



# Does a Targeted Engagement and Diversion program reduce emergency department utilization?

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## Abstract

**Objectives** The Targeted Engagement and Diversion (TED) program in Ottawa provides health care to unhoused or shelter/community housed adults outside of an emergency department (ED) setting. We sought to determine the proportion of patients diverted away from the ED by the TED program.

**Methods** We conducted a health records review of adult patients who visited the TED program from January to December 2022 using random sampling to account for seasonal variation. Data were extracted from the Ottawa Inner City Health database and hospital records from two university-affiliated EDs. The primary outcome was successful diversion from the ED, defined as any of the following: TED program patients (i) presenting in the evening or overnight; (ii) brought in by police/paramedic services; (iii) referred from the safe consumption site; (iv) assessed by a nurse or physician; (v) admitted for higher level of observation; or (vi) that received an antidote (e.g., naloxone). Data were described using descriptive statistics.

**Results** We reviewed 500 total visits of 241 unique patients (76.3% male, median age 38 years). The most common reason for presentation was unspecified intoxication (83.4%,  $n=417$ ). A total of 359 visits met criteria for successful diversion from the ED (71.8%, 95% confidence interval (CI) 67.7–75.6). Most patients who met diversion criteria revisited the TED program within 7 days (82.8%,  $n=323$ ), whereas 7.9% ( $n=31$ ) visited an ED within 7 days. At 2 years, 39% ( $n=94$ ) of all patients were stably housed and 10.8% ( $n=26$ ) died.

**Conclusion** The TED program may be successful at attracting patients and diverting their care away from busy local EDs, and few patients treated by the TED program visited the ED within the subsequent 7 days. This model of care may provide a solution to offload from overcrowded EDs and improve access to comprehensive care for patients who are unhoused.

**Keywords** Inner city health · Ill-housed · Emergency department

## Résumé

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**Objectifs** Le programme de mobilisation et de déjudiciarisation ciblées (TED) en Ottawa fournit des soins de santé aux adultes sans abri ou hébergés dans un refuge/une collectivité à l'extérieur d'un établissement d'urgence. Nous avons cherché à déterminer la proportion de patients détournés du DE par le programme TED.

**Méthodes** Nous avons effectué un examen des dossiers de santé des patients adultes qui ont visité le programme TED de janvier à décembre 2022 en utilisant un échantillonnage aléatoire pour tenir compte de la variation saisonnière. Les données ont été extraites de la base de données Ottawa Inner City Health et des dossiers hospitaliers de deux DE affiliés à l'université. Le principal résultat a été une dérivation réussie du DE, définie comme l'un ou l'autre des cas suivants : patients du programme TED (i) présentant une présentation le soir ou pendant la nuit; (ii) ont été amenés par des services de police ou paramédicaux; (iii) ont été référés du lieu de consommation sécuritaire; (iv) évalués par une infirmière ou un médecin; (v) admis pour un niveau d'observation plus élevé; ou (vi) ont reçu un antidote (p. ex., la naloxone). Les données ont été décrites à l'aide de statistiques descriptives.

**Résultats** Nous avons examiné 500 visites totales de 241 patients uniques (76,3 % hommes, âge médian 38 ans). La intoxication non précisée était la cause la plus fréquente de la présentation (83,4 %, n=417). Au total, 359 visites répondaient aux critères d'une dérivation réussie du DE (71,8 %, intervalle de confiance (IC) de 67,7 à 75,6 % de 95 %). La plupart des patients qui répondaient aux critères de déviation ont revisité le programme TED dans les 7 jours (82,8 %, n=323), tandis que 7,9 % (n=31) ont consulté un ED dans les 7 jours. À 2 ans, 39 % (n=94) de tous les patients étaient logés dans des logements stables et 10,8 % (n=26) sont décédés.

**Conclusions** Le programme TED peut réussir à attirer des patients et à détourner leurs soins des DE locaux occupés, et peu de patients traités par le programme TED ont visité la DE dans les 7 jours suivants. Ce modèle de soins pourrait offrir une solution pour décharger les ED surpeuplés et améliorer l'accès aux soins complets pour les patients qui ne sont pas logés.

