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We're recruiting

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We are always recruiting in rural. Even those 'most envious of rural communities who surely have enough' are recruiting (insert expletive uttered sotto voce). It's a tiring lament. Why does it have to be so? There are many reasons but changing physician factors as mentioned in this issue's study about recruiters (Page 141) partly explain it.

New graduates increasingly require tailored approaches. It's not that we have a job that they may want to do, but determining what life can we make for them (and their families). These important negotiations are not only necessary to attract someone but also ensure that the community keeps them. There are limits of course as there will be a set of community healthcare needs based on rural demographics and social determinants of health.

Rural communities are ageing faster than urban ones. Our isolation, poverty and chronic disease-burden do not make attracting healthcare

workers easy. In fact, the communities that need physicians the most appear to be the hardest for recruiters. However, even fortunate communities must recruit for the future as things can change in a moment by a single person. Fundamentally, rural suffers from quantum physics' effects. Unlike urban the loss or gain of a single physician is state changing. One in five to one in four is a felt thing that cramps your intestines. Two Family Practice Anaesthetists who recruit a third is a landmark. Replacing patchy locum surgical coverage with a local surgeon is fireworks and champagne.

Rural medical education is even couched overtly or covertly in terms of recruitment. If you take a student, you might be increasing your chances of recruiting a physician. To a nuanced extent, this is indeed true. However, to say that we are succeeding or not in Canada with the rural training of the upcoming rural medical workforce is probably premature to opine. For rural communities who are always recruiting, colour me sceptic.

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Nous recrutons constamment

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Nous recrutons constamment dans les zones rurales. Même les communautés rurales les plus enviées, qui ont pourtant tout ce dont elles ont besoin, recrutent (insérez ici un juron prononcé à voix basse). C'est une tristesse lassante. Pourquoi en est-il ainsi? Il existe de nombreuses raisons, mais les facteurs liés à l'évolution de la profession médicale, mentionnés dans l'étude sur les recruteurs publiée dans ce numéro (page 141) expliquent en partie cette situation.

Les nouveaux diplômés ont de plus en plus besoin d'approches personnalisées. Il ne s'agit pas seulement de leur proposer un emploi qui pourrait les intéresser mais de déterminer quelle vie nous pouvons leur offrir; ainsi qu'à leur famille. Ces négociations importantes sont non seulement nécessaires pour attirer ces personnes, mais aussi pour s'assurer qu'elles restent dans la communauté. Cela dit, il existe bien sûr des limites car les besoins en matière de soins de santé varient en fonction de la démographie rurale et des déterminants sociaux en matière de santé.

Les communautés rurales vieillissent plus rapidement que les communautés urbaines. Notre isolement, notre pauvreté et le fardeau des maladies chroniques ne facilitent pas le recrutement de

professionnels de santé. En réalité, les communautés qui ont le plus besoin de médecins semblent être les plus difficiles à pourvoir. Cependant, même les communautés privilégiées doivent recruter pour l'avenir, car une seule personne peut changer la donne du jour au lendemain. Les zones rurales souffrent fondamentalement des effets de la physique quantique. Contrairement aux zones urbaines, la perte ou le gain d'un seul médecin a un impact sur l'ensemble de la communauté. Passez d'un sur cinq à un sur quatre, c'est quelque chose qui se ressent très fortement. Deux anesthésistes généralistes qui en recrutent un troisième, c'est un événement exceptionnel. Le remplacement d'un service chirurgical de remplacement fragmenté par un chirurgien local, c'est une véritable célébration.

La formation médicale en milieu rural est explicitement ou implicitement présentée comme un moyen de recrutement. En acceptant un étudiant, vous augmentez peut-être vos chances de recruter un médecin. Dans une certaine mesure, cela est vrai. Cependant, il est probablement prématuré de se prononcer sur la réussite ou l'échec de la formation en milieu rural de la future main-d'œuvre médicale rurale au Canada. Je reste sceptique quant aux communautés rurales qui sont constamment à la recherche de personnel.

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The SRPC concluded another excellent Rural and Remote Medicine annual conference in Winnipeg in April. A huge thanks goes out to co-chairs Drs. Sarah Lesperance and Selena Papetti, as well as the tireless efforts of the SRPC staff for putting on another amazing event. Thank you to the many of you who presented talks, hosted workshops and helped encourage your friends and colleagues to get involved. We are looking forward to seeing you all again in Quebec City on 16–18 April 2026, where co-chairs Drs. Nicholas Potvin and Dr. Michelle Lajzerowicz will no doubt create a gathering equally memorable. I would also like to welcome Dr. Sarah Giles as our new president-elect and thank Dr. Sarah Lesperance as she concludes her term as past president.

Luckily, we will have a chance to gather very soon at the 2nd Annual Rural and MINI Remote Medicine Conference, taking place on 20 September 2025, in Regina, Saskatchewan. Hosted in conjunction with the Saskatchewan College of Family Physicians' 71st Annual Family Medicine Conference, this conference offers an opportunity for folks to connect with the SRPC outside of our flagship conference while maintaining the same level of rurally relevant CME along with camaraderie and inclusivity. The SRPC staff will also be hard at work representing your organisation at various conferences, meetings and events to help our organisation grow.

Your executive has been hard at work post R and R and we are

engaging membership in a governance review of the organisation. Good governance is key to the growth of our organisation and will ensure we derive maximum benefit for our members and our communities. We have also been in discussions with both the Rural Doctors Association of Australia and the Australian College of Rural and Remote Medicine to create formal memorandums of understanding between our like-minded organisations to strengthen our ties with them.

We have a new federal government in place, and I am looking forward to meeting and working with all the new ministers whose policies shape how rural patients access health care. Federal funding was vital to the creation of our National Advanced Skills Training Programme, and we are exploring long-term funding solutions to sustain this work. The Caring for Canadians report released shortly before the election highlighted the deficits in generalist medicine for all Canadians, while further highlighting the more dire circumstances in rural Canada. Advocating for physician workforce portability, hopefully in the form of national licensure, is vital to help address these shortages. We hope to work with our federal colleagues to ensure equitable health access for all Canadians.

Thank you again for all the work you do in caring for rural Canadians.

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Réénergisés

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La SMRC conclu une autre excellente conférence annuelle sur la médecine rurale et isolée à Winnipeg en avril. Nous remercions chaleureusement les coprésidentes, les docteurs Sarah Lesperance et Selenia Papetti, ainsi que le personnel de la SMRC pour leurs efforts inlassables qui ont permis d'organiser un autre événement remarquable. Nous remercions également toutes celles et ceux qui ont présenté des exposés, animé des ateliers et encouragé leurs amis et collègues à participer. Nous avons hâte de vous revoir tous à Québec du 16 au 18 avril 2026 où les coprésidents, les docteurs Nicholas Potvin et Michelle Lajzerowicz, créeront sans aucun doute un rassemblement tout aussi mémorable. Je souhaite également la bienvenue à la nouvelle présidente élue, la docteure Sarah Giles, et remercie la docteure Sarah Lesperance qui termine son mandat de présidente sortante.

Heureusement, nous aurons l'occasion de nous réunir encore plus tôt lors de la deuxième conférence annuelle et MINI sur la médecine rurale et éloignée, qui se tiendra le 20 septembre 2025 à Regina, en Saskatchewan. Organisée en collaboration avec la 71e conférence annuelle sur la médecine familiale du Saskatchewan College of Family Physicians, cette conférence offre aux participants l'occasion de rencontrer la SMRC en dehors de notre conférence phare, tout en bénéficiant du même niveau de formation médicale continue pertinente pour les zones rurales, et ce dans un esprit de camaraderie et d'inclusion. Le personnel de la SMRC sera également présent pour représenter votre organisation lors de diverses conférences, réunions et événements afin de contribuer à la croissance de notre organisation.

Votre équipe de direction a travaillé d'arrache-pied après la période de repos et de détente, et nous invitons les membres à participer à un examen de gouvernance de l'organisation. Une bonne gouvernance est essentielle à la croissance de notre organisation et nous permettra de tirer le meilleur parti pour nos membres et nos communautés. Nous avons également engagé des discussions avec la Rural Doctors Association of Australia et l'Australian College of Rural and Remote Medicine afin d'établir des protocoles d'accord officiels entre nos organisations, qui partagent les mêmes valeurs, afin de renforcer nos liens.

Avez l'arrivée d'un nouveau gouvernement fédéral, j'ai hâte de rencontrer tous les nouveaux ministres dont les politiques déterminent l'accès aux soins de santé des patients en milieu rural et de collaborer avec eux. Le financement fédéral a été essentiel à la création de notre Programme national de formation continue en compétences avancées. De plus, nous explorons des solutions de financement à long terme pour soutenir ce travail. Le rapport "Les soins offerts aux Canadiens", publié peu avant les élections, a mis en évidence les lacunes en médecine généraliste pour l'ensemble des Canadiennes et Canadiens, tout en soulignant la situation encore plus grave dans les régions rurales du Canada. Par conséquent, il est essentiel de plaider en faveur d'une transférabilité des médecins, idéalement sous la forme d'un permis d'exercice national afin de remédier à ces pénuries. Nous espérons collaborer avec nos collègues fédéraux afin de garantir à toutes les Canadiennes et Canadiens un accès équitable en matière de santé.

Encore une fois, merci pour tout le travail que vous accomplissez pour prendre soin des Canadiennes et Canadiens vivant en milieu rural.

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Sepsis management in a rural hospital in Northwest Ontario

Abstract

Introduction: A retrospective quantitative study of emergency department (ED) management of patients diagnosed with sepsis in a rural hospital in northwest Ontario was conducted to understand the management of sepsis guidelines and department performance.

Methods: Our study includes all adult ED patients (18+) receiving an ED diagnosis of sepsis as identified by hospital medical records coding according to National Ambulatory Care Reporting System diagnostic codes from January 1, 2021 to December 31, 2021. Charts were reviewed for patient demographics, initial presentation, timing of ED management and outcomes. Statistical analysis involved descriptive methods.

Results: Twenty-five adults were eligible, 16 female, average age 53.1 years (standard deviation [SD] = 21.9). Mortality rate was 28%. The average age of the 7 non-survivors was 64 (SD = 14.73). Time to nursing assessment averaged 8 min (SD = 7.27); time to MD assessment was 41 min (SD = 30.93). Canadian Triage and Acuity Scale scores were urgent or higher in 20 of 23 cases. Retrospective Systemic inflammatory Response Syndrome scores were elevated in 17/25 cases. Average time to fluids administration was 85 min (SD = 79.41). Sixteen of the 23 patients with recorded times of antibiotic delivery received them in 180 min or less.

Conclusion: Patients with sepsis present with a variety of clinical features, and laboratory findings. Awareness of the urgency of sepsis treatment and an organised departmental approach is important in the management of potentially septic patients.

Keywords: Emergency department, management, rural, sepsis

Résumé

Introduction: Une étude quantitative rétrospective sur la prise en charge aux urgences des patients diagnostiqués avec une septicémie dans un hôpital rural du nord-ouest de l'Ontario a été menée afin de comprendre les directives en matière de prise en charge de la septicémie et les performances du service.

Méthodes: Notre étude porte sur tous les patients adultes (âgés de 18 ans et plus) admis aux urgences et ayant reçu un diagnostic de septicémie selon le codage des dossiers médicaux de l'hôpital, conformément aux codes diagnostiques du Système national d'information sur les soins ambulatoires (SNISA), entre le 1^{er} janvier 2021 et le 31 décembre 2021. Les dossiers ont été examinés afin de recueillir des données démographiques sur les patients, les premiers symptômes,

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le moment de la prise en charge aux urgences et les résultats. L'analyse statistique a été réalisée à l'aide de méthodes descriptives.

Résultats: Vingt-cinq adultes étaient admissibles, dont 16 femmes, avec un âge moyen de 53.1 ans (écart-type = 21,9). Le taux de mortalité était de 28%. L'âge moyen des seven patients décédés était de 64 ans (écart-type = 14,73). Le délai moyen avant l'évaluation infirmière était de 8 min (écart-type = 7,27); le délai avant l'évaluation médicale était de 41 min (écart-type = 30,9). Les scores de l'échelle canadienne de triage et d'acuité étaient urgents ou supérieurs dans 20 cas sur 23. Les scores rétrospectifs du syndrome de réponse inflammatoire systémique étaient élevés dans 17 cas sur 25. Le délai moyen avant l'administration de liquides était de 85 min (écart-type = 79,41). Seize des 23 patients pour lesquels le délai d'administration des antibiotiques a été enregistré les ont reçus en 180 min ou moins.

Conclusion: Les patients atteints de septicémie présentent divers signes cliniques et résultats de laboratoire. Il est important de connaître l'urgence du traitement de la septicémie et d'adopter une approche organisée au sein du service pour prendre en charge les patients potentiellement septiques.

Mots-clés: Septicémie, prise en charge, milieu rural, service d'urgence

INTRODUCTION

Survival from sepsis improves with early recognition and treatment.¹ Descriptions of best practice suggest a 3-h window for initial assessment and treatment for possible sepsis, and a recommended '1-h bundle' of investigations and treatment for septic shock.² The major components of management are timely investigations with serum lactic acid, blood cultures and early administration of intravenous fluids and broad-spectrum antibiotics.¹ Our study is part of a quality improvement initiative at the Sioux Lookout Meno Ya Win Health Centre (SLMHC) in northwest Ontario. We examined the clinical presentation and timeliness of investigations and management of adult patients diagnosed with sepsis in the emergency department (ED).

SLHMC is a 65-bed general hospital with a catchment population of 30,000, including 25,000 residents among 30 remote First Nations communities.³ Adult and paediatric medicine, surgery and obstetrics programs are provided at SLMHC. Patients requiring management in an intensive care unit (ICU) receive initial stabilisation before being transferred to a tertiary care centre. Several road-accessible First Nations communities and neighbouring towns access the ED directly or by land ambulance. For patients from remote communities, emergency care is started in the community nursing station before a medevac to Sioux Lookout or directly to an urban centre if warranted. If there is no onsite physician available, initial assessment is by community nursing staff supported by telephone consultation

by a 'virtual ED' physician. Initial blood cultures and other laboratory samples are generally collected in-community before intravenous antibiotics and transfer.

METHODS

Our study included all adult ED patients (18+) receiving an ED diagnosis of sepsis as identified by hospital medical records coding according to National Ambulatory Care Reporting System diagnostic codes from January 1, 2021 to December 31, 2021.⁴ Charts were reviewed by 2 clinical researchers for: Age, sex, timing of ED management and outcomes. Our data were limited to ED management; we did not access pre-hospital data.

Data included timing of RN/MD assessment, fluid and antibiotic administration and laboratory measurements: Lactate, white blood count (WBC) and C-reactive protein (CRP). Clinical data included temperature, respiratory and heart rates and blood pressure (BP). Outcomes were survival and transfer to other facilities. Canadian Triage and Acuity Scale (CTAS)⁵ scores were recorded and, while our hospital does not use Systemic Inflammatory Response Syndrome (SIRS) scores, retrospective SIRS⁶ scores were calculated (positive if ≥ 2 present: Temp >38 or <36 ; heart rate >90 bpm; respiratory rate >20 breaths per minute; WBC $>12,000 \times 10^9/L$).⁶ Laboratory values were considered abnormal for white blood cell count (WBC) $>12,000 \times 10^9/L$; lactate >2 mmol/L; CRP >10 mg/L.⁷

The study was approved by the SLMHC Research Review and Ethics Committee (#01-23).

RESULTS

In 2021, 34 SLMHC ED charts received a sepsis-related code; 9 were excluded (4 paediatric, 2 direct admissions from the outpatient day medicine department to inpatient care, 1 outpatient endometritis, 1 septic arthritis, and 1 patient incorrectly coded as septic). See Appendix A. Data were collected from the ED charts of the 25 eligible adults [Table 1]. Sixteen of the 25 cases were female; the average age was 53.1 years (standard deviation [SD] = 21.9); approximately one-half (12/25) were over 60 years, including 10 patients over 70.

