ORIGINAL RESEARCH

THE ROLE OF PHYSICIAN ASSISTANTS IN RURAL EMERGENCY DEPARTMENTS OF MANITOBA

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ABSTRACT
Introduction: Wait times in Winnipeg emergency departments (EDs) are currently amongst the longest in Canada. With the goal of improving wait times and lower costs, the Winnipeg Regional Health Authority plans to consolidate services by closing one ED and one urgent care centre, while converting two EDs to urgent care centres. With the conversion of EDs in Winnipeg to urgent care centres, an analysis of new and cost-effective models of managing the less acute, but urgent medical conditions typically seen at urgent care centres, is needed.
Objective: The objective of this study was to identify the Canadian Triage and Acuity Scale (CTAS) classification of illness severity that Physician Assistants (PAs) are currently treating in rural EDs in Manitoba. If PAs are currently providing effective patient care to rural patients who match the expected profile of the urgent care patients, then they may be a valuable resource in Winnipeg as well.
Methods: Patient charts were reviewed from the emergency departments of Beausejour District Hospital and Selkirk Regional Health Centre between January and May 20017 to obtain 15 full working days from 3 full-time PAs.
Results: The majority of patients treated by PAs in these rural EDs were of CTAS levels 3 and 4.
Discussion: This study highlights that PAs are experienced in treating CTAS level 3 presentations and are utilized to help increase patient flow in these rural emergency departments. Furthermore, with the increased need to find cost-effective and innovative ways of reducing wait times in Winnipeg EDs and urgent care centers, it may be suggested that PAs could be beneficial in this process.

Introduction

Emergency Departments in Winnipeg

Current wait times in Winnipeg emergency departments (EDs) are amongst the longest in Canada.[(1)] Concordia Hospital, Victoria General Hospital and St. Boniface General Hospital have been shown to have the longest ED wait times, with an average of 6.8, 6.7 and 6,5 hours, respectively.[(1)] With a rising mean age of the population, emergency room use and wait times are only expected to increase. Moreover, the provincial government has ordered the Winnipeg Regional Health Authority (WRHA) to cut $83 million in 2017-2018 out of a $2.8 billion budget.[(2)] In response to this situation, the Victoria Hospital and the Misericordia Health Centre were converted

to an urgent care centre and a community IV clinic, respectively, in the Fall of 2017. Future plans to convert the Seven Oaks General Hospital to an urgent care centre and close the Concordia Hospital ED are to come in 2018. With these changes, the WRHA plans to consolidate resources and improve wait times.

The problem with long wait times

Long wait times in EDs are not only an inconvenience to patients, but have adverse effects on patient outcomes. At a suburban ED, Singer et al. demonstrated that mortality increased from 2.5% to 4.5% when the wait time increased from <2hrs to >12 hrs.[3] Furthermore, the mean length of stay in the hospital increased from 5.6 days to 8.7 days for patients who had a wait time of <2hrs compared to those who waited for greater than 24hrs.[3] Emergency department wait times are composed of waiting for an initial assessment, time to disposition, and time waiting for an inpatient hospital bed. Wait times vary depending on the severity of the presentation. The severity of presentations are categorized based on the Canadian Triage and Acuity Scale (CTAS), where CTAS 1 is resuscitation, CTAS 2 is emergent, CTAS 3 is urgent, CTAS 4 is less urgent, and CTAS 5 is non-urgent. While CTAS level 1 has a median wait time for initial assessment of only 11 minutes, CTAS 3 and 4 have the longest wait time for initial assessment of 79 and 66 minutes, respectively.[4] CTAS 3 and 4/5 make up the majority of emergency presentations at 38% and 42%, respectively in the year 2012-2013.[5] Furthermore, the majority of these non-acute presentations are not admitted.[5] In 2012, the Canadian Institute for Health Information (CIHI) concluded that only 1% of emergency department presentations are non-acute admissions.[4] Therefore, identifying initiatives to treat the common urgent cases at urgent care centres efficiently will be a key factor in reducing wait times in urgent care centres and EDs.

Objectives

Due to the current limitations on the health care budget, the government is looking for new and innovative ways to improve the quality and sustainability of the Canadian Health Care system. While recent closures of EDs is projected to consolidate resources and alleviate costs, it is likely that further changes will be necessary to make the system more efficient and reduce wait times. One way to increase efficiency is through the implementation of interprofessional and collaborative teams, in which physician assistants, in particular, will be the focus of the study.