**Mots clés** Santé en milieu urbain · Mal logés · Service des urgences

### Clinician's capsule

#### *What is known about this topic?*

People who are unhoused use emergency departments (EDs) more frequently than the general population and have visits of higher resource-intensity.

#### *What did this study ask?*

Is a program that delivers emergent care to this population in the community able to divert patients away from EDs.

#### *What did this study find?*

This program appears to be successful at attracting patients and diverting their care away from busy local EDs.

#### *Why does this study matter to clinicians?*

This model provides a potential solution to offload from overcrowded EDs and improve access to care for unhoused patients.

departments (EDs), as this population uses ED services at higher rates than the general population and experiences increased rates of physical and mental health problems, substance use, and violence [2–4]. One Canadian study found that people who are unhoused utilized ED services up to eight times more often than age- and gender-matched low income controls [3]. Despite being more likely to be triaged as lower acuity, people who are unhoused are more likely to arrive to the ED via ambulance, have longer lengths of stay, and to have repeat ED visits both within three and 30 days of discharge [2, 5–8].

There is evidence that services tailored to the unique needs of this population, and providers with expertise in addressing both health and psychosocial concerns are more effective in providing care and reducing ED visits [9, 10]. Simply providing access to food, safety, and shelter can reduce up to 25% of ED visits [11]. Mobile primary care clinics and temporary clinics located within shelters and drop-in centers can alleviate access barriers, facilitate building trust between patient and provider, and engage people who are unhoused in more comprehensive care [12, 13]. We are aware of no published data from a Canadian emergent care program specifically designed to provide rapidly accessible care and divert unhoused patients away from local EDs.

The Targeted Engagement and Diversion (TED) program was found in 2013 and is a nursing-led emergent care program embedded within an Ottawa shelter. It delivers rapidly accessible acute care and monitoring for persons with physical health issues, substance use disorders, and mental

## Introduction

The number of people who are unhoused in Canada has been increasing, with an estimate of over 40,000 persons experiencing homelessness between 2020 and 2022 [1]. This poses a unique challenge to already strained Canadian emergency

health problems. In this study, our primary aim was to determine if the TED program is successful at diverting unhoused patients who require care from local EDs. Additional objectives were to describe the populations treated and care delivered, return visits to the TED program and ED visits within 7 days of the initial TED visit, as well as stable housing placements and deaths within our sample.

## Methods

### Study design and setting

We conducted a health records review of adults who visited the TED program between January and December 2022. The study settings were the TED program located within the Shepherds of Good Hope shelter in the downtown area, as well as three large academic EDs (The Civic Hospital, General Hospital, and Queensway Carleton Hospital). There are a total of four adult EDs in Ottawa, with other neighboring community EDs being over 30 min away by car. We were unable to access medical records from the fourth hospital. This study was reviewed by the Ottawa Health Science Network Research Ethics Board and determined to be exempt from requiring written or verbal consent. The RECORD checklist [14] was adhered to for this study.

### Population

Subjects were adults (age  $\geq 18$  years) who had a TED visit intake completed between January 1st and December 31st, 2022. Subjects were excluded for the following reasons: age  $< 18$  years; patient presented to the TED program on the day of discharge from an ED; or if the TED visit was a continuation or same day return visit from a visit already included in our sample.

### TED program

The TED program is an emergent care program located in Ottawa that provides immediate acute care for issues of substance use, physical and mental health problems outside of the hospital environment. The TED program also places emphasis on basic health needs such as food, hydration, hygiene, and shelter. It provides the opportunity to begin engaging patients in a long-term plan of care focused on harm reduction to the individual and community by connecting them to services focused on the social determinants of health.

Patients who present to the TED program can be self-referred, brought by friends, or emergency medical services. On presentation, patients are immediately assessed by a registered practical nurse or a personal support worker

working under a medical directive. Patients can be triaged to the general care program, the observation area, or transferred directly to paramedics for hospital transfer.

