

ARTICLE

A Community Paramedic Clinic at a Day Center for Adults Experiencing Homelessness

Jennifer L. Ridgeway, PhD, MPP, Erin O. Wissler Gerdes, MA, Xuan Zhu, PhD, Dawn M. Finnie, MPA, Liana M. Wiepert, Amy E. Glasgow, MHA, Andrew J. Torres, NRP, Olivia A. Smith, BS, Michael B. Juntunen, NRP, Chad P. Liedl, RN, MSN, CEN, NREMT, Rozalina G. McCoy, MD, MS

Vol. 4 No. 4 | April 2023

DOI: 10.1056/CAT.22.0300

People experiencing homelessness have difficulty accessing primary care and are vulnerable to poor health outcomes. Gaps in health care access are particularly apparent in smaller communities, which often lack the large-scale public health investments and infrastructures of metropolitan areas. Community paramedics (CPs) have advanced training in chronic disease management and social determinants of health and can deliver primary care services to patients with medical complexity and residents of medically underserved areas. However, the feasibility of leveraging community paramedicine to deliver acute, chronic, and preventive services to people experiencing homelessness is unknown. The authors evaluated the feasibility of a fixed-site CP clinic at a day center for adults experiencing homelessness in a small metropolitan area of the U.S. Midwest. CPs provided free health services to drop-in patients twice a week with general supervision by a physician medical director. The clinic was developed by the CP team with financial support from Mayo Clinic. The authors' objectives were to: (1) assess implementation of the program (e.g., feasibility and acceptability); and (2) identify areas for improvement and perceptions of program sustainability. Study outcomes were selected based on their utility for program decision-making. Data sources included metrics on care volumes and services (ascertained from electronic health records and CP patient tracker log) plus surveys and interviews with CPs, day center staff, county partners, and leadership from the ambulance service, hospital, and county; patients/clients were not interviewed as part of this report. Electronic surveys

and semi-structured interviews included questions on program acceptability, feasibility, and sustainability. CP surveys included additional questions regarding role clarity, knowledge and skills, beliefs about capabilities, work stress, and safety concerns. Metrics and surveys were analyzed descriptively. Interviews were analyzed by using a rapid template-driven approach organized around core survey/interview constructs. Between January and June 2022, CPs provided care on 38 days and conducted 127 visits (mean [standard deviation], 3.3 [1.6] visits per day). Patients had a mean (standard deviation) of 4.1 (3.3) Elixhauser index conditions, most frequently hypertension, depression, drug or alcohol use, diabetes, and other serious mental health conditions. Vital sign checks, clinical assessment, medication management/education, and wound care were among the most common services provided. Thirty-one program stakeholders completed surveys, and 13 completed interviews. Both survey ratings and qualitative data on program acceptability, appropriateness, and feasibility were favorable across groups. Among sustainability domains, survey ratings were least favorable for the financial stability domain. Interview data also suggest concerns about sustainability and the need for robust community collaboration to support future growth. Mayo Clinic's experience shows the feasibility and acceptability of CP care, but it also raises questions about long-term sustainability, as well as whether CPs operate in a clear scope of practice and bridge to other health care providers and systems.

People experiencing homelessness have high rates of morbidity and mortality, including from mental health comorbidities, as well as significant unmet health needs, even in high-income countries.¹⁻³ They also face a myriad of social and structural barriers to care, including lack of trust in the health care system, inconsistent access to food and medications, and demands of daily living.⁴⁻⁷ These barriers are further magnified by discrimination and stigma in health care settings^{6,7} and may drive inappropriate high-cost ED use while limiting the receipt of preventive care. Collaborations with community-based services may improve access to care and connect individuals with comprehensive preventive care but are often unavailable.⁸⁻¹¹

Paramedics are medical professionals with expertise in emergency triage and treatment. Community paramedics (CPs) are paramedics who, along with emergency medical treatment, have additional specialized training in chronic disease management, patient engagement and education, and social determinants of health. This combined skill set makes them uniquely positioned to deliver comprehensive patient-centered care in low-resource community settings.¹² CPs can evaluate patients, deliver acute services using standard protocols, and triage patients with unmet needs for transfer to the ED for emergency care or to ambulatory settings for diagnosis, specialized medical procedures, and ongoing disease management.

CP models have been used to increase access to care in rural communities with primary care shortages and support chronic disease management in the home setting.^{13,14} They have also been deployed in urban areas and, during the Covid-19 pandemic, provided testing and infection

care in shelters, hotels, and other community settings.¹⁵⁻¹⁷ However, there has been little or no evaluation of the feasibility of leveraging community paramedicine to provide acute and chronic care to people experiencing homelessness, especially in brick-and-mortar community locations in smaller urban areas.

We examined the feasibility and sustainability of a novel community paramedicine program — the CP clinic at The Landing MN — that provided drop-in services (i.e., unscheduled and on-demand) for people experiencing homelessness; this service was offered two half-days per week at a day center program in a small metropolitan area in the upper Midwest. Our objectives were to: (1) assess implementation of the program (e.g., feasibility and acceptability); and (2) identify areas for improvement and perceptions of program sustainability.

