Describing and Evaluating the Clinical Pharmacist's Role in a Canadian Multiple Sclerosis Clinic

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ABSTRACT

Background: The current approach to treatment of multiple sclerosis (MS) involves use of disease-modifying therapies to slow progression of the disease, as well as the symptomatic management of fixed neurological deficits. Although pharmacists are uniquely positioned to support MS care teams with all aspects of medication management, their presence is rare among MS ambulatory care teams in Canada.

Objectives: To document the pharmacist's contributions and to evaluate the impact of the pharmacist's role following creation of a clinical pharmacist position in a Canadian MS clinic within a large, urban, university-affiliated, tertiary care centre.

Methods: This study was conducted in 2 parts: a prospective, descriptive case study of the clinical pharmacist's role and a retrospective assessment of medication-related patient calls before and after implementation of the pharmacist position.

Results: The pharmacist performed a variety of clinical activities, with the greatest proportions of time spent on patient care (63.3%), drug access research (15.7%), and development and review of internal documents (9.0%). Patient care primarily involved conducting patient assessments, making medication recommendations, and assisting patients with medication-related issues. The proportion of medication-related issues resolved remained similar at 92.9% before and 95.7% after implementation of the clinical pharmacist ($p = 0.48$). The median time to resolve medication-related issues was reduced from 4.1 to 2.9 days ($p = 0.016$) with pharmacist involvement.

Conclusions: Pharmacists can support MS care teams through a variety of medication-related clinical activities aligned with their scope and expertise. The presence of a pharmacist on the MS care team significantly reduced turnaround times for resolving medication-related issues, improving the efficiency and timeliness of care.

Keywords: multiple sclerosis, clinical pharmacist, ambulatory care, multidisciplinary, interdisciplinary

RÉSUMÉ

Contexte : L'approche actuelle du traitement de la sclérose en plaques (SP) implique l'utilisation de traitements modificateurs de la maladie pour ralentir sa progression, ainsi que la prise en charge symptomatique des déficits neurologiques fixes. Bien que les pharmaciens occupent une position unique pour soutenir les équipes de soins de SP dans tous les aspects de la gestion des médicaments, leur présence est rare parmi les équipes de soins ambulatoires en SP au Canada.

Objectifs : Documenter les contributions du pharmacien et évaluer l'incidence potentielle de son rôle après la mise en place d'un poste de pharmacien clinicien dans une clinique canadienne de SP au sein d'un grand centre de soins tertiaires urbain affilié à une université.

Méthodologie : Cette étude a été menée en 2 parties : une étude de cas prospective et descriptive du rôle du pharmacien clinicien et une évaluation rétrospective des appels des patients liés aux médicaments avant et après la mise en place du poste de pharmacien.

Résultats : Le pharmacien effectuait diverses activités cliniques, la plus grande proportion de temps étant consacrée aux soins aux patients (63,3 %), à la recherche sur l'accès aux médicaments (15,7 %) et à l'élaboration et à l'examen de documents internes (9,0 %). Les soins aux patients consistaient principalement à évaluer les patients, à formuler des recommandations en matière de médicaments et à aider les patients confrontés à des problèmes liés aux médicaments. La proportion de problèmes liés aux médicaments résolus est restée similaire, soit 92,9 % avant et 95,7 % après la mise en œuvre du pharmacien clinicien ($p = 0,48$). Le délai médian nécessaire pour résoudre les problèmes liés aux médicaments a été réduit de 4,1 à 2,9 jours ($p = 0,016$) avec la participation du pharmacien.

Conclusions : Les pharmaciens peuvent soutenir les équipes soignantes de SP grâce à diverses activités cliniques liées aux médicaments, adaptées à leur portée et à leur expertise. La présence d'un pharmacien dans l'équipe de soins de la SP a considérablement réduit les délais d'exécution pour résoudre les problèmes liés aux médicaments, améliorant ainsi l'efficacité et la rapidité des soins.