All patients are provided with a bed and any necessary as needed medications (e.g., analgesia, naloxone, mental health medications). Several diagnostic tests can also be completed within the program if necessary, including blood work, viral/bacterial swabs, bedside ultrasound, and electrocardiograms. Registered nurses and physicians are available to assess patients as needed. All admitted patients are rounded on every 30 min to monitor their breathing and any other signs of discomfort. Patients who were identified as higher risk at presentation can be admitted to an observation area in direct view of the nursing station, and have their vitals monitored every 15 min. Patients can be transferred to emergency medical services at any time should this be deemed necessary by healthcare staff.

### Outcome measures

The main outcome was the proportion of patients successfully diverted from the ED by the TED program. There are no validated criteria for ED diversion of this population. Our definition was created in consultation with key stakeholders including emergency physicians, Ottawa Inner City Health physicians, and TED program nurses. We defined diversion of TED program patients from the ED as any of the following: (i) presentations in the evening or overnight (17:00–07:00); (ii) patients brought in by police or paramedic services; (iii) patients referred from the safe consumption site; (iv) those assessed by a registered nurse or physician; (v) those admitted to the observation area for higher level of care; (vi) or any patient who received an antidote (e.g., oxygen, naloxone, dextrose).

We also sought to describe patient characteristics (age, sex, self-identification as indigenous, comorbidities) and visit characteristics (time of presentation, vital signs, referral source, ambulation capacity, communication capacity, admission to a higher level of observation, consultations, treatments administered, and transfers to paramedics or police). If patients had no comorbidities documented in their chart, they were presumed to have none. The following data were collected following the TED program visit: return visits to the TED program within 24 h and 7 days, and ED visits within 7 days. TED program nurses were interviewed to obtain data on connections with stable housing or death within 2 years.

### Data collection and statistical analysis

There were 22,057 TED program visits in 2022 (Supplementary Table 1). Recognizing that TED visits may differ

depending on the time of year, we selected a random sample of 500 visits to account for seasonal variation. This sample size was selected based on convenience, considering resource and time constraints, to ensure feasible data collection within the study's limitations. Our sample was selected using a Microsoft Excel random number generator to assign each visit in 2022 a number between 0 and 1, and then by sorting the visits in ascending order until our target of 500 was reached. Patients were anonymized via the creation of a unique study ID.

Data were collected through medical chart review using a data collection form (Supplementary Fig. 1) from Ottawa Inner City Health's electronic medical records and The Ottawa Hospital electronic medical records (comprising two large academic EDs and one large external community ED with provider notes included within The Ottawa Hospital electronic medical record). Bedside nurses were also interviewed to obtain select baseline demographic data including patient self-identification as Indigenous, placements in stable housing, and deaths. Data from Ottawa Inner City Health medical records were extracted by two independent reviewers (CH and MJ), and data from The Ottawa Hospital medical records and bedside nurse interviews were extracted by a third separate reviewer (RS). 10% of cases were reviewed by an additional two authors (RS and RP) for accuracy. There was 100% agreement for the reviewed outcomes between data abstractors. Data were described using descriptive statistics, with continuous data presented as medians with interquartile range (IQR) and categorical data presented as proportions with 95% confidence intervals (CI).

## Results

Five hundred charts were initially screened for eligibility, and as three of five hundred initial charts were deemed ineligible, an additional three random charts were included (Fig. 1). The total sample of 500 visits included 241 individual patients (Table 1). The median age of TED program patients was 38 (IQR 30–48), most patients were male (76.3%) and 23.3% self-identified as Indigenous. There was a high prevalence of substance use disorders within our sample, particularly opioid use disorder (61.8%), alcohol use disorder (48.5%), cocaine/crack use disorder (41.5%) and 53.5% had documented mixed substance use disorder (defined as two or more substances). Other prevalent comorbidities within our sample included post-traumatic stress disorder (50.2%), major depressive disorder (34.4%), psychotic disorder (29.5%), traumatic brain injury (32.8%), and skin and soft tissue infection (68.9%).