Setting and Intervention

Mayo Clinic Ambulance established a CP service in Rochester, Minnesota, in the summer of 2020 with the goal of expanding access to medical care to rural and underserved communities. Initially focused on chronic disease management,¹³ the CP service also sought ways to address clinical care gaps among people experiencing homelessness who frequently relied on emergency medical services for low-acuity care. In November 2020, the Mayo Clinic Ambulance CP service partnered with Olmsted County, Minnesota (population 163,436; 77.8% white alone, not Hispanic or Latinx; 7.7% in poverty),¹⁸ to develop a Mobile Covid-19 Unit for people experiencing homelessness.¹⁵ Throughout November and December 2020, CPs involved in this partnership identified a need for more stable and ongoing preventive and acute care for this population, many of whom were not accessing local primary care services despite their availability at Mayo Clinic and other community health care organizations. During this time, the CP service connected with [The Landing MN](#), a nonprofit organization in Rochester, Minnesota (population 121,000; 73.5% white alone, not Hispanic or Latinx; 8.7% in poverty),¹⁹ which was working to secure a physical storefront location to provide services for people experiencing homelessness, including food support and services to identify assistance for housing, substance use disorder treatment, and mental health services. Other on-site services available currently include help obtaining health insurance, legal services, and meetings for Alcoholics Anonymous and Narcotics Anonymous groups.

“*CPs approached The Landing MN leadership and proposed development of a medical clinic at its location; for two half-days per week, the CPs would be on hand for any medical need within the CP scope of practice, supervised remotely by a physician medical director.*”

The Landing MN opened its physical location in January 2021, and CPs approached The Landing MN leadership and proposed development of a medical clinic at its location; for two half-days per week, the CPs would be on hand for any medical need within the CP scope of practice, supervised remotely by a physician medical director. Clients would be able to seek services

during those times without a scheduled appointment. Approval to proceed with planning was quickly provided by The Landing MN leadership and Mayo Clinic Ambulance leadership. Within days of the agreement, necessary equipment for the clinic was procured from Mayo Clinic's charity supply.

The clinic, including daily supplies, was funded by [Mayo Clinic Ambulance](#) and [Mayo Clinic](#) as part of their community engagement efforts. Mayo Clinic Ambulance agreed to fund time for a physician medical director (R.G.M.), CP coordinator, and other ambulance service leadership (who oversee all aspects of the CP service, including this clinic). In 2022, Mayo Clinic began to fund CP time and any supplies and equipment used for patient care in the clinic (e.g., over-the-counter medications, medications carried by CPs, wound care supplies). Although CP services are reimbursable under Minnesota state Medicaid, and most clients at the day center have coverage or are eligible for insurance programs or charity care, the team decided against tracking coverage and submitting for reimbursement, as those systems can disenfranchise individuals experiencing homelessness. By removing barriers such as insurance paperwork and appointment scheduling, the team hoped to remove key barriers to care and improve accessibility.

To understand the needs of the population visiting the center, in the first 2 weeks after approval in January 2021, CPs spent time at The Landing MN, served food alongside other volunteers, and visited with clients to understand their needs. The CPs also attended staff meetings to gather input on service needs. The clinic officially launched in February 2021. CPs and CP service leadership continue to attend monthly staff meetings at The Landing MN to maintain a feedback loop and discuss opportunities for further collaboration or program refinement; they also maintain informal lines of communication for any concerns or needs that may arise, as is often uniquely possible in smaller communities. While at The Landing MN, CPs interact with clients even if these clients are not overtly seeking care; this is intended to foster trust and identify need for services. The established drop-in hours of the clinic are meant to provide predictable and accessible care to this population, but CPs may also provide care to individuals experiencing homeless in other settings, including in local encampments if they are asked by The Landing MN staff, law enforcement, emergency medical services, or other community partners to check on individuals' health needs. Consistent with our objective to evaluate the CP clinic at The Landing MN, data reported here are limited to visits that took place at The Landing MN location.

Data Collection

To assess program service use, we examined metrics ascertained from the Mayo Clinic electronic health record (EHR) and an administrative tracking log maintained by the CPs. To assess implementation, we examined perceptions of acceptability, feasibility, appropriateness, and sustainability ascertained using surveys and interviews with day center staff, county leadership and community partners, and hospital and ambulance service leadership. In this study, clients provided input during the planning stage, and staff at The Landing MN — who helped facilitate services — shared their perspectives on client experiences during the program. Future interviews are planned with clients of The Landing MN to understand their perspectives after receiving care.

The tracking log was maintained by CPs for patients whose care involved medical decision-making. It included patient identifiers used to calculate numbers of patients and visits as well as the patient's chief symptom and actions taken (e.g., procedure, treatment, or referral). In addition to the tracking log, EHR data were available for those patients on the tracker with a documented Mayo Clinic medical record number. EHR data were abstracted to identify services provided. Comorbidities were also ascertained from EHR data using the Elixhauser Comorbidity Index²⁰ between January 20, 2022, and June 21, 2022. Although some visits were documented in the EHR between February 2021 and January 2022, documentation workflows were not consistently followed, and no tracker was in place; therefore, that period was excluded from analyses. Improved procedures and additional CP training were implemented in January 2022.

We conducted electronic surveys and qualitative interviews between November 2021 and May 2022. Surveys included items from implementation measures: (1) the Acceptability, Appropriateness, and Feasibility of Intervention Measure;²¹ and (2) the Program Sustainability Assessment Tool.²² CP surveys included additional questions regarding role clarity, knowledge and skills, beliefs about capabilities, work stress, and safety concerns, modified from the Theoretical Domains Framework-based²³ Determinants of Implementation Behavior Questionnaire.²⁴ Interviews further explored these constructs and elicited information about potential program improvements. Interviews were recorded and conducted either in person or by video conference or telephone.