Mots-clés : sclérose en plaques, pharmacien clinicien, soins ambulatoires, multidisciplinaire, interdisciplinaire

INTRODUCTION

Multiple sclerosis (MS) is a complex, chronic inflammatory disease of the central nervous system and the leading nontraumatic cause of disability in young adults.[1] Although MS was previously viewed as a rapidly progressing disease, the introduction of disease-modifying therapies (DMTs) in the early 1990s redefined the natural course of the disease.[2,3] Since then, the MS treatment landscape has rapidly evolved to include several more DMTs with superior efficacy and ease of administration.[2,3] These therapies require regular monitoring due to their potential adverse effects. High treatment costs ($13 000 to > $50 000 per year in Canada) are associated with restrictions on access.[4] As MS therapy options expand and the costs of treatment continue to rise, medication management has become an increasingly substantial and complex component of MS care.[3,5]

The current approach to treatment of MS involves use of DMTs to slow progression of the disease, as well as symptomatic management of fixed neurological deficits.[2] Pharmacists are uniquely qualified to support MS care teams with all aspects of medication management, thereby improving the quality and efficiency of care.[3,5] However, the presence of pharmacists in MS care teams is rare in Canadian clinics. Without medication experts in multidisciplinary MS care teams, gaps in care may arise, including delays in treatment and suboptimal patient outcomes.[3] Inefficiencies of care may also emerge, whereby medication management activities detract from time that physicians and nurses spend on other patient care roles.[3,5]

Previous studies have demonstrated the overwhelmingly positive effects of the clinical pharmacist's role in US centres. Botts and others[6] showed that the pharmacist's role increased the efficiency of DMT initiation, increased accountability for ongoing monitoring of therapy, and reduced overall demand for clinic appointments with physicians. Jones and others[7] showed a clear benefit of the pharmacist's role on patient outcomes through a 28% reduction in all-cause emergency department visits over a 1-year period. May and others[5] revealed agreement among providers that the presence of a clinical pharmacist led to fewer delays in initiation of therapy and fewer questions to other clinic team members regarding medication management.

This study was conducted in the BARLO MS Centre within St Michael's Hospital (Toronto, Ontario), a specialty physician–led clinic serving approximately 8000 patients with MS. The multidisciplinary team composition has historically included neurologists, nurses, a nurse practitioner, a social worker, a physiotherapist, an occupational therapist, and a drug access navigator. In April 2022, new funding allowed for the formal implementation of a part-time clinical pharmacist position in the clinic, which provided an opportunity to document the clinical pharmacist's contributions to MS patient care and the MS clinic team, as well as to illustrate the potential benefit of the role at a Canadian site.

The primary objective of this study was to describe the role of the clinical pharmacist at the BARLO MS Centre. The secondary objective was to evaluate the impact of the clinical pharmacist's role on patient care.

METHODS

Study Design and Setting

This study was conducted at a large urban, university-affiliated, tertiary care teaching hospital in Toronto, Ontario.

This study had 2 parts: a prospective, descriptive case study of the clinical pharmacist's role, and a retrospective assessment of medication-related patient calls before and after implementation of the pharmacist position (see Figure 1 for the study design and timeline).

The new pharmacist position was implemented in April 2022. Data collection for the prospective case study occurred during June 2022, after a 2-month learning phase. Qualitative description and descriptive statistics were employed to show the clinical pharmacist's contributions to MS patient care and the MS clinic team during the study period.

Each of the pre- and post-implementation assessment phases consisted of a 4-week period, separated by 2 months. The pre-implementation assessment took place in March 2022 and the post-implementation assessment took place in June 2022. Descriptive and inferential statistics were used to compare wait times for the clinical team to return medication-related patient calls, the percentage of medication-related issues resolved by the clinical team,

FIGURE 1. Study design and timeline.

and wait times for the clinical team to resolve medication-related issues.

Outcomes

The primary outcomes of this study were the description of clinical pharmacist activities performed (patient care and non–patient-facing), the proportion of time spent on each category of clinical pharmacist activities, and the proportion of time spent on each subcategory of patient-facing clinical pharmacist activities.

