambulance calls when comparing between intervention and non intervention groups, with a mean age of 72 and those who had multiple comorbid CCs they were attempting to manage. Not only did this CP intervention demonstrate the improved outcomes through standardized health markers, but also reduced reliance upon the EMS and ED services which were never designed to be the management strategy for a CC. Four participants in this research shared that there exists a need to move away from disaster management, and towards meaningful, patient-oriented care, to protect both patient health and outcomes, alongside the capacity and longevity of EMS and ED services.

5.1.4 Impacts and Lessons Learned from the COVID-19 Pandemic

As the COVID-19 pandemic started in mid 2020, the BCEHS CP program faced significant shifts in care approaches and priorities. The shift from face-to-face to virtual care and care priorities moving to vaccine deployment and viral testing, resulted in a generalized feeling of a diminished ability to provide quality care to CP patients, fraying the relationships built through the unique care approaches of the CP program. CPs identified numerous challenges through this process and stated that a return to the roots of care delivery through face-to-face engagements, alongside the ability of CPs to re-engage patients, are necessary to maintain the integrity, reach of, and quality of holistic, collaborative and patient oriented care across rural and remote BC.

As the COVID-19 pandemic response began, BCEHS, along with other CP delivery services, transitioned care towards meeting immediate needs, supporting community level care and engagements, and delivering COVID-19 testing, vaccinations and treatment services (Cebollero, 2020; Master et al., 2020; MHealth, 2020; Burnett et al. 2020; Eastern Ontario Health Unit, 2020; Brittain et al. 2020). As described by Brittain et al. (2020), the BCEHS CP program rapidly transitioned towards virtual care and an expansion of CP scope of practice to include viral testing and vaccination administration to support province-wide care priorities. CPs provided valuable insight on these transitions, described that though they were necessary in the context of the COVID-19 response, the execution of the transition presented unique, and in some cases, frustrating challenges. Through the work CPs performed in building trusting relationships with patients and their communities, CPs stood as caring, trustworthy, and educated sources of information when little was known about COVID-19. CPs provided supports including the delivery of food and medications to patients unable to leave their homes, developed outdoor walking groups and Zoom events, and attempted to keep patients up to date on information to keep them safe during uncertain times.

Paramedic services and the foundations of paramedic practice have long stood as a healthcare service that is adaptable to patient and context specific needs (O’Meara & Duthie, 2018; O’Meara et al., 2012). Whether during an emergency call where timely care and treatment decisions have a significant impact on patient outcomes, or in response to population level epidemics or crisis', such as the toxic drug crisis or longstanding challenges of rural and remote healthcare services, paramedics are able to mold to meet needs. The rational for development of the BCEHS CP program noted disparities in patient outcomes and staffing challenges in rural and remote areas, and its development represented the adaptation of traditional paramedic services to meet identified needs (Woodman et al., 2019a, 2019b; Brittain et al. 2020). Returning to the challenges of COVID-19, Dornerm (2020), Orillia Matters (2020) and Gates (2020) discuss the adaptation of CP services to assist in maintaining the delivery of IV antibiotic therapy, blood transfusions and urinary catheterization in the patients' homes, as to prevent COVID-19 exposure to vulnerable patients. Though BCEHS CPs did not receive as significant an expansion of scope as described in Dornerm (2020), Orillia Matters (2020) or Gates (2020), the expansion of scope to provide immunization and perform viral testing, in support of the healthcare system, can represent a foundation on which further scope expansion can be built, as described by CPs interviewed. The COVID-19 pandemic response by BCEHS CPs is a testament to their dedication to providing care that meets context needs and how CPs can work collaboratively with interdisciplinary providers to delivery the best care and services possible to patients.

In the transition from the hallmark face-to-face care of the BCEHS CP program, to virtual care and telehealth, there emerged a significant discrepancy in ability for CPs to maintain meaningful, holistic and deeply informed connections with their patients (Brittain et al. 2020). As previously established, face-to-face care stands as a core attribute of CP practice, with CPs describing the transition as significantly diminishing the potential of care and ability to maintain outcomes. CPs shared that providing care virtually was comparable to completing an emergency call over the phone or feeling around in a dark cave, with no ability to actually know how patients were doing. As numerous CPs described, without the ability to see patients in their environment, look at the holistic elements of their engagement, and maintain a deep, trusting relationship with them, the care they were able to provide simply did not meet the needs of patients, despite the efforts and adaptations CPs made. As described by Watson et al. (2012) and Kant et al. (2018) as CPs stand as the eyes and ears of the healthcare system, they are uniquely positioned to provide suggestions and information to deeply inform care planning and treatment decision among an IPT. At the time of writing, limited published evidence existed to support a deterioration in CP patient condition, particularly within the BCEHS CP program. Yet every CP interviewed in this research presented numerous examples and anecdotes representing this significant attribute that requires investigation to ensure patient care delivery is performed to optimize patient experience and outcomes, and work to address the concerns shared by CPs in this project.