The average time to nursing assessment from registration was 8 (SD = 7.27) minutes; time to MD assessment was 41 (SD = 30.93) minutes. Most patients (23/25) had a documented CTAS score at triage, 87% (20/23) of whom were coded as urgent or higher acuity [Tables 1 and 2]. Retrospective SIRS scores indicated possible sepsis in 68% (17/25) of cases. The BP of 4 of the 5 patients with an initial BP <90 mmHg normalised after initial fluid resuscitation. The 5th patient with ongoing hypotension was diagnosed with septic shock and received antibiotics at 53 min and 5 h of norepinephrine support before transfer to the regional ICU, where they expired.

All 25 patients had a complete blood count, and WBC values were above normal in 19 cases. Lactate measurements were recorded in 24 cases and elevated in 12; most lactate measurements were obtained within 3 h of registration (19/24) [Table 1], [Figure 1]. CRP was measured in 20 cases and above normal (>10 mg/L) in 18, including 15 markedly elevated levels (>100 mg/L) [Table 1].

The average time to initiation of fluids, recorded in 24 of 25 charts, was 85 min (SD = 79.41). The time to initial antibiotic administration was recorded for 23 patients; 16 (70%) received broad-spectrum antibiotics in 180 min or less [Figure 2]. Among the 7 'delayed' cases, 4 of these presented with non-urgent, non-septic complaints (anaemia, leg pain, medication re-order, social admission) and appeared to have developed signs of sepsis after their initial ED presentation. Because of these outliers, we did not calculate the average time to antibiotic administration and did not include times beyond 600 min in the analysis. The common choice of antibiotics was ceftriaxone ($n = 12$) and

Table 1. Baseline characteristics

Characteristics	Results
Total n	25
Age, years (SD)	53.1 (21.92)
Male, n (%)	9 (36)
Female, n (%)	16 (64)
SBP <90 mmHg, n (%)	5 (20)
SIRS criteria, $n=25$ (%)	
Temperature	
>38°	10 (40)
<36°	0 (0)
HR >90, n (%)	16 (64)
RR >20, n (%)	10 (40)
WBC >12,000, n (%)	19 (76)
SIRS score ≥ 2	17 (68)
CTAS scores, $n=23$, n (%)	
1 (resuscitation)	4 (17)
2 (emergent)	6 (26)
3 (urgent)	10 (41)
4 (less urgent)	3 (13)
5 (non-urgent)	0
Abnormal laboratory values	
WBC >12,000, n (%)	19/25 (76)
Lactate >2 mmol/L, n (%)	12/24 (50)
C-reactive protein >10 mg/L, n (%)	18/20 (90)

SD: Standard deviation, SBP: Systolic blood pressure, SIRS: Systemic inflammatory response syndrome, HR: Heart rate, RR: Respiratory rate, WBC: White blood cell, CTAS: Canadian Triage and Acuity Scale

Table 2: Assessment and outcomes

Characteristics	Results
Mean time to RN assessment, min (SD)	8 (8)
Mean time to MD assessment, min (SD)	41 (31)
Mortality, $n=25$, n (%)	7 (28)
Transferred to tertiary care centre	11 (44)

SD: Standard deviation, RN: Registered nurse

piperacillin/tazobactam ($n = 11$); 2 patients received clindamycin plus gentamycin or penicillin.

The mortality rate was 28% (7/25). The average age of the 7 non-survivors was 64 years (SD = 14.73). They portrayed a range of laboratory values; 3 had an elevated WBC with normal lactate, and another 3 had a normal WBC with elevated lactate values. All 3 had abnormal CRPs. Results from CTAS triaging and retrospective calculation of SIRS sepsis screening scores were disparate: Only 4 cases had both positive SIRS scores and a CTAS score greater than urgent.

Eleven patients were transferred to the regional tertiary care centre, including all 7 non-survivors.

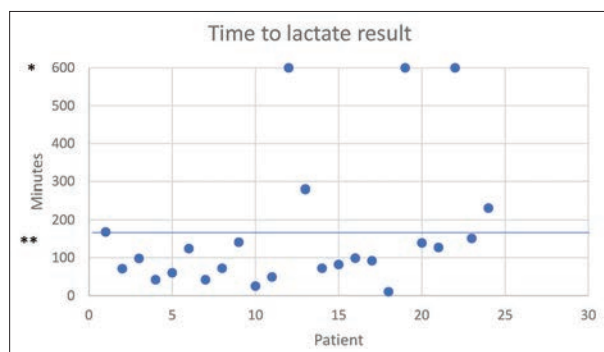


Figure 1: Time to Lactate result. * ≥ 600 min was used as marker for a prolonged time period. **Recommended 3-h mark for investigating possible sepsis.

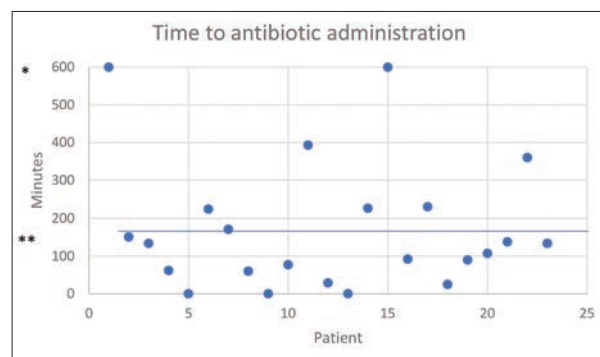


Figure 2: Time to Antibiotic administration. * ≥ 600 min was used as marker for a prolonged time period. **Recommended 3-h mark for investigating possible sepsis.

DISCUSSION

Recommendations for the management of sepsis have evolved over the past decade due to a series of research-driven international consensus statements by the Surviving Sepsis Campaign.^{1,8} The 28% overall mortality rate for septic patients treated at the SLMHC ED is within the expected range of 30%–50%.^{8–10}

The hallmark of best practices is the early administration of antibiotics. A 2017 US tertiary care study documented an increase in septic shock mortality of 4% for every additional hour delay.¹¹ Current guidelines for possible or suspected sepsis recommend a 3 h time frame for lactate measurement, antibiotic and fluid administration, and a 1-h window for a definitive initial diagnosis of sepsis, or septic shock (systolic blood pressure <90 mmHg after initial fluid resuscitation).^{1,12}

Our average time to MD assessment of 41 min compares to 50 min time in a 2020 study of 3 Ontario community hospitals.¹³ The times to lactate measurement (19/24) commonly fell within the 3 h recommended mark. Timely antibiotic administration occurred less often (16/23), including 4 patients within 60 min; 3 had ongoing antibiotics upon admission to the ED. Our performance is likely slower than the average time of 129 min in Lo's Ontario study.¹³ We did not calculate an average time to antibiotic administration due to the presence of 3 extreme outliers who did not initially present with sepsis. The choice of broad-spectrum antibiotics (pip/tazo, ceftriaxone) is similar to a recent international review of ED management.¹⁴

CTAS acuity scores did not always align with cases diagnosed with sepsis, presumably because patients presented at different points along the clinical sepsis pathway. However, they were more (87%) consistent with a subsequent diagnosis of sepsis than SIRS scores which were specifically developed to assist in the early identification of sepsis. While our ED does not use SIRS scoring, we retrospectively calculated these and found it identified only 68% of septic patients. In other settings, a positive SIRS score has a sensitivity of 0.82 (95% confidence interval [CI]: 0.78–0.75), but a low specificity of 0.24 (95% CI: 0.19–0.29).¹⁵ We note that the BC SIRS scoring system model uses altered mental state as the 4th criteria, while most centres and this study used an elevated WBC.^{1,12}

Two other screening tools for sepsis are also in use with varied results. The Quick Sequential Organ Failure Assessment screening was developed to predict survival in an ICU setting;¹⁶ and the National Early Warning Score, a pre-hospital screening tool developed in the UK.¹⁷

In our study, patients with the late investigation and treatment attest to the difficulty in recognising sepsis. A quality improvement nursing and physician education initiative is being developed to prioritise sepsis management. These include presenting these results at ED team and hospital grand rounds and considering adopting some of the available nursing and physician educational programs developed by Health Quality BC.¹⁸ These initiatives combine group training as well as point-of-care poster material. These will be important components to improving care and achieving recommended 1 and 3-h treatment guidelines.

Early laboratory testing and results contribute to timely diagnosis and treatment.^{8,10} While SLMHC has on-site laboratory personnel, many small rural hospitals may not. Point-of-care testing may be an option for these hospitals; it has been successfully introduced in many northern nursing stations and remote settings.¹⁹ In our region, point-of-care serological had been introduced in several remote First Nations nursing stations. There has been no formal evaluation, but physicians find real-time haematologic and biochemical results provided by community nurses an important adjunct to clinical assessments. As commercially available testing includes WBC, serum lactate and CRP, its impact on the identification and treatment of sepsis holds promise.

Our study has several limitations, primarily its retrospective methodology and small cohort size. Another limitation is the accepted use of hospital coding for the identification of cases of sepsis, which would not capture misdiagnosed cases or those diagnosed later during their admission. Other studies use evaluation of prospective screening tools to identify sepsis and our data is not directly comparable. We did not have access to the timeliness of medical transportation from remote communities or for inter-hospital transfers, which affect treatment and survival. We used the time of ED registration as our baseline, rather than RN assessment time used in other studies, slightly increasing time assessments. Despite chart review of ED charts by 2 clinical researchers, some data were not available. SLMHC ED is unique as it receives medevac'd patients from remote First Nations communities and our hospital-based data does not capture their complete treatment pathway.^{20,21}

CONCLUSION

Patients with sepsis presented at the SLMHC ED with varied clinical features and laboratory results. Screening tools can support but will not replace clinical judgement. Awareness of the urgency of sepsis treatment and an organised departmental approach are important in the management of potentially septic patients. A larger regional study of sepsis management, including medical transportation and pre-hospital care, would further inform the understanding of the care

pathway and areas of improvement, particularly for patients living remotely.

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Conflicts of interest: There are no conflicts of interest.

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Appendix A: Sepsis as main diagnosis in SLMHC ED 2021

NACRS Codes	2021
(A400) Sepsis due to <i>Streptococcus</i> , Group A	2
(A403) Sepsis due to <i>Streptococcus pneumoniae</i>	
(A408) Other <i>Streptococcal sepsis</i>	
(A410) Sepsis due to <i>Staphylococcus aureus</i>	4
(A4150) Sepsis due to <i>Escherichia coli</i>	3
(A4152) Sepsis due to <i>Serratia</i>	1
(A4158) Sepsis due to other Gram-negative organisms	2
(A418) Other specified sepsis	2
(A419) Sepsis, unspecified	10
Not available	1
Total	25

NACRS: National Ambulatory Care Reporting System, SLMHC: Sioux Lookout Meno Ya Win Health Centre, ED: Emergency department

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Peer coaching in a rural setting: A feasibility study

Abstract

Introduction: Peer coaching has gained traction as a method for enhancing practical and personal skills without the hierarchical dynamic sometimes found in mentorship. It creates a collaborative environment, encourages inclusivity and community building, and supports skill development across various disciplines and levels of experience. The objective of our study was to assess the feasibility, satisfaction, and effects of a reciprocal peer coaching pilot program for practising physicians in Northern Ontario's remote and rural regions.

Methods: Participants completed 'Peer coaching in practice' micromodules from The Royal College of Physicians and Surgeons of Canada and attended an in-person demonstration. Each participant committed to 2 sessions as both coach and coachee with a self-selected partner. Feedback was gathered at each study interval.

Results: Our qualitative study found that peer coaching positively impacted physicians' daily habits, wellness, and professional growth. The study emphasised the importance of cohesive partnerships in peer coaching and highlighted substantial benefits for both coaches and coachees. The feasibility of peer coaching was a key finding, demonstrating its potential to build supportive communities, particularly for providers in remote areas. While in-person interaction was preferred, the study also acknowledged the potential of virtual coaching, which could benefit providers isolated by geography, demographics, or practice modality.

Conclusion: Peer coaching is an alternative, novel form of continuing medical education and knowledge exchange. It is particularly relevant in rural communities offering crucial support to local providers, especially those in rural or isolated areas where access to formal continued medical education is limited. Our results suggest that peer coaching can significantly improve the daily practices and overall well-being of physicians.

Keywords: Feasibility, peer coaching, rural

Résumé

Introduction: Le coaching entre pairs s'est imposé comme une méthode permettant d'améliorer les compétences pratiques et personnelles sans la dynamique hiérarchique que l'on retrouve parfois dans le mentorat. Il crée un environnement collaboratif, favorise l'inclusion et le développement communautaire, tout en soutenant le développement des compétences dans diverses disciplines et à différents niveaux d'expérience. L'objectif de cette étude était d'évaluer la faisabilité, la satisfaction et

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les effets d'un programme pilote de coaching réciproque entre pairs destiné aux médecins en exercice dans les régions rurales et isolées du nord de l'Ontario.

Méthodes: Les participants ont suivi les micromodules " Expérience Coaching entre pairs " du Collège royal des médecins et chirurgiens du Canada et ont assisté à une démonstration en personne. Chaque participant s'est engagé à participer à deux séances en tant que coach et aidé (e) avec un partenaire de son choix. Des commentaires ont été recueillis à chaque intervalle de l'étude.

Résultats: Notre étude qualitative a révélé que le coaching entre pairs avait un impact positif sur les habitudes quotidiennes, le bien-être et le développement professionnel des médecins. Elle a souligné l'importance de partenariats solides dans le cadre du coaching entre pairs et a mis en évidence des avantages substantiels tant pour les coaches que pour les aidés. La faisabilité du coaching entre pairs a été une conclusion clé, démontrant son potentiel pour créer des communautés solidaires, en particulier pour les prestataires de soins dans les zones isolées. Bien que les interactions en personne aient été préférées, l'étude a également reconnu le potentiel du coaching virtuel qui pourrait bénéficier aux prestataires isolés par la géographie, la démographie ou leur mode d'exercice.

Conclusion: Le coaching entre pairs est une forme alternative et novatrice de formation médicale continue et d'échange de connaissances. Il est particulièrement pertinent dans les communautés rurales où il offre un soutien crucial aux prestataires locaux, en particulier ceux des zones rurales ou isolées où l'accès à une formation médicale continue formelle est limité. Nos résultats suggèrent que le coaching entre pairs peut améliorer considérablement les pratiques quotidiennes et le bien-être général des médecins.

Mots-clés: Coaching entre pairs, Rural, Faisabilité

INTRODUCTION

Medical education has always been based on an apprenticeship model. Undergraduate learners (mentees) typically work with senior and experienced practitioners (mentors) to develop their clinical skills and strengthen their academic knowledge.^{1,2} This relationship helps familiarise mentees with community practices and administrative tasks and optimises new or infrequently practised skills.

Peer coaching, on the other hand, fosters a collaborative environment by not establishing the senior/junior relationship present in mentorship, although both aim to support recipients. This collaborative nature supports the foundation of deliberate practice, which is essential in developing expertise across numerous disciplines.^{3,4}

Peer coaching is a modality that has gained a growing interest for improving practical and personal skills such as surgical procedures, managing learners with difficulty, and improving communication with patients and colleagues.^{3,4} Peer coaching is a moderately structured process that enables experienced providers to support colleagues in identifying solutions to their questions, thereby fostering a sense of inclusion and community.

