

A retrospective cross-sectional analysis of Winnipeg's Urgent Care Centres: Have presenting patient complaints changed since converting from emergency departments?

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Abstract

Three emergency departments (EDs) in Winnipeg, Manitoba were recently converted to urgent care centres (UCCs). This study sought to understand the effects of conversion from a traditional ED to UCC on the types and severities of medical presentations to those health facilities. This study also sought to compare complaint presentations between all UCCs and EDs as well as compare each UCC to its associated ED. This was a retrospective chart review of presenting complaints at Seven Oaks General Hospital (SOGH), Concordia Hospital (COH), and Victoria General Hospital (VGH) three months prior to and three months following the transition to UCC. Pearson's chi-squared test and *t*-test were used to describe and compare changes in presenting complaints and their acuity. A significant decrease in CTAS score acuity was observed at SOGH (9 vs. 3 for CTAS 1 and 2 patients, $p = 0.045$). There was no significant change in CTAS scores at VGH and COH ($p > 0.05$). There was a significant increase in ear, nose, and throat complaints at VGH UCC compared to VGH ED (1% vs. 7.9%, $p = 0.0208$) and in skin-related complaints at SOGH UCC compared to SOGH ED (9.4% vs 26.8%, $p = 0.0093$). There was a decrease in gastrointestinal complaints at VGH UCC since converting from an ED (19.4% vs. 9.0%, $p = 0.0434$). There were no statistically significant changes in presenting complaints at COH UCC. This study could form the basis of a larger study to examine how patient complaints have changed at Winnipeg's three UCCs. Future research should focus on patient education, administrative considerations, and creating acuity goals for UCCs and EDs.

Keywords: emergency medicine; urgent care; medical systems

Conflict of Interest Statement: None to declare.

Introduction

Since the 1980s, urgent care centres (UCCs) have been used in North America in response to long emergency department (ED) wait times and overcrowding.¹ UCCs are distinct from EDs as they primarily address non-life-threatening health concerns. The level of patient acuity, and therefore degree of urgency, is often classified according to the Canadian Triage and Acuity Scale (CTAS) score. Developed in the 1990s, the CTAS system used in Canada among other countries. It consists of five levels, where 1, 2, 3, 4, and 5, indicate resuscitation, emergent, urgent, less urgent, and non-urgent respectively.² UCCs typically receive patients meeting CTAS 3–5 criteria. However, UCCs should also be equipped to manage life- or limb-threatening

conditions because patients often choose these sites for their higher-acuity illness.^{3,4}

The impact of UCCs on ED wait times is unclear.^{5–7} One theory suggests that diverting less acute patients to UCCs frees up valuable ED beds and therefore decreases subsequent wait times.⁵ Some also believe that ED overcrowding is a system-wide problem that cannot be easily addressed by focusing on EDs alone.⁸ Regardless, there is consensus on the appropriate level of acuity, as designated by CTAS scores, for EDs compared to UCCs.^{8,9}

In Manitoba, the impetus to convert three Winnipeg EDs to UCCs was due to Dr. David Peachey's report: *Clinical and Preventative Services Planning for Manitoba: Doing Things Differently and Better*.^{10,11} It describes the allocation and delivery of healthcare services

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in Manitoba, stating “...the actual number of patients that require an acute level of medical care could be consolidated into three hospitals. The majority of patients in medical beds in the Winnipeg Regional Health Authority do not require this level of care, are in the convalescence period or simply waiting for a non-hospital option.” Peachey et al. suggested that patients with CTAS scores of 4 and 5 would be better suited for community UCCs. They recommended that three community hospitals transition to UCCs. The intention was to concentrate resources in EDs that care for the sickest patients, whereas less acute patients would be treated in UCCs.