“ *Between January 20, 2022, and June 21, 2022, CPs cared for 69 unique patients in 127 documented visits over 38 clinical half-days (as documented in the CP tracker), on average completing 3.3 visits per day.*”

Data Analysis

We analyzed EHR, administrative, and survey data descriptively using R version 3.6.2 (R Foundation for Statistical Computing) and SAS version 9.4 (SAS Institute, Inc.). Implementation measure domain scores are reported according to group. Interview data were analyzed by using a rapid template-driven approach²⁵ organized around core survey/interview constructs (e.g., acceptability). One investigator populated the template after each interview, and the second reviewed it and provided additional insights. We analyzed each interview separately and then aggregated findings according to role. Joint displays were created by common survey/interview constructs (e.g., acceptability) to facilitate data interpretation.

Program Metrics

Between January 20, 2022, and June 21, 2022, CPs cared for 69 unique patients in 127 documented visits over 38 clinical half-days (as documented in the CP tracker), on average completing 3.3 visits per day. The mean number of visits per patient was 1.8 (standard deviation [SD], 1.8), with a range of 1–10. Care volumes and services provided are detailed in Table 1.

Table 1. Care Volumes and Services Provided, Between January 20, 2022, and June 21, 2022

| Care Volumes | Visits (n = 127) |
|--|------------------|
| No. of clinic days | 38 |
| No. of visits per clinic day | |
| Mean (SD) | 3.3 (1.6) |
| Median (IQR) | 3 (2, 4) |
| No. of unique patients | 69 |
| No. of visits per patient | |
| Mean (SD) | 1.8 (1.8) |
| Median (IQR) | 1 (1, 2) |
| Range | 1–10 |
| Services Provided | n (%) |
| Vital sign check | 59 (46.5%) |
| Clinical assessment/examination | 58 (45.7%) |
| Medication management/education | 27 (21.3%) |
| Wound care (including sutures and foot care) | 15 (11.8%) |
| Post-ED or hospital care | 8 (6.3%) |
| Laboratory collection | 2 (1.6%) |
| ECG | 3 (2.4%) |
| Medical equipment education | 2 (1.6%) |
| Acute health condition evaluation/management | |
| Skin/soft tissue infection | 5 (3.9%) |
| Injury or trauma | 4 (3.1%) |
| Covid-19 | 3 (2.4%) |
| Chronic condition evaluation/management | |
| Diabetes (including glucose monitoring) | 23 (18.1%) |
| Cardiovascular disease (including blood pressure checks) | 20 (15.7%) |
| Substance use disorder | 4 (3.1%) |
| Mental health condition | 7 (5.5%) |
| Other | 2 (1.6%) |

Services were tracked in a community paramedic (CP) tracking log and cross-referenced against the Mayo Clinic electronic health record. To reduce administrative burden, CPs only tracked encounters and services where clinical decision-making was involved. Simple encounters such as normal vital sign checks or conversation without need for evaluation and management, as may have been the case for mental health or substance use concerns, were not consistently tracked. In addition, encounters were not tracked upon patient request if the CP determined this would not hinder patient care. The extent of missing encounter data is unknown but believed to be minimal for encounters with medical decision-making. SD = standard deviation, IQR = interquartile range, ECG = electrocardiogram. Source: The authors

Of the 69 unique patients who received services during the study period and were logged on the CP tracker, 55 (79.7%) had a documented medical record number that allowed for EHR data abstraction; their characteristics are presented in Table 2. Those patients had a mean (SD) of 4.1 (3.3) chronic conditions, mostly notably hypertension and other cardiovascular conditions, depression, drug or alcohol use disorders, pulmonary disease, and serious mental health conditions.

Table 2. Characteristics of Patients Served, Between January 20, 2022, and June 21, 2022

| Characteristic | Patients (n = 55) |
|---|-------------------|
| Age, y | |
| Mean (SD) | 46.1 (16.8) |
| Median (IQR) | 45 (35, 59) |
| Age category, y | |
| 18–44 | 26 (47.3%) |
| 45–64 | 24 (43.6%) |
| ≥65 | 5 (9.1%) |
| Male | 35 (63.6%) |
| Race | |
| White | 36 (65.5%) |
| Black | 12 (21.8%) |
| Asian | 3 (5.5%) |
| Native American, American Indian, Alaska Native | 0 |
| Native Hawaiian or Pacific Islander | 0 |
| Other | 1 (1.8%) |
| Unknown or missing | 3 (5.5%) |
| Ethnicity | |
| Hispanic | 2 (3.6%) |
| Not Hispanic | 48 (87.3%) |
| Unknown | 5 (9.1%) |
| Elixhauser Comorbidity Index | |
| Mean (SD) | 4.1 (3.3) |
| Median (IQR) | 4.0 (1, 5) |
| Range | 1, 17 |
| Elixhauser comorbidities | |
| Hypertension, complicated and uncomplicated | 18 (32.7%) |
| Depression | 17 (30.9%) |
| Drug use | 16 (29.1%) |

Table 2. Characteristics of Patients Served, Between January 20, 2022, and June 21, 2022 (cont.)

| Characteristic | Patients (n = 55) |
|---|-------------------|
| Alcohol use | 14 (25.5%) |
| Serious mental health condition | 13 (23.6%) |
| Diabetes with and without chronic complications | 10 (18.2%) |
| Chronic pulmonary disease | 9 (16.4%) |
| Deficiency anemia | 8 (14.6%) |
| Obesity | 7 (12.7%) |
| Heart failure | 6 (10.9%) |
| Liver disease, mild | 5 (9.1%) |
| Other neurologic disorders | 5 (9.1%) |
| Peripheral vascular disease | 5 (9.1%) |
| Kidney disease | 4 (7.3%) |
| Seizures and epilepsy | 3 (5.5%) |
| Cancer | 3 (5.5%) |
| Hypothyroidism | 3 (5.5%) |
| Valvular disease | 3 (5.5%) |
| Unintentional weight loss | 3 (5.5%) |
| Other | 4 (7.3%) |

