

## ORIGINAL ARTICLE OPEN ACCESS

# Drop-In Wound Care: Calgary's Wound Care Model Centred Around People Experiencing Homelessness

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## ABSTRACT

People experiencing housing insecurities or homelessness face significant barriers to equitable healthcare. A drop-in wound care service was established to mitigate social barriers and improve accessibility. This model facilitates direct access to a multi-disciplinary team of trauma-informed medical staff on a walk-in basis. A retrospective chart review was performed on patients seen at the drop-in clinic from January 2021 to December 2021. A total of 119 patients were serviced over 798 visits, with 254 unique wounds managed. 82.8% of patients were living unsheltered, in emergency shelters or in provisional accommodation at the time of assessment. Trauma wounds, lower leg ulcers and frostbites represented the top three complaints. 69.7% of all patients returned to service for at least a second visit, with a median of 4 visits per patient over 42.5 days. Unsheltered patients were most likely to return to service (87.5%) but were most likely to be lost prior to wound closure (68.8%). Timely access to care with consistent follow-up is essential for quality wound care. Our drop-in service presents a working model for providing equitable wound care to socially disadvantaged patient populations. The effectiveness of this model is highlighted by the continual expansion serving 909 and 1029 visits in subsequent years.

## 1 | Introduction

Homelessness is a complex social and medical issue affecting up to 235 000 Canadians each year [1]. People experiencing housing insecurities or homelessness face significant barriers to equitable healthcare [2–4]. Missed appointments are common in outpatient settings, as they face transportation barriers and experience volatile daily schedules secondary to compounding social and financial issues [5]. Additionally, the ongoing stigma against homelessness from healthcare workers creates significant challenges for patients as they navigate through the complicated healthcare system [6, 7].

To improve the accessibility of wound care to patients experiencing homelessness, a drop-in service was implemented at the

outpatient Wound Clinic located within the Sheldon M. Chumir Health Centre in downtown Calgary, Alberta. Drop-in models implemented across the globe have shown success in providing crucial medical services such as wound care, needle exchange, mental health services and HIV screening to people experiencing homelessness [8–11]. Likewise, our model facilitates direct access to comprehensive wound care from a multidisciplinary team of trauma-informed healthcare professionals on a walk-in basis at an outpatient clinic located at the core of the city. This programme serves to directly mitigate social barriers and improve accessibility to wound care.

To this end, a retrospective chart review of patients managed at the drop-in service from January 2021 to December 2021 was completed to obtain a better understanding of the patient

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## Summary

- A drop-in service is a working model for providing equitable wound care to socially disadvantaged patients including people experiencing homelessness or housing insecurities.
- A retrospective chart review was completed to obtain a better understanding of the patient demographics, and the types of wounds managed at the drop-in clinic serving people experiencing homelessness in Calgary, Canada.
- Our model observed a return to service rate in over two-thirds of patients. Frostbites and infections were the most common in unsheltered patients, whereas trauma wounds and frostbites were the most common in emergency sheltered patients.

demographics, housing arrangements and the characteristics of wounds specific to this patient population.

## 2 | Methods

A retrospective chart review of electronic medical records was performed on all patients treated at the Sheldon M. Chumir Health Centre Wound Clinic in Calgary, Alberta, Canada from 1 January 2021 to 31 December 2021. Ethical approval was granted from the University of Calgary Conjoint Health Research Ethics Board (REB22-0560). All serviced patients were included in the analysis without any exclusion criteria to enable a comprehensive study of the target study population. Patient demographics data, including housing address, were recorded into the EMR by staffed wound care nurses. Additional information collected include the sex, age, date of service, number of revisits, nature of medical visit, nature and location of the wound and treatment provided. The data were extracted and de-identified prior to analysis by a resident dermatologist and reviewed by a staff dermatologist.