As identified by Allana and Pinto (2021) paramedicine, and specifically CP practice, has the potential to provide a novel, well informed approach to meeting patient care needs, improving patient outcomes and working towards the administration of preventative care in favor of acute care, in contexts where these services are appropriate. The evidence collected in this research is a testament to these attributes, presenting numerous novel elements of care, supporting patients through deep and meaningful engagements, and demonstrating outcomes representative of moving care upstream to the prevention of exacerbation and acute events. This is further supported through evidence from the COVID-19 pandemic experience including a deterioration in ability to provide truly meaningful care, exemplified by testimonies of diminished patient condition, exacerbations resulting in EMS and ED encounters, and a shared sentiment of loss for the efforts and outcomes CPs had worked to build with patients, who have long been underserved by the healthcare system. Though CPs have demonstrated their ability to adapt, recognition must be drawn to the importance of delivering care through proven face-to-face methods that has qualitatively and quantitatively demonstrated its fundamental importance to CP practice (Leyenaar, et al. 2018; Agarwal et al. 2022; Paramalingam et al. 2024). In this lies a potential, as described by Allana & Pinto (2021), for CPs to transform the way primary care services and uniquely identified patient needs can be addressed, and how paramedicine, as a whole, can continue to evolve as a potential solution in meeting broad healthcare system needs and improving outcomes.

5.2.0 Implications and Recommendations

This research provides implications for both clinical practice and systemic/operational attributes, while supporting the development of understanding in an established gap in knowledge of CP practice. Implications allows for CP program management and policy makers to be informed by strongly supported themes that emerged through this research that require attention. For CPs engaged in care, the importance of continuing their work, calling attention to outcomes, and sharing the importance of 'real-world' engagements is paramount in ensuring implications are duly considered and recommendations are acted upon. Recommendations provided were informed by implications established and stand to ensure that program continuation and future developments are informed by practice and outcomes noted in this research. A summary of implications and recommendations is included in figure 1.

Figure 1

Summary of Implications and Recommendations

Implications

- CP reduce barriers to CC management and continuity of care
- CP programs require face-to-face engagements
- Meaningful patient relationships require investments of time and thoughtfulness to establish trust and understanding of the ‘real-world’ patient experience
- CPs require autonomy to inform their delivery of care by community and patient specific attributes identified through their engagements
- Continuation of interprofessional care supports holistic, patient-oriented care

Recommendations

- Offering CP care on a full-time schedule, with multiple positions and expanded community offerings
- Expanded scope of practice for CPs to include additional primary care and routine procedures to support CC management
- Supporting the expansion to urban CP care services for targeted populations
- Streamlined referral pathway to the CP program for emergency paramedics engaging with patient outside of CP care
- Future research should explore linkages between patient experience, health outcomes and provider (CP) engagement in rural and remote contexts

5.2.1 Clinical Practice Implications

Through an understanding of CP practice and outcomes of the program, implications in the context of clinical practice and care delivered through the CP program are shared to inform program users and administrators of key elements of program delivery. Historical shortfalls and challenges in delivery, ability to identify and engage with services, while maintaining motivation to shift lifestyle among patients has stood as a continuum of barriers to managing CCs. To tackle these barriers, interventions such as CP services in their multifaceted approach must be introduced to develop pathway towards CC management that can be maintained across the patient’s life. CP practice stands as a novel approach to extend care into the homes of patients, delivering holistic, knowledgeable and patient-oriented care to support those facing challenges in managing CCs. In this comes the recognition that CP practice is making a meaningful difference in CC management through the identification of needs, collaborative interprofessional planning, engagement in care, and demonstrated positive outcomes, as shared by CPs. This approach has demonstrated it ability to avoid exacerbations and reliance on reactive care among patients and move care upstream to management and meaningful planning.