A physician assistant (PA) is a medically educated healthcare professional working under the indirect supervision of a physician to provide health care. The scope of practice of each PA differs depending on experience and knowledge, with individualized contracts and agreements between the PA and their supervising physician. Physician assistants are utilized to extend the care of physicians, assess and treat patients, and provide physicians with additional time for alternative tasks.

The objective of this study was to identify the CTAS level of patients that PAs are currently treating in rural emergency departments in Manitoba. This data will allow the WRHA to see the profile of patients currently treated by PAs and match this with the expected profile of patients at

urgent care centres.

A chart review from 2016-2017 of two Manitoban rural EDs (i.e. Beausejour District Hospital and Selkirk Regional Health Centre) determined the CTAS classification of the patients that PAs treated. The average CTAS classification of patients was compared to common CTAS classifications of patients presenting at the urban urgent care centres and emergency departments.

It was important to select EDs that have not undergone recent changes and have established working PAs. Beausejour District Hospital and Selkirk Regional Health Centre both include this criterion, as well, being rural hospitals, are more likely to represent an urban urgent care centre in terms of severity of case presentations.

Methods

All data collection was obtained in accordance with ethical approval from the University of Manitoba and under the agreement of the Provincial Health Information Act. A chart review was conducted to include all patients triaged at Selkirk Regional Health Centre emergency department in January 2017 and Beausejour District Hospital from January to April 2017. There were two full-time PAs working in emergency at Selkirk, while the PA in Beausejour only worked in the emergency department once a week. Charts were analyzed in order to obtain 15 full working days from all 3 PAs, therefore, in order to obtain the same number of working days for each provider, 4 months' worth of charts were analyzed in Beausejour.

On any emergency record, the attending physicians are listed electronically as the provider, and the only record of a PA's involvement in a case was found by their signature on the paper chart. Therefore, the paper document of every emergency case was assessed to determine whether or not the PA was involved as a health care provider. Separate summary documents for Selkirk and Beausejour were created that listed every emergency presentation for each day along with the patient's medical record number (MRN). In Selkirk, all of the charts were listed electronically. The MRN number was obtained for each patient presenting to the ED for the month of January in order to look for one of the PA's signatures on the note.

In all presentations that were reviewed, if a patient left after triage or without being seen by a provider the patient was excluded from the chart review. Additionally, if a patient had different CTAS scores on the triage note and the emergency document, the initial CTAS score from triage was included in the study.

In Selkirk Regional Health Centre, there were a total of 1829 charts reviewed, 290 of which were treated by a PA and met the criteria to be included in this study. In Beausejour District Hospital, the system is based on paper charts. Therefore the charts were similarly assessed for the signature of the PA to determine if they were involved in the treatment of that patient. In Beausejour, a total of 166 charts were assessed between January and April 2017, 58 of which were treated by the PA and met inclusion criteria. From each emergency encounter that was treated by a PA, the CTAS level was

recorded in addition to the date and the provider. Note that no patient identifiers were documented in this process.

The proportion of each CTAS level was then calculated for Beausejour and Selkirk hospitals and graphs were constructed to demonstrate the proportion of each CTAS level treated by a PA. These values were compared with the proportion of each CTAS levels at all EDs and an urgent care centres in Winnipeg, obtained from CIHI.[6]

Results

In the current study, charts were analyzed in order to obtain 15 full working days from 3 different PAs. A total of 290 cases from two PAs in Selkirk Regional Health Centre and 58 cases from one PA in Beausejour District Hospital were included in this study. It was shown in Selkirk that the greatest proportion of cases treated by a PA had a CTAS level of 4. There were 0 CTAS level 1, while 15.6% were a CTAS 2, 39.2% were a CTAS 3, 43.4% were CTAS 4, and 1.7% were a CTAS 5 (Fig. 1). In Beausejour, the greatest proportion of cases treated by a PA were a CTAS level 3, in which case 1.7% were a CTAS 1, 20.7% were a CTAS 2, 34.5% were a CTAS 3, 22.4% were a CTAS 4, and 20.7% were a CTAS 5 (Fig. 1).

The same data can be categorized based on individual providers, rather than location (Fig. 2), demonstrating that "Provider A" treated a greater proportion of cases that were a CTAS 4 (45.4%), followed by a CTAS 3 (39.5%), "Provider B" treated a greater proportion of CTAS 4 cases (39.8%), followed by CTAS 3 (38.8%), and "Provider C" treated a greater proportion of CTAS 3 (34.5%), followed by CTAS 4 (22.4%).