Patients were directly asked for their housing arrangements by nursing staff during their visits, who subsequently recorded the data into the EMR. Reported addresses or agency names were classified into five housing categories adapted from definitions established by the Canadian Observatory of Homelessness and Statistic Canada [1]: unsheltered, emergency sheltered, provisionally housed, independent and unknown. 'Unsheltered' was defined as those who currently lack housing and are not accessing emergency shelters, including those living in public spaces such as sidewalks and parks, and in places not intended for permanent human habitation such as vehicles and tents. 'Emergency sheltered' was defined as those who cannot secure permanent housing and access emergency shelters or system supports without cost or at minimal cost. 'Provisionally accommodated' encompasses those who are accommodated without prospects of permanence. This includes people living in housing provided by the government, transitional housing or in subsidised housing. This also includes those living with others temporarily. 'Independent living' defined individuals who support themselves without external aid and are living in a permanent

address. This also includes those who are at risk of homelessness. Lastly, patients whose housing information could not be extracted from their electronic medical records were defined as 'unknown'.

### 2.1 | Statistics

GraphPad Prism 9 software was utilised for statistical analysis and graph generation. One-way ANOVA test with Tukey correction was used to compare multiple means of continuous variables between patient housing status. Kruskal-Wallis test was used to compare multiple medians of continuous variables. Chi-square test was used to compare multiple proportions of categorical characteristics.

### 2.2 | Results

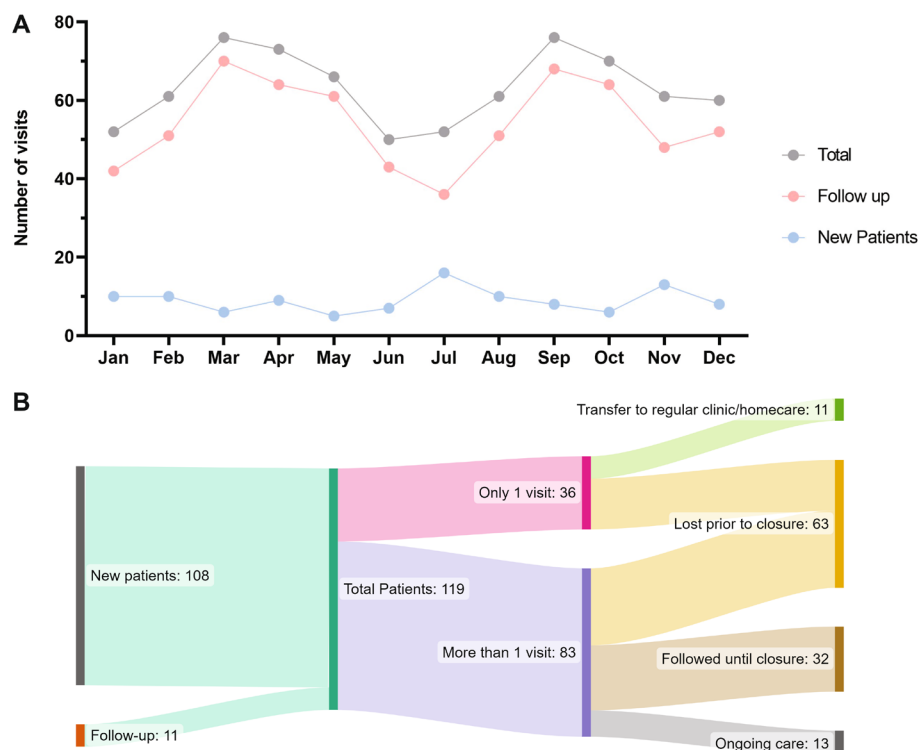
In 2021, the drop-in service catered to 119 patients (108 new and 11 follow-up) over 798 total visits (Table 1). The service experienced a peak engagement of 76 visits in a month during March and September, with the lowest monthly visit of 50 occurring in June (Figure 1A). The average age of patients was 46.0 years, with ages ranging from 22 to 91 years. Male patients accounted for 73.9% ( $n=88$ ) of the total, while female patients made up 26.1% ( $n=31$ ; Table 1). A reassuring 69.7% of all patients returned for more than one visit. Eleven patients out of the 36 who did not return were transferred to the regular wound clinic or homecare, as they did not meet criteria for the drop-in service. Therefore, the service produced a compelling 76.8% ( $n=83/108$ ) return to service rate (Figure 1B). Although 52.9% ( $n=63$ ) of patients were lost prior to the closure of the wound, 26.8% ( $n=32$ ) were followed until closure (Figure 1B). Of note, patients who were followed until wound closure were seen on average for 9.9 total visits over 120.8 days, compared to just 3.0 visits over 21.4 days for those lost prior to wound closure (Figure 1B).