Face-to-face care stands at the core of CP practice and facilitates the perspective of *eyes of the healthcare system*. CPs engaging patients in their homes and communities ensures care planning is holistically informed, appropriate services and supports are established, and patients feel genuinely cared for. Among paramedicine providers, in-person care has been a foundational tenet and something Allana and Pinto (2021) describes as unable to be removed without renaming the entire service. With this and the demonstrated necessity to develop deep, meaningful and trusting relationships outside of the traditional emergency paramedic role and in the scope of CP services, continuation of face-to-face care ensures congruency in services patient have come to rely upon, and providers base their practice upon. Traditional primary care, through a clinic or other medicalized setting offers a sterile, scientifically-informed approach that demonstrates challenges in holistically understanding patients it engages, which is demonstrated by the persistent gap in effective CC management and continuity of care. In delivering novel clinical care, and understanding the patient, CPs can deeply inform care providers, enhancing tailoring of care, and optimizing the opportunity for successful patient outcomes.

5.2.2 Systemic and Operational Implications

With the administration of a CP model comes considerations for the operational, systemic, and clinical oversight, necessary to provide quality care, keep providers accountable, and ensure sustainability of the service. The unique attributes of CP practice and its ability to provide care in untraditional settings and contexts functions to support desirable outcomes and a more sustainable care delivery model. Strategically, the way in which care is delivered with its desirable outcomes can provide a reasonable 'return on investment' (Leyenaar et al. 2018). As established in this research, CPs stand as a well-informed, patient-oriented care providers, whose practice, governed by scope and guidelines, requires the ability to be tailored to patient and community specific needs, identified through their engagements. This autonomy to provide care based on CPs observations stands to support continued positive outcomes, as well as the expansion in administration of services in both scope of practice and operational delivery (West et al. 2017). The ability to inform, design and deliver care, must leave space for the best positioned providers, CPs, to innovate, and attempt well-informed approaches. Rural healthcare delivery has demonstrated its challenges and need for such innovation.

Within operational oversight, the orientation of services through an interprofessional approach in collaboration with local health authorities and providers, stands as an effective utilization of resources, considering the breadth in which the BCEHS CP program is delivered. Though oversight of care is governed by an independent licencing board, internal medical direction, and government legislated scope, the operation within an interprofessional approach can offer multidisciplinary providers the insight into the patient's life, deeply relevant to the interprofessional care they provide. Strengthening ties and collaboration with local providers and health authorities is paramount to successful operation, and effectively delivering holistic care.

5.2.3 Recommendations

This research provided novel insight into the importance of CP practice and the potential it holds to improve care services in rural and remote BC and provide upstream supports to patients managing CCs. This provides strong support for both clinical and operational recommendations as informed by perspectives shared by CPs, existing literature on CP practice and outcomes, and researcher interpretation in the context of this project.

CP services were largely described as being delivered through part-time positions, and most often by a single CP in each rural and remote community served. This not only presents challenges in the capacity to perform numerous, diverse tasks, but also the CP's ability to dedicate adequate time and attention to developing the deep, trusting relationships necessary with patients. As the BCEHS CP program was established on a tenet of stabilizing rural and remote paramedic staffing and bridging health service delivery gaps, an actionable solution would be to establish full-time employment, opening the availability of CPs to meet goals of care. It is understandable that in the piloting of a program in a context with little evidence to support potential outcomes, that conservative approaches be introduced, but with strong evidence of positive provider perspectives and patient outcomes, consideration for expansion should be made. Communities where patient numbers exceed a single CPs capacity, additional positions should be considered to support upstream preventative approaches. This is not only beneficial for patients but has the potential to offset costs of additional positions by preventing reactive, exacerbation based EMS and ED encounters (Bennett et al. 2017; Dixon et al. 2009). This expansion legitimizes CPs as a valued component of the healthcare system, provides capacity for services and patient engagements, and stands to move care upstream towards prevention.

With positive outcomes and perspective of current CP practice, expansion to include a broader scope of practice, supporting primary and routine care services offered by higher level providers not only expands capacity within CP care, but also ensures patients have access to care in a timely and comfortable manner. As described in the literature review of this project, CP programs across other contexts work within broader scopes of practice, governed through their licensing body and employer, but offer numerous primary care procedures, in the patient's home, or a community setting, supporting easier access to care for patients and alleviating pressure from high volume primary care services. As CPs work directly through interprofessional team, there is the capacity to oversee the distribution of tasks, evaluate outcomes, and provide direction through the information captured by CPs functioning as the *eyes of the healthcare system* (Watson et al. 2012; Kant et al. 2018).