Most TED program visits were self-referrals (86.4%) and occurred overnight (46.2%) or in the evening (27.2%) (Table 2). The most common abnormal vital sign on

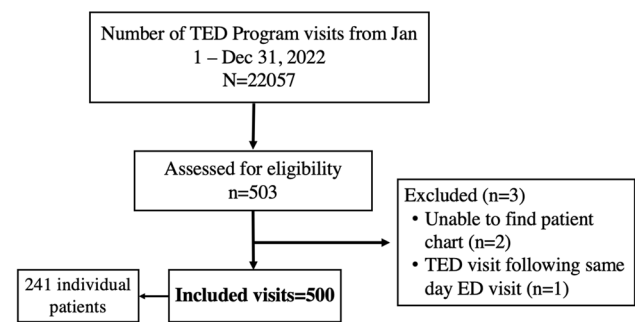


Fig. 1 Flow diagram

presentation was tachycardia (29.8%). There were very few missing data for referral source, vital signs, ambulation, communication, and aggression (<4.0%) except for blood pressure which was not documented in 7.4% of cases.

Nearly all patients were stable enough to be admitted to the general care program (96.4% of visits), with only 16 visits (3.2%) requiring admission to the observation area (Table 3). Most visits included assessment by a registered practical nurse (72.2%) on admission. Within 24 h of admission, 5.4% of visits included assessment by a registered nurse, 1.2% by a physician, and 0.8% by a member of the Ottawa Inner City Health mental health team (psychiatrist or mental health nurse). Treatments administered during TED program visits included wound care (2.2%), antipsychotics (2.0%), supplemental oxygen (1.6%), acetaminophen (1.6%), antibiotics (1.4%), naloxone (1.0%), and antiemetics (0.6%).

A total of 390 visits (78.0%) met the pre-specified ED diversion criteria (Table 4). Of these, 31 patients (7.9%) had an ED visit within 7 days of their index TED program visit. The most common reasons for ED visits were skin and soft tissue infection ( $n=6$ ), head injury ( $n=5$ ), and mental health concerns ( $n=5$ ) (Supplementary Table 2). Two patients (0.005%) were admitted to a hospital from the ED, with diagnoses of facial cellulitis and altered level of consciousness. Excluding these patients, a total of 359 patient visits (71.8%, 95% CI 67.7–75.6) were successful diversions (i.e., without a subsequent ED visit in the following 7 days). There were high rates of return visits to the TED program, with only 78 visits (15.6%) not having another TED program visit within the subsequent 7 days. The median duration of stay for admitted patients was 9 h (IQR 5–13). The most common discharge diagnosis was unspecified intoxication (83.4%). With respect to long-term outcomes, 94 of 241 patients (39.0%, 95% CI 33.1–45.3) were connected with stable housing by Ottawa Inner City Health within 2 years, and 26 patients (10.8%, 95% CI 7.5–15.3) were deceased within 2 years.

**Table 1** Baseline demographics of TED program patients

Baseline demographics	N=241
<b>Age (years), median (IQR)</b>	38 (30–48)
<b>Male sex, n (%)</b>	184 (76.3)
<b>Self-identified as indigenous, n (%)</b>	56 (23.2)
<b>Comorbidities, n (%)</b>	
<b>Substance use disorders</b>	<b>208 (86.3)</b>
Opioid	149 (61.8)
Alcohol	117 (48.5)
Cocaine/crack	100 (41.5)
Methamphetamine	87 (36.1)
Mixed substance ( $\geq 2$ substances)	129 (53.5)
None	32 (13.3)
<b>Mental health disorders</b>	<b>167 (69.3)</b>
Post-traumatic stress disorder	121 (50.2)
Major depressive disorder	83 (34.4)
Psychotic disorder <sup>a</sup>	71 (29.5)
Anxiety disorder	64 (26.6)
Attention-deficit hyperactivity disorder	38 (15.8)
Bipolar disorder	25 (10.4)
Personality disorder <sup>b</sup>	29 (12.0)
Intellectual/learning disability	14 (5.8)
None	74 (30.7)
<b>Physical health disorders</b>	<b>202 (83.8)</b>
<b>Neurological</b>	
Traumatic brain injury	79 (32.8)
Seizure disorder/epilepsy	31 (12.9)
<b>Respiratory</b>	
Asthma	23 (9.5)
Chronic obstructive pulmonary disease	18 (7.5)
<b>Cardiovascular</b>	
Hypertension	25 (10.4)
Dysrhythmia	11 (4.6)
Heart failure	7 (2.9)
Coronary artery disease	5 (2.1)
<b>Endocrine</b>	
Diabetes mellitus	12 (5.0)
<b>Infection</b>	
Skin and soft tissue infection	166 (68.9)
Hepatitis B and/or C	72 (29.9)
Spine and/or joint infection <sup>c</sup>	20 (8.2)
Human immunodeficiency virus	12 (5.0)
Tuberculosis	10 (4.1)
Endocarditis	8 (3.3)
<b>Gastrointestinal</b>	
Cirrhosis	4 (1.7)
<b>Other</b>	
Chronic pain	55 (22.8)
None	39 (16.2)