Patients include those in the community paramedic (CP) clinic tracking log who had a documented medical record number. Although CPs are able to establish medical record numbers for patients who did not have them, patients had the option to decline providing identifying information and, in those circumstances, medical record numbers could not be established. SD = standard deviation, IQR = interquartile range. Source: The authors

Surveys and Interviews

Thirty-one individuals of a total of 43 involved in the development and implementation of the pilot program and invited to provide feedback on the experience completed a survey, as shown in Table 3. Survey response rates varied by role but were lowest for hospital and ambulance program leadership. Twenty individuals were approached to participate in an interview, and 13 individuals completed interviews. Response rates for interviews were lowest for hospital and ambulance program leadership, followed by county leadership and community partners. The mean duration of interviews was 32 minutes (range, 20–85 minutes).

The clinic received favorable survey ratings on acceptability, appropriateness, feasibility, program favorability (mean [SD], 4.5 [0.9]), likelihood to recommend (mean [SD], 4.6 [0.9]), and accessibility (mean [SD], 4.2 [0.8]), all on 1–5 scales, with slight variations across groups ([Appendix](#), Exhibit 1). Interviews deepened understanding of implementation (Table 4).

Participants described client appreciation for being able to access care “where they were,” but they said trust-building took time. CPs fostered trust and commitment by being there on the

Table 3. Roles of Research Participants

| Role | Total Invited to Share Survey Feedback (n = 43) | Survey Respondents (n = 31)* | Total Invited to Share Interview Feedback (n = 20) | Interview Participants (n = 13)** | Overlap Between Survey and Interview Respondents |
|---|---|------------------------------|--|-----------------------------------|--|
| Community paramedic | 6 | 6 (19.4%) | 3 | 3 (23.1%) | 3 |
| Day center staff | 11 | 10 (32.3%) | 4 | 4 (30.8%) | 3 |
| County leadership and community partners [#] | 9 | 7 (22.6%) | 6 | 3 (23.1%) | 2 |
| Hospital and ambulance program leadership | 17 | 8 (25.8%) | 7 | 3 (23.1%) | 3 |

*Survey response rates: Overall = 72.1% (31 of 43); community paramedics = 100% (6 of 6); day center staff = 90.9% (10 of 11); county leadership and community partners = 77.8% (7 of 9); hospital and ambulance program leadership = 47.1% (8 of 17). **Interview response rates: Overall = 65% (13 of 20); community paramedics = 100% (3 of 3); day center staff = 100% (4 of 4); county leadership and community partners = 50% (3 of 6); hospital and ambulance program leadership = 42.9% (3 of 7). [#]Community partners included community nonprofit social service staff. Source: The authors

Table 4. Implementation Domains: Survey Ratings with Selected Quotes

| Domains | All Respondents (n = 31) Mean (SD) | Selected Quotes |
|-----------------------|------------------------------------|---|
| Acceptability (AIM) | 4.7 (0.5) | <ul style="list-style-type: none"> • “The staff were way on board with [the Clinic] and they see how beneficial and helpful it is to the visitors at The Landing.” (Community partner) • “[Clients] feel so comfortable here ... I can see a big weight lifted off of them ... for some people, it’s hard to open up or even talk to somebody.” (The Landing MN staff) • “[Trust] was slow at first. Once people realized that we were there to help them, they started to see us more.” (CP) • “The word is getting around that they come there ... with [the clients], word-of-mouth travels very fast....” (The Landing MN staff) |
| Appropriateness (IAM) | 4.7 (0.5) | <ul style="list-style-type: none"> • “[The Clinic] meets the goals of getting the right care to where and when patients need it.” (Ambulance service leadership) • “That’s intimidating for them to interact with people they don’t know ... for someone who has mental health issues or feels like they are seen as ‘less than’ to strangers, they aren’t necessarily going to put themselves out there for help because they’ve been told ‘no’ so many times. So, I think for us to be able to bring it to them and show that we care has been a big thing.” (CP) • “When a 911 truck goes to The Landing for a 911 response, there’s something acute going on, but typically law enforcement is there, too. When folks in uniform are there, it’s a different feel versus a community paramedic goes in there and it’s like, ‘You have some needs, how can we help you out?’” (Ambulance leadership) • “What I don’t know is how much connection back to the medical system is happening. I know how much effort that takes, and sometimes hand holding; that’s what we ultimately want. We don’t want people to get all of their medical care forever and ever at The Landing.” (Community partner) |
| Feasibility (FIM) | 4.7 (0.5) | <ul style="list-style-type: none"> • “[The client is] already here. You’re already eating your bowl of cereal. And then, the [CP’s] right there in the room, you know, ... you put down your cereal, put down your coffee, get your foot checked out, and go back to your cereal.” (Landing staff) • “I’ve taken glass out of a wound. Being paramedics, we have emergent acute side knowledge but that chronic condition management knowledge, as well. So, we’re a good mix of the two.” (CP) • “A lot of people would just come up and ask a question and then be like, ‘I would have gone to the ER for this.’” (CP) |

Acceptability, Appropriateness, and Feasibility of Intervention Measure questionnaire used a 5-point scale: 1 = completely disagree to 5 = completely agree. SD = standard deviation, AIM = Acceptability of Intervention Measure, CP = community paramedic, IAM = Intervention Appropriateness Measure, FIM = Feasibility of Intervention Measure. Source: The authors

scheduled days, as expected. Client trust was shown with return visits and word-of-mouth referrals among people in the community.