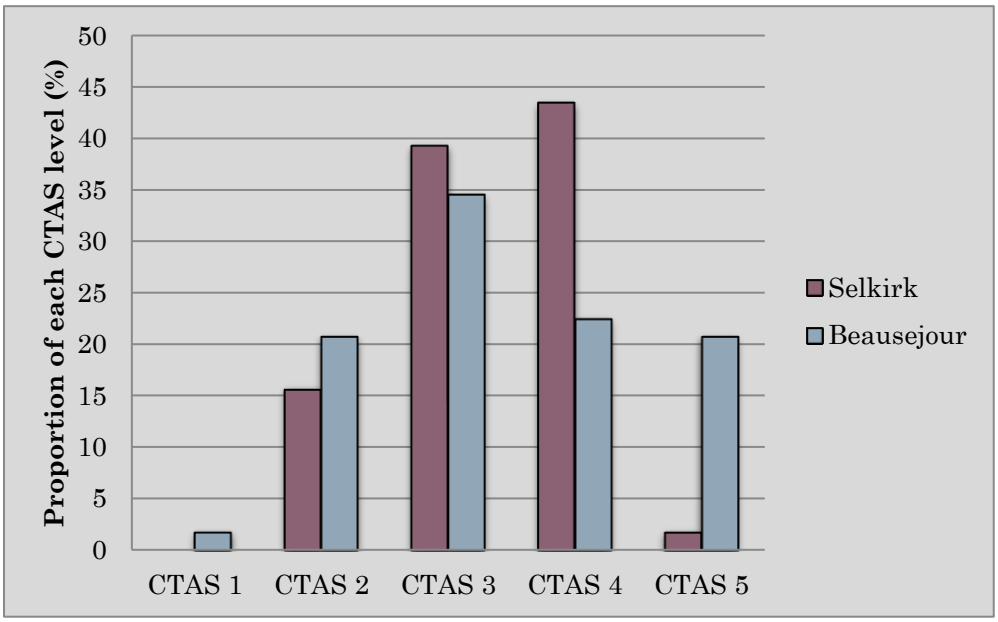


Figure 1. The proportion of cases for each CTAS level, categorized according to those treated by a Physician Assistant in Selkirk Regional Health Centre compared to Beausejour District Hospital emergency departments.

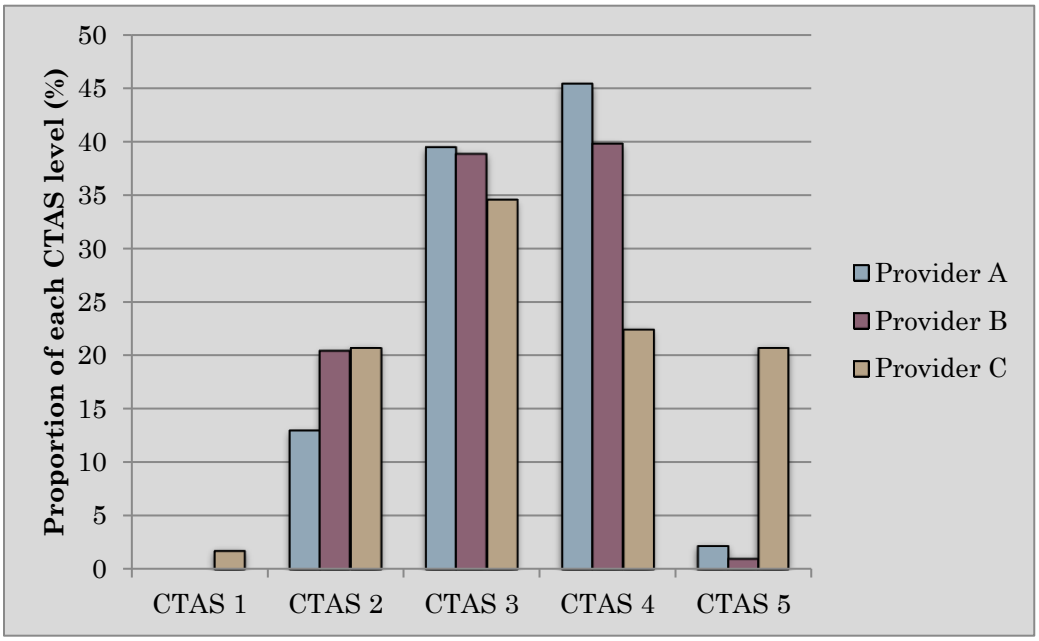


Figure 2. The proportion of cases for each CTAS level, categorized according to one of three Physician Assistants in Selkirk Regional Health Centre and Beausejour District Hospital emergency departments.