Although three EDs in Winnipeg were ultimately converted to UCCs, it is unclear how this affects acuity and presenting complaints in patients that self-present to these centers. A retrospective study of 1263 UCC visits in the USA suggests that 2–3% of all UCC visits are referred to an ED for further management.¹² In contrast, there is a paucity of research in Canada to evaluate UCC transfers to emergency departments or appropriateness of the complaints presenting to UCCs. A 2017 study from Manitoba described patient demographics of EDs in Winnipeg, although it did not provide a description of the types of presenting complaints. This study revealed that Winnipeg’s six emergency departments in 2012/2013 saw a case distribution of approximately 1% CTAS 1, 16% CTAS 2, 38% CTAS 3, and 42% CTAS 4 or 5. Approximately 3% of cases had missing CTAS scores.¹³ CTAS scores at Winnipeg’s only UCC at the time, Misericordia UCC, were not described. An older study by Doupe et al. in 2008 described a case distribution at Misericordia UCC of 2.5% emergent (CTAS 2), 26% urgent (CTAS 3), 45.9% less-urgent (CTAS 4) and 7.0% non-urgent (CTAS 5). There were negligible resuscitation (CTAS 1) cases. This study further revealed that 2.2% of UCC visits were transferred for further management.¹⁴ These results were consistent with another Canadian study that reported a 2–3% referral rate from UCCs to EDs.¹² To our knowledge, there are no uniformly agreed-upon case distribution goals per the Winnipeg Regional Health Authority for the three new UCCs.

The objectives of this study were therefore to (1) Determine whether the types of presenting complaints at three newly opened UCCs in Winnipeg have changed since converting from EDs, and (2) Determine whether those presentations differ in terms of severity.

Methods

Setting

This was a retrospective cohort study of the case-mix at three community UCCs in Winnipeg, Manitoba: Seven

Oaks General Hospital (SOGH), Concordia Hospital (COH) and Victoria General Hospital (VGH). These centres were selected because they are former EDs that transitioned to UCCs following the Peachey report in February 2017.¹¹

All adult patients 18 years or older who self-presented to a UCC during time periods from July 2017–October 2019 identified in Figure 1 were eligible for inclusion. All presenting illnesses were considered for inclusion. Patients were excluded if they were younger than 18 years of age, were brought to a UCC via emergency medical services, or were transferred from an inpatient ward. Patients from emergency medical services were excluded because these services follow their own criteria that dictates to which destination they are permitted to bring a patient. This exclusion criteria also allowed impacts of public education and acceptance of the changes to the healthcare system at the time to be examined.

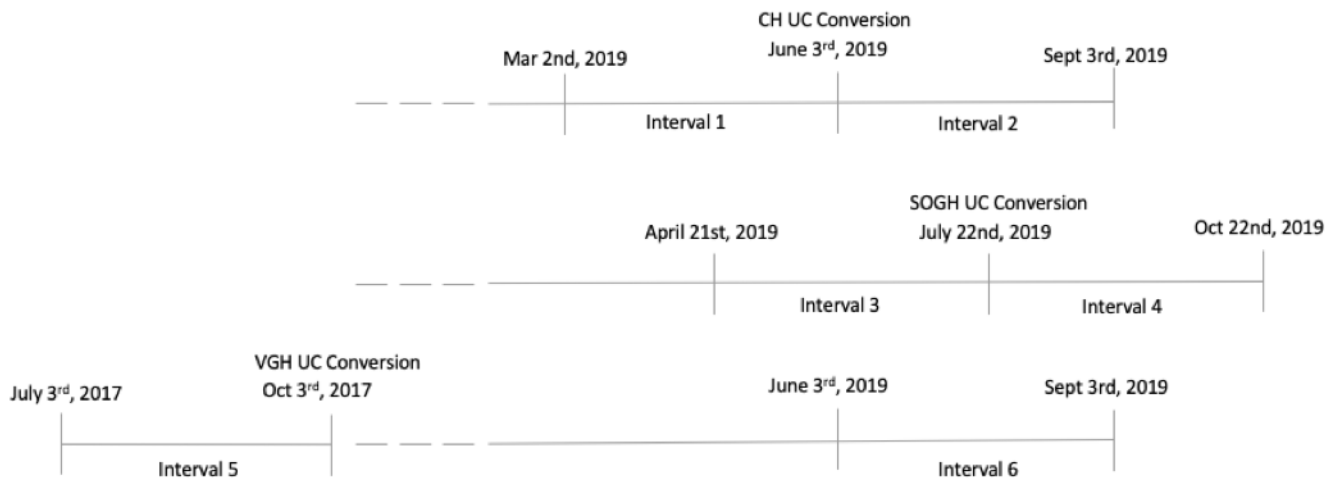
Population and data sources

Data from electronic personal records and paper charts from each UCC were accessed. A study period of three months prior and three months following transition to UCC was used. This was selected to allow time for sufficient transition to occur to reflect changes in CTAS scores/presentation complaints. Thus, six separate time intervals were examined (Figure 1). 50 charts were selected at random by a computerized number generator program from each of the six time intervals, totalling 300 charts. If the selected chart included multiple visits from either before or after the conversion, they were all included in the analysis.