Peer coaching typically requires less time commitment, is less structured, and supports open discussion without the power relationship

associated with the apprenticeship model.⁵⁻⁷ Peer coaching topics can be specific for early career physicians, marginalised or underrepresented participants, and may include resident learners.^{5,6,8} Peer coaching is historically common in surgical practice, although it was not always identified as such, where experienced staff supports the acquisition of new skills in novice colleagues.¹ Peer coaching programs are predominantly done in person.⁹⁻¹¹ However, digital and virtual technology use increased throughout the COVID-19 pandemic.¹¹ Virtual opportunities facilitate coaching for physicians who may live in remote communities or prefer support outside of their medical community.^{6,12} Topics may include, but are not limited to, emotional support, patient advocacy, governance structure, practical advice or integration of research into routine practices.⁶

What is unique about peer coaching is that it supports self-disclosure in a safe environment, allowing colleagues to communicate openly, without judgement.⁶ Supportive work environments are directly related to reduced physician burnout and increased physician retention.¹³ Peer coaching has been shown to improve knowledge acquisition and retention and skill development with high participant satisfaction.^{1,9} However, peer coaching is traditionally initiated at senior levels of organisations and within academic centres, seldom including rural or remote faculty who

are geographically or ethnically isolated. Peer coaching supports continued self-improvement, medical education and skill development.^{9,10,13}

Continuing medical education (CME) is a requirement in most countries. However, most CME requires practitioners to attend conferences away from their practice, read articles, watch videos or take additional coursework. Peer coaching supports adult learning theories through practice, goal setting, reflection and critical analyses in real time. It facilitates and reinforces personal reflection in a supportive environment.¹³

While studies confirm peer coaching benefits the coach and the coachee in various ways, data regarding rural communities are absent.¹²

This study was designed to evaluate the feasibility of, satisfaction with and implications for the practice of a reciprocal peer coaching pilot program for practising physicians in various career stages in remote and rural areas of Northern Ontario.

METHODS

Research personnel from the Huntsville Physicians, South Muskoka and Parry Sound Local Education Groups coordinated this single cohort prospective longitudinal study.

Participants included the faculty of the Northern Ontario School of Medicine University. Invitations were sent by E-mail through the Local Education Group administrative staff and snowball sampling among peers. All participants completed an informed consent before the start of the study. Each participant was provided with a research ID following consent to link surveys and feedback while ensuring participant anonymity. Coaching pairs were matched by mutual agreement, personal goals and experience; they were required to communicate verbally and have identified learning goals (technical or non-technical) that could reasonably be expected to be met through coaching interactions with their partner. In other words, they were to coach each other. Partners self-selected at the in-person workshop based on pre-existing relationships, experience and expertise of the partner and relatable goals. Each partner had to agree to the pairing before the pairs were confirmed. Members of each pair did not need to be from the same speciality or geographic region.

Before the training sessions, participants completed an online baseline questionnaire

regarding their attitudes towards reciprocal peer coaching, their expectations about this intervention and a demographic questionnaire.

All participants were given access to the 'Peer coaching in practice' micromodules from The Royal College of Physicians and Surgeons of Canada. Completion of these modules (6 modules, each 10 min in length) was required before the coaching workshop. The coaching workshop, which was an in-person event at a local facility, included a coaching instructor who demonstrated a coaching session and allowed participants to practice, familiarise themselves and delve further into coaching skills and practices. Participants openly discussed their coaching needs and/or goals, which facilitated the natural pairing of partners before the workshop was complete. All participants were offered an orientation to the Zoom platform (zoom.com) to facilitate their coaching sessions if face-to-face meetings were not feasible.

Each participant committed to 4 coaching sessions, 2 as the coach and 2 as the coachee. These sessions occurred virtually or in person and were scheduled for at least 30 min each (more if required – no hard stop time). Coaching sessions were anonymous to the researchers, and information shared within a coaching session was not shared for study purposes. Partners were instructed to discuss their individual goals, fears, concerns and areas they wished to focus on during the sessions. Eligible participants' topics could be subject oriented (i.e. provision of MAID), administrative (i.e. tips to adhere to a clinical schedule – time management with patients) or medico-legal (i.e. dealing with addiction treatment and prescribing), among others identified by participants. The coaching sessions were to be completed within 9 months of the initial training. Pre- and post-intervention survey responses were collected prior to, immediately after and 9 months following the initial coaching workshop.

The post-intervention questionnaire explored the impact of the coaching interventions on the physicians' practices, the usefulness of the experience compared to other continuing professional development (CPD) activities and the impact of the exchange on their relationship with their partner.

Two independent reviewers analysed qualitative data according to the grounded theory methodology. Inferential *t*-tests were

used to examine differences in pre- and post-interventional responses between males and females, between respondents who had been in practice for 9 or fewer years and 10 or more years or between Family Medicine Specialists and all other Specialists.

RESULTS

Thirty-two physicians confirmed an interest in participating, including representatives from each community. Participants included those with specialised practice (e.g., surgery, internal medicine, physiatry and emergency medicine) and primary care providers. A total of 22 participants completed all the requirements for this study, equally represented by male and female participants. Respondents primarily practised family medicine (53%), with others specialising in surgery, emergency medicine, gastroenterology, internal medicine and physiatry. Thirty-five per cent of respondents were in practice for <10 years, and 63% were in practice for 10 or more years. Four respondents (18%) had previously experienced peer coaching, while 15 (68%) had experienced mentorship.

There were no statistical differences in pre- and post-interventional responses between males and females, between those who had been in practice for <10 years and those who had been in practice for 10 or more years. However, there was a trend for more inexperienced participants to be concerned about their reputation and professional acceptance when discussing personal areas of difficulty.

Qualitative analyses

Responses were collected for 7 questions related to the pre- and post-intervention coaching experiences. Using the grounded theory, common themes were identified by respondents about their experience with peer coaching.

Participants explored *wellness and professional growth* through the reflective and supported nature of peer coaching. Participants were asked to comment on various aspects of the need for peer coaching, how the coaching impacted them, its relevance and applicability in the rural setting and how the experience impacted their practice. They indicated a goal to enhance their skills as coaches,

emphasising the self-directed aspect of coaching. It was also noted that coaching skills should be reciprocal and standard for all physicians.

'Anxiety was alleviated, having completed the interaction',

'Learning how to create a safe space for discussion and explore situations non-judgmentally is a life skill!'

'In a time of high physician burnout I think most of us would recognize the value in peer coaching',

'The benefit is hard to perceive at the front end, but it does improve communication and team building as well as emotional health'.

The role of coaching was found to be effective in *fostering a supportive network and community*. Participants were asked about the reproducibility of this programme, the impact on their established relationships and their feelings about coaching after participating.

'Peer coaching promises to become a very enjoyable and efficient way to achieve this goal and foster the connections to my colleagues and peers'.

'I appreciated the opportunity to work alongside my colleagues. I felt supported'.

'We could all use some help and help others'

'It is important to feel supported emotionally and socially in a community'.

In developing a community of support, participants were asked how this peer coaching compared to more traditional forms of CME and indicated that adapting this type of coaching programme to *meet the needs of participants and the local context* is essential for its success. The opportunity to receive CME in the community relevant to practitioners and community health was noted to be of significant value.

'Rural peer coaching has the distinct advantage of providing assistance in the setting (or equivalent) in which the need has arisen'.

'This type of peer coaching could be implemented in virtually any workplace, not only medicine. Although, with the current strains on our medical system and its health care providers, it is particularly valuable in medicine'.

'The program is quite adaptable'.

Peer coaching *enhanced participant learning and engagement* and was perceived to be a more interactive, relevant and effective method of

professional development compared to traditional CME opportunities. While CME is required in medical practice, many options lack hands-on practice, require travel and require time away from family and clients. A significant number of respondents appreciated the relevance to their practice, community and patients of peer coaching.

'Adult learning, to me, is comprised of presentation of information or a skill followed by an opportunity to apply the information or skill to allow consolidation of the information or skill. This modality supplied information to review before meeting and instruction from the expert, followed by an immediate opportunity to apply the knowledge and skills, followed by a consolidation period over months'.

'More engaging, ability to form relationships and bond with peers'.

When asked about the universality of a program such as this, peer coaching was reported as an effective medium for *mutual knowledge exchange* and CPD, which may be highly relevant to the growth of newer medical schools.

'As NOSM U expands we will have a lot of colleagues who will need our coaching as they assume greater roles in medical education'.

'Excellent opportunity to meet and exchange knowledge and experience'.

'I think we will be able to draw experiences from our colleagues'.

Coaching was also reported as directly applicable and valuable as *daily CME*. Coaching not only expands personal knowledge and skills but also establishes and supports collegial communication and support.

'This is a unique skills area that I don't think I have come across any CME for previously'. *'More relevant and engaging'.*

'Peer teaching (sic) in our community will be much better than traditional CME as it will recognize our context and our current strengths and weaknesses'.

Participants expressed a desire to enhance their skills as coaches, underlining the self-directed aspect of peer coaching. In rural communities, physicians are at various stages of their careers. Coaching can be an effective learning strategy for all levels of expertise, for physicians who often have skills in different areas based on when they received their training, what additional education

they have pursued and what their practice focuses on.

'Peer coaching seems to be a more efficient and enjoyable way of teaching towards becoming an excellent physician'.

'I think we can all benefit from learning how to coach our physician colleagues at various stages of their careers'.

'I would consider it a form of emotional intelligence, which is as important as intellect in my opinion'.

Respondents also highlighted how peer coaching enhanced collaborative practices among physicians. Collaborative practice and effective communication were noted as necessary in *improving patient care* and establishing a more cohesive, positive, work environment.

'As a newly practicing family physician, collegiality amongst my colleagues is a tool that can greatly improve my day-to-day function both clinically and professionally'. *'Coaching skills such as helping people find their own answers as well as supporting colleagues beyond any agenda other than ensuring they act with integrity and according to their own values and core beliefs are much needed in medicine'.*

Rural physicians have different *practice needs* and *demands* than their urban counterparts. Coaching that provides support specific to this environment was reported to be closely aligned with physicians' practical needs, enhancing the immediate applicability of these skills.

'Local solution to local issues'.

'beneficial for health care professionals of all levels of experience'.

Peer coaching was also found to positively impact physicians' *daily practice habits* through increased communication and knowledge sharing, thus improving their confidence. Rural physicians can feel isolated and reluctant to ask for help or reveal their challenges, particularly in smaller communities. Participating in peer coaching can motivate and engage physicians, offering collegial support, which can be accomplished in person or through hybrid technology.

'It was a reminder to listen more actively without wanting to jump in and offer solutions or suggestions'.

'I am better at discussing issues with colleagues'.

'I feel comfortable asking for help and not be labelled as 'weak'.

'In a rural community it is easy to feel isolated so knowing that a peer is officially there for you if needed would be a comfort for most'.

Challenges to successful peer coaching programs were noted, including time constraints currently facing medical professionals and ensuring a good match between the coach and coachee. Suggestions were made to compensate for participation and offer protected time for those interested in participating.

'Finding the right coach-coachee relationship will be key',

'Anything that requires time is challenging to implement',

'The only issue might be time constraints'.

DISCUSSION

Peer coaching programmes aim to develop relationships within peer groups that allow the coach and the coachee to expand their knowledge and skills while fostering a supportive work environment.¹ Peer coaching may begin through organic, informal interactions that become essential in providing social and professional support in times of need. By establishing trusted interactions and peer relationships, physicians experience better camaraderie. These physicians are more supported in professional and personal challenges, positively impacting physicians' well-being and reducing burnout.^{13,14}

Cross-disciplinary peer coaching can be particularly supportive in developing relationships to establish collaborations for academic and research purposes.^{5,6} Peer coaching can be implemented in regular small group meetings or as a one-to-one experience.¹² It is associated with increased physician retention, research interest and publications.¹² Formalised feedback to help the coachee meet self-defined goals distinguishes peer coaching from mentoring (the apprenticeship model), which involves informal advice without specific goals in mind.¹⁴ Peer coaching differs from mentorship programmes in that it can reduce the time commitment, has fewer power differentials and increases the alignment of goals.⁷ Peer coaching facilitates the transfer of knowledge and skills into the workplace, improving experience, skills and attitude.⁵

There exists minimal research on the impact of peer coaching across different practices and even less in rural communities.¹³ To our knowledge, this study is the first of its kind to report how meaningful peer coaching can be in supporting rural providers academically, intellectually and personally.

Our study found that peer coaching was easily facilitated, supported wellness and professional growth and met the local physician community's needs while developing a supportive network for them. It was noted that learning about and incorporating peer coaching into their routine was accessible and more effective than many other CME options. Having the opportunity to interact with a peer coach positively impacted self-perceived physician communication and interactions with patients and colleagues and was reported to reduce feelings of physician burnout. Barriers exist for peer coaching, most notably time, followed by ensuring an appropriate coach/coachee match, which others have recognised.^{1,13}

Qualitative findings reported elsewhere and confirmed in our study demonstrate substantial benefits for both the coach and coachee in an array of areas.¹³ Establishing a community of support can reduce provider burnout and improve job satisfaction, which in turn may lead to better quality of life and patient care.

Limitations

This study included physicians with diverse practice focus who lived across a vast geography. While the methodology was sound and included pre- and post-questionnaires with long-term follow-up, our results are related to this group of physicians and may not extrapolate similarly to other communities. More research needs to be completed to inform people about the long-term benefits of coaching and its transferability to other areas.

CONCLUSION

Peer coaching is an alternative, novel form of continuing medical education and knowledge exchange. It is particularly relevant in rural communities offering crucial support to local providers, especially those in rural or isolated areas where access to formal continued medical

education is limited. Our results suggest that peer coaching can significantly improve the daily practices and overall well-being of physicians.

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Access to endovascular thrombectomy treatment for stroke patients with large vessel occlusion in Northern Ontario

Abstract

Introduction: Globally, stroke is the second-leading cause of death and the third-leading cause of combined death and disability. Stroke caused by large vessel occlusion (LVO) carries high morbidity and mortality. Endovascular thrombectomy (EVT) has improved the outcome of patients with LVO-related stroke. Despite therapeutic advances, timely access to EVT remains a critical challenge in many parts of the world, particularly large geographical areas with low population density and rural/remote regions. Our study aimed to share the real world data on the outcome of patients treated with EVT in a large geographic region with long transfer distances and high representation of rural and remote populations.

Methods: We conducted a retrospective analysis of the first 103 patients treated between February 2020 and December 2022 at a newly launched regional EVT programme in Northeastern Ontario, Canada. Data included patient demographic, clinical characteristics, treatment metrics and 90-day functional outcomes assessed by modified Rankin score (mRS).

Results: Establishment of a regional EVT programme led to a significant improvement in the access to EVT treatment (<1% prelaunch to ~6% postlaunch). Median transport distances between the site of initial stroke presentation to the EVT centre decreased substantially from 450.80 km pre-launch to 108.04 km post-launch. Over half of the treated patients (53/103, 51.5%) were ambulating independently (mRS 0–3) while mortality was 39.8%. Younger age (odds ratio [OR] 0.896, 95% confidence interval [CI] 0.824–0.975; $P = 0.011$), lower stroke severity (0.840, interquartile range [IQR] 0.745–0.946, $P = 0.004$) and shorter time from symptom onset to reperfusion (0.796, IQR 0.677–0.936, $P = 0.006$) were associated with lower odds of unfavourable outcomes (mRS 4–6).

Conclusion: Our study shows improved access to EVT treatment after the establishment of a regional EVT programme. About 51.5% of patients had favourable outcomes with LVO-related stroke following EVT in a large geographic region with long transfer distances and high representation of rural and remote

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populations. More data are needed from similar regions across the globe to help understand treatment and outcome trends following EVT and strategies to improve EVT access.

Keywords: Endovascular thrombectomy, large vessel occlusion, large vessel occlusion-related-stroke, rural endovascular thrombectomy

Résumé

Introduction: À l'échelle mondiale, l'AVC est la deuxième cause de décès et la troisième cause de décès et d'invalidité combinés. Les AVC causés par une occlusion de gros vaisseaux (OGV) entraînent une morbidité et une mortalité élevées. La thrombectomie endovasculaire (TE) a amélioré les résultats chez les patients victimes d'un AVC lié à une OGV. Malgré les progrès thérapeutiques, l'accès rapide à la TE reste un défi majeur dans de nombreuses régions du monde, en particulier dans les zones géographiques vastes à faible densité de population et dans les régions rurales/isolées. Notre étude visait à partager des données réelles sur les résultats obtenus chez les patients traités par TE dans une région géographique vaste, caractérisée par de longues distances de transfert et une forte proportion de population rurale et isolée.

