



Family Medicine

McMaster
Community
Paramedicine
Research Team

Scalability of the Community Paramedicine at clinic (CP@clinic) Program using an implementation science approach: replicability of program impact in British Columbia, Canada and Victoria, Australia

Dr. Gina Agarwal, MBBS, PhD (Epidemiology)

Tier 1 Canada Research Chair in Vulnerable Individuals in Primary Care

Professor, Department of Family Medicine

Director, CP@clinic Program



Ricardo Angeles, Melissa Pirrie, Francine Marzanek, Christie Koester, Guneet Mahal,
Mikayla Plishka, Jasdeep Brar, Sahar Popal



@CPatClinic
@GinaAgarwall



cpatclinic.ca



Health
Canada

Santé
Canada

Presentation Overview

- What is CP@clinic & Evidence
Dr. Gina Agarwal
- Scale-up in British Columbia
Stuart Woolley
- Scale-up in Australia
Dr. Evelien Spelten
- Replicability/Impact of CP@clinic in scale-up sites
Dr. Gina Agarwal
- Questions

What is Community Paramedicine at Clinic?



Standardized, out-of-the-box, evidence-based program focused on chronic disease prevention, management, and health promotion

For scale up, the following are provided:

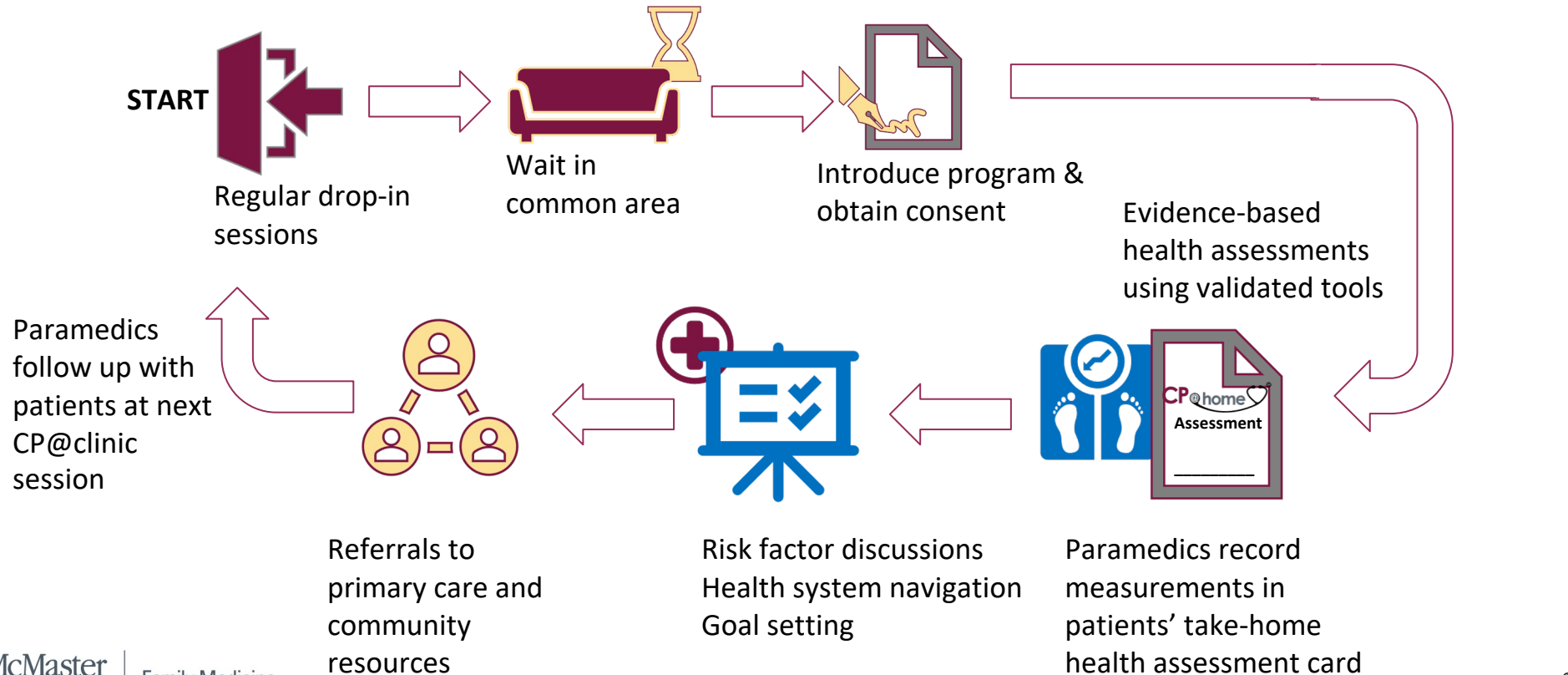
CP@clinic-specific training for paramedics

Evidence-based assessments to evaluate health risks

Algorithms within a secure database to support paramedics

CP@clinic core research team works in partnership with scale up site

What does a typical CP@clinic look like?





Evidence-based CP program in Canada

cmaj

RESEARCH ■ VULNERABLE POPULATIONS

Evaluation of a community paramedicine health promotion and lifestyle risk assessment program for older adults who live in social housing: a cluster randomized trial

Gina Agarwal MBBS PhD, Ricardo Angeles PhD, Melissa Pirrie MA, Brent McLeod MPH, Francine Marzanek BSc, Jenna Parascandalo BA, Lehana Thabane MSc PhD



Prehospital Emergency Care

Taylor & Francis
Taylor & Francis Group

ISSN: 1090-3127 (Print) 1545-0066 (Online) Journal homepage: <https://www.tandfonline.com/loi/ipec20>

Reducing 9-1-1 Emergency Medical Service Calls By Implementing A Community Paramedicine Program For Vulnerable Older Adults In Public Housing In Canada: A Multi-Site Cluster Randomized Controlled Trial

Gina Agarwal, Ricardo Angeles, Melissa Pirrie, Brent McLeod, Francine Marzanek, Jenna Parascandalo & Lehana Thabane