The VGH UCC was designated a “mature site” because it opened approximately two years earlier than both SOGH and COH. This designation was applied to clarify how the types of complaints may change at both COH and SOGH over time relative to VGH.

Demographic and clinical variables at triage were collected, including age, sex, blood pressure, heart rate, oxygen saturation, temperature, and Glasgow Coma Scale. All presenting complaints were assigned to one of 17 categories outlined by the 2008 complaint-oriented triage method: substance misuse, mental health & psychosocial, neurologic, ophthalmology, combined nose/mouth/ears/throat/neck (ENT), respiratory, cardiovascular, gastrointestinal (GI), obstetrics and gynecology, genitourinary, orthopedic, trauma, environmental, skin, general, and minor.²

Figure 1. Pictorial representation of the timelines used to establish each of the six time intervals.



VGH UC = Victoria General Hospital Urgent Care; SOGH UC = Seven Oaks General Hospital Urgent Care; CH UC = Concordia Hospital Urgent Care.

Data analysis

Categorical data was represented as percentages within each site. Continuous data was represented as a mean with standard deviation. Pearson's chi-squared test was used to identify differences in the distribution of CTAS scores between EDs and UCCs. Differences in the proportion of presenting complaints, age, sex, blood pressure, heart rate, oxygen saturation or temperature between EDs and UC centres were detected using standard *t*-test. Significance level was set at ≤ 0.05 . Variables were analyzed by comparing each ED site to its UCC counterpart, each ED other UCC sites, and each site to the "mature site" of VGH before and after the UCC transition. No adjustments were made for multiple comparisons. The primary outcome was the change in CTAS scores at new UCCs. The secondary outcome was the change in presenting complaints that could account for this change in acuity.

Using a significance level of 0.05, it was calculated that a power ($1 - \beta$) of 0.8 and a sample size of 190 patients (95 UCC and 95 ED) was required for each site analyzed. This calculation assumes a cohort study design estimates that the probability of CTAS score 1 and 2 in ED (unexposed group) would be 15% and the probability of CTAS score 1 and 2 in UCC (exposed group) would be 2.5%.¹⁴ This calculation also assumes that the goal CTAS 1 and 2 score distribution for the new UCCs is the same as previously recorded for Misericordia UCC in 2008.¹⁴ This assumption was made because there are currently no clear guidelines as to the goal CTAS score distribution for the new UCCs.

A further comparison of the CTAS scores was conducted using Pearson's chi-squared analysis. CTAS scores 1 and 2 were grouped as "high acuity" and scores

3–5 were grouped as "low acuity" for subsequent *t*-test analysis due to the small sample size. Presenting complaints at each of the UCCs and EDs were compared to one another using *t*-statistics and *z*-scores to assess change in the proportion of each presenting complaint. These complaints were represented as a proportion of all complaints at each of the sites. Significance was measured at *p*-value ≤ 0.05 .

Ethics and dissemination

This study received approval from the University of Manitoba's Health Research Ethics Board, the Winnipeg Regional Health Authority, and each of the research review and impact committees at COH, VGH, and SOGH.

Results

No statistically significant changes were observed between each ED and UCC when comparing patient entrance characteristics including age, systolic BP, diastolic BP, respiratory rate, heart rate, oxygen saturation or temperature ($p < 0.05$).

Table 1 summarizes CTAS score distribution at each UCC. After grouping and analyzing CTAS scores (Table 2), SOGH was found to be the only site that demonstrated a decrease in acuity after converting to UCC (9 vs. 3 among CTAS 1 and 2 patients, $p = 0.045$). VGH UCC did not demonstrate statistically significant changes in acuity (17 vs. 8 among CTAS 1 and 2 patients, $p = 0.088$). COH UCC neither demonstrated significantly decreased acuity (8 vs. 12 among CTAS 1 and 2 patients, $p = 0.255$).

Table 1. Summary of CTAS score distributions with high acuity and low acuity groupings amongst patients presenting to one of three EDs converted to UCCs.