Discussion

According to the chart review conducted in this study, PAs in rural EDs (Selkirk Regional Health Centre and Beausejour District Hospital) treated a greater proportion of CTAS level 3 and 4 than any other CTAS level between January and April 2017. While the exact level of involvement the PA had in each case could not be ascertained, it can still generally be concluded that PAs played a role in treating these cases. Both of the PAs working at Selkirk Regional Health Centre have been working for over 5 years, and practice medicine with a large amount of autonomy. Furthermore, a recent pilot project has begun in Beausejour District Hospital, in which the PA is in the primary provider, treating all ED presentations when they are on shift and consult the attending physician only when it is deemed necessary. Therefore, the level of involvement the PA has in each case is likely significant, although it cannot be directly measured.

The current study has demonstrated that PAs in rural EDs have been trained to treat patients presenting as CTAS levels 3 and 4. In a recent report by the CIHI, it was demonstrated that the

greatest proportion of patients who presented to the Grace General Hospital, St. Boniface General Hospital, Victoria General Hospital, Concordia General Hospital and Health Sciences Center EDs had a CTAS level of 3, while Misericordia Urgent Care Center and the Health Sciences Children's Hospital had the greatest proportion of patients with a CTAS level of 4[1]. Therefore, PAs are well trained and capable to treat ED cases that reflect the same CTAS level as what is currently seen at emergency and urgent care centers in Winnipeg. Considering the recent changes across Winnipeg's ED system and the need for further efficiencies in terms of wait times and cost, PAs could be essential to the future of EDs and urgent care centres in Winnipeg.