Méthodes: Nous avons mené une analyse rétrospective des 103 premiers patients traités entre février 2020 et décembre 2022 dans le cadre d'un programme régional de TE récemment lancé dans le nord-est de l'Ontario. Les données comprenaient les caractéristiques démographiques et cliniques des patients, les paramètres de traitement et les résultats fonctionnels à 90 jours évalués à l'aide du score de Rankin modifié.

Résultats: La mise en place d'un programme régional de TE a permis d'améliorer considérablement l'accès au traitement par TE (moins de 1% avant le lancement, environ 6% après le lancement). La distance médiane entre le lieu de la première manifestation de l'AVC et le centre de TE a été considérablement réduite, passant de 450,80 km avant le lancement à 108,04 km après le lancement. Plus de la moitié des patients traités (53/103, 51,5%) pouvaient marcher de manière autonome (mRS 0-3), tandis que le taux de mortalité était de 39,8%. Un âge plus jeune (OR 0,896, CI à 95% 0,824-0,975; $P = 0,011$), une gravité moindre de l'AVC (0,840, IC 0,745-0,946, $P = 0,004$) et un délai plus court entre l'apparition des symptômes et la reperfusion (0,796, IC 0,677-0,936, $P = 0,006$) étaient associés à un risque moindre d'issues défavorables (mRS 4-6).

Conclusion: Notre étude démontre une amélioration de l'accès au traitement de TE après la mise en place d'un programme régional de TE. Environ 51,5% des patients ont obtenu des résultats favorables après un AVC lié à une OGV suite à un traitement de TE dans une vaste région géographique caractérisée par de longues distances de transfert et une forte proportion de populations rurales et isolées. Il est nécessaire de disposer de davantage de données provenant de régions similaires à travers le monde afin de mieux comprendre les tendances en matière de traitement et de résultats après un traitement de TE, ainsi que les stratégies visant à améliorer l'accès à ce traitement.

Mots-clés: Thrombectomie endovasculaire (TE), occlusion de gros vaisseaux (OGV), accident vasculaire cérébral lié à une OGV, TE en milieu rural

INTRODUCTION

Globally, stroke is the second-leading cause of death and the third-leading cause of combined death and disability.¹ Large vessel occlusion (LVO) stroke occurs due to acute occlusion of the proximal cerebral circulation (intracranial internal carotid artery [ICA], proximal middle cerebral artery [MCA] and basilar artery) and accounts for approximately 24%–46% of acute ischemic stroke (AIS), with two-thirds of LVO occurring in the anterior circulation.^{2,3} LVO strokes are associated with high morbidity and mortality. In 2015, five

randomised controlled trials demonstrated the efficacy and safety of endovascular thrombectomy (EVT) for AIS and EVT is now the standard of care for AIS with proximal LVO in the anterior circulation.^{4,5} The number needed to treat to reduce disability (at least one point on the modified Rankin scale at 90 days) is 2.6, making it one of the most effective stroke treatments.⁶ Patients can be treated up to 24 h after stroke onset when carefully selected using advanced imaging.^{7,8} However, the benefit of EVT is time dependent with each 1-h delay to reperfusion associated with reduced functional independence by about 19%.⁵ Despite the wide

treatment window, the time to treatment remains the most robust predictor of stroke outcomes.^{5,9}

A recent survey shows that access to EVT globally is low.¹⁰ In Canada, a previous modelling study demonstrated appropriate geographic access to stroke services in Northern Ontario communities, with the exception of EVT,¹¹ with only 3.3% of rural population within 60 min of an EVT centre.

The Ontario stroke report demonstrated low EVT access at <2% in Northeastern Ontario in 2020–2021¹² and rates were even lower in 2018–2019 at <1%. A large geographical area with long travel times, lower population density, weather-related challenges during winter months and lack of EVT centres in the north are the main contributors to limited EVT access in Northern Ontario. Although ample data exist about outcomes following EVT from high volume centres, data are limited from the regions with large geographies, long transfer distances and high representation of rural and remote populations. The data are needed from these regions across the globe to help understand treatment and outcome trends following EVT and strategies to improve EVT access.

Northeastern Ontario is one of the six health regions in Ontario serving more than 557,000 people distributed across a vast geography of over 273,580 km.^{2,13} This geographical area covers 30.6% of Ontario's land mass and significant numbers live in rural and remote communities. The largest urban community in the region is Sudbury with a population of 165,958. A regional EVT program at Health Sciences North (HSN) Sudbury was launched in February 2020 to reduce geographical disparity and treatment delay to receive EVT for the population of Northeastern Ontario. The aim of our study was to investigate EVT access to patients with LVO in Northeastern Ontario following the launch of our regional EVT program and report their 90-day functional outcomes of treated patients.

METHODS

The EVT programme at HSN Sudbury was established in February of 2020. This regional program consisted of 8 designated stroke centres¹⁴ and organized using a hub and spoke model with 7 EVT referring sites (spokes), which were designated stroke hospitals in the Northeastern Ontario region (3 district stroke centres and

4 telestroke referring sites), and a single EVT site (hub) in Sudbury. Figure 1 shows hub and spoke sites. Service levels of different stroke centres are described in Figure 2.¹⁴

Prior to launch of the EVT program, patients seen in the emergency department (ED) of any of the stroke centres in Northeastern Ontario (all 8 sites including Sudbury) were assessed by the on-site stroke physician (ED physician, family physician on-call, internist, intensivist and neurologist based on the local physician model) followed by acute stroke imaging (computed tomography (CT) head and CT angiogram of the head and neck). Patients with acute stroke symptoms in the community were transported to the nearest designated stroke centre by Emergency Medical Services (EMS). If the nearest centre was a non-stroke hospital, EMS used acute stroke bypass protocol to bypass a closer hospital and redirect transport to the appropriate designated stroke centre (using EMS prompt card).¹⁶ Non-stroke hospitals were also able to activate bypass protocol if a patient presented in the treatment window and needed a transfer to a designated stroke centre. After clinical assessment and imaging, CitiCall Ontario¹⁷ was used to call a telestroke neurologist. CitiCall Ontario is a 24-h-a-day emergency referral and consultation service for physicians based in acute care hospitals across the province of Ontario.¹⁷ A telestroke neurologist is a neurologist participating in the provincial telestroke program. The provincial telestroke programme¹⁸ provides access to a standard-of-care-hyperacute-stroke patient assessment and management for Ontario residents. The program is supported by a group of neurologists (telestroke neurologist) and provides support for clinicians who lack the expertise to assess and treat patients. If the patient was eligible, intravenous thrombolysis was delivered at the referring sites. If a LVO was identified, the patient was emergently transported to the mapped EVT site under provincial 'Life or Limb policy'.¹⁹ Prior to February 2020, these patients were transferred to EVT centres in Southern Ontario [Toronto or London, Figure 1] based on EVT mapping. From February 2020, these patients were transported to HSN Sudbury [Figure 1]. For emergent transport, patients were exclusively airlifted to EVT centres in Southern Ontario (Toronto or London) before the launch of our EVT program

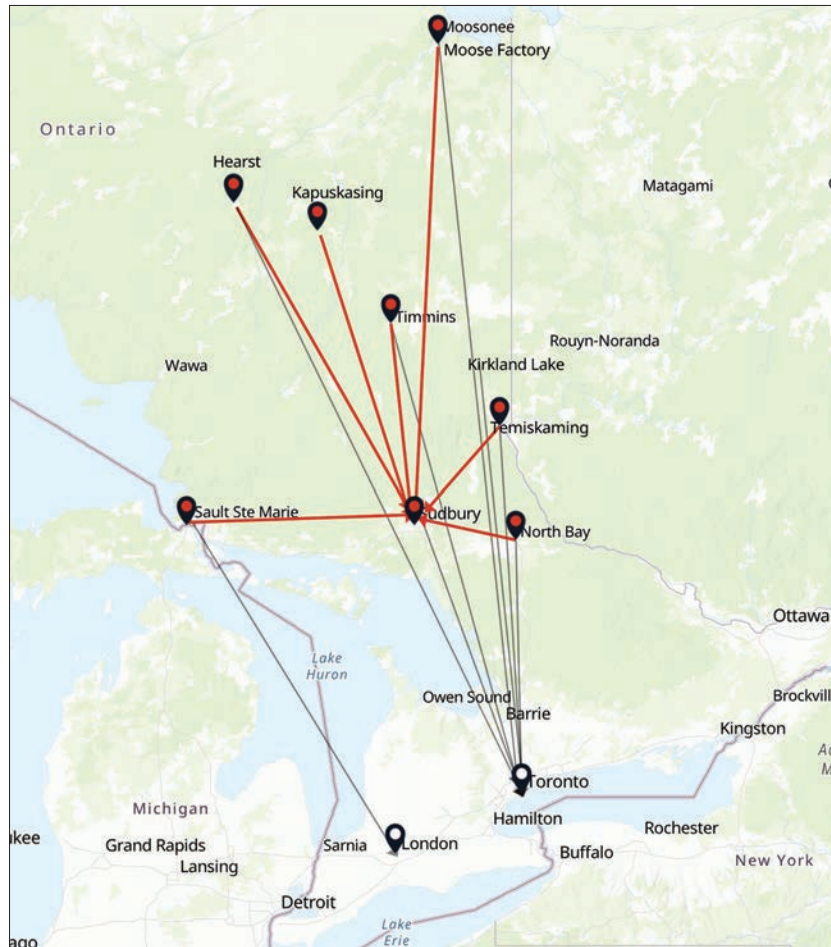


Figure 1: A map illustrating the hub-and-spoke model for EVT access in Northeastern Ontario. Stamps with red centre are referring sites (spokes) and stamps with white centre are EVT sites (hub). Black lines represent patient transport routes to EVT centres in Southern Ontario (Toronto and London) prior to the establishment of the regional EVT program. Red lines show current patient transport pathways following the launch of the regional EVT program in Sudbury, serving the Northeastern Ontario region.

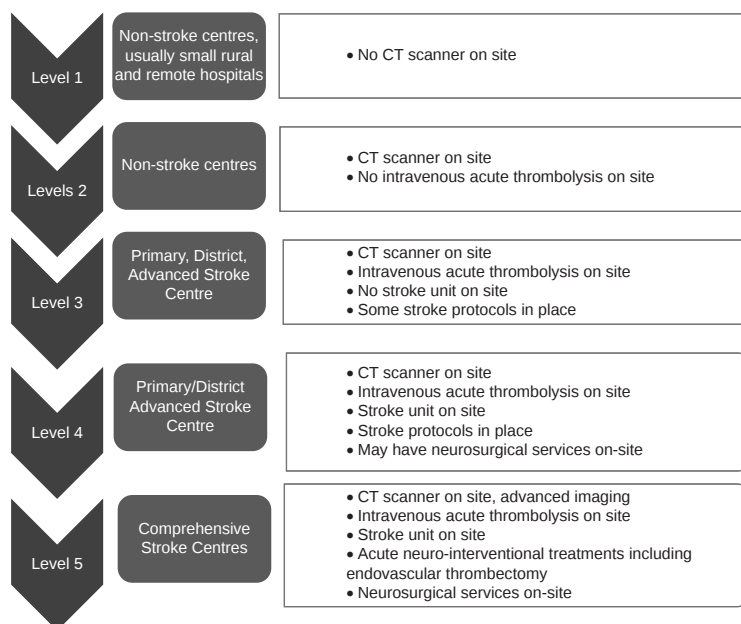


Figure 2: Service levels of Hospitals: Adapted from Canadian stroke best practice recommendations.¹⁵

in Sudbury, due to long travel distances. With the establishment of the EVT program in Sudbury, land transport became an option for patients in some of the closer regional telestroke-referring sites, reducing the reliance on air ambulance.

We reviewed the clinical, imaging, treatment and outcome data of the first 103 patients treated between February 2020 and December 2022. The data were prospectively collected in a quality improvement EVT registry. Clinical data were extracted by a trained data abstractor to enter in the registry. A standardised form was used to collect demographic information, medical history including vascular risk factors, referring site, mode of arrival, distance of transfer, stroke severity on the National Institute of Health Stroke Scale (NIHSS) and tissue plasminogen activator administration. Data collected from imaging included the Alberta stroke program early CT score (ASPECTS), site of occlusion, collateral status, details on EVT treatment, perfusion outcome (captured on modified thrombolysis in cerebral infarction TICI score) and workflow metrics. This was completed in real-time by the treating stroke neurologist and neurointerventionist at the conclusion of the procedure and entered into the customised EVT form. The transport distance was calculated using the most direct road distance (on Google maps) between the referring centre (home was used if the patient presented directly to HSN) and the EVT centre (HSN). We used aerial distance as being available for patients transported from James Bay coast as there is no road access available. Access to EVT was defined by the proportion of patients with ischemic stroke in the region receiving EVT treatment in a given year. We used 2022 as the final study year as the program was a full 24/7 service during that year (number of patients treated with EVT/total ischaemic stroke in the region during a given year). Functional outcomes were assessed by the stroke neurologist using a modified Rankin score²⁰ (mRS) at 3 months. The modified Rankin scale is a 7-point scale ranging from 0 (no symptoms) to 6 (death). A score of 3 or less (modified mRS 0–3) indicates functional independence in mobility and was considered a good outcome while mRS 4–6 was defined as a poor outcome. The data quality was checked regularly by the study principal investigator.

Data are reported using the standard descriptive statistics. Frequency (percentage) is

presented for the categorical or ordinal variables. Normality of data distribution was assessed using the Shapiro–Wilk test. The continuous variables are presented as mean (SD) for normally distributed data or median (interquartile range, IQR) for non-parametric data. Student's *t*-test, Mann–Whitney U-test and the Fisher exact test were used as appropriate. Logistic regression was used to build a multivariable model testing the association between baseline clinical and imaging variables and good patient outcome (mRS 0–3). All variables with $P < 0.20$ in the univariate analysis were included in the multivariable logistic regression model and the final parsimonious model was achieved using backward elimination. SPSS (IBM, Illinois, USA) was used for the statistical analysis.

All patient data were collected according to the Canadian Tri-Council policy statement on ethical conduct for research involving the secondary use of data originally collected for health care purposes and was approved by HSN's Research Ethics Committee. Waiver of consent was obtained allowing consecutive patient enrolment.

RESULTS

Between February 2020 and December 2022, 103 patients were treated with EVT in Northeastern Ontario for LVO. A summary of patient clinical characteristics, vascular risk factors, workflow and post-EVT perfusion outcomes are shown in Table 1.

Regional EVT access improved from <1% pre-launch between 2018 and 2019 to ~6% in 2022 when the program became a full 24/7 service. A total of 41 patients (39.8%) were regionally transferred patients, 48 (46.6%) were patients presenting directly to HSN and the remaining 14 patients (13.6%) were from community hospitals near Sudbury (for example, Elliot Lake, Little Current, Mindemoya). The majority of interfacility transfer occurred using air ambulance (31 patients, 30.1%) while 67 patients (65%) were transferred using land ambulance. The remaining 5 patients (4.9%) were self-transporters. The average transfer distance to the EVT centre reduced significantly to 108.04 km compared to 450.80 km if these patients were treated using referral pathways before the launch of the regional EVT program.