	CTAS 1	CTAS 2	CTAS 3	CTAS 4	CTAS 5	High Acuity (CTAS 1–2)	Low Acuity (CTAS 3–5)	Total Visits
VGH ED	0	17	47	9	25	17	81	98
VGH UC	0	8	42	15	25	8	82	90
COH ED	0	8	35	19	11	8	65	73
COH UC	0	12	23	24	9	12	56	68
SOGH ED	1	8	25	20	10	9	55	64
SOGH UC	0	3	23	28	17	3	68	71

VGH ED = Victoria General Hospital Emergency Department; VGH UC = Victoria General Hospital Urgent Care Centre; COH ED = Concordia Hospital Emergency Department; COH UC = Concordia Hospital Urgent Care Centre; SOGH ED = Seven Oaks General Hospital Emergency Department; SOGH UC = Seven Oaks General Hospital Urgent Care Centre.

Table 2. Pearson’s chi-squared analysis of changes in CTAS scores between and amongst UCC and ED sites.

UCC & EDs Compared	<i>p</i> -value
VGH ED vs. VGH UC	0.088
COH ED vs. COH UC	0.255
SOGH ED vs. SOGH UC	0.045
VGH ED vs. COH ED	0.242
VGH ED vs. SOGH ED	0.578
VGH UC vs. COH UC	0.101
VGH UC vs. SOGH UC	0.244
COH UC vs. SOGH ED	0.582
COH UC vs. SOGH UC	0.011

VGH ED = Victoria General Hospital Emergency Department; VGH UC = Victoria General Hospital Urgent Care Centre; COH ED = Concordia Hospital Emergency Department; COH UC = Concordia Hospital Urgent Care Centre; SOGH ED = Seven Oaks General Hospital Emergency Department; SOGH UC = Seven Oaks General Hospital Urgent Care Centre.

Table 3. Proportion of entrance complaints at each site before and after conversion from ED to UCC.

CTAS Complaint	Victoria General Hospital			Concordia General Hospital			Seven Oaks General Hospital		
	ED visits (%)	UC visits (%)	<i>p</i> -value	ED visits (%)	UC visits (%)	<i>p</i> -value	ED visits (%)	UC visits (%)	<i>p</i> -value
Genitourinary	2.7	7.4	0.2077	2.0	3.4	0.5755	4.7	2.8	0.5687
Cardiovascular	9.6	14.7	0.3524	9.2	13.5	0.3524	10.9	4.2	0.1362
GI	17.8	13.2	0.4533	19.4	9.0	0.0434	21.9	9.9	0.0549
Respiratory	8.2	8.8	0.8966	9.2	9.0	0.9601	6.3	8.5	0.6241
OB/GYN	4.1	0	0.091	3.1	0	0.0969	0	0	–
Orthopedic	21.9	19.1	0.6818	13.3	11.2	0.6745	12.5	14.1	0.7872
Skin	12.3	10.3	0.7039	13.3	16.9	0.4902	9.4	26.8	0.0093
ENT	5.5	5.9	0.9203	1.0	7.9	0.0208	10.9	8.5	0.6241
General	2.7	7.4	0.2077	15.3	18.0	0.6241	10.9	15.5	0.4354
Neurologic	13.7	10.3	0.5353	5.1	7.9	0.4413	6.3	5.6	0.8808
Substance use	1.4	0	0.332	6.1	1.1	0.0719	0	0	–
Trauma	0	0	–	2.0	2.2	0.9203	1.6	0	0.2891
Mental health	0	0	–	1.0	0	0.3371	4.7	2.8	0.5687
Ophthalmology	0	2.9	0.1389	0	0	–	0	1.4	0.3421