Alongside the expansion of both position and scope should come the consideration for expansion into urban centers. Though rural centres have historically been underserved and demonstrate higher prevalence of CCs and poorer healthspan, urban populations are not immune to the potential of developing CCs, experiencing exacerbation events, and facing challenges navigating both primary care and supportive service (Wilk et al. 2021). Expansion of CP to urban centers, targeting vulnerable groups and high-volume acute care users can build a targeted approach to shift care towards prevention over acute reaction. In an urban setting exists the potential for easier engagement with specialty IPT services and providers, further supporting patient-oriented, holistic care services.

In consideration of the current referral pathway into the BCEHS CP program, primary care providers including physicians, nurse practitioners and nurses can initiate referral for CP care and review for eligibility of services. This may also be brought forward by patients to their primary care providers who have heard of the BCEHS CP program, engaged in community services, or in situations where a provider feels a patient would be a good fit for CP services, either in primary care events, or acute care events such as in an ED. CPs engaged in community-based care may recommend a patient to the IPT, but at the time of this project, no pathway exists for emergency paramedics and CPs to initiate a referral to the BCEHS CP program. The lack of a referral pathway came forward in numerous interviews, and the development of a pathway has the potential to capture high-volume EMS and ED service users. Agarwal et al. (2017, 2018a) and the CPs interviewed for this research described that in many cases frequent EMS and ED service users are encounter multiple EMS crews repeatedly, and without an expanded referral process, a significant population may be overlooked. Considering this in the context of BCEHS as an organisation, significant benefit may develop through a referral pathway to CP services and stands as a current missed opportunity for identifying and engaging patients who could benefit from CP care.

In consideration of the limited published literature on this topic, particularly that of perspectives of both patients and CPs, exploration of linkages between patient experience, health outcomes, and provider engagements should be sought. Knowledge from this study and published literature strongly suggests the potential and demonstrated positive outcomes of CP care and programming, but evidence to link the three aforementioned elements can provide definitive conclusions (Paramalingam et al. 2024; Agarwal et al. 2022). As CP care and programming expands across contexts, evaluation across approaches such as those included in this project with those shared in Agarwal et al (2018a), Bennett et al. (2017) and Dainty et al. (2018) can provide valuable insight into the tailoring of services to best meet the needs of specific populations. Diversity in approach such as those described by Crockett et al. (2017) which included the integration of a pharmacist into a CP team, or Agarwal et al. (2018b) who focused their study on an urban subsidized housing complex stand as a comparison tool for further assessment into specific attributes of programming within the BCEHS CP program. These attributes require careful evaluation, and should measure key elements identified in this research, including barriers to CC management and continuity of care, efficacy of face-to-face care in varying contexts and populations, and integration with IPTs with measures drawn from the perspectives of all those involved in care. Shah et al. (2018) and Martin et al. (2016) demonstrates the importance of patient perspectives and the value they hold in informing a truly patient centered care delivery model. Capturing the perspectives of patients in the context of the BCEHS CP program can support action and ensure *value on investment* in the care delivered through the program.

In reflection on thoughts shared by Nolan et al. (2018), the importance of defining role among a position that has long been varied in presentation and approach, prioritizing its uniqueness and ability to meet rural and remote health needs, and deliver care that is patient oriented, further work must be done to clarify this role and define it on a scale comparable to *better known* programing and approaches. Comparisons to previous efforts including community nursing, home care services, and public health approaches are critical in ensuring outcomes and *value on investment*, but require a strong foundation of research and deep understanding to truly understand outcomes and perspectives on the CP approach. This research, among other published literature builds upon a developing foundation of knowledge of CP practice, care, and outcomes. Further building of this foundation will only add to the credibility of this novel approach to care, improve its comparability to previous attempts and established approaches, and identify areas where expansion may be made or efforts can be focused in further improving care to patients whom the healthcare system serves.

The complex nature and multifaceted elements involved in CP care working in congruence with primary care and supportive care services, represents a dynamic relationship, with common goals of improving patient care outcomes, continuity of care, and moving towards upstream preventative care. In considering this research and its value in the context of the implications and recommendations, CP care can stand to represent a novel solution to long standing issues and be tailored to best fit the needs of patients, systems and the organisations in which it functions.

5.3 Strengths and Limitations

This research utilized a qualitative interpretive description approach collecting interview data from fifteen practicing BCEHS CPs to develop a foundational understanding of CC management among rural and remote patients in the context of the BCEHS CP program. From evidence gathered, and implications drawn, strong evidence exists to support the continuation of CP practice and its importance within the delivery of rural and remote healthcare services.