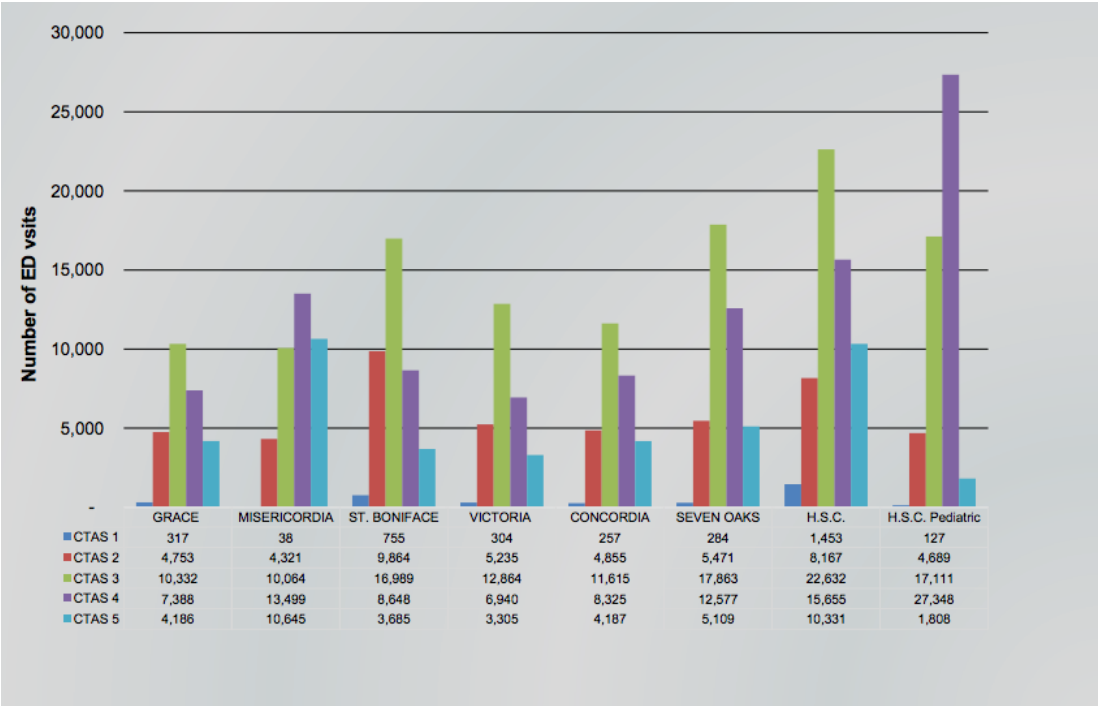
Reduction in wait times

Canada has the longest ED wait times among Commonwealth countries, and Manitoba, in particular, is among the worst nationwide.[7] According to the CIHI, the wait time to be seen by a physician in an ED had a nationwide average of 3.0 hours in Canada and 5.5 hours in Manitoba.[1] Even more startling, the wait time for admission to a hospital bed, has a national average of 29 hours in Canada and 40 hours in Manitoba.[1] With current concerns of extensive ED wait times in Winnipeg, two EDs have been closed, and it is projected that two more will close in 2018.[2] By closing EDs in Winnipeg, the Government of Manitoba aims to consolidate resources and improve wait times.[2] Considering that Winnipeg accounts for four of five EDs with the longest wait times across the country[1], it can be suggested that consolidating resources may aid in a long-term solution; however, due to the current state of Winnipeg's emergency system, consolidation will likely not solve the solution in entirety. Therefore, further changes to the structure of emergency departments will need to be implemented, such as including additional health care providers as part of the interprofessional team, namely physician assistants.

Currently in Winnipeg, in addition to further ED closures, there is a plan to convert these EDs to urgent care centres, with the aim of preserving the main EDs for higher acuity cases, while the urgent care centers would be responsible for treating lower acuity cases. According to the Wait Time Reduction Task Force (WTRTF) the quality of care is quite respectable for patients presenting with a CTAS level of 1 or 2 and the wait time is generally quite short[8]. Patients that present as a CTAS level of 1 or 2 often require their own beds, which are of limited availability, yet these cases are typically not considered a major factor in contributing to overall wait times.[8] Conversely, cases with a CTAS level of 4 and 5 rarely require a bed and are often able to wait in chairs, have classically been identified by politicians, staff and patients as the problem in ED wait times[8]. A study conducted in Ontario refutes both of these viewpoints, as they demonstrated that for every CTAS 4 and 5 patient arriving in the ED, there is only a 13 second delay to patients with a CTAS level of 1, 2, and 3 in seeing a physician and a 32 second increase in their total time spent in the ED[9]. The minimal increase in wait time and length of stay suggests that the non-urgent presentations are not the major issue in wait times. In concordance with this theory, the WTRTF states that it is the CTAS level 3 patients that increase the wait times most significantly, as the level 3 severity cases are highest in number, do not have priority over the acutely ill, yet often still require an ED bed.[8]

The high proportion of CTAS level 3 presentations to Winnipeg EDs was confirmed by a recent

report by the CIHI (Fig. 3).[1] Similarly, PAs in Beausejour District Hospital and Selkirk Regional Health Centre EDs treated a high proportion of patients presenting as CTAS 3 and 4 (Fig.1). This leads to the idea that PAs are well trained in treating moderate severity emergency presentations and could significantly aid in reducing the ED wait times in Winnipeg.



	GRACE	MISERICORDIA	ST. BONIFACE	VICTORIA	CONCORDIA	SEVEN OAKS	H.S.C.	H.S.C. Pediatric
CTAS 1	317	38	755	304	257	284	1,453	127
CTAS 2	4,753	4,321	9,864	5,235	4,855	5,471	8,167	4,689
CTAS 3	10,332	10,064	16,989	12,864	11,615	17,863	22,632	17,111
CTAS 4	7,388	13,499	8,648	6,940	8,325	12,577	15,655	27,348
CTAS 5	4,186	10,645	3,685	3,305	4,187	5,109	10,331	1,808

Figure 3. Emergency department volumes across all WRHA emergency department sites between 2015 to 2016, categorized according to the CTAS level (modified from WTRTF 2017).

According to a retrospective study based on 6 emergency departments in Ontario, when a PA was directly involved in a patient's care, patients were 1.6 times more likely to be seen within the wait time standards.[10] It has been proven that PAs in Ontario EDs make a substantial difference to improve wait times, and thus could likely benefit Winnipeg EDs in a similar way. Furthermore, long wait times often results in a longer hospital admission, which would then lead to a lower patient turnover rate and utilize more physician time.[5] In 2009, Ducharme demonstrated that the length of ED stay was 30.3% lower when PAs were involved. Therefore, implementing more PAs in urgent care centres may help reduce wait times in a multifactorial sense. Physician assistants not only decrease the time to be seen in ED but also reduce the length of ED stay, which would ultimately increase patient turnover and thus improve wait times.