An Evidence-Based Program



19-25% reduction
in EMS calls



Decreased blood
pressure



Reduced
diabetes risk



Improved QALYs
& quality of life

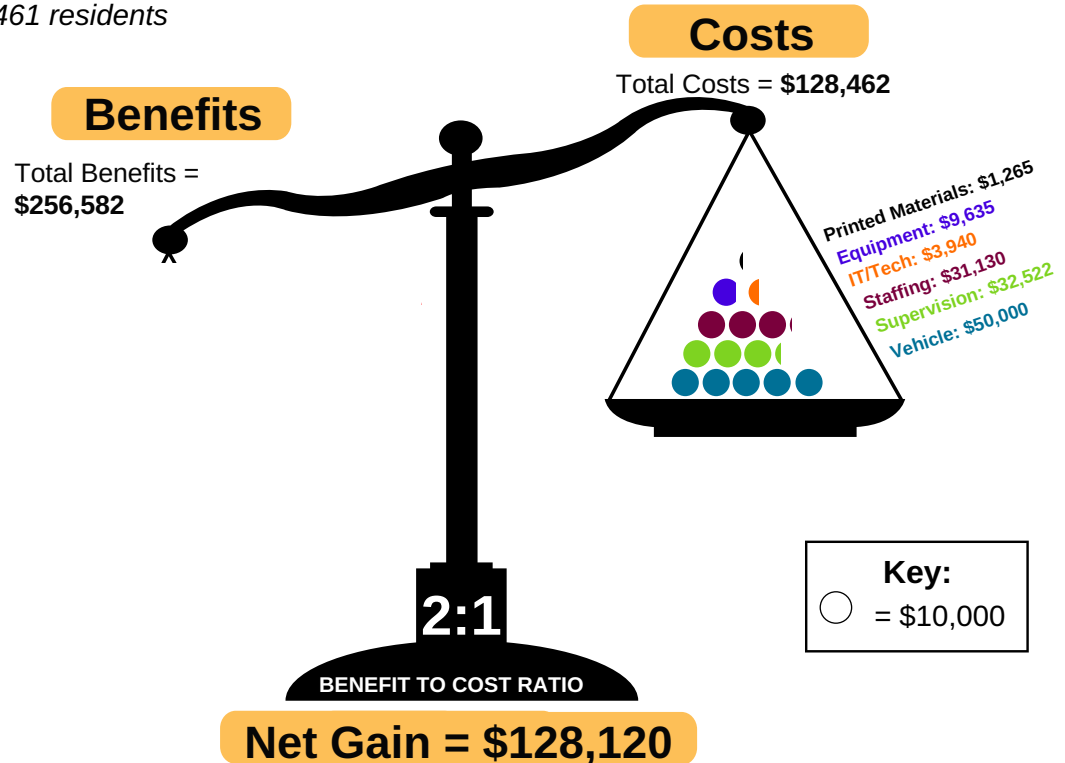


Social relationships
facilitated between
older adults

- Focuses on vulnerable low-income older adults who are socially isolated, and with multi-morbidity
- Empowers participants and improves health literacy
- Encourages primary care visits and appropriate healthcare use
- Expands the reach of community paramedicine into primary care

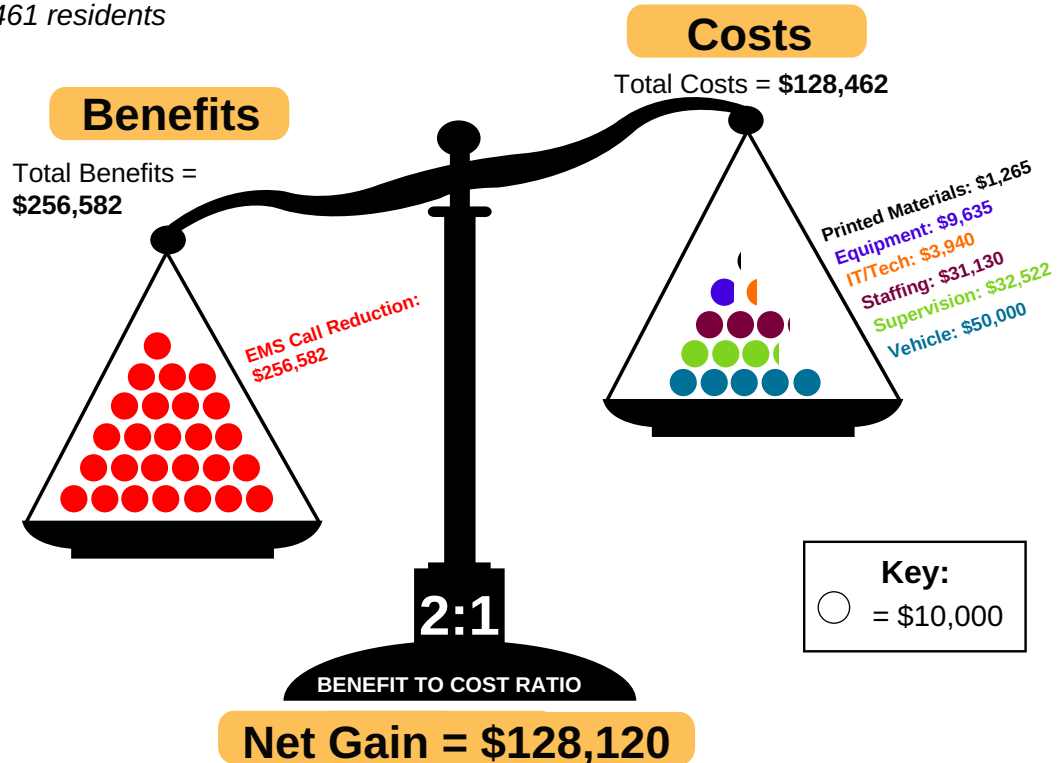
Cost-effectiveness of the CP@clinic[®] Program

Data from the CP@clinic Multi-Site Randomized Controlled Trial
Based on 13 social housing buildings & 1461 residents



Cost-effectiveness of the CP@clinic[®] Program

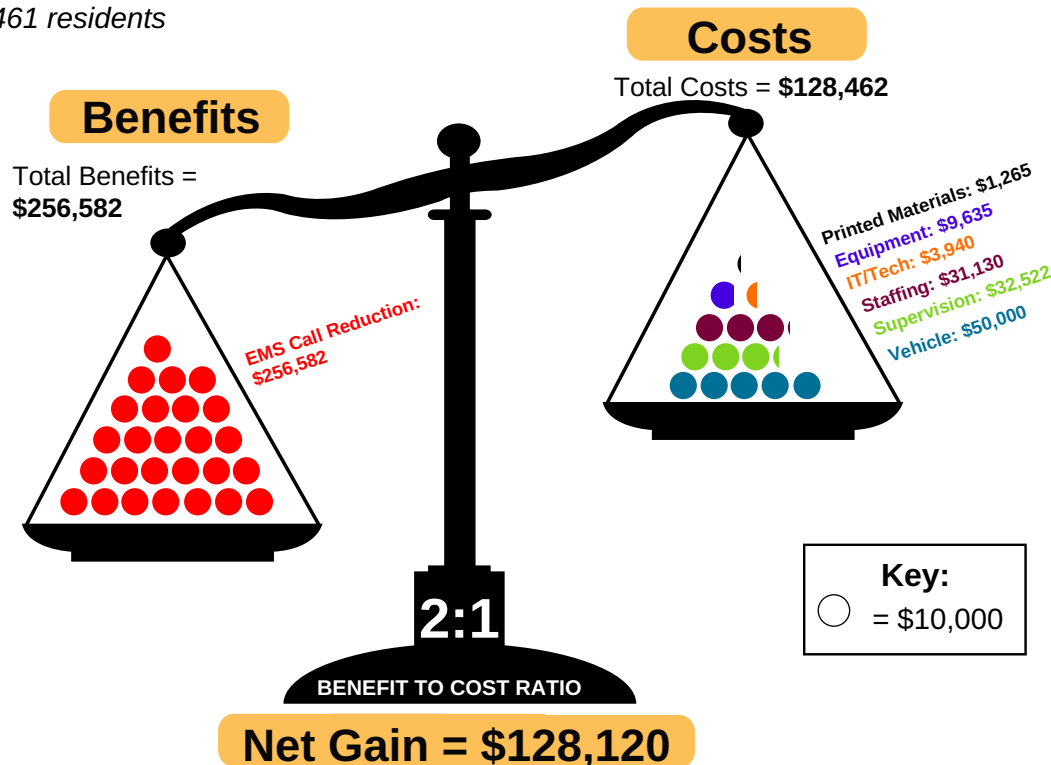
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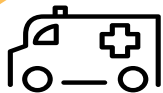
For every **\$1** spent on
the CP@clinic Program,
the Emergency Care System
sees **\$2** in benefits!