This project was able to demonstrate several strengths. In reflection upon research questions, methodological approach and theoretical foundation, the research approach and execution were appropriate to explore the research questions and study objectives. This also afforded the collection of rich data from the perspective of those directly engaged in CP care, developing deep insights into the foundations and outcomes of CP practice in rural and remote BC. Through extended data engagement and ongoing data reflection and reflexivity, rigor and theoretical integrity were maintained throughout the research. This was further supported through reflective journalling throughout the research and provided an opportunity for reflection and awareness of biases for their potential effect throughout the research process. This reflection also demonstrated transparency to the approach in which themes and interpretations were drawn, while grounded in data collected, and affording the accrual of credibility to the research approach and execution. In identifying a gap in current literature and understanding on CP care and CC management, this project offers a foundation on which future investigations can be built to refine the delivery of CP services and optimize care delivered to rural and remote patients. Through the collection of CP perspectives directly engaged in care, identification and presentation of themes common across perspectives collected, and providing insights in the context of quantitative literature demonstrating congruent outcomes, implications from this study can be extended to rural and remote healthcare practice, healthcare design and delivery, policy development, and future research.

This study faced several limitations and challenges. Though the sample size may be considered small, in the context of qualitative studies similar in scope and depth, sample size was consistent, prioritizing depth during inductive analysis over the breadth of results across topics discussed (Braun & Clarke, 2022; Morse, 1995). Data saturation was reached, and richly informed interpretations, implications and recommendations could be drawn and are strongly supported through perspectives shared. In consideration of the participants focused upon in this research, perspectives gathered may not be representative in the context of CP programs beyond BC due to the diversity of CP programs including goals, scope of practice, geographic context, target population, and integration with primary care. Findings and interpretations will have to be assessed at each application and use. These factors however, did not limit the potential implications of this research, as they focused upon establishing a foundation of understanding on CP care in BC on which future assessment and program development can be built and informed. This is bolstered by interviews that were focused, unrushed and provided depth in understanding of specific core elements critical to the BCEHS CP program and present the potential to provide support for the continuation of delivery and adaptation of elements of care to optimize outcomes for patients.

5.4 Conclusions

CP practice has demonstrated its ability to improve continuity of primary care services, develop and deliver holistic care to rural and remote patients, and improve the management of CC among a long-underserved population. This study gathered the perspectives of 15 practicing BCEHS CPs from across rural and remote BC. This research explored the status of CCs across rural and remote BC, impacts of BCEHS CP practice on the management of CCs, and the impacts of COVID-19 on BCEHS CP practice and CC management. CPs interviewed shared insights into the status of rural and remote CCs and supported existing literature suggesting poor patient outcomes, understanding, and motivation to manage CCs. CP practice uses a unique approach to the delivery of primary care and supportive care services for patients managing CCs, through face-to-face care, developing deep and trusting relationships with patients, and functioning within an IPT to deliver holistic care. CPs interviewed shared numerous notable improvements among patients including understanding of this CCs, accountability and motivation to improve CC management, and outcomes to suggest improved QoL and healthspan. COVID-19 shed light upon the adaptability of CP services to meet care needs and close health service delivery gaps, while also affirming the critical CP practice of in community face-to-face patient care. Face-to-face care stood as the single most important factor in establishing a holistic understanding of the patient, their unique care needs, and how best to support them on their care journey. This attribute is fundamental to CP practice and allowed CPs to make a meaningful difference in the care rural and remote patients received.

In completing this research, further investigation is needed to explore the linkages between patient experience, health outcomes, and CP engagement in rural and remote context to foster further support for the continuation and expansion of CP programming in BC. Through implications and recommendations offered, through ensuing CPs have the autonomy to orient their care and services to best meet their community and patient needs, and working to expand CP services regarding both scope of practice and communities where it is offered, CP care can continue to build it credibility and demonstrate the significant value it offers on investment. This offers an opportunity to reorient reactive, exacerbation-based care upstream to preventative engagements and management, improving patient healthspan and QoL, alongside more appropriate utilization of EMS and ED services to ensure sustainability. As the healthcare systems works towards delivering equitable, patient-oriented care, knowledge gathered from this study can be used to guide further development and deployments of CP and more broadly paramedic services to meet the needs of diverse context and populations.

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Appendix A

Interview Script

Start Recording

Thank you for taking the time out of your busy schedule to complete this interview. To ensure complete documentation, we have completed the informed consent process and have any other questions arose? [pause for response] Are you comfortable continuing with this interview? [pause for response] Great, I want to make it clear that you can refuse to answer any question during this interview for any reason, and I anticipate that this interview will take 40-60 minutes. Are you comfortable continuing this interview? [pause for response] Great, so we will start with a few demographic questions before we get into the questions about your practice.