TED Targeted Engagement and Diversion, IQR interquartile range

<sup>a</sup>Psychotic disorder includes schizophrenia, schizotypal, brief psychotic episode, drug-induced psychosis, and other mental health disorders with psychotic features

<sup>b</sup>Personality disorder includes borderline personality disorder and antisocial personality disorder

**Table 1** (continued)

<sup>c</sup>Spinal infection includes discitis, spinal epidural abscess; joint infection defined as septic arthritis

**Table 2** Patient presentation to the TED program

Patient presentations	N=500
<b>Time of presentation, n (%)</b>	
Day (0700–1700)	133 (26.6)
Evening (1701–2300)	136 (27.2)
Night (2301–0700)	231 (46.2)
<b>Referral source, n (%)</b>	
Self	432 (86.4)
Safe consumption site	24 (4.8)
Paramedics	14 (2.8)
Other (peer/friend, other shelters)	7 (1.4)
Police	5 (1.0)
Not specified	18 (3.6)
<b>Vital signs, n (%)</b>	
<b>Heart rate*</b>	
Normal	339 (67.8)
Tachycardic	149 (29.8)
Bradycardic	1 (0.2)
Not documented	11 (2.2)
<b>Oxygen saturation<sup>a</sup></b>	
Normal	486 (97.2)
Hypoxemic	4 (0.8)
Not documented	10 (2.0)
<b>Blood pressure<sup>a</sup></b>	
Normotensive	431 (86.2)
Hypertensive	17 (3.4)
Hypotensive	15 (3.0)
Not documented	37 (7.4)
<b>Ambulation capacity, n (%)</b>	
Independent	443 (88.6)
Able to walk without assistance but unsteady	34 (6.8)
Requires $\geq 1$ -person assistance or wheelchair to transport	21 (4.2)
Not specified	2 (0.4)
<b>Communication capacity, n (%)</b>	
Appropriate	464 (92.8)
Able to communicate but nonsensical at times	29 (5.8)
Incoherent or not responsive to verbal stimulation	6 (1.2)
Not specified	1 (0.2)
<b>Aggression, n (%)</b>	
Cooperative with no signs of aggression	490 (98.0)
Verbal or physical aggression	0 (0.0)
Not specified	10 (2.0)

TED Targeted Engagement and Diversion

<sup>a</sup>Normal range defined as 50–100 for heart rate,  $> 90$  for oxygen saturation, 90/60–160/90 for blood pressure. If vitals are outside of normal range and patient is symptomatic, they are transferred to paramedics



**Table 3** TED program delivered care

Care delivered	N=500
<b>TED admission, n (%)</b>	
Admitted to general care program	482 (96.4)
Admitted to observation	16 (3.2)
Refused TED service	2 (0.4)
Transferred to paramedics or police	0 (0.0)
<b>Assessment, n (%)</b>	
Assessed by registered practical nurse	361 (72.2)
Assessed by registered nurse within 24 h of admission	27 (5.4)
Assessed by physician within 24 h of admission	6 (1.2)
Assessed by psychiatrist and/or mental health nurse within 24 h of admission	4 (0.8)
<b>Consult, n (%)</b>	
Nurse on call consulted	9 (1.8)
Physician on call consulted	4 (0.8)
Mental health team on call consulted	4 (0.8)
<b>Additional treatments administered, n (%)</b>	
Wound care	11 (2.2)
Antipsychotic	10 (2.0)
Supplemental oxygen	8 (1.6)
Acetaminophen	8 (1.6)
Antibiotic	7 (1.4)
Naloxone	5 (1.0)
Antiemetic	3 (0.6)
Other <sup>b</sup>	6 (1.2)