Cost-effectiveness of the CP@clinic Program

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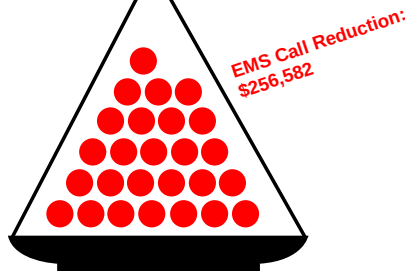
Net Savings
Per Resident:
\$88



Program Cost Per
QALY is well below
the threshold for
program adoption in
Canada

Benefits

Total Benefits =
\$256,582



Costs

Total Costs = **\$128,462**

Printed Materials: \$1,265
Equipment: \$9,635
IT/Tech: \$3,940
Staffing: \$31,130
Supervision: \$32,522
Vehicle: \$50,000

Key:

○ = \$10,000

British Columbia Emergency Health Services

BCEHS to present their slides - 15 mins

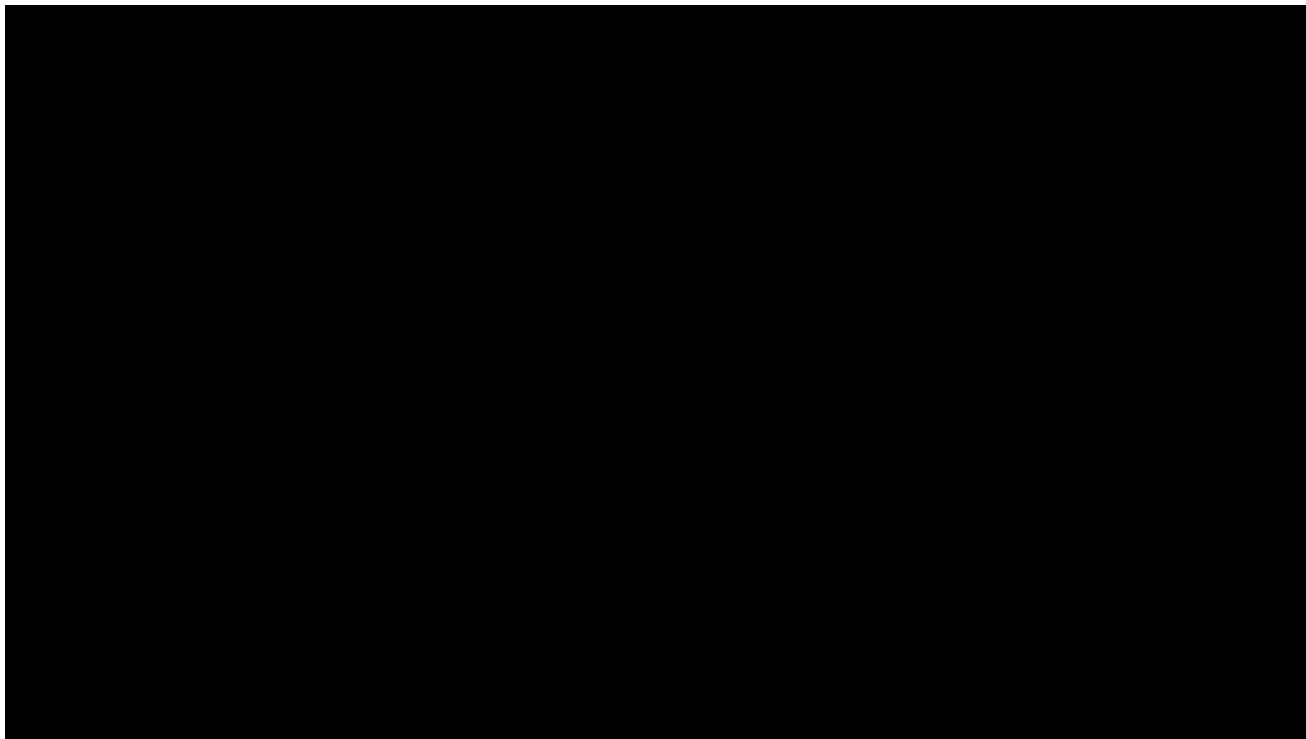
La Trobe University and Sunraysia Community Health Services

Mildura to present their slides - 15 mins

Implementation Science Approach

*Replicability of the Impact of CP@clinic in
British Columbia, Canada and
Victoria, Australia*

Testimonials



Replicability of CP@clinic in British Columbia



Ontario

British Columbia

RCT: Compared 15 intervention buildings to 15 control buildings

Pilot: 1 building compared to 2 matched, similar buildings

**Annual Reduction
in 911 Calls**

19 - 25%* for 1461 units

38%* for 434 units

Resource Gain

~\$256,582**

~\$99,368**

Net Resource Gain

~\$128,120

~\$73,676***

* Based on actual data

** Average cost of one EMS call in Ontario assumed to be **\$1626** (**NOTE:** Costing from 2016) and **\$848** in B.C. (**NOTE:** Does not include hospital visit/stay)
With an average annual inflation rate of 2.85%, the estimated 2024 cost in Ontario is **\$2035**

*** Assuming Ontario RCT program cost per site

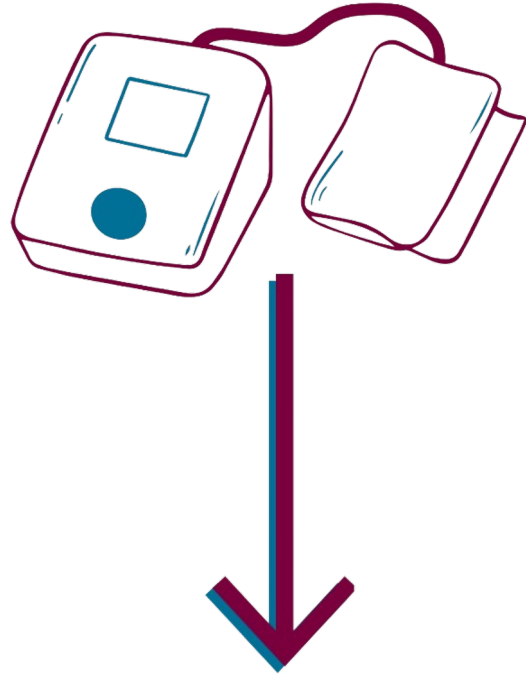


Demographics

	Ontario	British Columbia	Victoria, Australia
Age			
< 65	24.2%	53.8%	21.2%
65 - 75	38.3%	33.8%	28.2%
> 75	37.5%	12.5%	50.6%
Gender			
Female	79.9%	53.8%	48.8%
Male	20.1%	46.3%	51.2%