1. How long have you held your role as a BCEHS CP?
2. Are you the only CP in your community, or are there multiple CPs?
3. Approximately how many people live in the community or area you serve?
4. Would you be comfortable sharing your gender identity
5. How long have you worked as a paramedic?
6. How long have you worked as a CP?

Great, that is all the demographic questions out of the way, now we will get into the interview questions regarding your practice.

1. What are the primary activities you perform in your role as a CP?
   a. Prompt: Do you perform any other tasks beyond direct client consultation in regards to chronic conditions (i.e. community education)?
2. What are the primary chronic conditions your encounter among the clients you serve?

3. How have clients historically managed chronic conditions?
    a. What supports and services have clients historically needed and has this changed as a result of the CP program?
        i. Prompt: Can you describe some of these changes? (If they identify that the CP program has changed some of the supports provided or utilized)
    b. Prompt: Has client chronic condition self-management and continuity of care between providers changed since the introduction of the CP program? (If not identified in responses to the above questions)
    c. Prompt: What factors do you feel played a role in this?
    d. Prompt: What practices or tasks are you performing to improve chronic condition management among rural and remote clients?
4. (Read all three parts, then discuss) Do you feel that barriers to effective self-management of chronic conditions persist among the clients you see?
    a. Prompt: Could you describe an example of where you might have overcome a barrier or limitation in your practice?
    b. Prompt: How do you feel these barriers or limitations could be mitigated or overcome?
5. Do you feel that since the introduction of the Community Paramedic program or since clients have been enrolled in the program, that there has been a change in the use of emergency health services and emergency department visits in your community?
    a. Prompt: Why do you think this has occurred?
6. Do you feel that your training prepared you to understand care for clients who live with chronic conditions?

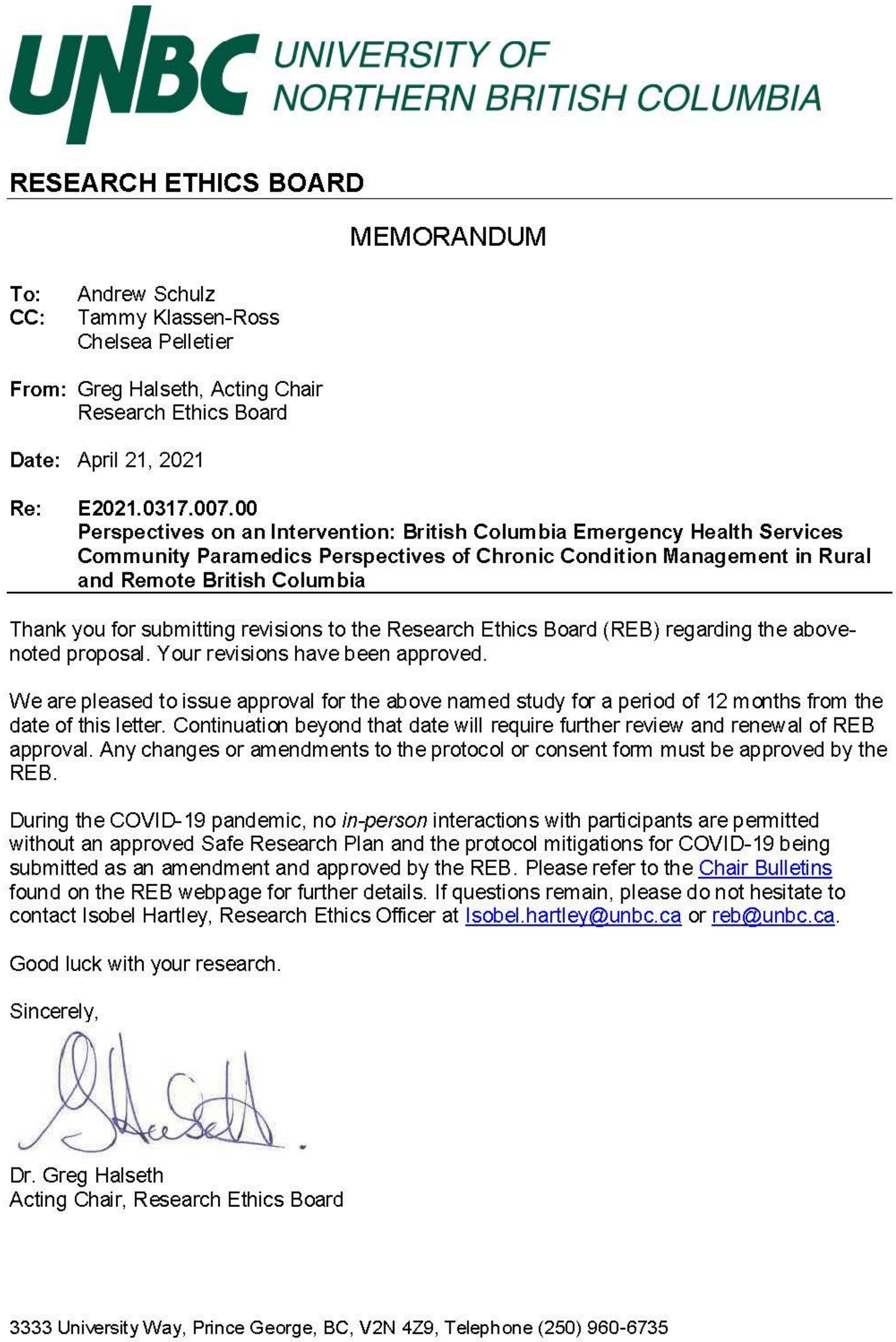
   a. Prompt: Do you feel that additional training around caring for clients with complex care needs (i.e. multiple chronic conditions or co-morbidities) would be beneficial for your practice?
   b. Prompt: What other training or education do you feel would be beneficial for your practice? (Medications, labs, palliative or advanced care planning)
   c. Prompt: What services would you like to receive training on and be able to deliver in your practice?