Table 1: Clinical characteristics, workflow and perfusion outcomes of patients

Variable	All patients (n=103), n (%)
Clinical characteristics	
Age (years), median (IQR)	70 (61–70)
Male sex	55 (52.4)
Hypertension	76 (73.8)
Dyslipidaemia	64 (62.1)
Diabetes mellitus	30 (29.1)
Atrial fibrillation	30 (29.1)
Coronary artery disease	26 (25.2)
Congestive heart failure	10 (9.7)
Prior stroke	25 (24.3)
Current smoker	39 (37.9)
NIHSS, median (IQR)	16 (10–20)
IV tPA	40 (40.8)
Baseline imaging	
Location of occlusion	
Intracranial ICA	4 (3.9)
ICA + M1	11 (10.7)
M1	60 (58.3)
M2	23 (22.3)
Tandem cervical ICA*	36 (36.7)
Basilar	5 (4.9)
ASPECTS, median (IQR)*	8 (6–9)
Moderate to good collaterals*	87 (88.8)
Workflow metrics and reperfusion**	
Onset to door time, h (IQR)	4.15 (1.05–7.50)
Onset to CT time, h (IQR)	4.37 (1.22–7.58)
Onset to puncture time, h (IQR)	5.4 (3.36–9.25)
Onset to reperfusion time, h (IQR)	7.40 (5.08–10.44)
Final reperfusion of mTICI 2b-3	84 (81.6)

*Among patient with anterior circulation occlusion (n=98), **median (IQR). mTICI: Modified thrombolysis in cerebral infarction score, CT: Computed tomography, EVT: Endovascular thrombectomy, IQR: Interquartile range, ASPECTS: Alberta stroke program early CT score, ICA: Internal carotid artery, NIHSS: National Institute of Health Stroke Scale, IV: Intravenous, tPA: Tissue plasminogen activator

The demographic, medical and clinical variables are shown in Table 1. The median age of the cohort was 70 years and 52.4% were men. Hypertension (73.8%) and dyslipidaemia (62.1%) were the most common vascular risk factors while atrial fibrillation was present in almost a third of patients (29.1%). The median NIHSS score was 16 (IQR 10–20) and median ASPECTS was 8 (IQR 6–9). The most common location of LVO was the M1 segment of the MCA (60 patients [58.3%]) and tandem cervical ICA severe stenosis/occlusion was seen in 36 patients (36.7%). Leptomeningeal collaterals were moderate to good in 87 patients (88.8%).

In terms of workflow metrics, the median onset to door time at HSN was 4.15 h

(IQR 1.05–7.50 h), onset to CT time was 4.37 h (IQR 1.22–7.58) and onset to puncture time was 5.4 h (IQR 3.36–9.25). The median onset to reperfusion time was 7.4 h (IQR 5.08–10.44). The final reperfusion of mTICI 2b-3 was achieved in 84 (81.6% of patients). Of the 103 patients, 53 (51.5%) were shown to have a good outcome (mRS 0–3) and 50 (48.5%) were shown to have a poor outcome (mRS 4–6). Mortality rate was 39.8%. The individual Rankin levels of the entire cohort are provided in Table 2. A good outcome was noted in 28 of 48 (58.3%) patients presenting directly to the EVT centre in Sudbury, 6 of 14 patients (42.9%) from surroundings areas near Sudbury and 19 of 41 (46.3%) of regionally transferred patients. Although patients directly presenting to the EVT centre had numerically better functional outcome, these differences were not statically different. The small sample size limited further comparison.

The univariate and multivariate analysis of the predictors of good versus poor outcome is shown in Table 3. In the final model, age (OR 0.896, 95% CI 0.824–0.975; $P = 0.011$), stroke severity (0.840, IQR 0.745–0.946, $P = 0.004$) and onset to reperfusion (0.796, IQR 0.677–0.936, $P = 0.006$) time showed significant association with functional outcomes.

DISCUSSION

Our study is the first to report access to EVT treatment and functional outcome of the EVT treated population using the real-world data in Northern Ontario. Launch of the regional EVT program improved regional EVT access from <1% pre-launch to ~6% (contemporary provincial EVT access rate was ~7%) when it became a full-time service while reducing transport distances of the treated population by almost 75% (average 108.04 km post-launch vs. 450.80 km pre-launch). A good functional outcome (defined as ambulating independently) occurred in 51.5% of patients. The median stroke onset to EVT centre arrival time was still long at 4.15 h (compared to ~2.2 h in the ESCAPE trial⁴ which was one of the 5 landmark EVT trials with largest representation of the Canadian population), reflecting the extensive geographic area and other factors contributing to the delay in reaching the EVT centre. Our study offers

Table 2: Modified Rankin score at 90 days

mRS category	Description	Frequency (%)
0	No symptoms at all	12 (11.7)
1	No significant disability despite symptoms: Able to carry out all usual duties and activities	14 (13.6)
2	Slight disability: Unable to carry out all previous activities but able to look after own affairs without assistance	14 (13.6)
3	Moderate disability: Requiring some help, but able to walk without assistance	13 (12.6)
4	Moderately severe disability: Unable to walk without assistance and unable to attend to own bodily needs without assistance	7 (6.8)
5	Severe disability: Bedridden, incontinent and requiring constant nursing care and attention	2 (1.9)
6	Dead	41 (39.8)
Total		103 (100.0)

mRS: Modified Rankin score

Table 3: Univariate and multivariate analysis of predictors of good outcome

	Good outcome (mRS 0–3) (n=53), n (%)	Poor outcome (mRS 4–6) (n=50), n (%)	P	OR (95% CI)	P
Clinical characteristics					
Age (years), median (IQR)	64 (57.50–75)	75 (65–80.50)	0.001	0.896 (0.824–0.975)	0.011
Male sex	31 (58.5)	23 (46)	0.239		
Hypertension	38 (71.7)	38 (76)	0.660		
Dyslipidaemia	31 (58.5)	33 (66)	0.543		
Diabetes mellitus	13 (24.5)	17 (34.7)	0.284		
Atrial fibrillation	12 (22.6)	18 (36.7)	0.133		
Coronary artery disease	13 (24.5)	13 (26)	1.000		
Congestive heart failure	4 (7.5)	6 (12)	0.518		
Prior stroke	11 (20.8)	14 (28)	0.492		
Current smoker	24 (45.3)	15 (30)	0.155		
NIHSS, median (IQR)	12 (8.5–18)	18 (14–23)	0.078		
IV tPA	26 (51)	14 (29.8)	0.041	0.840 (0.745–0.946)	0.004
Baseline imaging					
Location of occlusion					
Intracranial ICA	3 (5.7)	1 (2)	0.370		
ICA + M1	4 (7.5)	7 (14)			
M1	31 (58.5)	29 (58)			
M2	13 (24.5)	10 (20)			
Tandem cervical ICA**	19 (37.3)	17 (36.2)			
Basilar	2 (3.8)	3 (6)			
ASPECTS, median (IQR)**	8 (7–9)	7 (6–9)	0.193		
Moderate to good collaterals**	49 (96.1)	38 (80.9)	0.024		
Workflow metrics and reperfusion*					
Onset to door time, h (IQR)	3.02 (0.59–6.11)	5.09 (1.44–10.21)	0.045		
Onset to CT time, h (IQR)	3.48 (1.13–6.24)	5.27 (2.29–10.41)	0.023		
Onset to puncture time, h (IQR)	5.17 (3.25–8.17)	7.22 (4.11–11.93)	0.057		
Onset to reperfusion time, h (IQR)	6.54 (4.42–9.20)	8.37 (6.41–12.90)	0.039	0.796 (0.677–0.936)	0.006
Final reperfusion of mTICI 2b-3	50 (94.3)	34 (68)	0.001	0.129 (0.009–1.902)	0.136

*Among patient with anterior circulation occlusion (n=98), **Median (IQR). EVT: Endovascular thrombectomy, mTICI: Modified thrombolysis in cerebral infarction score, CT: Computed tomography, OR: Odds ratio, IQR: Interquartile range, CI: Confidence interval, IV: Intravenous, tPA: Tissue plasminogen activator, ICA: Internal carotid artery, NIHSS: National Institute of Health Stroke Scale, ASPECTS: Alberta stroke program early CT score, mRS: Modified Rankin score

crucial real-world data from Northern Ontario, where a significant portion of the population lives in rural and remote communities.

Factors associated with good functional outcome were age, stroke severity and onset to reperfusion time and are in line with the previous

data.^{5,21-25} Our population did differ from patients enrolled in previous EVT trials.⁴⁻⁸ For example, our patients were older (median age = 70 years) compared to patients in the HERMES collaboration⁶ (median age = 68 years), which pooled the data from all 5 early window clinical trials. The time to treatment and reperfusion was also longer (median time to reperfusion 7.4 h vs. 4.75 h in HERMES). In addition, our patients had a much higher burden of tandem disease (36.7% vs. 9.5% in HERMES). Finally, the rate of intravenous thrombolysis was lower at 40.8% compared to ~70% in HERMES, as our patients included both early and late window patients.

We noted higher mortality of 39.8% in our cohort compared to clinical trials. In the HERMES collaboration, 90-day mortality in the endovascular arm was 15.3% compared to 18.9% in the control population,⁶ while the extended window DEFUSE 3 trial showed a mortality rate of 14% in the endovascular-therapy group and 26% in the control group.⁸ In contrast, in the real-world practice, 90-day mortality seems to be higher. A recent prospective observational study reported a higher mortality rate (up to 51.5 in older adults) - results in line with our data.²³ Older age, longer time to treatment, presence of significant vascular burden (i.e., high prevalence of tandem disease) and low use of intravenous thrombolysis could explain our higher mortality rate. Lower use of thrombolysis was likely a reflection of wider treatment window for EVT (and the study only included EVT treated patients vs all ischemic stroke patients). In our experience, nonmedical factors significantly influence mortality among patients with anticipated poor outcomes. For instance, treating physician's prognostic perception; local variations in palliative care, practices; healthcare system (public health care vs. private insurance); aging population with complex healthcare needs and a strained local health care system and the community resources available to support patients with anticipated poor outcomes all impact the decisions made by physicians and caregivers or families regarding goals of care.

Although sample data exist about the outcomes following EVT from high volume centres, data are limited from the regions with large geographical populations, long transfer distances and high representation of rural and remote populations. A previous Australia and

New Zealand experience among patients with ultra-long transfers showed a benefit for EVT, with outcomes similar to those treated in the comprehensive stroke centre in the EVT extended window trials.²⁵ Our real-world data from a region in Northern Canada – representing a region with long transfer distances and a high rural and remote population – also show favourable outcomes in patients with LVO-related stroke following EVT. More data are needed from similar regions across the globe to help understand treatment and outcome trends following EVT and strategies to improve EVT access. Improving emergent patient transport, use of telemedicine (including innovative technology that allows procedures to be performed remotely), telerehabilitation and rural stroke coordinators in strategic locations might be some strategies to improve access to EVT and stroke care in general in rural and remote communities.

One of the major limitations of our study was the absence of a historical control arm to compare patient outcomes before and after the launch of the EVT program. Additionally, there were very few patients treated with EVT prior to the establishment of the regional EVT program and only regional administrative data were available, which lack detailed information on patient characteristics. Although this data comprehensively captures EVT cases and is part of a special project by the Canadian Institute for Health Information (CIHI), we were unable to access patient-level data due to privacy and data-sharing regulations which limited our ability to compare the data.

CONCLUSION

Our study is the first to report access to EVT treatment and the functional outcome of the EVT treated population in Northern Ontario using the real world data. Launch of the regional EVT program improved population access to EVT from <1% pre-launch to ~6% when it became a full-time service while reducing transport distances of the treated population by almost 75%. Despite a mortality rate of 39.8%, half of the patients were able to achieve independent ambulation. Our population was older, had longer time to treatment, lower use of intravenous thrombolysis and had a higher prevalence of

tandem disease. The study provided crucial data from a large geographical region in Northern Ontario, with low population density, significant representation of rural and remote communities, limited resources and weather-related challenges. Future studies from other parts of the world with similar geography and patient demographics would help us better understand trends in EVT access, outcome following treatment as well as systemic challenges in the delivery of acute stroke treatment and opportunities to improve care in these regions.

Consent to participate: waiver of consent was obtained from REB allowing consecutive patient enrolment.

Data availability statement: Data is available upon reasonable request from the corresponding author.

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A rolodex of skills and roles: listening and learning from northern physician recruiters

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Abstract

Introduction: In Canada, 18% of the population lives in rural areas, yet only 8% of practising physicians work rurally. Rural communities face ongoing challenges in both recruitment and retention of physicians and other healthcare professionals. Improving quality and access to care for rural Canadians rests on the successful recruitment and retention of community-based physicians. The aim of this study was a broad exploration of the roles, experiences, and strategies of physician recruiters. Their stories, when woven together, provide us with valuable insights from the “front lines.”

Methods: Using a grounded theory approach, we conducted semi-structured interviews with Northern Ontario Physician Recruiters.

Results: Twelve physician recruiters were interviewed. Six themes were identified: (1) Community engagement: Big and small ‘e’ engagement, (2) Recruiter role: Know thyself, know thy community, (3) Strategies: It is all about movement: reaching people, pulling strings and dodging bullets, (4) Outcomes: listening, learning, liaising, (5) *LEARN (er)* ING opportunities and (6) A PanNorthern approach: *Their* success is *our* success. Comments from recruiters provide insight and valuable information on their role in securing adequate health professionals in their area.

Conclusion: Physician Recruiters have a very challenging job. They are expected to generate results with scant resources within a complex environment that poorly understands or values their role. Yet, their stories highlighted the relevance and joy in their challenges.

Keywords: Health workforce strategies, qualitative research, recruitment and retention

Résumé

Introduction: Au Canada, 18% de la population vit en milieu rural, mais seulement 8% des médecins en exercice travaillent dans ces régions. Les communautés rurales sont confrontées à des défis permanents en matière de recrutement et de maintien en poste des médecins et autres professionnels de la santé. L'amélioration de la qualité et de l'accès aux soins pour les Canadiennes et Canadiens vivant en milieu rural repose sur le recrutement et le maintien en poste de médecins exerçant en milieu

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communautaire. L'objectif de cette étude était d'explorer de manière approfondie les rôles, les expériences et les stratégies des recruteurs de médecins. Une fois mises en perspective, leurs histoires nous fournissent des informations précieuses provenant directement du terrain.

Méthodes: À l'aide d'une approche fondée sur la théorie, nous avons mené des entrevues semi-structurées auprès de recruteurs de médecins du Nord de l'Ontario.

Résultats: Douze recruteurs de médecins ont été interviewés. Six thèmes ont été identifiés: 1) Engagement communautaire: engagement avec un grand "E" et un petit "e", 2) Rôle du recruteur: se connaître soi-même, connaître sa communauté, 3) Stratégies: tout est question de mouvement: aller vers les gens, tirer les ficelles et esquiver les obstacles, 4) les résultats: écouter, apprendre, assurer la relation, 5) les possibilités d'apprentissage, et 6) une approche pannordique: leur réussite est notre réussite. Les commentaires des recruteurs fournissent des informations précieuses sur leur rôle dans le recrutement de professionnels de la santé appropriés dans leur région.

Conclusion: Les recruteurs de médecins ont un travail très exigeant. On attend d'eux qu'ils obtiennent des résultats avec des ressources limitées et dans un environnement complexe où leur rôle est mal compris ou peu valorisé. Pourtant, leurs témoignages ont mis en évidence la pertinence et la satisfaction que leur procurent ces défis.

Mots-clés: Recrutement et rétention, stratégies relatives au personnel de santé, recherche qualitative

INTRODUCTION

Maintaining the healthcare workforce is fundamental to providing access to quality health care in rural areas. Globally, rural areas often face a shortage of physicians, leaving the population underserved and contributing to increased health disparities.¹⁻⁶ In Canada, 18% of the population lives in rural areas, yet only 8% of practising physicians work rurally.⁷ Rural communities face ongoing challenges in both recruitment and retention of physicians and other healthcare professionals. Despite Canadians being healthier and having better quality health care writ large, there continue to be large gaps in both access and quality of care.^{7,8} Improving quality and access to care for rural Canadians rests on the successful recruitment and retention of community-based physicians. Further investigations to determine and define successful recruitment and retention efforts for rural physicians in Canada are needed in this nascent area of research.