Mean Systolic Blood Pressure

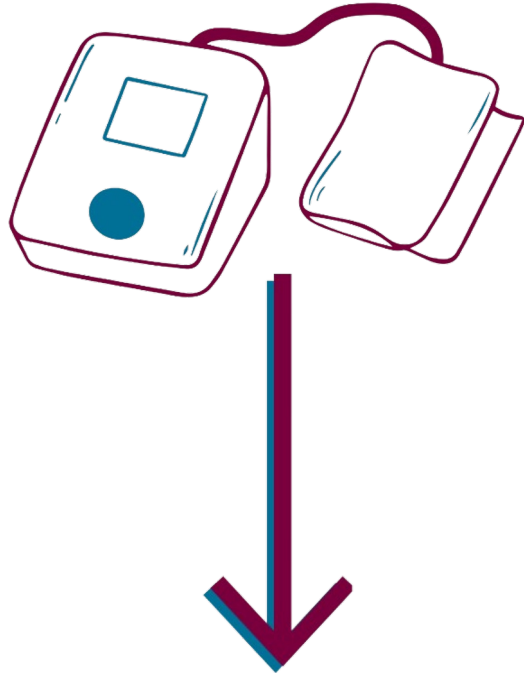
In attendees with elevated systolic BP at first visit



Visit	Ontario	British Columbia	Victoria, Australia
1	153.03	171.33	156.60
2	146.55	129.33	146.50
3	145.58	150.33	146.90
4	143.43	156.67	144.70
5	144.30	147.33	145.60
6	143.68	138.33	144.50
7	142.83	152.33	146.40
8	141.47	147.33	151.40
9	142.91	140.67	144.30
10	142.00	153.33	144.20

Mean Systolic Blood Pressure

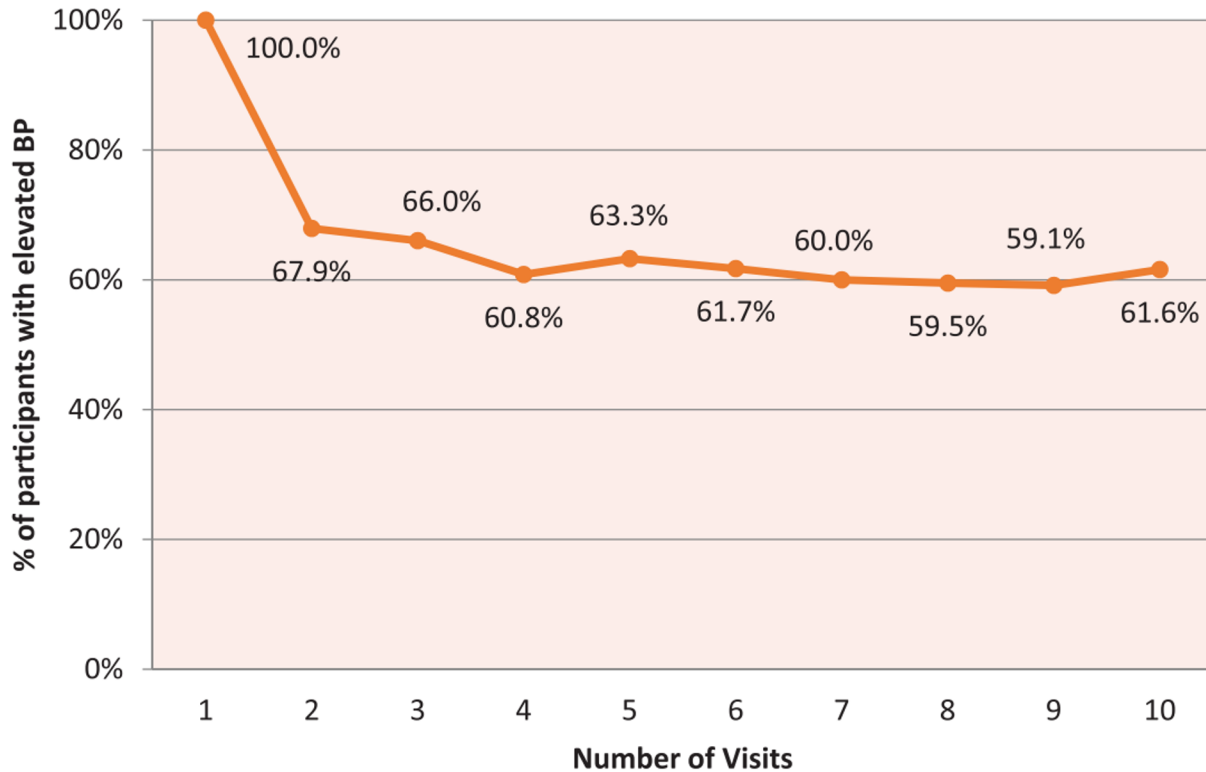
In attendees with elevated systolic BP at first visit



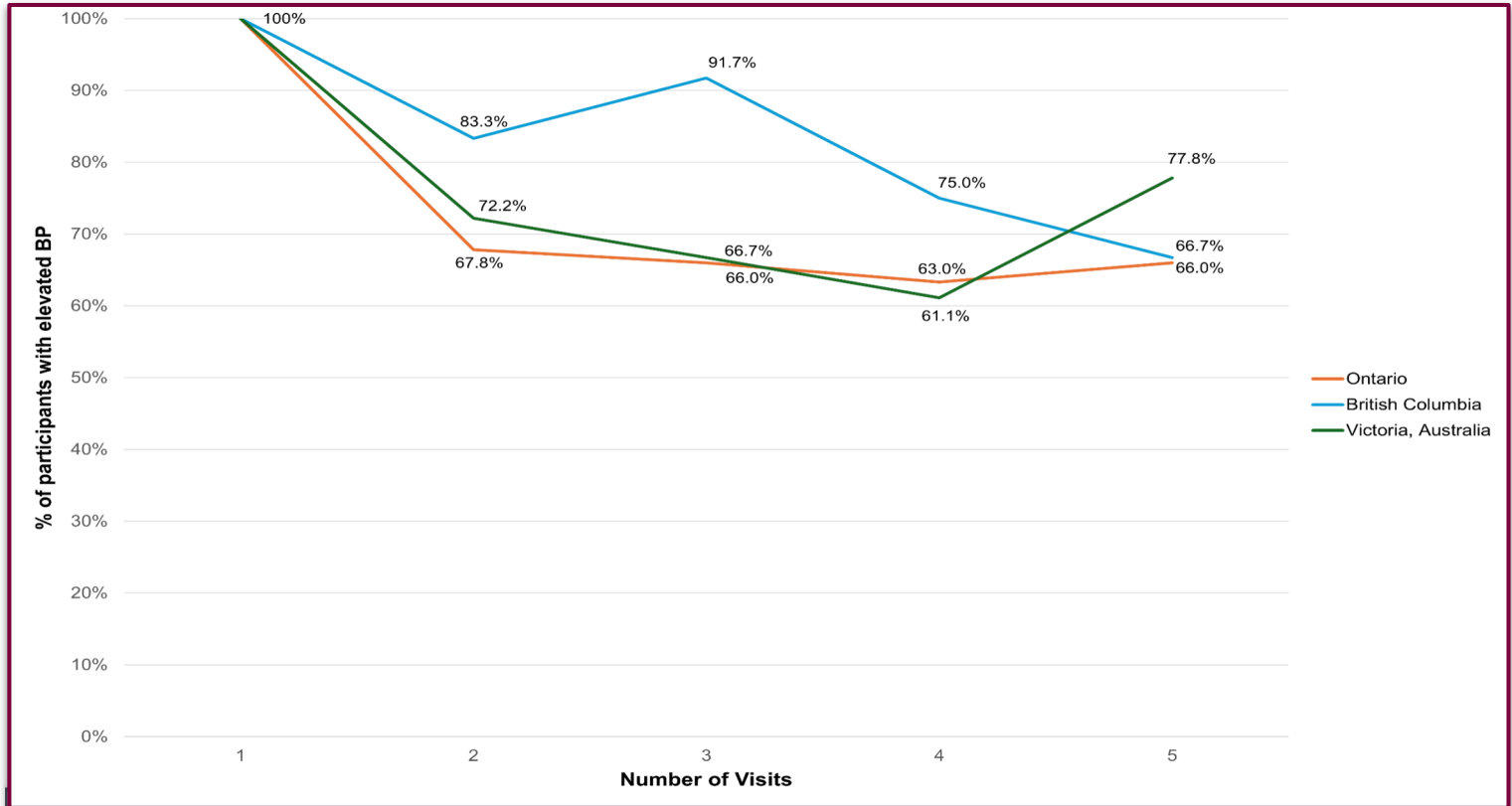
	Ontario	British Columbia	Victoria, Australia
Visit #1 Mean	153.0	171.3	156.6
Visit #10 Mean	142.0	153.3	144.2
Decrease	11.0mmHg	18.0mmHg	12.4mmHg