7. How has the COVID-19 pandemic impacted your practice as a BCEHS CP?
   a. Prompt: What adaptations to the care and delivery of services have you made in the midst of the COVID-19 pandemic?
   b. Prompt: Do you feel the changes you have made to your practice have impacted the care you are able to provide to clients?
   c. Prompt: In what ways do you think this pandemic will impact the care you provide in the future?
8. In your practice as a Community Paramedic, do you feel you have been able to make a positive change in the care provided to clients in rural and remote areas?
9. Do you have another other comments or thoughts you would like to share or add to this interview?

Thank you very much for completing this interview.

Stop Recording

Appendix B



UNBC UNIVERSITY OF
NORTHERN BRITISH COLUMBIA

RESEARCH ETHICS BOARD

MEMORANDUM

To: Andrew Schulz
CC: Tammy Klassen-Ross
Chelsea Pelletier

From: Greg Halseth, Acting Chair
Research Ethics Board

Date: April 21, 2021

Re: **E2021.0317.007.00**
Perspectives on an Intervention: British Columbia Emergency Health Services Community Paramedics Perspectives of Chronic Condition Management in Rural and Remote British Columbia

Thank you for submitting revisions to the Research Ethics Board (REB) regarding the above-noted proposal. Your revisions have been approved.

We are pleased to issue approval for the above named study for a period of 12 months from the date of this letter. Continuation beyond that date will require further review and renewal of REB approval. Any changes or amendments to the protocol or consent form must be approved by the REB.

During the COVID-19 pandemic, no *in-person* interactions with participants are permitted without an approved Safe Research Plan and the protocol mitigations for COVID-19 being submitted as an amendment and approved by the REB. Please refer to the Chair Bulletins found on the REB webpage for further details. If questions remain, please do not hesitate to contact Isobel Hartley, Research Ethics Officer at Isobel.hartley@unbc.ca or reb@unbc.ca.