Recruitment research, albeit limited, has highlighted that the primary challenges are geographical barriers, as rural areas are often isolated and may lack the infrastructure, amenities and community support.^{4,9} In addition, limited resources, which include healthcare facilities in rural communities, make it difficult to attract and retain physicians. Access to employment and educational opportunities for spouses and children, along with limited entertainment and cultural opportunities, can deter physicians from choosing

rural practice; so too can the absence of specialised medical services and professional networks.²

To address the challenges involved in physician recruitment in rural areas of Canada, implemented strategies to date can be categorised in five broad areas; medical education partnerships in the community, early experience in rural communities, programmes and peer groups in rural medicine, moving beyond financial barriers and providing support for new rural physicians.¹⁰⁻¹⁹

Physician recruitment in rural areas in Canada is a pressing issue, directly impacting healthcare services and the health of rural Canadians. The availability of physicians in rural communities is crucial for ensuring timely access to quality health care and for improving patient care outcomes.⁸ Adequate physician complements not only have positive impacts on health outcomes, but there is also evidence to support positive community economic outcomes.^{19,20} While there is some research to support specific recruitment activities, understanding better how recruiters engage in the everyday business of recruiting is not well understood.

The goal of our study was a broad exploration of the role of physician recruiters to better understand their roles in rural physician recruitment. Our aim was twofold: (1) to reveal northern recruitment efforts and (2) to provide lessons learned for those communities who are developing or struggling with recruitment efforts. Our hope is that this research helps others develop their own strategies and better understand what

it takes for individuals, healthcare organisations, communities and industry partners to achieve success in their physician recruitment efforts.

METHODS

Using a grounded theory approach, we conducted semi-structured interviews of Northern Ontario Physician Recruiters.^{21,22} Employing a snow-ball sampling method, we were able to interview recruiters from a variety of geographical locations and a mixture of small- and medium-sized communities. Interviews took place June 2023–October 2023 using WebEx. Interviews were audio recorded, transcribed, de-identified and member checked for accuracy. Each transcript was independently coded by 2 members of the research team. Using Braun and Clarke’s six-step Thematic Analysis, an initial thematic analysis of the first 4 interviews was conducted with preliminary themes developed.²³ Subsequent interviews were conducted, and those transcripts were coded and analysed by 2 members of the team. All members of the team met to discuss the 6 overall themes, and subsequent meetings occurred with selected members of the team to choose representative quotations and discuss manuscript preparation.

This study was approved by the Research Ethics Board of Lakehead University (protocol # 1468994).

RESULTS

Twelve recruiters were interviewed. The interviewees comprised a heterogeneous group of recruiters from a variety of communities in Northern Ontario. Some came from one community, whereas others came from several small communities. Their job duties had similar descriptions with their roles as both recruiters and retainers of physicians in their communities. That work included marketing, advertising, job fairs, tours, networking and engaging with potential recruits, social media presence, presentations, event planning and hosting. Recruiters were often the first point of contact, providing local knowledge, assistance and personalised visits for prospective hires. They also worked closely with learners, residents and locums, providing each group with support and connection to both the community and the healthcare system. Many

described their roles as varied, all-encompassing and dynamic, providing above all else a connection to the community. For a detailed description of interviewee roles and characteristics, see Table 1.

All but one recruiter interviewed had learners from the region’s medical school, NOSM University integrated within their community at the hospital or family healthcare team. Many communities also had learners from other medical schools, either as residents or for visiting electives. Learner involvement for some communities was extensive, and included undergraduate medical learners in years 2, 3 and 4. Residents (or postgrad trainees) were also part of many of the communities, predominantly in Family Medicine, with some Royal College residents there for short rotations. Many of these learners were recruited by physician recruiters.

Employing a grounded theory approach, utilising Braun and Clarke’s six-step thematic analysis method 6 themes were identified: (1) Community engagement: big and small, (2) recruiter role: Know thyself, know thy community, (3) strategies: It is all

Table 1: Description and characteristics of participants

Description and characteristics of participants
Full time/part time roles
Number of full time recruiters 5
Number of part time recruiters 5
One participant did not indicate full time or part time
There were two participants from the same community, counted once
Where their offices are physically located
Hospital: 6
Family health care team: 4
Other: 1
How they are funded
Hospital: 5
City/municipality: 2
Multiple sources: 1
Unknown: 3
Who they report to
CEO of hospital: 3
Senior administration of hospital (VP, chief of staff): 2
Other health leadership: 1
Recruitment committee: 6
Some report to multiple people/committees
NOSM learner involvement in the community/hospital
UME Y1–3: 4
UME learners in 4 th year electives: 4
UME summer studentships: 1
Residents (Family medicine): 9
Residents (Royal college): 2
Residents (visiting electives): 3

about movement: reaching people, pulling strings and dodging bullets, (4) Outcomes: listening, learning and liaising, (5) LEARN (er) ING Opportunities and (6) A PanNorthern Approach: *Their* success is *our* success. All participants were given a pseudonym.

Community engagement: Big and small

Participants described recruitment through 6 main mechanisms: funding, control, reporting, involvement, opinion and helping. Specifically, they identified the important role of community engagement. Here, they highlighted how community engagement was scaled and included big engagement, those in the community with power, authority and money and small engagement, visibility within the community, earned trust, and collective voices. Present in both types of engagement was attention to detail, emphasising the ‘small things that matter’.

“It is really not just a, your typical standard ideology of a hospital recruiting 1 on 1 with a physician. It is really a community coming together to put together, a vision a strategy to be able to then be able to attract and recruit and retain physicians”- Josh.

“We have ambassadors in our community. People have different interests and pursuits when they get here. So it’s, it’s utilising that network to showcase things in our community that people are interested in seeing and doing and it is coordinated. And it’s sincere and it’s about saying thank you and telling people how important it is, and the little things they’re doing add up...”- George.

Recruiter role: Know thyself, know thy community

Recruiters described their position as ambassadors, community connectors/liaisons and spokesperson/salespersons. Some were lifelong members of their community, while others were newcomers to the community, with each using their positionality as a recruitment tool. What resonated, however, was that their job required community connection at all levels, along with an in-depth knowledge of individual personalities, institutional processes and system-level structures. Recruiters leveraged this knowledge to aid in their efforts, in many cases creating a synergistic effect.

“I basically am the ambassador for the community is the way I would describe it. So, I showcase, I promote our work, recreational and kind of social

opportunities that are available. I connect with residents and students... I become a point of contact for them moving forward. So, they just feel like they have someone in the community.”- Gavin.

“I see my role as your HR rep, right? Every organisation has these HR departments that help recruit new employees, help them settle, train them, settle into their position, you know, ensure their wellness, all of that. Physicians don’t have that. They have no HR group. That’s what I see us as physician recruiters. We’re your HR group, right?”- Emma.

“Create a rapport with your local physicians. There has to be that rapport, there has to be that level of trust, especially if you’re, you have any say in any of the scheduling... having that rapport so that you can easily slide new recruits, new locums, new residents, new learners into those and they will accommodate you based on their schedules is actually a huge, huge bonus”- Luke.

Strategies: It’s all about movement: reaching people, pulling strings and dodging bullets

Approaches to recruitment revealed strategies that include organisational relationships, outreaches, social media, connecting with learners and word of mouth as recruitment tools. Another strategy recruiters emphasised was being adaptable, visible, and incorporating recruitment and retention strategies as part of ALL the work they do. Being prepared to work outside of regular business hours, making do with limited resources and open to feedback were also emphasised as important strategies for success.

“Most of it’s just word of mouth. I’ll be honest with you. It’s like I had a colleague that’s been here or heard good things (Preceptors) involvement... goes a long way”- Gavin.

Outcomes: Listening, learning and liaising

Many participants concede to a shifting philosophy in recruitment strategies based on changes in what potential recruits want in their practice. Physician work has changed, and what new recruits are looking for in a practice from community recruiters needs to reflect this. The job of the recruiter is to work with the community to adapt the scope of practice to be in line with what appeals to new graduates. Recruitment efforts which focus on ‘family recruitment strategies’, flexible work arrangements and lifestyle accommodations, have the greatest potential for

success. The standard recruitment models of the past are no longer effective, with a personalised customer service model reflecting the new recruitment reality.

"Listen to what the learner or the resident, or the locum is looking for. Right off the hop,..., every community is unique and different in all their different ways, whether that's contractually, whether that's a lifestyle, all of it, schooling for kids ...completely depends and not just from academics, but socially too. So, I would just listen to exactly what they were looking for and then I would say, okay, here are the options that fit with what you're looking for, lay them all out, tour them on, you know all the communities that would fit what they're looking for"- Steph.

"So, when you're looking at a community minded recruitment strategy, we have to make sure that when a physician comes, their spouse is supported, their children have day care, they know the options for schooling, and that's easy to integrate their families as well into our community. So, I think, you know, you look at the medicine community of recruitment and then you also look at the, the personal family aspect of recruitment as well with a community-based approach"- Emma.

LEARN(er) ing opportunities

All participants emphasised the importance of learners as pipelines to recruitment. Keeping in touch with students, residents and locums, long after they leave the community, building rapport and making yourself available is key. Gathering feedback from learners and advocating for placements were seen as opportunities to enhance recruitment.

"We also ask for feedback on their placement and from the feedback we've learnt a lot about basically our practice set up on what we can do to make their visit here better as well. So yeah, we always try to do an exit interview. With most of our students... we always do plan several events for them"- Linda.

"The medical learners as well. So, I mean, NOSM University is our greatest bloodline for physician recruitment... I can show you statistics that show that that's accurate"- Marlie.

"We've recruited ... physicians, and out of that over 50% of those positions did some sort of medical education with us. Now, whether that was a clerkship residency, or even just one week placement with us"- Emma.

A pan-northern approach: Their success is our success

Recruiters also spoke about how they see their

jobs as being recruiters for the whole of Northern Ontario. This pan-northern cooperation was reflected in their recruitment efforts and in their connection to each other. Informally, there have been meetings among northern recruiters for years, to learn from each other and to assist each other. In addition, recruiters spoke about referring potential recruits to other communities, as they would be a 'better fit', and speaking positively about other communities as potential places to set up practice.

"So, making the contacts I know, the Northwestern Ontario group and Northeastern Ontario group, we all meet as physician recruiters maybe 3 times a year. It's just nice to hear what other people are doing and keep in contact with them"- Rachel.

"But the relationships that the recruiters have in Northern Ontario is quite remarkable. Recruitment is competitive and, you know, we're all kind of selling our version of the same thing. However, the relationships that I've developed with my fellow recruiters is remarkable"- Marlie.

DISCUSSION

Physician recruiters, particularly in rural and underserved communities, have a challenging, poorly understood, and often underappreciated role. While there is no argument that healthy communities require physicians, little is known from the perspective of the individual recruiter. Qualitative research focussed on recruiters' stories has been absent from the literature.

Strategies to address physician recruitment are found in 5 broad categories: (1) *Medical education partnerships in the community*: Collaborative approaches with medical schools and residency programs have played a crucial role in encouraging new physicians to consider rural practice by creating opportunities for medical students and post-graduate trainees to gain valuable experiences in rural practice settings.¹⁰ (2) *Early experiences in rural communities*: Research, which looks at educational settings and their influence on practice location, suggests that early experiences in rural settings increase the likelihood of students choosing rural placements for residency and positively impact their consideration of rural practice post-residency.¹¹⁻¹⁵ These experiences have helped dispel misconceptions and biases about rural practice and contribute to rural physician recruitment.¹¹⁻¹⁵ (3) *Programs and peer groups in rural medicine*: Creating rural medicine interest groups

to encourage the exploration of specialised rural training programmes, better equip physicians and learners with the skills and knowledge necessary to address the unique healthcare needs of rural communities, has contributed to increases in rural practice choice.^{16,17} (4) *Moving beyond financial incentives*: The provision of non-financial incentives has been identified as important factors for successful recruitment. Promoting work–life balance and quality of life in rural areas, looking out for physicians’ best interests and that of their families, in addition to providing incentives and financial support such as relocation assistance or higher salaries, have also made rural practice more appealing.^{15,18} (5) *Providing support for new rural physicians*: Fostering community engagement and support through initiatives like mentoring programmes and involving community members in the recruitment process has helped attract and retain physicians in rural areas.^{6,19} Together, these broad areas represent evidence-supported best practices in physician recruitment in rural areas and should be considered when developing recruitment programmes.^{5,11}

The role and impact of learner placement in communities were seen by several participants as their strongest recruitment strategy. This echoes results from several research studies, in Canada and globally, which establish a strong correlation between learner placements in communities and practice choice after graduation.^{11–18} Participants capitalised on this learner potential, spending significant time and resources on their learners.

Research in physician recruitment and retention reflects a limited understanding of effective strategies. Verma *et al.*,¹⁵ in their systematic review of strategies, conclude that there is some evidence to support specific types of strategies over others, but the overall quality of studies limits stronger conclusions.¹⁶ We contend that a fuller understanding of recruitment and retainment strategies can be achieved through not just ‘high-quality quantitative studies’ but also through the lens of qualitative research methodologies. In that regard, there is evidence to support such efforts, with investigations into place attachment/sense of place and community fit/compatibility.^{3,22} Indeed, our participants reflected these ideas clearly in their interviews, understanding the need for fit and the importance of connection to community as necessary for both recruitment efforts and for physicians deciding where to practise.

The interviews also highlighted important areas of contention, including overall responsibility for this work, the funding for this work and how this work is undertaken, overseen and evaluated. All participants emphasised the importance of an approach that involves the community. Research on the economic impact of health care highlights direct economic benefits to communities who have healthcare services.²³ Given the large economic return on investment, employing a whole community approach to recruitment and retention efforts reflects the pan-community impact of the work. Communities who have worked through, at least in part, considerations of responsibility, oversight, and financial contributions for physician recruiters were reflected in the type of participants we recruited.

Given what we heard from all participants, local solutions, partnerships and cooperation are necessary components, but how each community gets there is highly variable and contextual. No ‘cookie cutter’ approach to this work could be seen, even though the work itself had commonalities. What was evident for all recruiters we interviewed was in-depth local knowledge coupled with a keen sense of how to best capitalise on it. Each recruiter spoke about cooperative strategies, personalised approaches and incorporating feedback as core attributes of their work. This suggests an element of autonomy and flexibility either given initially by those overseeing these positions and/or earned through reflection, education and measures of success. This also suggests a level of mutual trust. Another interesting attribute expressed by many recruiters was a keen ability to navigate complex institutions, for example holding complementary roles, i.e., recruiter and scheduler and utilising activities from one role to support the other. Recruiters interviewed understood how to work within these systems, leveraging insider knowledge and using person-centred approaches as successful strategies in both recruiting of physicians and obtaining the resources to do their jobs well. Future areas of research could examine the personal qualities of successful recruiters.

Limitations

This study focused on communities that have been ‘successful’ by employing recruiters, and we recognise that this recruitment strategy is limited. Acknowledging that our participants represent a ‘ceiling effect’ of sorts, we caution broad

interpretations of our results. There are many communities who are still struggling with getting recruitment positions off the ground and their stories are not reflected here. Continued research which looks at struggling communities is needed, as their voices can offer all of us valuable insight on the hurdles that have yet to be overcome.

Another area worthy of some reflection is the paucity of data collected on *retention*. Most participants spoke almost exclusively about recruitment. While this could reflect how we conducted the interviews and the questions we asked, retention, as a process is still not well studied. We suggest that a focus for further research should be specifically targeted at retention strategies.

CONCLUSIONS

Physician recruiters have a very challenging job. They are expected to generate results with scant resources within a complex environment that poorly understands or values their role. Yet, what we heard from them was not strife, but the joy in their challenges. These talented individuals possess a unique skillset, they must understand, navigate, and negotiate complex health systems and community needs. Despite being under resourced, each of their stories is testament to their love of community, their optimism for a brighter future and their determination to be part of the solution. Healthcare may be in crisis, but with these folks working in the trenches, there are valuable lessons for all. Recruiters – at least those we had the privilege to interview – are an inspiration and should be celebrated as unsung heroes in an otherwise bleak landscape.