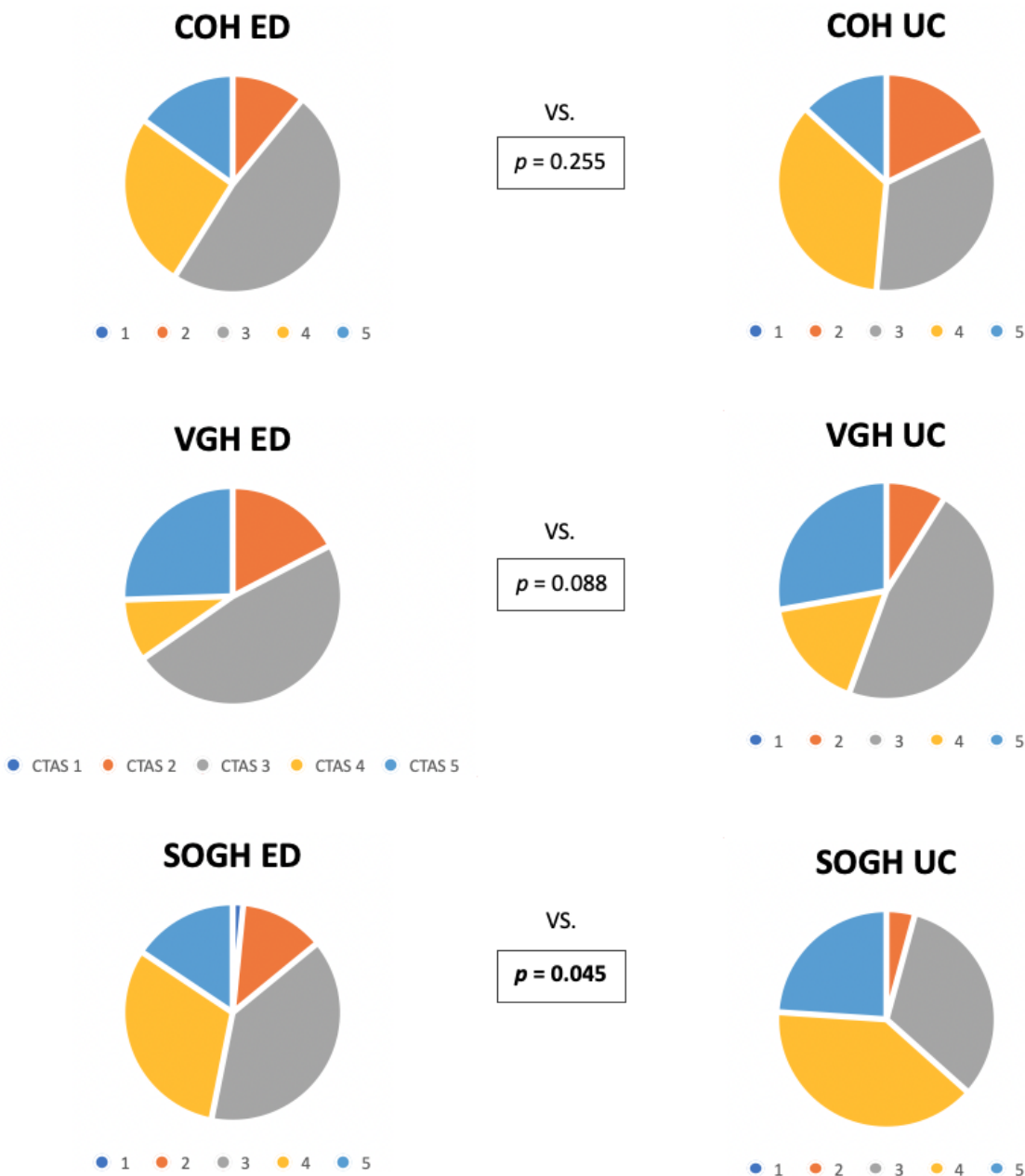
ED = emergency department; UCC = urgent care centre; GI = gastrointestinal; OB/GYN = obstetrics and gynecology; ENT = combined nose/mouth/ears/throat/neck. P-values in bold are significant.

CTAS scores as a proportion are depicted in Figure 2. The “mature site” VGH saw no change in acuity as measured by CTAS scores in 2019 compared to 2017. There was no statistically significant difference in acuity when comparing SOGH UCC and COH UCC to VGH UCC.

Table 3 describes the proportion of entrance complaints at each ED and UCC before and after conversion. There was a statistically significant increase (1% vs. 7.9%, $p = 0.0208$) in “ENT” presentations at

VGH UCC since converting from an ED. There was also a statistically significant decrease (19.4% vs 9.0%, $p = 0.0434$) in “GI” complaints at VGH UC since converting from an ED. Presenting complaints at SOGH UCC demonstrated a statistically significant increase in “Skin” complaints compared to SOGH ED (9.4% vs. 26.8%, $p = 0.0093$). No statistically significant changes ($p < 0.05$) in presenting complaints were identified at COH UCC.