Blood Pressure Normalization (RCT)

Ontario



Blood Pressure Normalization (5 visits, all 3 sites)



Cardiometabolic Risk Factors

Lifestyle

Ontario

- 20% improved in fruit and vegetable intake
- 21% improved in physical activity

British Columbia

- 71% improved in fruit and vegetable intake
- 29% improved in physical activity

Victoria, Australia

- 45% improved in fruit and vegetable intake
- 9% improved in physical activity



Cardiometabolic Risk Factors

Body Composition

Ontario

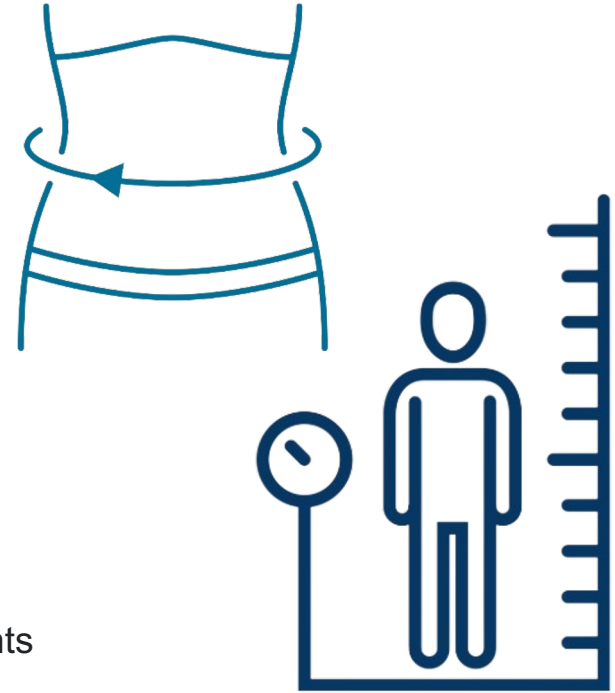
- BMI significantly **decreased** by a mean of **0.11** in patients

British Columbia

- BMI **decreased** by a mean of **0.36** in patients
- Weight **decreased** by a mean of **0.94 kg** in patients

Victoria, Australia

- Waist circumference **decreased** by a mean of **2.9 cm** in patients



Cardiometabolic Risk Factors

Ontario

- Usual activities **improved** in **34%** of patients
- Pain & discomfort **improved** in **34%** of patients

British Columbia

- Usual activities **improved** in **33%** of patients
- Pain & discomfort **improved** in **33%** of patients

Victoria, Australia

- Usual activities **improved** in **14%** of patients
- Pain & discomfort **improved** in **36%** of patients

Quality of Life



60% of patients with this issue at **baseline** **improved**



43% of patients with this issue at **baseline** **improved**



60% of patients with this issue at **baseline** **improved**



53% of patients with this issue at **baseline** **improved**

Adaptability

These scale-up and scale-out projects implementing the CP@clinic Program have demonstrated that...



It is **adaptable**



The outcomes are **replicable** to different Canadian and international settings



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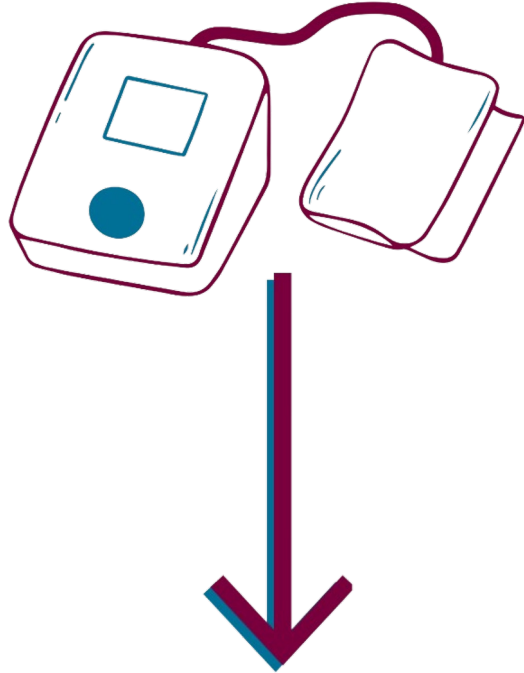
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Mean Diastolic Blood Pressure

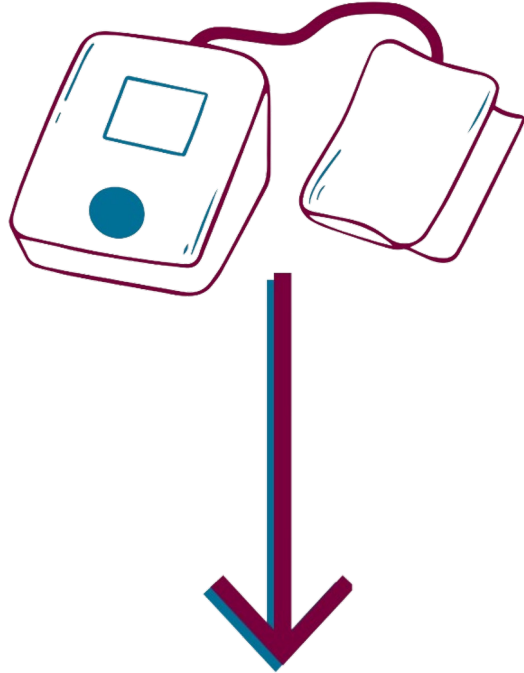
In attendees with elevated diastolic BP at first visit



Visit	Ontario	British Columbia
1	94.51	93.00
2	86.72	92.00
3	85.19	94.50
4	84.64	80.50
5	83.60	81.50
6	83.26	81.50
7	82.51	82.50
8	81.72	81.50
9	82.57	84.00
10	82.83	77.50

Mean Diastolic Blood Pressure

In attendees with elevated diastolic BP at first visit



	Ontario	British Columbia	Victoria, Australia
Visit #1 Mean	94.5	93.0	*Only one patient had high diastolic at first visit
Visit #10 Mean	82.8	77.5	
Decrease	11.7mmHg	15.5mmHg	

Qualitative Interviews

Qualitative interviews with CP@clinic patients from sites in Canada (**Ontario** & **British Columbia**) and **Australia** revealed that...