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How to rescue a crashing asthmatic patient in a remote emergency department: Ketamine and non-invasive ventilation

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INTRODUCTION

Management of the patient in a severe asthma exacerbation (SAE) can be incredibly challenging. These patients are at risk of developing respiratory failure and arrest and may require intubation and invasive mechanical ventilation. The risks of intubating and ventilating these patients include laryngospasm, worsening bronchospasm, gas trapping, barotrauma and cardiac arrest.¹

When performing rapid-sequence intubation of a patient in SAE, ketamine is often the induction drug of choice.² Ketamine is a dissociative anaesthetic which can provide sedation while maintaining cardiorespiratory reflexes. The risks of hypotension and respiratory depression from ketamine are low. Ketamine is also a bronchodilator, which is an additional benefit to using this drug in patients with obstructive lung disease.³ Because of these unique properties, ketamine can also be used to perform delayed-sequence intubation, where the drug facilitates pre-oxygenation of an agitated patient in respiratory failure prior to administering a paralytic and performing a controlled

intubation.² Ketamine has also been found to improve the respiratory status of intubated patients in SAE despite 24 h of conventional therapy and mechanical ventilation.⁴ There is emerging evidence that ketamine sedation can also facilitate non-invasive positive pressure ventilation (NIPPV) in agitated patients with respiratory failure, avoiding intubation altogether. A retrospective study published in 2024 found ketamine to improve NIPPV tolerance in agitated patients with severe exacerbations of heart failure, chronic obstructive pulmonary disease (COPD) and asthma.⁵ In a case similar to ours, a 36-year-old male in respiratory failure due to SAE failed conventional medical treatment and did not tolerate NIPPV due to agitation.⁶ He received six bolus doses of ketamine 50 mg intravenous (IV) over a 40-min period which allowed him to tolerate NIPPV and improve his respiratory acidosis. The patient continued to improve after ketamine was discontinued and was discharged from hospital 48 h after his ED presentation.

In this article, we describe a scenario in which a patient presented in SAE to a

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small remote hospital that was not equipped with an intensive care unit (ICU). We were able to manage our patient with ketamine sedation and non-invasive ventilation, avoiding the risks of intubation and invasive ventilation in our resource-limited setting. Our patient had a highly positive outcome, and we suggest this strategy be considered as definitive management for status asthmaticus in both resource-limited and resource-rich settings.

CASE REPORT

A 51-year-old female presented to our remote emergency department in Happy Valley-Goose Bay, Newfoundland and Labrador, in March 2019 complaining of shortness of breath and a non-productive cough. She had a past medical history of asthma and a 25 pack-year smoking history. She had been treated in our emergency room several times over the preceding 3 months for asthma exacerbations. On initial examination, she had mildly increased work of breathing, a respiratory rate of 24, oxygen saturation of 96% on room air, heart rate of 110 and blood pressure of 150/90. Expiratory wheezes were heard on auscultation of her bilateral lung fields. A venous blood gas showed a pH of 7.4 and pCO₂ of 47 mmHg. She was treated promptly with nebulized salbutamol and ipratropium and prednisone 50 mg orally. She remained in our ER for observation.

Several hours later, the patient rapidly deteriorated. Her oxygen saturation decreased to 90% and she developed severe increased work of breathing with subcostal retractions and a respiratory rate of 40. Her chest was silent. Her mental status changed and she became agitated.

She was placed on nasal prong oxygen which was titrated up to 8 L/min. She was treated with continuous nebulized salbutamol and ipatropium, epinephrine 0.3 mg intramuscular, magnesium sulphate 2G IV and methylprednisolone 100 mg IV. A portable chest X-ray was normal. We attempted to start NIPPV, but she became increasingly agitated and did not tolerate this. An arterial blood gas revealed a pH of 7.2 and a PaCO₂ of 65 mmHg. At this point, the patient was evidently in hypercarbic respiratory failure and at risk of respiratory arrest.

Our 25-bed health centre was staffed by family physicians with limited specialist backup. Our community had a single anaesthesiologist on-call year-round, supported by two local respiratory therapists. We did not have any local internal

medicine specialists. We had a special care unit in which we offered cardiac monitoring and NIPPV. Our established practice was to transfer patients requiring higher levels of care to St. John's, NL. Due to the remote location of our community, air ambulance transfer was required for all transfers to St. John's. The flight time was typically 2 h.

In our case, intubation and invasive mechanical ventilation would have certainly been required prior to air transfer. Wary of the risks of intubating and ventilating a patient in a SAE in our resource-limited setting, we decided to try ketamine for its bronchodilating and sedating properties. Our hope was to decrease the patient's agitation to help her tolerate NIPPV.

Immediately prior to giving ketamine, the patient's respiratory rate was 40, heart rate was 130, blood pressure was 173/95 and her oxygen saturation was 94% on 8 L/min of nasal prong oxygen. We gave the patient 1 mg/kg of ketamine, administered intravenously over a slow push. Within minutes her work of breathing improved and her respiratory rate decreased to 24. She had improved air entry on auscultation of her lungs. Her heart rate and blood pressure increased slightly to 136 and 174/104. The ketamine achieved light sedation, decreased the patient's agitation and allowed the patient to tolerate NIPPV. Thirty min following the first ketamine dose, the patient's respiratory rate increased to 30 and she became slightly agitated again. We repeated a ketamine 1 mg/kg IV bolus and started a ketamine infusion of 0.5 mg/kg/h IV. This dose maintained light sedation and allowed for the continuation of NIPPV with an FiO₂ of 35%, a peak end expiratory pressure of 5 cmH₂O and a peak inspiratory pressure of 13 cmH₂O. She maintained a spontaneous respiratory rate of 24. Continuous nebulised salbutamol was given while she was on NIPPV. Ceftriaxone 2G IV and azithromycin 500 mg IV were also given. Normal saline maintenance fluid was started at 100 cc/h.

Following 4 h of the ketamine infusion and NIPPV, the patient's work of breathing and air entry was greatly improved. The ketamine infusion was stopped and the patient quickly returned to a normal mental status with a Glasgow Coma Scale of 15. She was not agitated and was able to tolerate the NIPPV for several hours without sedation. Serial arterial blood gasses showed improvement in her pH to 7.4 and her PaCO₂-33 mmHg. NIPPV was then discontinued and she was admitted to the inpatient

unit of our hospital on 2 L of nasal prong oxygen. Methylprednisolone 100 mg IV was continued every 6 h and salbutamol nebulas were continued every 4 h.

The following morning, the patient was alert and oriented, sitting up and eating breakfast. She was able to speak in full sentences and reported feeling much better. Her oxygen was 94% on room air, respiratory rate was 24, heart rate was 112 and blood pressure was 142/82.

She had an unexpected finding of excessive urinary output of 500 cc/h for a 10 h period on day 3 of admission. She was moderately hypernatremic and hyperchloremic with a serum sodium of 154 and chloride of 117. All other electrolytes were normal. Her kidney function was normal. We suspected she had urea osmotic diuresis secondary to steroid-induced tissue catabolism.⁷ We changed her maintenance fluid to dextrose 5% in 0.45% saline and began weaning down her steroid doses. Within 24 h, her urine output and electrolytes normalised. Four days following her emergency room presentation, the patient felt well, had normal vital signs and was discharged from the hospital.

DISCUSSION

Our case demonstrates the successful use of ketamine and NIPPV as definitive management of a patient in respiratory failure secondary to SAE. This strategy prevented intubation, invasive mechanical ventilation and an air-ambulance transfer to a tertiary care centre. Our dose regimen of ketamine 1 mg/kg IV boluses followed by 0.5 mg/kg/h IV infusion was effective in achieving light sedation that allowed the patient to tolerate NIPPV with spontaneous respiration and a return to her baseline mental status once the infusion was stopped. Ketamine has known risks of hypertension, tachycardia, vomiting, apnoea and laryngospasm.⁸ The only adverse effects observed in our case were mild and short-term increases in heart rate and blood pressure. The patient's length of stay in hospital was much shorter than would be expected if she had been intubated. We suspect her electrolyte abnormalities and excessive diuresis were the complications of excessive IV steroids rather than ketamine.

A limitation of our study is the absence of pulmonary function testing to distinguish if this patient had any asthma-COPD overlap, which may have affected her treatment response. An additional limitation is that we are unable to

ascertain whether the patient's positive outcome was primarily due to the bronchodilating effects of ketamine, or due to the sedating effect of ketamine that allowed her to tolerate NIPPV. We suspect she benefitted from both properties. Future randomised controlled trials comparing NIPPV with ketamine versus alternative sedating agents or placebo would be helpful to further understand the unique benefits and risks of ketamine treatment in patients with respiratory failure.

We conclude that a ketamine infusion combined with NIPPV is a promising treatment strategy to manage patients with SAE, especially when agitation is limiting the effectiveness of NIPPV alone. This treatment approach can prevent intubation and invasive mechanical ventilation, which may be particularly helpful to clinicians working in remote facilities without access to an ICU.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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The Occasional insertion of intrauterine devices: new approaches

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INTRODUCTION

Intrauterine devices (IUDs) are a highly effective form of long-acting reversible contraception, offering a reliable, non-permanent option for birth control.¹ Recently, there has been a profusion of new IUDs and better evidence on pain control.² The rural generalist physician can provide IUDs as an important solution for women seeking effective contraception, both emergent and long-term.

In rural areas, women may face significant barriers to accessing consistent and effective reproductive healthcare. These barriers include geographic isolation, limited healthcare facilities, and a shortage of trained medical professionals.

Despite these challenges, the IUD remains one of the most effective forms of contraception, with efficacy rates exceeding 99%.^{1,2} IUDs may be especially valuable in rural settings, as they offer long-term contraception with minimal follow-up.

The technique of IUD insertion is similar to both endometrial biopsy and hysterosalpingograms, so that any physician familiar with one is likely to accomplish the other.

INDICATIONS AND TYPES OF INTRAUTERINE DEVICES

Health Canada licences a growing list of 19 IUDs. In general, there still are only two types of IUDs:

- **Copper IUD:** The copper IUD is non-hormonal and works by preventing fertilisation through the spermaticidal effect of copper. It is effective for up to 10 years and is suitable for women who prefer a hormone-free method or are unable to use hormonal contraception. It is immediately effective so is also suitable for emergency contraception within 5 days of unprotected intercourse (99.9% effective) but is probably underused.³
- **Hormonal IUD (levonorgestrel [LNS]):** The hormonal IUD releases LNS, a progestin, which thickens cervical mucus, suppresses endometrial growth and prevents ovulation in some women. Recurrent spotting is common, as is acne and breast tenderness. It is particularly useful for women with heavy menstrual bleeding or dysmenorrhea.

SELECTION OF INTRAUTERINE DEVICE

The ideal IUD is sized for the patient's uterus (to minimise expulsions), has

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no side effects, is of negligible cost and is easy and painless to insert even through a tight cervix. That IUD is not currently available, but there are several options that can come close.

Women with a transverse diameter of the uterine cavity at the fundus that is mismatched to the width of the IUD theoretically have a higher risk of expulsion or displacement. Studies show that multiparous women have larger uterine cavity widths.⁴ In practice, we only have the history of parity, the bimanual exam and a measure for uterine length (sounding) to guide us in IUD selection.

The rural doctor is advised to familiarise themselves with two or three brand types that cover both smaller and larger IUDs and both copper and LNS. The author has inserted many types of IUD. His personal preference is the Kyleena or Flexi-T 300 for nullips and Mirena or Flexi-T+ 300 for parous women.

Table 1 lists the 19 IUDs licensed by Health Canada. The advantage of the Flexi-T series and Ballerine is that you do not really need to sound the uterus, avoiding that pain and that they have the thinnest inserter. No instruments at all, except the speculum, are used with the Yanae IUD which becomes thus painless for tenaculum and sounding. The innovative membrane deployment (an inflatable membrane that surrounds the IUD) and IUD placement could make even insertion more comfortable (claimed but not studied).

COSTS COVERAGE AND AVAILABILITY

Prices in Table 1 are approximate retail prices in Canadian dollars. The Non-Insured Health Benefits program provides healthcare coverage for registered First Nations and recognised Inuit for

Table 1: 18 Intrauterine devices licensed by health Canada

IUD	Type	Years	Technique	Length × width (mm)	\$	Inserter diameter	Suggested patient (cm)	Notes
Mirena	LNS 52 mg	8	Mirena	32×32	450 [‡]	4.3	Parous	50% eventual amenorrhoea
Kyleena	LNS 19.5 mg	5	Mirena	30×28	420 [‡]	3.6	Nullip	23% eventual amenorrhoea
Flexi-T 300	Cu 300 mm ²	5	Push	29×23	150 [‡]	3.3	Nullip	Smallest inserter
Flexi-T+ 300	Cu 300 mm ²	5	Push	32×28	150 [‡]	3.3	Multip	
Flexi-T+ 380	Cu 380 mm ²	5	Push	32×28	150 [‡]	3.3	Multip	Difficult to fold past Cx
IUB ballerine	Cu 380 mm ²	5	Ballerine	77	185	3.2	Sounds 6–9	Ball shaped
Mona Lisa 10	Cu 380 mm ²	10	Fundal	36×32	112 [‡]	4.3	Sounds >6.5	Longest lifespan
CuT 380A QL								
Mona Lisa 5	Cu 380 mm ²	5	2-step	32×32	96 [‡]	3.6	Sounds >6.5	
NT Cu380								
Mini NT Cu380	Cu 380 mm ²	5	2-step	30×24	96 [‡]		Sounds <7	
Mona Lisa N ST	Cu 300 mm ²	3	Push	29×23	96 [‡]		Sounds <6	Shortest lifespan
Cu300								
Liberté TT	Cu 380 mm ²	10	Fundal	34×30	135 [‡]	4.3	Parous or sounds >7	Longest lifespan
Short	Cu 380 mm ²	5	Fundal	30×23	135 [‡]	4.3	Nullip	
Liberté UT	Cu 380 mm ²	5	2-step	35×32	125 [‡]	3.8	Parous or sounds >7	
Short	Cu 380 mm ²	5	2-step	28×32	125 [‡]	3.8	Nullip	
Yanae	Cu 380 mm ²	5	Yanae	33×31	140	NA	Parous	“Painless” only speculum needed
Mini	Cu 380 mm ²	5	Yanae	30×28	140	NA	Nullip	
SMB 380 AG	Cu 380 mm ²	5	2-step	33×31			Sound s >7	
Mini	Cu 380 mm ²	5	2-step	30×24			Sounds <7.5	
SMB 380 A	Cu 380 mm ²	10	Push	36×32			Sounds 6–9	Longest lifespan

[‡]Copper and hormonal IUDs covered by BC Pharmacare. IUDS: Intrauterine devices, NA: Not available, LNS: Levonorgestrel

both copper and hormonal IUDs. BC Pharmacare covers both copper and hormonal IUDs indicated by ‡. Most other provincial programs, including Manitoba Health, La Régie de l'assurance maladie de Québec and Ontario Drug Benefit, do not cover any copper IUDs but cover hormonal IUDs. The Liberte TT and UT are backordered as of 11 March 25. SMB is ordered from India.

INTRAUTERINE DEVICE INSERTION

The patient is informed of the risks, including expulsion (2%–10% - most in the 1st year), pregnancy (<1%), pelvic inflammatory disease (PID) infection (1% in first 90 days) and perforation (0.5%). Vasovagal reactions at the time of insertion are rare (2%). Discontinuation rates due to spotting and/or bleeding for both copper and LNS IUDs are particularly high in the first 6 months but may be reduced by counselling before insertion to ensure realistic patient expectations.⁵

At my clinic, we time the insertion during menses to ensure some cervical dilatation and lack of pregnancy. Otherwise, we do a urine pregnancy test unless we are absolutely sure that the patient has been celibate. For LNS, back-up contraception is needed for 7 days after insertion if not done within 7 days after menses onset.²

We use re-usable sterilised instruments, including scissors, tenaculum, ring forceps and sound. We sometimes use a Hegar uterine 3/4 mm dilater [Figure 1]. The procedure requires disposable gloves, gauze and antiseptic and a well-lighted speculum.



Figure 1: Intrauterine device instruments from right to left, metzenbaum scissors, single toothed tenaculum, ring forceps, malleable sound, Hegar 3/4 mm.