Figure 2. Graphical representation of the proportion of CTAS scores for EDs and UCCs at each of the data collection sites.



VGH UC = Victoria General Hospital Urgent Care Centre; VGH UC = Victoria General Hospital Urgent Care Centre;
 CH ED = Concordia Hospital Emergency Department; CH UC = Concordia Hospital Urgent Care Centre;
 SOGH ED = Seven Oaks General Hospital Emergency Department; SOGH UC = Seven Oaks General Hospital Urgent Care Centre.

Discussion

To our knowledge, this is the first Canadian study to characterize how acuity and presenting complaints change in UCCs when converted from EDs. Although there are several documented cases of EDs converting to UCCs, literature examining how this transition has affected both acuity and presenting complaints at these centres has not been published to our knowledge.¹⁵⁻¹⁷

Most existing literature related to conversion of EDs to UCCs is based out of the United States and focuses on the economic cost of UCCs compared to EDs.¹⁸⁻²⁰ Additionally, much of the American literature focuses on conversion of “free-standing” EDs to UCCs. These departments differ from all the included EDs in our study as these departments are privately owned and are not hospital affiliated. Poon et al. in 2019 characterized changes of patient characteristics and common diagnoses in a Texas ED when converting from a UCC.²⁰ Although the conversion of this UCC to an ED was opposite to what we was observed in Winnipeg, some comparisons can be made. Similar to the results of our study, Poon et al. saw a decrease in GI complaints and an increase in ENT complaints in their UCC compared to its respective ED. Similarly, no changes were seen in the sex and age of patients.²⁰ This is consistent with the findings herein. Given that the results of our study were congruent to a similar intervention in a different country, it may lend credence to the notion that these results are true and not solely due to chance.

Changes in ENT and skin presentations

Each of the 175 distinct entrance complaints corresponds to a base CTAS score prior to added modifiers. “ENT” and “Skin” are the two categories in this system that are considered the least acute if no modifiers for pain or abnormal vital signs are used.² Some of the highest acuity categories prior to modifiers include cardiovascular, respiratory, environmental, and trauma.² The increase in “ENT” and “Skin” complaints observed at VGH and SOGH respectively highlights how the transition to the UCC system increased these types of complaints at these centres. This suggests the public is aware that these types of complaints are generally minor and can trust a UCC to adequately manage their minor health concern. These findings are again consistent with Poon et al. in 2019.²⁰ It would be useful to ascertain whether there exists a corresponding decrease in these complaints at other EDs in the city. It is possible that the increase in “Skin” and “ENT” complaints at UCCs is due to patients preferring to access 24-hour care available on short notice at UCCs instead of waiting to see their family doctors.

Minor vs. major complaints

Difficulty arises in complaints that are not obviously minor. A patient cannot be expected to diagnose their symptoms or to predict how much resources their complaint will require. It is especially true for GI com-

plaints, which are difficult for patients and clinicians alike to classify as low or high risk. This is because many serious GI pathologies manifest as minor abdominal pain, diarrhea, or anorexia.²¹ It is therefore difficult for a patient to decide if their GI symptoms warrant a visit to an ED or a UCC. Our study found that VGH had a decrease in the number of “GI” complaints but no difference in CTAS scores. This may suggest that patients fear their issue is too serious to be adequately addressed at a UCC. It could also be related to selection bias in our study design given our low sample size.

Minimal change in CTAS scores

The minimal change in CTAS and entrance complaints may suggest that there was inadequate public education surrounding the capabilities of each type of centre. Patients chose UCCs when their complaint was obviously minor, which is consistent with the goal of the conversion. We would expect that the proportion of cardiac, neurologic, GI, and trauma complaints would decrease at UCCs since these types of complaints are more often life-threatening and demand more resources. One explanation for the lack of change is that patients choose the centre closest to them, especially when they fear the issue is serious and time sensitive. Additionally, they may have previous experience with a specific centre and choose to continue to go there even if they recognize that an ED might be more appropriate.