Perceived feasibility and appropriateness were described when participants spoke about the clinic as being the “right thing to do.” The day center was described as a prime location for care access (i.e., near the downtown core), and scope of training and knowledge by the CPs of acute care and chronic disease management made them a good fit for the types of medical needs present there. Furthermore, although anecdotal, participants provided examples of ways in which CP care resulted in benefits to clients and the health care system, including reduced ED visits. Some participants noted, however, that CPs have limited ability to manage mental health issues. They could triage mental health needs and provide limited support, but they were not able to care for the range of mental health needs of some clients, who might require psychiatric care, medication prescribing/management, or counseling. For patients such as these, as well as those who needed ongoing chronic illness or disease management such as for hypertension, some participants questioned whether the CP clinic was acting as a bridge to a more traditional health care system, where clients could get ongoing preventive and mental health care.

“*CPs fostered trust and commitment by being there on the scheduled days, as expected. Client trust was shown with return visits and word-of-mouth referrals among people in the community.*”

Challenges to feasibility also included limited time to document and capacity to share electronic records with partners in the day center (e.g., social workers). Likewise, CPs lacked support staff to room patients and set up visits, so although they appreciated being able to provide care in a setting that met the needs of the population, the CPs noted the limitations of being without the type of support they would have in a traditional clinical setting. They also noted feasibility issues that stemmed from ongoing challenges with CP recruitment that are similar to other health care staffing shortages, including challenges recruiting to the CP role specifically because of the impression that it is less known or less appealing than other roles within emergency medical services. These recruitment challenges in the larger paramedicine program left them feeling as if their staffing capacity was stretched thin at times.

CP survey results were high/favorable (on a 1–5 scale) on role clarity (mean [SD], 4.6 [0.5]) and beliefs about capabilities regarding patient assessments, delivering education, chronic disease care, and acute illness management (mean [SD], 4.3 [0.3]) and low/favorable on work stress (mean [SD], 1.3 [0.3]) and safety concerns (mean [SD], 2.3 [0.6]). In interviews, however, CPs identified additional training to meet the needs of this population, including skills in more complex wound care. They recommended shadowing primary care providers to see how to better conduct assessments, as well as training for how best to care for individuals with psychiatric needs. Although these types of care were within their scope of practice, CPs had less experience in these areas than in other areas of community paramedicine such as home-based care for patients with chronic conditions. One CP noted, “*We really need to be following PCPs*

[primary care providers], watching how they do things: how they look at charts; how they approach appointments; full physical visits. [In emergency paramedicine,] we don't really do full physicals. If your leg's broke, your leg's broke ... [In community paramedicine,] we really need to be emulating primary care." Recommendations such as this were presented in the context of ways the program could be improved by continuing to think about how CP care could better meet the needs of the patient population.

Of note, survey results on the clinic's capacity for sustainability were somewhat less favorable and had greater variability across groups. Select domains of the Program Sustainability Assessment Tool are shown, along with selected interview quotes, in Table 5.

Environmental support (i.e., having a supportive internal and external program climate) received one of the highest ratings. The program had internal and external champions, and there was a shared vision for growing the program. External support was generally described as positive among people who were aware of the program, but knowledge was often low. External support was perceived as complicated when policy makers faced public pressure against funding services for individuals experiencing homelessness. More specifically, participants commented on perceived lack of support from elected officials who made decisions about funding public programs but whose constituents varied in their support of services for people experiencing homelessness. Furthermore, during this study period, a government lease on the facility was being reviewed and was eventually

Table 5. Program Sustainability Assessment Tool Descriptive Statistics of Certain Domains and Selected Interview Quotes

| Domains | All Respondents (n = 31) Mean (SD) | Selected Quotes |
|-----------------------|--|--|
| Environmental support | 6.2 (1.0) | <ul style="list-style-type: none"> • "We've always had a vision of expanding it. We've had really good buy-in from the ambulance service and our CP management." (CPs) • "I have found that when people are aware [of the Clinic], they contribute, they want to help. But often, when I talk with people, they are like 'What? There is a clinic like that?'" (Mayo Clinic leadership) • "It's been hard to get buy-in from the city [who provided the initial space lease and then ended the lease], not necessarily on the medical care, but just the aspect of having a space to do it. That's kind of the hardest part." (CPs) |
| Partnerships | 5.9 (1.4) | <ul style="list-style-type: none"> • "A lot of times, our [CP] team or law enforcement have done courtesy escorts to The Landing to have them be seen." (County partner) • "I don't know what their caseload looks like. It seems like a lot of times, when we talk with the community paramedics, they're not able to come meet with us [to provide care for individuals served by the county partner at another location] because they are at The Landing." (County partner) • "It's providing a service that is not being provided by anybody else. There are a number of clinics [that provide medical care at no cost but using different models of care and serving different populations]. We've been actively trying to see how there can be some connections. There are some shared services that could be leveraged better." (Ambulance leadership) |
| Funding stability | 4.8 (1.7) | <ul style="list-style-type: none"> • "The government/political aspect of everything is really, really unfortunate; just the lack of support or funding with that is really difficult." (CPs) • "We commit to things and think about the business implications after we get there. Purely from a business standpoint, we're giving away a lot of free services, and that's good, but I don't know if it's sustainable unless we can figure out a way to be reimbursed. Times are good at (health system) right now. When times are tight, people start looking for redline opportunities." (Ambulance leadership) |

Seven-point scale: 1 = to little or no extent to 7 = to a very great extent. SD = standard deviation, CP = community paramedic. Source: The authors

ended, which was perceived as an indication that external support was inconsistent. Survey ratings were also high on questions about partnerships, but interviewees identified challenges, including limited CP capacity to staff multiple programs in the community (e.g., other CP programs such as home visits for patients with diabetes) and challenges coordinating services across different medical and social service providers in the community.