TED Targeted Engagement and Diversion

<sup>a</sup>PRN medications included acetaminophen, ibuprofen, and Imodium

<sup>b</sup>Other treatments include bronchodilators, antihypertensives, antidepressants, non-steroidal anti-inflammatory analgesics, opioid analgesics, dietary supplements

## Discussion

### Interpretation of findings

This study reports outcomes of a program that was designed to divert people who are chronically unhoused away from local EDs and engage them in a comprehensive plan of medical and social care. We found that there were a high number of visits to the TED program that, had such a program not existed, may have otherwise been managed in an ED setting. There were no transfers from the TED program to police/paramedic services and 7.0% of patients visited the ED within 7 days following their TED program visit, suggesting that these were true diversions rather than delays to appropriate care. In contrast to the low rates of ED visits, there were very high rates of return visits to the TED program and connections with stable housing. This suggests that patients were being engaged in a more longitudinal and comprehensive plan of care.

### Comparison to previous studies

We are not aware of any papers reporting outcomes from similar emergent care diversion programs in Canada. Our study population had very high rates of substance use, mental illness, and physical health comorbidities, consistent with what has been previously reported [15–20]. This makes it challenging for ED providers to address the complex health needs of unhoused patients during a single ED visit. It also enables repeat visits because the psychosocial aspects of health are not easily, consistently, nor comprehensively addressable in an ED setting. Similar to our findings, intoxication is known to be a common reason for this population to present to a hospital [21, 22]. Other reasons for presentation that this study identified, including traumatic injury, skin and soft tissue infections, and psychotic episodes, are also known to be frequent reasons for ED visits in this population [21, 22]. In contrast to other studies reporting high rates of aggression in this population, our study reported no aggression [23, 24]. We hypothesize that this reflects the trusted and voluntary nature of the TED program environment as well as the expertise of TED program staff in providing trauma-informed care tailored to the unique needs of this population. While there is little published data on longitudinal housing outcomes in this population, our study had very high rates of connection with stable housing compared to what has been previously reported in similar populations in Canada [25]. Lastly, while there were no deaths within the TED program, there was a high mortality rate within 2 years. Patients who are chronically unhoused are known to have significantly higher mortality compared to the general population, and this finding reflects the high acuity and morbidity in the population treated by the TED program [26].

### Limitations

First, as a health records review, we were limited by the availability and accuracy of documentation. We mitigated this by having a second set of reviewers verify a portion of the data extracted for accuracy. Second, there is no accepted definition in the literature of ED diversion criteria for this model of care. We developed a definition by including several key stakeholders (emergency physicians, Inner City Health specialist physicians, and TED program nurses). Our definition outlined criteria for patient presentations that would have been appropriate for emergent-level care in an ED. We recognize that this population experiences high levels of stigma and negative experiences when seeking healthcare, and in the absence of a TED program, a portion of these patients would have chosen to not present to an ED and instead may potentially recover on their own without the provision of healthcare [27]. Therefore, our findings may reflect an overestimate of the success of the TED program at