Timely access to health information and services



Support in achieving goals



Enhanced understanding of the healthcare system

Replicability of CP@clinic in British Columbia

Ontario

RCT: Compared 15 intervention buildings to 15 control buildings

➡ **19 - 25%** annual reduction in 911 calls for **1461 units**



➡ Resource gain of **\$256,582**** or a net resource gain of **~\$128,120** for the Emergency Care System



British Columbia

Pilot: 1 building compared to 2 matched, similar buildings

➡ **38%** annual reduction in 911 calls* for **434 units**



➡ Resource gain of **~\$99,368**** or an estimated net resource gain of **~\$73,676***** for the Emergency Care System

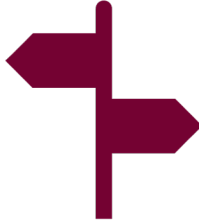


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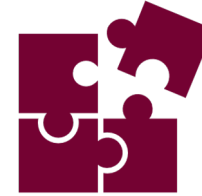
*** Assuming Ontario RCT program cost per site

Benefits of the CP@clinic Program



Health System Navigation

- Connect older adults to resources
- Health information and support
- Connects patients back to their primary care provider



Fills Healthcare Gap

- Fills a perceived gap in the healthcare system
- More personal, more time available

CP@clinic British Columbia

June 2024

Stuart Woolley
Paramedic Practice Leader
Learning & Professional Practice

BCEHS | BC Emergency
Health Services



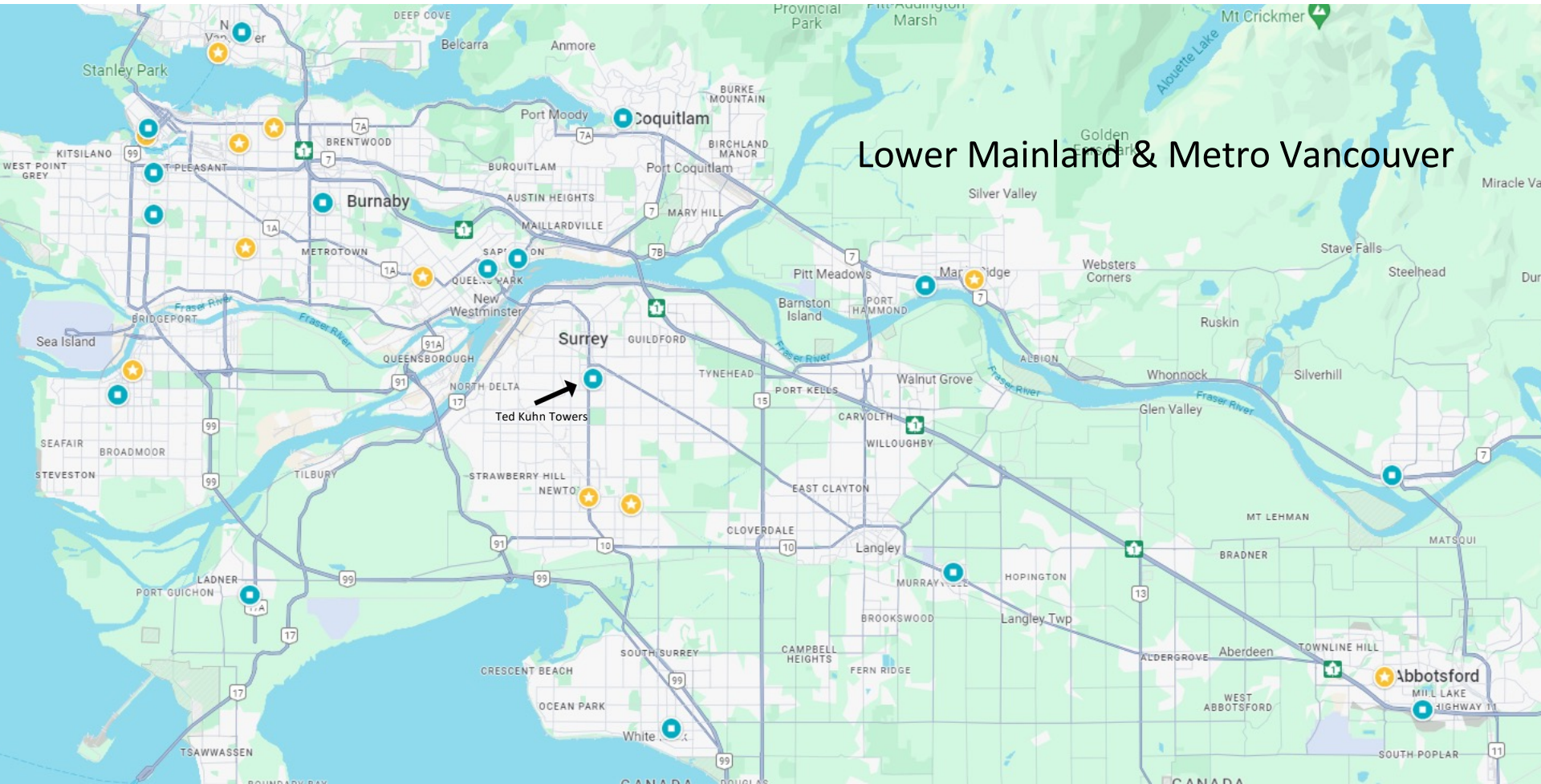


We would like to acknowledge that today we are coming together from a number of ancestral, traditional, and unceded territories.

We would like to acknowledge these homelands and recognize with respect the Indigenous peoples, humbly acknowledging them as the traditional stewards of the lands that we have the privilege to live, work, and play on.

- British Columbia is home to 5.6 million people, as of January 2024.
- The Lower Mainland is a geographic and cultural region of the mainland coast of BC that generally comprises the regional districts of Metro Vancouver and the Fraser Valley.
- As 2021 census, the population of the lower mainland core areas totals 2,999,830 people.
- Surrey is estimated to be 1,216,000 in 2024 up from 568,320 in 2021.
- British Columbia has 51,000 Social and Non-Profit housing units.

Lower Mainland & Metro Vancouver



Surrey, British Columbia

- Based on recent growth rates, the 2023 population in Surrey is estimated to be 1,216,000 in 2024 up from 568,320 in 2021.
- In 2023 BCEHS responded to 586,622 calls in the province, of which 49,746 were in Surrey.
- The 2021 census shows that the age group of 50 and older comprises 47% of the total population.
- The city of Surrey estimates up to 50,000 people are experiencing poverty.



Surrey is the largest city in land area, and the second most populous city within Metro Vancouver

Effects of poverty on health & well-being



Poverty negatively affects health, well-being and quality of life



Poverty can reduce life expectancy for the elderly, and they often face barriers to receiving adequate health care.



Those living in poverty are less likely to have adequate resources for food, housing, and health care, which can affect physical and mental health.

Partnering with CP@clinic

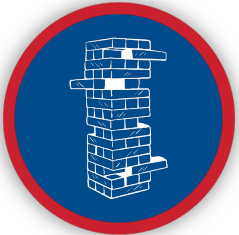
- Seniors living in subsidized housing can attend weekly drop-in sessions with community paramedics.
- Paramedics provide health assessments, make referrals to community-based resources, and engage participants in healthy lifestyle conversations.
- Targets leading chronic conditions such as cardiovascular disease, diabetes, and risk of falls.



CP@clinic in Surrey



In December 2021 BCEHS partnered with McMasters University Department of Family Medicine and McMaster Community Paramedicine research team to launch CP@clinic at Ted Khun Towers in Surrey.