Funding stability received the lowest rating, with CPs and ambulance and hospital leadership giving lower ratings than other groups ([Appendix](#), Exhibit 2). However, although leadership spoke in interviews primarily about challenges to reimbursement for CP services, CPs reflected on funding challenges faced by The Landing MN, especially challenges with city and county support for the location and the service.

“ *They could triage mental health needs and provide limited support, but they were not able to care for the range of mental health needs of some clients, who might require psychiatric care, medication prescribing/management, or counseling.*”

Implementation Insights

There is urgent need for sustainable and scalable models to deliver health care services to people experiencing homelessness that can be implemented in smaller, under-resourced cities, including those with existing primary care practices, given the myriad personal and structural barriers that persons experiencing homelessness face in accessing care in traditional clinical settings. Our study shows the feasibility and acceptability of a CP-run clinic for people experiencing homelessness that leverages existing emergency medical services providers and skill sets to deliver a wide range of medical services in a setting that was already trusted by this population. This approach highlights care delivery that is not only accessible, but is also patient centered.

The patients serviced by this model had high rates of medical and mental health comorbidities that are considered drivers of high-cost care (e.g., ED visits). Without regular access to care and chronic disease management, these individuals may also have high rates of hospitalization from exacerbations of conditions such as diabetes or heart failure. CP services were therefore aimed at minimizing the need for emergency care. Likewise, there were high levels of acceptability and perceptions that the clinic was the right thing to do and met the health system’s mission to provide accessible, high-quality, person-centered care. However, we identified several opportunities to improve the program, including additional education and skills to expand the CP scope of practice. In response to these data, CPs completed additional training in advanced wound care and implemented new patient care guidelines on cellulitis and hyperglycemia management. With experience, they have also become more comfortable with clinical decision-making and wound care skills that were previously the most different from their earlier emergency and community paramedicine encounters. By late 2022, the CPs routinely cited the clinic at The Landing MN as one of the most satisfying parts

of their job, based on factors including autonomy, ability to develop and implement a plan of care for patients, and ability to monitor patients over time as that care plan is implemented. CPs who identify additional training or educational needs can propose those to CP leadership for development.

Interviews also highlighted questions about the scope of CP practice and what CPs should manage relative to other types of care providers. The CP scope of service is set by legislative policy,²⁶ whereas the narrower scope of practice is dictated by the ambulance service. In this program, the CPs have clearly articulated protocols and ready virtual access to a physician medical director as needed. They transfer clients to a primary care clinic or the ED or connect them to other medical or social services when needs are outside of their scope. This ability to respond and triage as needed is consistent with the overall emergency medical services approach.

Despite an available medical record, we found that there are still challenges with documentation and complexities of sharing records with staff who may not have access to Mayo Clinic EHRs.

Our study also highlights the challenges of funding stability. In Minnesota, CP services are reimbursable by Medicaid and, in fact, many clients who get services at day centers such as this either have health insurance coverage (e.g., Medicaid, Medicare, veterans' benefits) or would qualify for them. At The Landing MN, an on-site social worker is available to help with social and health service enrollment. However, the value of creating administrative procedures for reimbursement in this setting must be balanced against potential disenfranchisement of clients and burden on staff responsible for documentation and processing.

“ *By late 2022, the CPs routinely cited the clinic at The Landing MN as one of the most satisfying parts of their job, based on factors including autonomy, ability to develop and implement a plan of care for patients, and ability to manage patients over time as that care plan is implemented.*”

This raises a critical issue for clinics such as this, which aim to remove administrative barriers such as scheduling and payment to improve access for individuals who have lower attendance at traditional clinic visits, even those in community settings. Our program benefits from health system funding, and the health system benefits from community engagement that is a qualifying factor for nonprofit exemptions. That arrangement, however, is subject to year-to-year leadership decisions. Block grants and Federally Qualified Health Center designation may be options for smaller communities to support these types of services. However, the administrative burden of pursuing these may be too high for smaller grassroots efforts such as The Landing MN or even the CP service.

Limitations of this study include omission of the client perspective on the program. Engagement of clients at The Landing MN in the weeks before launching the program provided critical insights into patient needs and built on the experience of the CP team delivering care to that population as

part of the Mobile Covid-19 Unit¹⁵ and in shelters and encampments over the years. This rapid approach was part of the team's ability to be nimble, get a program going, and then refine as they interacted with clients over time (i.e., as part of care or their time between visits). There are systems in place for ongoing feedback loops with staff at The Landing MN, but this is only a proxy for direct client input. Client interviews, planned for summer 2023, will provide important insights into program effectiveness and areas for improvement. Given the potential difficulties of using traditional qualitative recruitment strategies for this population, planned interviews will involve research staff spending longer periods of time on-site to develop rapport and make research participation accessible.