While PAs work as part of an interdisciplinary team and emergency physicians are essential to this team, it is important to note that PAs would be an important addition, not a replacement. Implementing more PAs into urgent care centres would alleviate more physician hours to focus on

CTAS levels 1 and 2. This time can then be used for senior medical staff to be more involved in complex clinical cases and to have an overview of a larger number of patients, which is critical in larger EDs.

Cost effectiveness

The other major concern of the health care system in Winnipeg is the financial budget. According to a report by the CIHI, Manitoba's health expenditure per capita in 2016 was among the highest at $7120, which is approximately 13% higher than the national average.[1] Because of this, the provincial government has ordered the Winnipeg Regional Health Authority (WRHA) to cut $83 million in 2017-2018 out of a $2.8 billion budget.[2] Part of the resolution to the financial concern has been to close EDs; however, further changes will need to be implemented considering the aging population and the continual rise of the projected health care costs. Implementing an interprofessional team with more physician assistants should be considered as part of the solution to the current budget crisis.

Because PAs in Canada are still considered relatively new, there is little research regarding their cost-effectiveness. In numerous studies, PAs and nurse practitioners are often compared due to their similar role and comparable salary. Results from a comparative, 2-group, a quasi-experimental study conducted by Cowan et al., suggests the addition of a nurse practitioner (NP) to the healthcare team significantly reduces the length of stay at a hospital, which was converted into direct health care dollars saved.[11] Cowan et al. determined that the hospital unit with an NP had a mean length of stay that was 1.01 days shorter than the unit without an NP working, which resulted in a $1,591 U.S. profit to the hospital per day for each patient admitted to the unit.[11] While the study by Cowan et al. does not pertain directly to emergency departments, it can be said that an overall decrease in the length of stay, as Ducharme has demonstrated with the use of PAs in Canadian emergency departments, can decrease the overall cost to the healthcare system.[10,11]

Similarly, an economic evaluation and randomized controlled trial that was conducted in the Netherlands, indicated no significant difference in resources (i.e. prescriptions, diagnostic procedures and referrals) used by NPs compared to family physicians; however, the consultation cost of NPs were found to be significantly lower than that of physicians due to the difference in salary.[12] Furthermore, while this does not specifically compare PAs to emergency medicine physicians in Canada, it is related to the fact that there is a clear salary difference between the two professions. According to the University of Manitoba, the mean salary of a physician assistant in Manitoba is $80 000 to $100 000, whereas the mean salary of an emergency room physician in Canada according to the CIHI is $339 566.[13,14] Therefore, while emergency physicians cannot be replaced due to their essential training and abilities, it is much more cost effective to hire additional PAs as part of an interprofessional team.

Limitations of the study

There are a number of limitations to this study. Firstly, the small sample size of PAs investigated at the two rural hospitals in Manitoba. Further research on this subject matter should be conducted to extend the research to additional rural EDs with working PAs in Manitoba. Secondly, this study was limited to reviewing charts over a short period of time. Further chart reviews to assess presentations over a greater length of time would be beneficial to this work in providing a more accurate picture of PAs in EDs. While changes to emergency departments in Winnipeg are ongoing, further research on PAs in Canada is essential to highlight the importance of implementing PAs in the interprofessional health care system.

Conclusion

In conclusion, PAs in rural emergency departments of Manitoba are currently treating a higher proportion of patients presenting as CTAS levels 3 and 4. Similarly, it has been demonstrated that the greatest proportion of ED presentations in Winnipeg are at a CTAS level 3. In addition, the WTRTF has suggested that it is the CTAS level 3 presentations that are currently contributing the longest ED wait times. Therefore, PAs working in emergency departments are well trained to treat CTAS level 3 cases and maybe a key component to implementing further efficiencies to resolve the current issue of ED wait times. Furthermore, PAs may contribute to additional economic efficiencies in the health care system as they are hired at a reduced cost, compared to physicians. While PAs cannot replace nurses or physicians, they do play an important role in the healthcare system. Future incorporation of PAs in urgent care centres of Winnipeg should be considered to increase both wait time and economic efficiencies.

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