Ted Khun Towers is considered to be a high-call volume building. It is a low-income housing development for seniors, people with disabilities and other medical issues. The Clinic is located in the Low Rise building (2 buildings make up Khun Towers) on the first floor.



There is a Clinic every Wednesday from 1000-1600 that tenants can sign up for and receive health care checks, including information and education on keeping healthy and living with chronic conditions. Tenants do not need to be referred to the clinic to see the Community paramedic.

Accomplishments



Expansion

Pilot site began in December 2021 through to December 2022. Ted Khun 1 was selected to be the primary site, and was expanded to tower 2 in April 2022



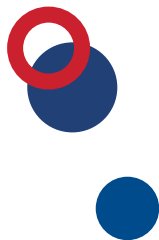
Historic call volume

Between November 2019 and November 2021, the average calls per year to Ted Khun Towers were 384 or 32 calls per month.



Call reduction

The first year of CP@Clinic showed the yearly calls to be 355 or 29.5 calls per month.



Future State

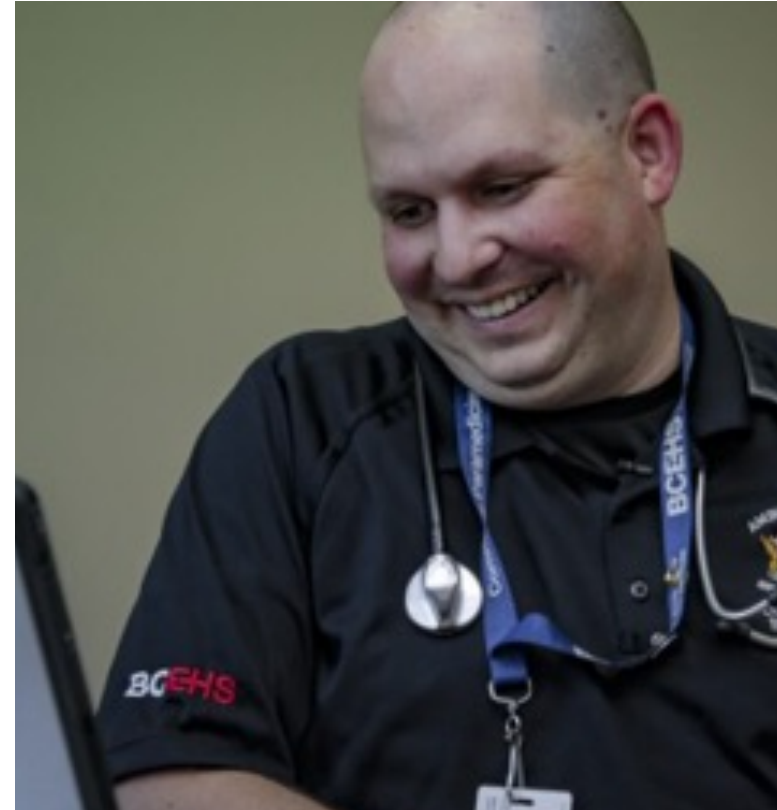
Enhanced urban outreach in partnership with CP@Clinic



Full-time CP@clinic positions, providing coverage over a larger metro area, and several low-income housing units



Case Presentation



CP@clinic Case Review



61 year old



Barrel Chest



Clubbed fingers



Normally tachycardic & tachypneic



Limited mobility

Medical Profile



Anxiety & Depression

Minimal support - no medications, but has social support to help with anxiety.



COPD

Has home oxygen, ventolin, prednisolone & trelegy to help with COPD. Occasionally has rescue antibiotic .



Chronic Nausea

PRN Zofran - cause potentially connected to ongoing medical history.



Chronic abdominal complains

Sennosides for chronic constipation - often exacerbates nausea!



Chronic neck & back pain

T3's PRN - no known origin of pain.

Background



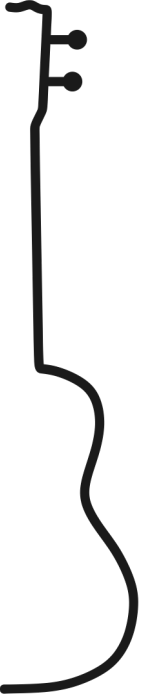
Grew up in the area - knows it well and has strong friend connections there.

Previously a musician

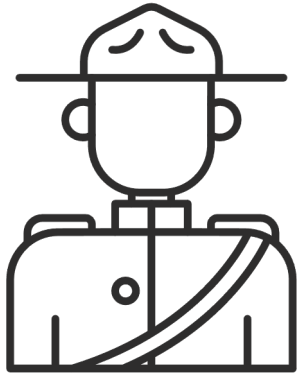
History of substance abuse

- Became homeless in his mid 40's
- Lived with no fixed address for 7-8 years
- States he needed to develop a tough persona to survive.
- Lived in a mix of SROs, subsidized basement suites, and storage lockers

Was one of the first regular patient we saw at CP@Clinic



Initial Care Plan



Initially local Paramedics would attend, with local law enforcement colleague - if this patient refused transport, he would like be sectioned and forced to go!



CP@clinic Involvement

One of the CP@Clinic Community Paramedics who also worked in Surrey and knew the patient quite well, started knocking on the patient's door to invite him to the weekly clinic.

The paramedic used conversations about music as a way to start a relationship with the patient, and gradually convinced the patient to come to the clinic.

The patient became connected to CP@Clinic in September 2022 for weekly 30-minute visits

The primary goal was to improve his access to primary care, improve his quality of life, and reduce his reliance on BCEHS and the ED.

Results?



Currently attached to a GP



Weekly CP@Clinic Reviews



Monthly GP Consults



Weekly home support - cleaning, laundry, meal prep.



RT support, COPD Management





Thank You



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Community paramedicine in Australian community health - implementation of the CP@clinic program