EHR documentation was limited by CP time constraints, and CPs were only required to document visits where medical decision-making took place, in an effort to decrease administrative burden. The result is that tracking is not available for all visits. In addition, The Landing MN lost its leased space in June 2022. Although this disrupted care, CP services continued in a portable unit until the new renovated space opened in November 2022. Since this pilot evaluation, the CP clinic at The Landing MN has expanded to offer three half-days of on-site care, with continued funding through Mayo Clinic as part of its commitment to community care. The schedule stays consistent so clients can anticipate when care will be available, but the team continues to work with the center staff and has occasionally adjusted the schedule based on their request (e.g., to match peak visiting hours or to coordinate with other services offered on-site).

Finally, although we attempted to recruit larger numbers of administrative stakeholders from government agencies and community partner organizations, both to complete surveys and interviews, we experienced low response rates from these groups. Anecdotal information suggests that Covid-19-related staffing and related challenges were higher priorities than research activities, but it is possible that individuals who declined to participate were also less enthusiastic about the CP clinic or about The Landing MN. Mixed methods and participation of individuals in various roles provided a relatively comprehensive evaluation of this work, but future research with strong participation from these groups will be critical, especially given concerns about sustainability and the need for robust partnerships for long-term success.

Jennifer L. Ridgeway, PhD, MPP

Senior Associate Consultant, Division of Health Care Delivery Research, Mayo Clinic, Rochester, Minnesota, USA

Assistant Professor of Health Services Research, Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, Minnesota, USA

Erin O. Wissler Gerdes, MA

Former Health Services Analyst, Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, Minnesota, USA

Xuan Zhu, PhD

Assistant Professor of Health Services Research and Senior Health Services Analyst, Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, Minnesota, USA

Dawn M. Finnie, MPA

Principal Health Services Analyst, Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, Minnesota, USA

Liana M. Wiepert

Undergraduate Research Intern, Division of Community Internal Medicine, Geriatrics, and Palliative Care, Department of Medicine, Mayo Clinic, Rochester, Minnesota, USA

Amy E. Glasgow, MHA

Principal Health Services Analyst, Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, Minnesota, USA

Andrew J. Torres, NRP

Emergency and Community Paramedic, Mayo Clinic Ambulance, Rochester, Minnesota, USA

Olivia A. Smith, BS

Associate Health Services Analyst, Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, Minnesota, USA

Michael B. Juntunen, NRP

Coordinator for Community Paramedicine, Mayo Clinic Ambulance, Rochester, Minnesota, USA

Chad P. Liedl, RN, MSN, CEN, NREMT

Director of Clinical Services, Mayo Clinic Ambulance, Rochester, Minnesota, USA

Rozalina G. McCoy, MD, MS

Associate Professor of Medicine, Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, Minnesota, USA

Consultant and Vice Chair for Research, Division of Community Internal Medicine, Geriatrics, and Palliative Care, Department of Medicine, Mayo Clinic, Rochester, Minnesota, USA

Medical Director, Community Paramedic Service, Mayo Clinic Ambulance, Rochester, Minnesota, USA

Appendix

[Descriptive Statistics of Implementation Outcomes and Program Sustainability](#)

Acknowledgments

We thank Teresa K. Swenson and Zachary Stickler (both formerly with Mayo Clinic Ambulance) for their support of this work. We also thank Dan and Holly Fifield from The Landing MN for their support of this work and for their tireless efforts in service to the community. This project was funded by the Robert D. and Patricia E. Kern Center for the

Science of Health Care Delivery, and the CP clinic was funded by Mayo Clinic Ambulance and Mayo Clinic.

Disclosures: Jennifer L. Ridgeway, Erin O. Wissler Gerdes, Xuan Zhu, Dawn M. Finnie, Liana M. Wiepert, Amy E. Glasgow, Andrew J. Torres, Olivia A. Smith, Michael B. Juntunen, Chad P. Liedl, and Rozalina G. McCoy have nothing to disclose.

References

1. Fazel S, Geddes JR, Kushel M. The health of homeless people in high-income countries: descriptive epidemiology, health consequences, and clinical and policy recommendations. *Lancet* 2014;384:1529-40 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4520328/> [https://doi.org/10.1016/S0140-6736\(14\)61132-6](https://doi.org/10.1016/S0140-6736(14)61132-6).
2. Baggett TP, O'Connell JJ, Singer DE, Rigotti NA. The unmet health care needs of homeless adults: a national study. *Am J Public Health* 2010;100:1326-33 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2882397/> <https://doi.org/10.2105/AJPH.2009.180109>.
3. Gutwinski S, Schreiter S, Deutscher K, Fazel S. The prevalence of mental disorders among homeless people in high-income countries: an updated systematic review and meta-regression analysis. *PLoS Med* 2021;18:e1003750 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8423293/>.
4. Liu M, Hwang SW. Health care for homeless people. *Nat Rev Dis Primers* 2021;7:5 <https://www.nature.com/articles/s41572-020-00241-2> <https://doi.org/10.1038/s41572-020-00241-2>.
5. Kushel MB, Vittinghoff E, Haas JS. Factors associated with the health care utilization of homeless persons. *JAMA* 2001;285:200-6 <https://jamanetwork.com/journals/jama/fullarticle/193438> <https://doi.org/10.1001/jama.285.2.200>.
6. Magwood O, Ymele Leki V, Kpade V, et al. Trust and personal safety in the margins: a systematic review on the acceptability and accessibility of health and structural interventions for persons with lived experience of homelessness. *PLOS One* 2019;14:e0226306 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6936789/>.
7. Reilly J, Ho I, Williamson A. A systematic review of the effect of stigma on the health of people experiencing homelessness. *Health Soc Care Community* 2022;30:2128-41 <https://onlinelibrary.wiley.com/doi/10.1111/hsc.13884> <https://doi.org/10.1111/hsc.13884>.
8. Pottie K, Kendall CE, Aubry T, et al. Clinical guideline for homeless and vulnerably housed people, and people with lived homelessness experience. *CMAJ* 2020;192:E240-54 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7062440/> <https://doi.org/10.1503/cmaj.190777>.
9. National Guideline Alliance (UK). Evidence reviews for effectiveness of approaches to improve access to and engagement with health and social care and joined up approaches: Integrated health and social care for people experiencing homelessness. Evidence review A-B. NICE Guideline NG214.