After consent and review of the manufacturer's specific directions, the patient is placed into lithotomy position. A bimanual examination confirms the lay of the uterus. A speculum is inserted, the cervix examined for signs of infection. If a patient has not been screened and meets indication for sexually transmitted infection (STI) screening, that can be done at this point. Provioidine is applied to the cervix with a long swab or ring forceps with gauze.

Pain relief

Each placement of the tenaculum, uterine sounding and insertion of the IUD is painful. The practitioner should be mindful of their patient's needs and have a plan in place. Treatment with a non-steroidal anti-inflammatory drug NSAID such as Naproxen 500 mg 1 h before insertion is helpful. Neither 2% lidocaine gel nor misoprostel has been found to ease IUD insertion and is best avoided. Instead consider 4 puffs of 10% lidocaine spray or 6 g of 4% xylocaine jelly applied to the cervix × 3 min before instrumentation. A four quadrant paracervical block with 10–20 mL of 1%–2% lidocaine is resource intensive but a great option in a hospital setting.⁶ As in many situations, talk to the patient about what you are doing to reassure and distract them from any pain as much as possible. The level of pain on insertion depends on the individual; some feel very little pain and for others it can be quite painful.

After topical or local anaesthetic, the tenaculum is attached to the cervix while instructing the patient to cough. The uterine sound is adjusted to the perceived lay of the uterus. While applying gentle traction on the tenaculum, to straighten the uterus, sound the uterus. Set the flange on the IUD parallel with the arms of the IUD at the marking for the sounded depth.

A malleable uterine sound typically has a tip diameter of 3 mm. If you cannot sound the uterus, you are not going to have success with IUD insertion. In that case the IUD package is not opened, and the case is deferred to the operating room and or a consultant, which is the author's preference. Dilatation increases the risk of perforation or forming a false passage.

Dilatation can be done as an outpatient in selected cases if anaesthesia is good and the operator familiar with the procedure. You will need to serially dilate with gentle continual pressure.

Further steps are guided by the manufacturers' instructions which should be reviewed and followed. There often is an insertion technique video available on the internet that can be reviewed.⁷⁻¹⁰ One-on-one training on the Yanae device is available by teleconference from 49 Care Ltd.

In general, there are several styles of insertion.

M ("Mirena" and "Kyleena")

The flange is set to the sounded length. The IUD is folded into the insertion tube by moving the slider all the way forwards. The tube is inserted to the fundus 1–2 cm short of the sounded length [Figure 2].

The slider is advanced to allow for the arms to release [Figure 3].

Then the insertion device is advanced to the fundus. The slider is slid all the way back and the insertion device removed [Figure 4].

Push ("Flexi-T" "SMB 380A" and "Mona Lisa N")

The IUD is inserted in the T formation by pushing up to the fundus [Figure 5]. Sounding and tenaculum

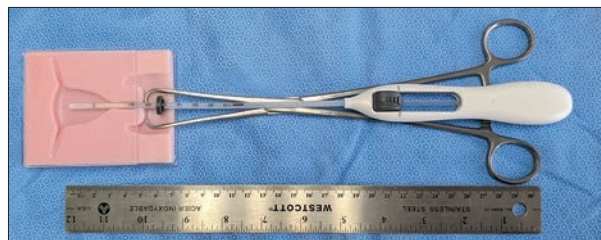


Figure 2: Kyleena placed 1 cm short of the sounded length.

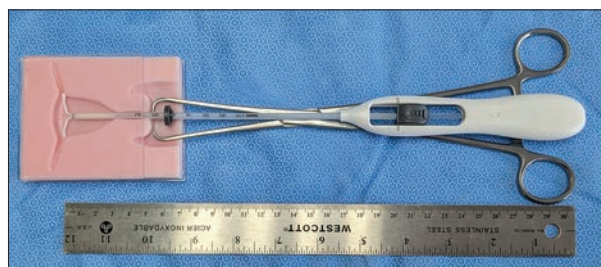


Figure 3: Kyleena with arms released.

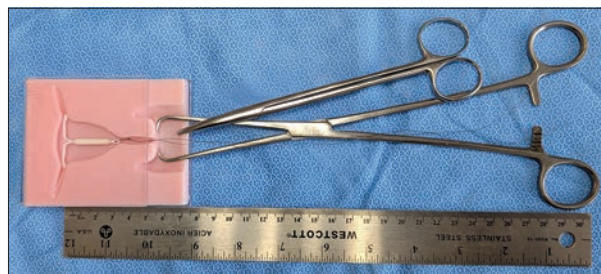


Figure 4: Kyleena with strings about to be cut.

steps can be skipped thus reducing discomfort. The arms are folded by the cervix. Folding is easy for most patients, but it depends on the arms being flexible and the external cervix os accommodating the bending. It is harder when the arms are stiff copper-covered as in Flexi-T+ 380 and SMB 380A or the external cervical os is stenotic [Figure 6].

B ("Ballerine")

Similar to the Flexi-T, sounding and tenaculum steps are optional thus reducing discomfort. The IUD comes straightened in the insertion tube. The tube is inserted to the fundus and then withdrawn 3 mm. Counter intuitively you then push the IUD out of the insertion tube and allow it to coil into a ball within the uterine cavity [Figure 7].

2-step ("Nova T" and "Mona Lisa 5")

This is a traditional technique where the uterus is first sounded. The IUD is then folded and retracted into the insertion tube. The tube is inserted 1–2 cm short of the sounded length [Figure 8]. A pusher is inserted up to its mark to release the

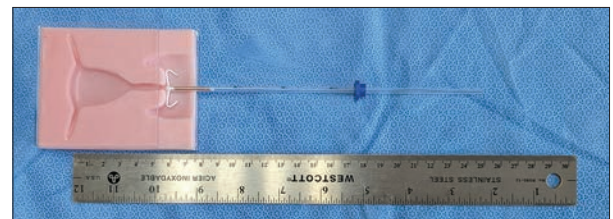


Figure 5: Flexi T 300 in position about to be pushed through cervix.

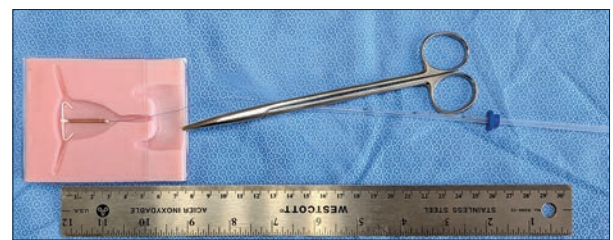


Figure 6: Flexi T 300 string about to be cut.

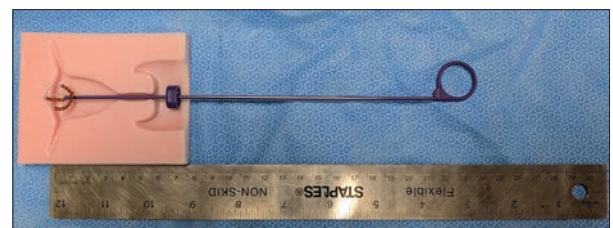


Figure 7: IUB Ballerine.

arms and only then the insertion tube is moved up to the fundus [Figure 9]. The insertion tube is then withdrawn over a stationary pusher. Then the pusher is removed followed by the tube.

Y (“Yanae” type) [Figure 10]

Sounding and tenaculum steps can be skipped thus reducing discomfort.

The IUD is first folded into the introducer and the membrane pressurised with saline. The membrane is advanced to the cervix and then deployed through the cervix to the fundus with the pusher tube. If the uterus is shorter than 7 cm you will feel resistance as it reaches the fundus. In such a case hold the pusher tube in position and slide the hub back to it [Figures 11 and 12].

If the uterus is longer, then advance the hub and pusher together until you feel resistance at the

fundus. Ensure that the displacer tube is against the back of the IUD. To release the IUD, hold the displacer tube in position as you slide the hub back over the displacer until the hub, pusher and displacer tubes are in contact. At this point you can remove the insertion device, and the strings are cut to 2 cm length [Figure 13].

Fundal release (“Mona Lisa 10” and “Liberte TT” type)

This is a variation on the second step. The IUD is first folded into the insertion tube. The tube is inserted to the fundus at the sounded length [Figure 14]. The tube is withdrawn over the plunger to the stop to allow for the arms and the IUD to release [Figure 15]. Then, the insertion device is removed.

Common

After insertion, the strings are cut to about a 2-cm length. Observe the patient for syncope and let

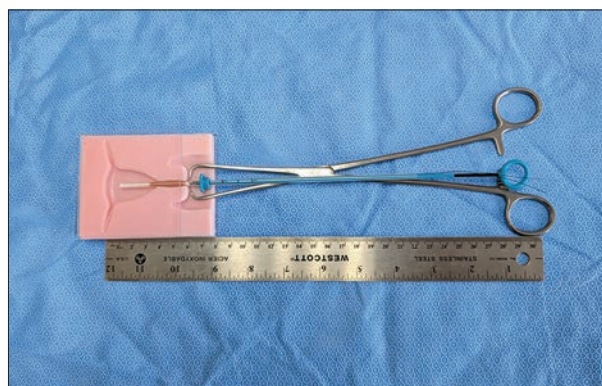


Figure 8: Liberté UT380 with arms folded short of sounded length.

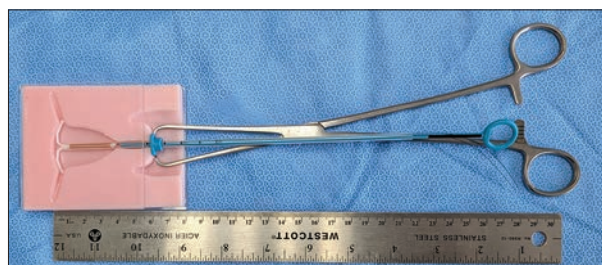


Figure 9: Liberté UT380 with released arms at fundus.



Figure 10: Yanae about to be folded.

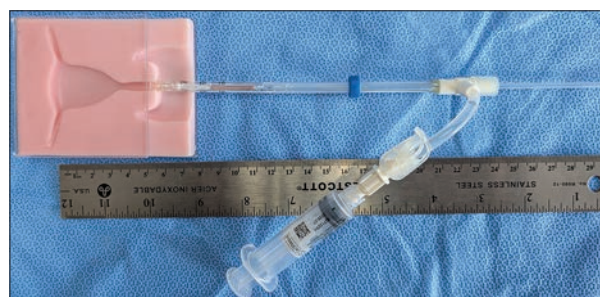


Figure 11: Yanae at the cervix about to deploy membrane.

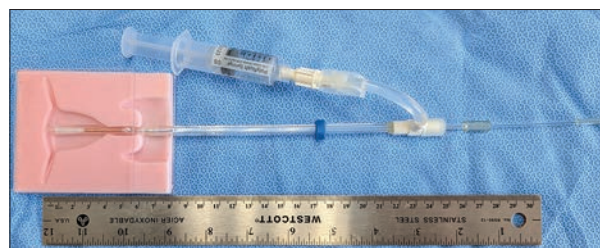


Figure 12: Yanae membrane is at fundus. With a short uterus the pusher tube is not at the hub.

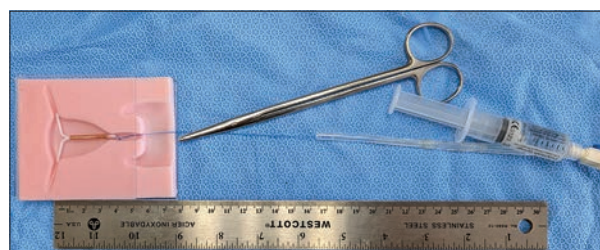


Figure 13: Yanae strings about to be cut.

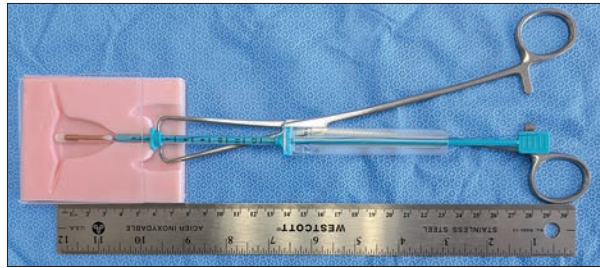


Figure 14: Liberté TT 380 at fundus.

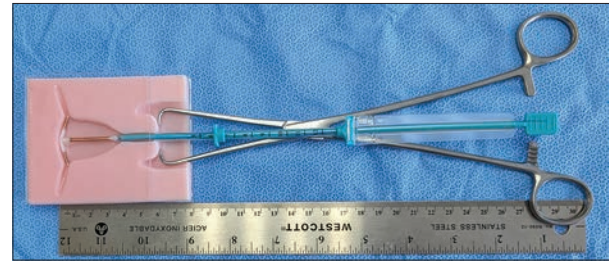


Figure 15: Liberté TT 380 at fundus.

them recover. Provide the patient with a wallet card marking the brand and the replacement date.

Follow-up care

Post-insertion follow-up is essential for monitoring the complications such as infection, expulsion or perforation.

The expulsion rate may be slightly higher in the first few months, especially in younger women or those who have not had children, or in the post-partum period. A point-of-care ultrasound is helpful in determining if the IUD is in place. An X-ray will show the IUD but will not be as good at determining where it's situated.

Although rare, uterine perforation can occur during insertion but may only be diagnosed in workup of prolonged and abdominal pain. In rural settings with limited access to specialised surgical care, perforation may require referral to urban centres for treatment.

The risk of PID may increase in the first 20 days after insertion, particularly in women with undiagnosed STIs. Conventionally, these infections were treated with antibiotics and the IUD removed; however, current practice is to treat with the IUD in place with close monitoring if the patient is not septic and is improving on treatment.²

If pregnancy occurs, then early confirmation of location by ultrasound of both the pregnancy and the IUD is necessary as ectopics are a particular concern.

CONCLUSION

In rural healthcare settings, the insertion of IUDs offers a promising solution for long-acting contraception. Despite challenges such as limited resources, geographic isolation and

cultural barriers, with appropriate training, rural healthcare providers can effectively offer IUD insertion to their communities. By addressing patient education, ensuring informed consent and providing adequate follow-up care, providers can help ensure the success of IUD use in rural areas, improving access to reliable contraception and contributing to better reproductive health outcomes for women in underserved regions.

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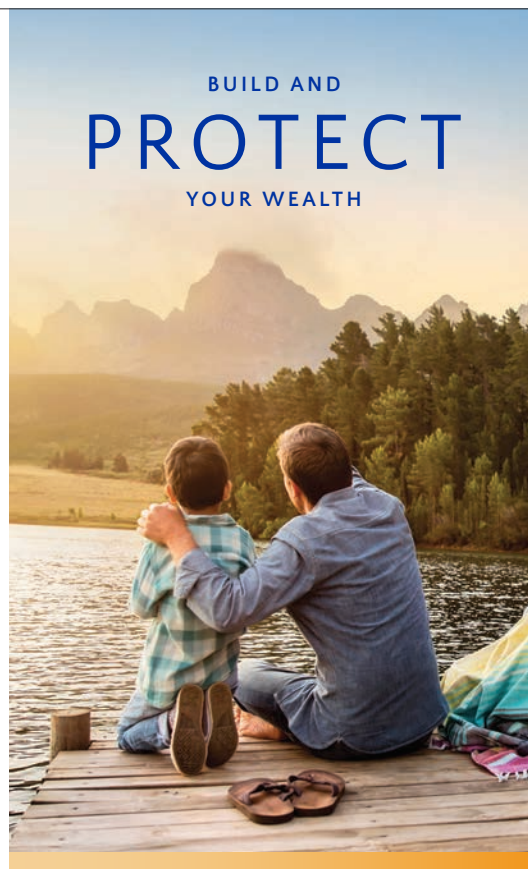
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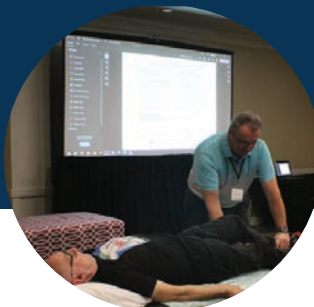
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