The largest group of patients were living in emergency shelters (34.5%) or in provisionally accommodated housing (34.5%). 13.4% of patients were unsheltered and 12.6% of patients were living independently. The housing status of 5.0% of patients could not be determined (Figure 2A, Table 1). Several differences were highlighted based on the patients' housing status. Our walk-in service was most utilised by patients from provisionally accommodated housing with 335 visits, followed by those living in emergency shelters with 233 visits (Table 1). Unsurprisingly, unsheltered patients had the highest male representation at 93.8% ( $n=15$ ), while patients living independently presented a balanced gender ratio of 46.7% male versus 53.3% female. 87.5% of unsheltered patients returned to service more than once despite their vulnerable living situations, a proportion higher than any other group. In comparison, the provisionally accommodated category recorded the lowest return rate at 61.0%. Unsheltered patients and those living in emergency shelters were most likely to be lost prior to closure at 68.8% and 65.8%, respectively, compared to the independent living population, who were lost prior to closure only 26.7% of the time (Table 1).

Over the year, a total of 254 unique wounds were followed. Wounds on the extremities including the leg (33.9%), foot

**TABLE 1** | Demographics data of all patients treated at the Sheldon Chumir Wound Clinic Drop-in service from 1 January 2021 to 31 December 2021, categorised based on housing status.

	All patients	Emergency shelter	Independent	Provisionally accommodated	Unsheltered	Unknown	Statistics	
							Chi-square	p
Total patients, <i>n</i>	119	41	15	41	16	6	—	—
Total visits, <i>n</i>	798	233	88	335	112	30	—	—
Mean age, years $\pm$ SD (range)	46.0 $\pm$ 14.2 (22–91)	45.0 $\pm$ 10.9 (29–67)	51.8 $\pm$ 14.8 (28–87)	46.6 $\pm$ 17.8 (22–91)	41.4 $\pm$ 12.0 (24–67)	47.5 $\pm$ 12.4 (32–64)	—	0.356
Sex, % ( <i>n</i> )	M 73.9% (88) F 26.1% (31)	M 78.0% (32) F 21.9% (9)	M 46.7% (7) F 53.3% (8)	M 75.6% (31) F 24.3% (10)	M 93.8% (15) F 6.3% (1)	M 50.0% (3) F 50.0% (3)	11.25	0.024
Return to service, % ( <i>n</i> )	69.7% (83)	70.7% (29)	73.3% (11)	61.0% (25)	87.5% (14)	66.7% (4)	5.09	0.278
Lost prior to closure, % ( <i>n</i> )	52.9% (63)	65.8% (27)	26.7% (4)	56.1% (23)	68.8% (11)	50% (3)	9.81	0.044
Follow-up from ED/UC, % ( <i>n</i> )	30.3% (36)	36.6% (15)	20% (3)	26.8% (11)	40% (6)	16.7% (1)	6.04	0.196
Median visits, <i>n</i> (range)	4 (1–49)	4 (1–43)	3 (1–27)	7 (1–49)	4 (1–26)	6 (3–9)	—	0.720
Median follow-up, days (range)	42.5 (1–326)	33 (3–325)	61 (5–316)	56 (3–275)	44.5 (2–326)	28.5 (10–158)	—	0.424



**FIGURE 1** | Patient visits at the Sheldon Chumir Wound Clinic Drop-in service from 1 January 2021 to 31 December 2021. (A) Total number of visits, number of follow-up visits and number of new patient assessments distributed by month of service. (B) Influx and outflux of patients treated at the drop-in wound care service.

(28.0%) and hands (19.7%) were the most common (Figure 2A). Additionally, the drop-in service addressed 145 unique presentations over the year. Wounds resulting from trauma (20.0%), lower leg ulcers (17.24%) and frostbites (12.41%) were the most common (Figure 2B). Diabetic foot ulcers and trauma wounds were the most common in patients living independently, and trauma and lower leg ulcers were most common in provisionally accommodated patients. Trauma, lower leg ulcers and frostbites were the most common in those living in emergency shelters. Lastly, frostbites, lower leg ulcers and infection were the most common in the unsheltered population (Figure 2B).