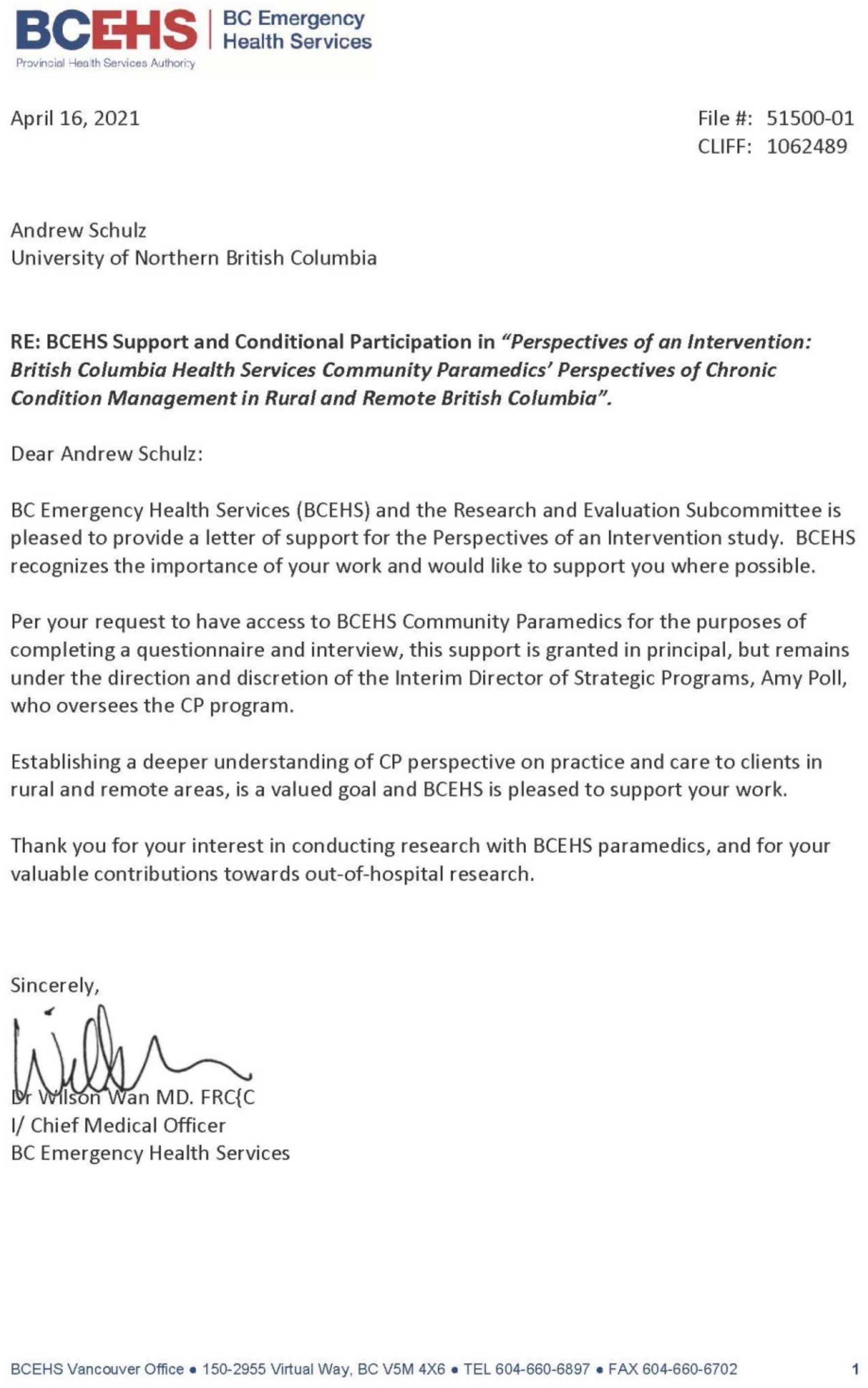
Good luck with your research.

Sincerely,

Dr. Greg Halseth
Acting Chair, Research Ethics Board

3333 University Way, Prince George, BC, V2N 4Z9, Telephone (250) 960-6735

Appendix C



BCEHS | BC Emergency Health Services
Provincial Health Services Authority

April 16, 2021

File #: 51500-01
CLIFF: 1062489

Andrew Schulz
University of Northern British Columbia

RE: BCEHS Support and Conditional Participation in *"Perspectives of an Intervention: British Columbia Health Services Community Paramedics' Perspectives of Chronic Condition Management in Rural and Remote British Columbia".*

Dear Andrew Schulz:

BC Emergency Health Services (BCEHS) and the Research and Evaluation Subcommittee is pleased to provide a letter of support for the Perspectives of an Intervention study. BCEHS recognizes the importance of your work and would like to support you where possible.

Per your request to have access to BCEHS Community Paramedics for the purposes of completing a questionnaire and interview, this support is granted in principal, but remains under the direction and discretion of the Interim Director of Strategic Programs, Amy Poll, who oversees the CP program.

Establishing a deeper understanding of CP perspective on practice and care to clients in rural and remote areas, is a valued goal and BCEHS is pleased to support your work.

Thank you for your interest in conducting research with BCEHS paramedics, and for your valuable contributions towards out-of-hospital research.

Sincerely,

Dr Wilson Wan MD. FRC{C
I/ Chief Medical Officer
BC Emergency Health Services