London: National Institute for Health and Care Excellence (NICE). March 2022. Accessed December 5, 2022. <https://www.ncbi.nlm.nih.gov/books/NBK579615/>.

10. Romm IK, Loughnane J, Goudreau M, Ajayi T. Walking with our patients in the community. *NEJM Catalyst*. July 27, 2017. Accessed January 20, 2023. <https://catalyst.nejm.org/doi/full/10.1056/CAT.17.0445>.
11. Rochlin DH, Lee C-M, Scheuter C, Platchek T, Kaplan RM, Milstein A. Health care is failing the most vulnerable patients: three underused solutions. *Public Health Rep* 2020;135:711-6 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7649988/> <https://doi.org/10.1177/0033354920954496>.
12. Chan J, Griffith LE, Costa AP, Leyenaar MS, Agarwal G. Community paramedicine: a systematic review of program descriptions and training. *CJEM* 2019;21:749-61 <https://www.cambridge.org/core/journals/canadian-journal-of-emergency-medicine/article/community-paramedicine-a-systematic-review-of-program-descriptions-and-training/93575DE28A2ADE61103459B72F8E2207> <https://doi.org/10.1017/cem.2019.14>.
13. Juntunen MB, Liedl CP, Carlson PN, et al. Diabetes Rescue, Engagement and Management (D-REM): rationale and design of a pragmatic clinical trial of a community paramedicine programme to improve diabetes care. *BMJ Open* 2022;12:e057224 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9024266/> <https://doi.org/10.1136/bmjopen-2021-057224>.
14. Patterson DG, Coulthard C, Garberson LA, Wingrove G, Larson EH. What is the potential of community paramedicine to fill rural health care gaps? *J Health Care Poor Underserved* 2016;27:4A:144-58 <https://muse.jhu.edu/article/634884> <https://doi.org/10.1353/hpu.2016.0192>.
15. Stickler ZR, Carlson PN, Myers L, et al. Community paramedic mobile COVID-19 unit serving people experiencing homelessness. *Ann Fam Med* 2021;19:562 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8575525/> <https://doi.org/10.1370/afm.2709>.
16. Sanko S, Eckstein M. Mobile integrated health care in Los Angeles: upstream solutions to mitigate the Covid-19 pandemic. *NEJM Catal Innov Care Deliv*. Published January 20, 2021. Accessed July 28, 2022. <https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0383> <https://doi.org/10.1056/CAT.20.0383>.
17. Constantine ST, Callaway D, Driscoll JN, Murphy S. Implementation of drive-through testing for COVID-19 with community paramedics. *Disaster Med Public Health Prep* 2022;16:2076-82 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8111182/> <https://doi.org/10.1017/dmp.2021.46>.
18. United States Census Bureau. Quick Facts. Olmsted County, Minnesota. July 2021. Accessed January 20, 2023. <https://www.census.gov/quickfacts/olmstedcountyminnesota>.
19. United States Census Bureau. Quick Facts. Minnesota, Rochester City. July 2021. Accessed January 20, 2023. <https://www.census.gov/quickfacts/fact/table/MN,rochestercityminnesota/PST045222>.
20. Elixhauser A, Steiner C, Harris DR, Coffey RM. Comorbidity measures for use with administrative data. *Med Care* 1998;36:8-27 <https://journals.lww.com/lww-medicalcare/Abstract/1998/01000/>

21. Weiner BJ, Lewis CC, Stanick C, et al. Psychometric assessment of three newly developed implementation outcome measures. *Implement Sci* 2017;12:108 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5576104/> <https://doi.org/10.1186/s13012-017-0635-3>.
22. Luke DA, Calhoun A, Robichaux CB, Elliott MB, Moreland-Russell S. The Program Sustainability Assessment Tool: a new instrument for public health programs. *Prev Chronic Dis* 2014;11:130184 https://www.cdc.gov/pcd/issues/2014/13_0184.htm <https://doi.org/10.5888/pcd11.130184>.
23. Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A; “Psychological Theory” Group. Making psychological theory useful for implementing evidence based practice: a consensus approach. *Qual Saf Health Care* 2005;14:26-33 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1743963/> <https://doi.org/10.1136/qshc.2004.011155>.
24. Huijg JM, Gebhardt WA, Dusseldorp E, et al. Measuring determinants of implementation behavior: psychometric properties of a questionnaire based on the theoretical domains framework. *Implement Sci* 2014;9:33 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4000005/> <https://doi.org/10.1186/1748-5908-9-33>.
25. Vindrola-Padros C. *Doing rapid qualitative research*. London: SAGE Publications Ltd, 2021.
26. Minnesota Department of Health. Community Paramedics (CP). Office of Rural Health and Primary Care, Minnesota Department of Health. Updated October 4, 2022. Accessed December 25, 2022. <https://www.health.state.mn.us/facilities/ruralhealth/emerging/cp/index.html>.