**Table 4** Targeted Engagement and Diversion program outcomes

Program outcomes	<i>N</i> = 500
<b>ED visit within 7 days following index assessment</b> ( <i>N</i> = 500)	35 (7.0)
<b>Visits meeting diversion criteria</b> ( <i>N</i> = 500) <i>n</i> (%)	390 (78.0)
<b>ED visit within 7 days following index assessment</b> ( <i>N</i> = 390), <i>n</i> (%)	31 (7.9)
<b>Proportion of successful diversions</b> ( <i>N</i> = 390), <i>n</i> (%)	359 (92.0)
<b>Patients successfully diverted</b> ( <i>n</i> = 500), <i>n</i> (%)	359 (71.8)
<b>Number of return visits to TED within 7 days following index assessment, <i>n</i> (%)</b>	
0	78 (15.6)
1–2	101 (20.2)
3–4	102 (20.4)
5–6	134 (26.8)
≥ 7	85 (17.0)
<b>Stably housed within 2 years of TED index visit</b> ( <i>N</i> = 241 patients), <i>n</i> (%)	94 (39.0)
<b>Deceased within 2 years of TED index visit</b> ( <i>N</i> = 241 patients), <i>n</i> (%)	26 (10.8)
<b>Duration of stay for admitted patients (hours)</b>	
Median (IQR)	9 (5–13)
Unknown, <i>n</i> (%)	28 (5.6)
<b>Diagnosis, <i>n</i> (%)</b>	
<b>Substance use</b>	
Unspecified intoxication	417 (83.4)
Alcohol intoxication	37 (7.4)
Opioid intoxication	29 (5.8)
Polysubstance intoxication	5 (1.0)
Stimulant (methamphetamine or cocaine/crack) intoxication	4 (0.8)
Cannabis intoxication	2 (0.4)
<b>Other</b>	
Traumatic injury	13 (2.6)
Skin and soft tissue infection <sup>a</sup>	9 (1.8)
Psychotic episode	3 (0.6)
Upper respiratory tract infection	2 (0.4)
Asthma exacerbation	1 (0.2)
Hypertension	1 (0.2)
Constipation	1 (0.2)
Seizure	1 (0.2)
<b>None</b>	4 (0.8)
<b>Medications prescribed at discharge, <i>n</i> (%)</b>	
Antibiotic	4 (0.8)
Antihypertensive	2 (0.4)
Antipsychotic	2 (0.4)
Other <sup>b</sup>	5 (1.0)
None	490 (98.0)

*TED* Targeted Engagement and Diversion, *IQR* interquartile range

<sup>a</sup>Defined as cellulitis or abscess

<sup>b</sup>Other medications include mood stabilizer, proton pump inhibitor, acetaminophen, iron supplement, and antiepileptic medications

diverting cases away from the ED. Lastly, we were only able to review charts from three of four large urban hospitals in Ottawa. Thus, it is possible that some patients may have visited the ED of the fourth community hospital which would result in an underestimate in the number of ED visits within

7 days. Despite this, we expect that the rates of ED visits following a TED program visit would remain low overall, and this would not have significantly impacted our main findings.

## Clinical implications

In recent years, several new advances and initiatives have been developed that aim to improve the emergency care of patients who are chronically unhoused. Examples include the implementation of peer workers and Housing-First initiatives [28]. We hope that the findings in this study demonstrate that a TED program approach is another implementable, complementary, and potentially effective approach to improve the care of this marginalized population.

## Research implications

Future research should involve prospective data on this population to estimate true successful diversion from the ED. Studies should also consider patients' perceptions and satisfaction with the program, and its impacts on other key stakeholders, such as police and paramedics. While our study showed that the TED program may be effective in diverting patient care away from the ED, an economic cost effectiveness analysis is needed to demonstrate benefit for the healthcare system.

## Conclusion

The TED program appears to be successful at attracting patients and diverting their care away from busy local EDs, and very few patients treated by the TED program visited the ED within the subsequent 7 days. This model of care may provide a solution to offload from overcrowded EDs and improve access to comprehensive care for patients who are unhoused.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s43678-025-00888-4>.

**Author contributions** RS, KY, RP, AH, and DE contributed to the study conception and design. RS drafted the article and KY, RP, AH, DE, CM, and MJN contributed to subsequent revisions. CH, MJ, RS, RP, CM, and JM performed the data acquisition. MJN completed the statistical analysis. All authors approved the final version and support the findings of this study.

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**Data availability** The authors confirm that the data supporting the findings of this study are available within the article.

## Declarations

**Conflicts of interest** RS, KY, CH, MJ, RP, AH, DE, CM, JM, and MJN report no conflicts of interest.

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