Evelien Spelten¹ and Louise Reynolds²

¹Professor, Violet Vines Marshman Centre for Rural Health Research

²Chief Paramedic Officer Victoria, AU, A/Prof in Paramedicine
ACU



LA TROBE
UNIVERSITY
AUSTRALIA





1. A feasibility study of CP@clinic
in Australian community health

2. Integration of paramedics in
primary care

A COLLABORATION BETWEEN



Violet Vines
Marshman Centre
For Rural Health
Research



Family Medicine

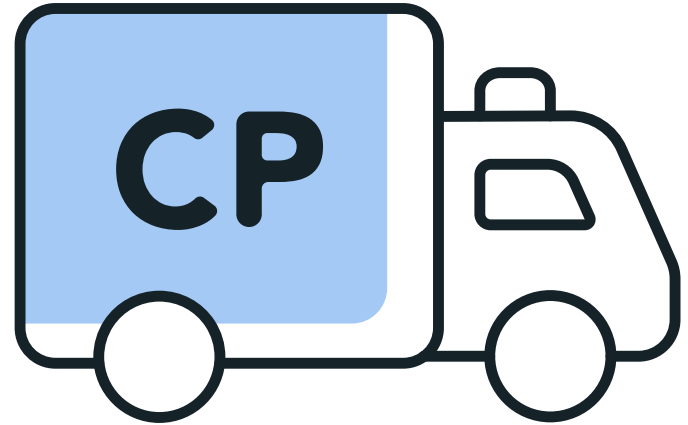


SCHS
Sunraysia Community
Health Services



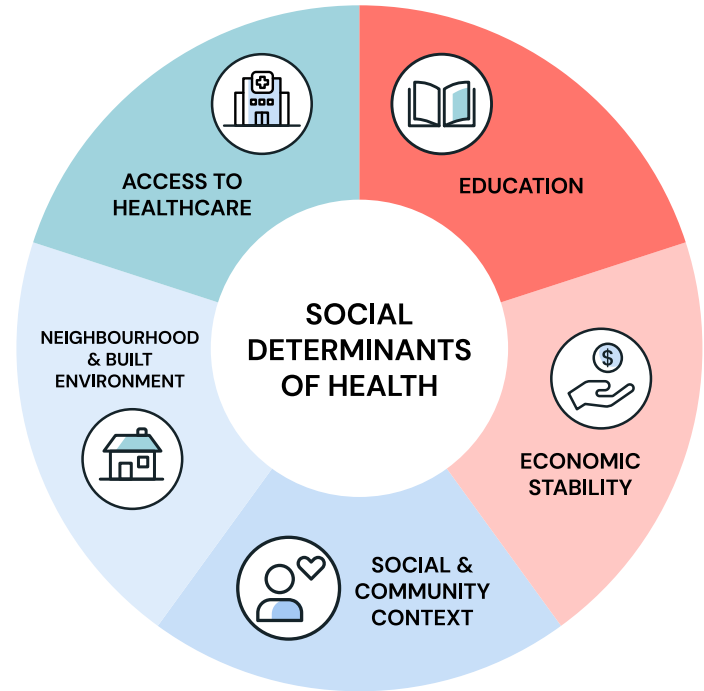
Relevance of this project for paramedics

- Available workforce:
 - We train more paramedics than ambulance services can employ
 - On average male paramedics work in ambulance service for 5 year, women for 3
- Need to develop alternative career opportunities for paramedics
- Need for new models of care
- Community Paramedicine is relatively new
- Also new: implementation in Community Health, so outside of the ambulance service



Relevance of CP outside of an Jurisdictional ambulance service in rural Australia in a community health service

- Vulnerable populations
- Primary Care domain
- Social Determinants of Health
- Integrated health and social care
- No or limited access to a GP
- Suited for CP? Not yet explored



A feasibility study of CP@clinic in Australian community health

The program

- Developed at McMaster University
- Evidence based: improves health, cost-effective
- Training program for paramedics
- Data collection program for evaluation





Mildura, Victoria, australia

- Population ≈ 57,000
- Average age of 40
- Indigenous Population 4.5%
- 10.5% born overseas
- 35% have mental health diagnosis
- 32% of the population have 2 or more chronic disease
- 6th (of 79) highest rate of ED presentation
- Twice median ED visits for Primary Care conditions
- Twice the rate of Vic Family Violence incidents
- SEIFA of 935, 4th most disadvantaged in Vic



The implementation

- 2 paramedics
- 3-hour free drop-in service to anyone seeking health screening or advice
- Various locations
- Additional: community meal and walking groups



The RESULTS

- Over 10 months, the program grew from:
- 1 clinic and 8 attendees to 5 clinics servicing 111 people
- 57% of participants were 65 or over
- 78% had 3 or more chronic diseases
- 94% had a moderate to high risk of diabetes
- 36% had no GP



QUOTES

"[CP@clinic] catches people before health problems arise [...] it's getting to the people that really need it."
– External Stakeholder

"I am able to support community members to work through the issues and barriers that exist for them to manage their health, which you do not have the capacity to do in AV [Ambulance Victoria]."
– Paramedic

"..you could class them as a friend, in a way [...] You can rely on them."
– Client

RESULTS



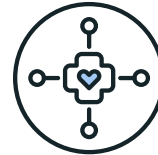
- **Good for clients** – the program successfully targets underserved clients due to its low access threshold, with a free drop-in service close to home. It increases social connectedness and reduces isolation.



Good for the community – the program clearly has a broad approach to health with its focus on prevention and rehabilitation. It addresses the social determinants of health which is evident from expansions such as walking groups and joint meals.



Good for paramedics – the role provides a welcome professional expansion, allowing for more career options and extended use of the skills and capabilities of these well-trained health care professionals. It might even help to boost paramedic retention rates from the current average of 5 years.



Good for the healthcare system – community paramedicine programs have been shown to take pressure off the healthcare system by identifying health issues at an early stage, thus preventing disease escalation, and reducing ambulance callouts. CP programs increase interdisciplinary collaboration and make use of an available qualified workforce.

RESULTS

Now expanding to 4 community health services in total, project for 4 years



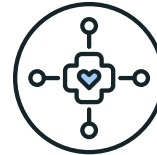
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Integration of paramedics in primary care

Unleashing the Potential of our Health Workforce Scope of Practice Review

- Prof Mark Cormack leading a national consultation to identify the systemic barriers to health professionals working at their 'top of scope' for opportunities to redesign primary care
- Issues Paper 1 identified five themes: legislation and regulation, education and training, employer practices, funding and technology
- Issue Paper 2 proposed a series of [eight] reform opportunities
- Final report due by end of October 2024



Chief Paramedic Officer - Sector Roundtable

- Stakeholders from jurisdictional ambulance services, community health, regulators, health department, professional body and rural health researchers participated in the consultation
- Facilitated activities used a modified Delphi and Claims, Concerns and Issues (CCI) methodology to:
- Round 1) Issue Identification
- Round 2) Solution Identification
- Round 3) Solution evaluation and ranking



Findings from Round 1

Theme	Barrier	Enabler
Legislation & regulation	No regulated scope of practice, lack of non-JAS enterprise agreements, lack of harmonization for drugs & poisons legislation	Paramedicine Board of Australia registration Dual registration (RP & RN)
Employer practices	Enterprise agreements limit mobility Lack of flexibility in workforce	Workforce supply pipeline (university graduation) Increasing appetite for new roles
Education & training	Primary care not yet part of curriculum	Training partnerships for student graduation and placement opportunities
Funding	No specific (state) funding model	Many potential sources with data linkage opportunities
Technology	Inability to access patient records from centralized platform	Virtual telehealth models emerging (such as VVED and VVGP)

Findings from Round 2

Theme	Evaluated Solution
Legislation & regulation	Include registered paramedics in drugs & poisons legislation Support dual registration (RN and RP) with mutual recognition
Employer practices	Support the transition of community paramedicine into primary care Expand enterprise agreements to include registered paramedics into awards which develops career structure
Education & training	Develop professional capabilities for primary care roles which will then be supported by area of practice endorsement and program accreditation
Funding	Increase flexibility in funding model
Technology	Improve access to digital platforms

Recommendations

1. National harmonisation of drugs, poisons, controlled substances across jurisdictions
2. Paramedicine Board of Australia to develop professional capabilities that align advanced roles such as primary care/community paramedic with accredited program standards
3. Enable the recognition of dual qualified registered paramedic and registered nurse scope of practice
4. Enable the eligibility for community health service funding mix to employ registered paramedics
5. Revise state and/or federal employment awards to recognise registered paramedics in the health professional category
6. Develop a recognised career strategy for registered paramedics independent in non-jurisdictional ambulance service roles

Next steps

- Chief Paramedic Officer to conduct a second roundtable with prospective paramedic employer groups to validate the proposed solutions.



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Thank you