Another possible contributor to the minimal change found in acuity and entrance complaint is the public resistance and outcry surrounding the conversion of the EDs. A campaign to “Save our Emergency Room” was started for COH ED, with lawn signs and billboards present for months before and after the change.²² From our collective experiences, patients at times expressed discomfort with presenting to a UCC, expecting inferior care in terms of skill or services, despite the staff remaining the same. This experience has been corroborated by studies in the United States and United Kingdom.^{23,24} Conversely, it is possible some patients with serious complaints intentionally went to UCCs to protest the loss of their local ED. Additionally, a \$100 000 public education campaign was launched five days before the conversion of the COH ED, called “My Right Care”.²⁵ A website and hotline were made available to assist members of the public determine if their complaint was more appropriate for a UCC or an ED.⁴ Due to the short lead time between launching the campaign and the conversion of the COH ED, there was criticism that the message would not have time to spread, leaving people unaware of these resources.²⁵ As public acceptance and awareness of UCCs improves over time, it is likely that a greater difference in entrance complaints and decrease in CTAS scores will be seen.

In our analysis, grouping CTAS 1 and 2 into high acuity and 3-5 into low acuity impairs our ability to appreciate differences in acuity scores between sites. However, this was necessary to analyze the small sample

size. Only one site saw a significant decrease in average CTAS score. Given the weaknesses in the CTAS score, it is difficult to conclude that the CTAS scores were an accurate representation of the demands of the patient population at each site. Canadian Institute for Health Information data that characterizes the entire ED or UCC population based on percent admission and length of stay would help determine the change in acuity after the conversion. Unfortunately, this data was not available at the time of our analysis due to the COVID-19 pandemic.

Limitations

There are several additional limitations to this study. The analysis was underpowered by 270 patients (45 patients at each site). This was due to time constraints. A larger follow-up study would be required to confirm our findings and perhaps offer sufficient power to reveal associations otherwise nonsignificant in the current analysis. Given the small sample size, potential selection bias may have occurred. Larger sample sizes would allow for analysis of individual CTAS scores across sites. Moreover, the insignificant change in CTAS scores and the type of entrance complaints may be related to the temporal proximity between pre- and post-transition periods and the actual date of transition from ED to UCC. A longer follow-up period further away from the transition date may show a greater change as public acceptance of the change increased. The season of the year during which the transition occurred (and, therefore, the timeframe over which the data we abstracted was recorded) may play a role as well: two of the sites transitioned during the summer while one transitioned during the fall. The type of complaint at each site might differ seasonally.

The CTAS score also has some inherent weaknesses which may leave differences in patient populations unappreciated. For example, a patient triaged as “Chest Pain with Cardiac Features” is a CTAS 2, even if the patient’s age and medical history make the pre-test probability of acute coronary syndrome unlikely. Similarly, any headache or abdominal pain where the patient reports 8/10 pain is a CTAS 2, even if vital signs, associated symptoms, general appearance, and medical history are reassuring. For this reason, one waiting room full of CTAS 2 patients can look extremely different from another, thus demanding different resources and level of attention.

Strengths

To the best of our knowledge, this is the first Canadian study to evaluate patient presenting complaints at UCCs since converting from EDs. This data may provide valuable insight into how patients utilize these relatively new services and whether more patient education is required around this new model. It also provides a basis for a larger study to examine these effects as UCCs become more established in the Canadian healthcare system.

Conclusion

Future research is needed to more accurately characterize how the acuity of presenting illnesses has changed at new UCCs. It should also be determined whether these changes have successfully reduced length of stay, wait times, and admission rates at UCCs. In future studies, it would also be important to include patients that present via emergency medical services to more accurately define how CTAS scores have changed overall and how to better allocate resources in the future. It may also be important to analyze whether there is a reduction of non-urgent complaints in Manitoba’s two tertiary care centres: St. Boniface Hospital and Health Sciences Centre Winnipeg.

This study adds a useful perspective that describes how patient complaints have changed at Winnipeg’s three UCCs. To the best of our knowledge, there are no other Canadian studies that examine the effects of converting an ED to UCC. We hope that this study stimulates administrative discussions in order to adjust operations that make these centers more efficient from both patient-flow and economic perspectives. Finally, this study can be used to help inform health authorities around the creation of a uniform CTAS score distribution goal for new UCCs. In doing so, more consistency can be achieved across all sites as there is substantial variation between sites currently. Ultimately, these research and interventions resulting from this study will allow for more accurate analysis of the effectiveness of the transition of EDs to UCCs.

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