### 3 | Discussion

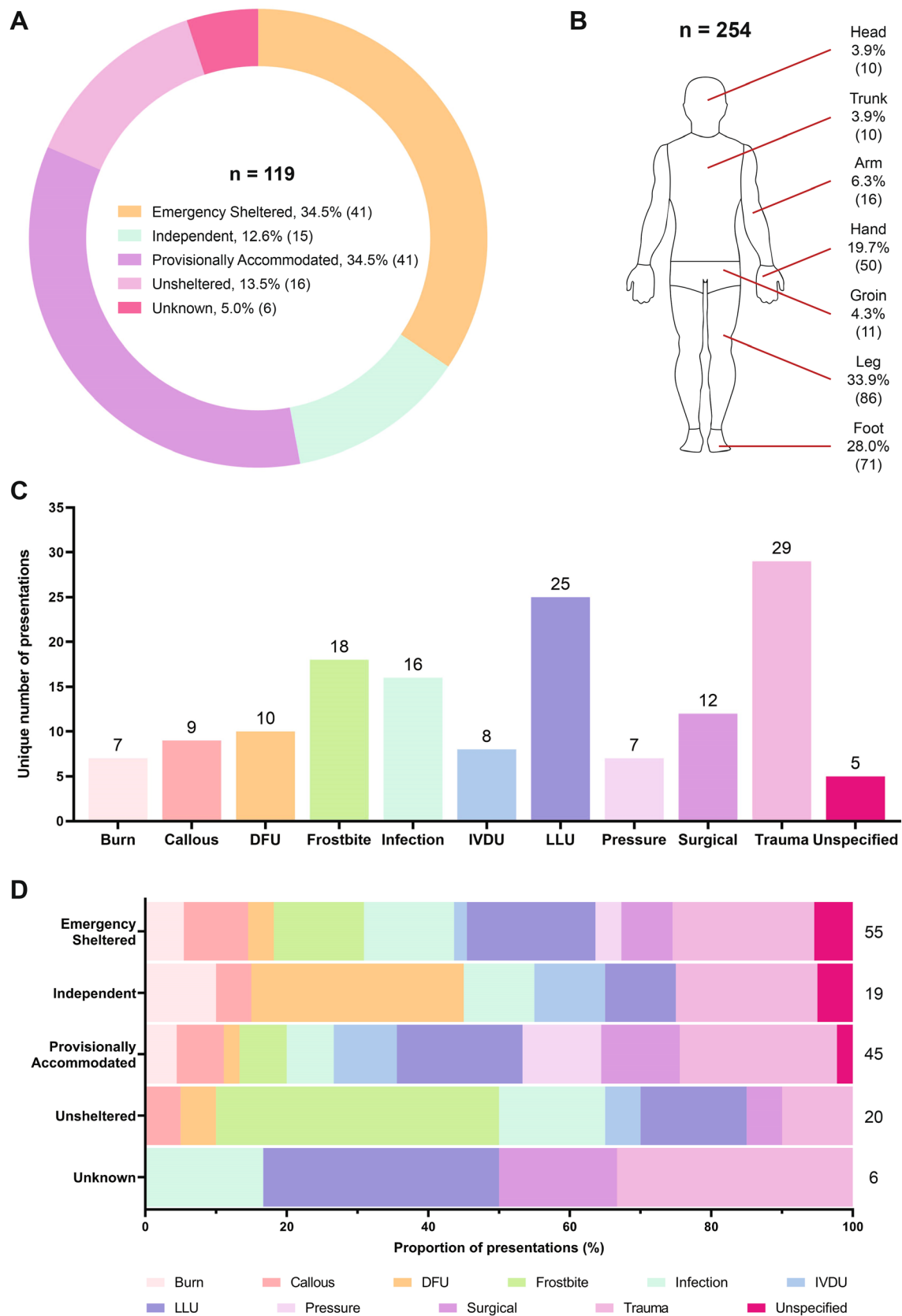
Canadian clinical guidelines for the management of homeless and vulnerably housed people recommend the incorporation of three best practices: providing trauma-informed and patient-centred care, connecting patients to comprehensive primary care and providing interdisciplinary community care [12]. From a healthcare provider perspective, it is imperative to identify and break down barriers to address the unique needs of this population [4]. Our walk-in service was designed to achieve these specific goals.

Providing wound care to people experiencing homelessness is especially challenging due to the resource and expertise intensive nature of wound care [13]. Goto et al. identified the availability of a drop-in service and access to an interdisciplinary team as two common factors of successful community wound care programmes for unhoused individuals [8]. In Calgary, several community programmes provide wound care directly at emergency

shelters. Although these programmes are cost-effective, most operate on limited resources and may face difficulties managing complex wounds. Our drop-in service presents a complementary programme, which facilitates direct access to a multidisciplinary team of trauma-informed nurses on a walk-in basis. Patients who were unsheltered or living in emergency shelters returned to service at a rate of 87.5% and 70.7%, respectively. The high rate of return to service reassures the effectiveness of the service provided. Coexistence of complementary wound care programmes is crucial in a populous city to serve the diverse and unique needs of people experiencing homelessness.

People who experience homelessness often lack sources of primary care and hence utilise acute services and emergency departments more frequently [2, 4]. A strength of this walk-in service was being situated in the same building as an Urgent Care Centre (UCC) at the core of the city. Interestingly, 30.3% of all patients were redirected patients from the adjacent UCC or other EDs across the city. Providing an alternative to diverge care to the drop-in wound care service can contribute directly to reducing wait times in the ED. By rough estimate, the cost for a patient seen in the ED including physician fees is \$1042 CAD, whereas a wound clinic visit is \$350 CAD per visit. Hence, a walk-in wound care service linked to a UCC or ED can save the hospital or government an estimated \$552 216 a year based on a similar volume of patients as our clinic.

In 2021, the Calgary Homeless Foundation calculated 1935 homeless individuals were sheltered in Calgary with potentially hundreds more unsheltered individuals [14]. As cutaneous wounds and associated complications are common medical concerns for



**FIGURE 2** | Patient housing categorisation and wound analysis. (A) Proportion of patients categorised into five categories of housing including emergency sheltered, independent, provisionally accommodated, unsheltered and unknown. Proportion in percentages are shown and total count is shown in parenthesis. (B) Total wounds categorised by body site in percentages and total count in parenthesis. (C) Total number of unique complaints categorised into broader categories of wound. (D) Proportion of unique complaints by housing arrangements. Total number of unique complaints are shown per housing arrangement.



people experiencing homelessness [15], it is probable there are hundreds of individuals in Calgary who will benefit from our drop-in service. In our patients, wounds secondary to trauma, lower leg ulcers and frostbites were the most common presentations managed at our walk-in service. While high rates of trauma are consistent with previous publications [16, 17], our data support the high rates of frostbites that are unique to countries with colder climates such as Canada [18]. Wound care services in Canada catering to people experiencing homelessness will benefit from additional capital to address cold-related injuries such as frostbites.

Our study was limited due to a short study period of one calendar year from a single centre, resulting in a small study of 119 patients. Over the years, the walk-in service grew to see 909 unique visits in 2022, then 1023 visits in 2023. Due to the limitations of the EMR database, only limited patient data could be extracted. Future research will benefit from a transition to EMR software that enables comprehensive data extraction. Limited government funding for this programme constrained the full potential of the service, as the programme did not hold allocated funding, but instead was a subdivision of the regular wound clinic. Ongoing funding for this programme will be crucial for its longevity and potential impact.

Timely access to appropriate care with consistent follow-up assessments are essential foundations of quality wound care [13, 19, 20]. Our drop-in service presents a working model for providing equitable wound care to socially disadvantaged patient populations, including people experiencing homelessness. The insights from our study emphasise the importance ongoing education of physicians and other healthcare providers in providing equitable and inclusive medical care.

## Acknowledgements

The authors have nothing to report.

## Conflicts of Interest

The authors declare no conflicts of interest.

## Data Availability Statement

Data are available upon reasonable request to the corresponding author.

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