The secondary outcomes of this study were the turnaround times for the clinic team to return medication-related patient calls, the turnaround times for resolving medication-related issues, and the resolution rates for medication-related issues before and after implementation of the pharmacist position.

Data Collection

Descriptive Case Study

The pharmacist documented all clinical activities performed using a daily diary. The details related to patient care activities were automatically captured in the electronic medical record (EMR) through a unique documentation template (Appendix 1). At the end of the study period, the relevant data were extracted from the pharmacist's documentation.

Retrospective Assessments before and after Role Implementation

All recorded patient voice messages were reviewed. Non-urgent, medication-related patient calls directed to clinical staff met the inclusion criteria for analysis. Calls were excluded from analysis if no call-back was required, if follow-up was untraceable, or if the patient had previously called about the same issue. Medication-related calls included requests for DMT enrolments, inquiries about medical clearance for continuation of DMT, and medication-related issues. Medication-related issues were defined as a subset of medication-related calls in which the patient or their agent had a question or concern or was seeking instruction from the clinical team about medications. In all cases, medication-related issues required the clinical team to provide the patient with an answer or to advise them on the appropriate course of action.

For each medication-related call meeting the eligibility criteria, the patient's chart was accessed to view the documentation posted by the pharmacist, nurse, or physician who responded to the inquiry. The date and time the patient call was received, the date and time of initial call-back by MS clinic staff, and the type of medication-related call (i.e., DMT enrolment, medical clearance, or medication-related issue) were extracted from each call. If the call referred to a medication-related issue, the medication category (i.e., DMT, additional/adjunct therapy, vaccines, or acute therapy), whether it was resolved, and the date and time of resolution were also recorded. A medication-related issue was considered to have been resolved if the question or request was completely addressed and the individual was not directed to inquire elsewhere (e.g., family physician, patient support program).

Ethics Approval

Approval to conduct this study was obtained from the Unity Health Toronto Research Ethics Board, and written informed consent was obtained from the clinical pharmacist working in the BARLO MS Centre. Given the large quantity of patient charts and inquiries reviewed, along with the low-risk nature of this observational study, a waiver of consent was obtained for use of charts and call records.

RESULTS

Primary Outcome: Clinical Pharmacist's Role

The part-time (0.6 full-time equivalent) clinical pharmacist spent 75 hours (10.5 days) in the clinic over the course of the data collection period. During that time, the pharmacist performed several clinical activities, with the greatest proportion of time spent on patient care (63.3%), followed by drug access research (15.7%) and developing or reviewing internal documents (9.0%) (Figure 2A). Physicians and nurses referred patients to the pharmacist for specific medication-related concerns. The pharmacist subsequently assessed and continued to follow referred patients as required.

The 39 documented entries in the EMR revealed that the pharmacist's primary contributions to patient care involved conducting patient assessments and making medication recommendations (37 of 39), responding to patient inquiries (20 of 39), and obtaining best possible medication histories (7 of 39) (Figure 2B). The pharmacist primarily conducted patient assessments and made medication recommendations related to DMTs (19 of 37) and other drug therapies (12 of 37) (Figure 2C). Examples of the pharmacist's contributions included optimizing medication therapy in relation to past medical history (e.g., in the setting of gastric bypass), evaluating the risks and benefits of medication therapy, suggesting therapy modifications in the context of changes in drug coverage, optimizing medication dosing (e.g., for prednisone, carbamazepine, acetazolamide), assisting patients with therapy changes in the context of family planning (e.g., switch from teriflunomide or fingolimod to ocrelizumab), navigating the timing of vaccines relative to DMT administration or recent infection (e.g., COVID-19), managing drug interactions (e.g., modafinil and carbamazepine, dienogest and cladribine, denosumab and ocrelizumab), assessing adverse effects (e.g., nausea/anorexia, hives, dizziness, hair loss, lymphopenia, edema), and managing MS symptoms (e.g., incontinence, ataxia, pain, spasticity, tremors, fatigue).

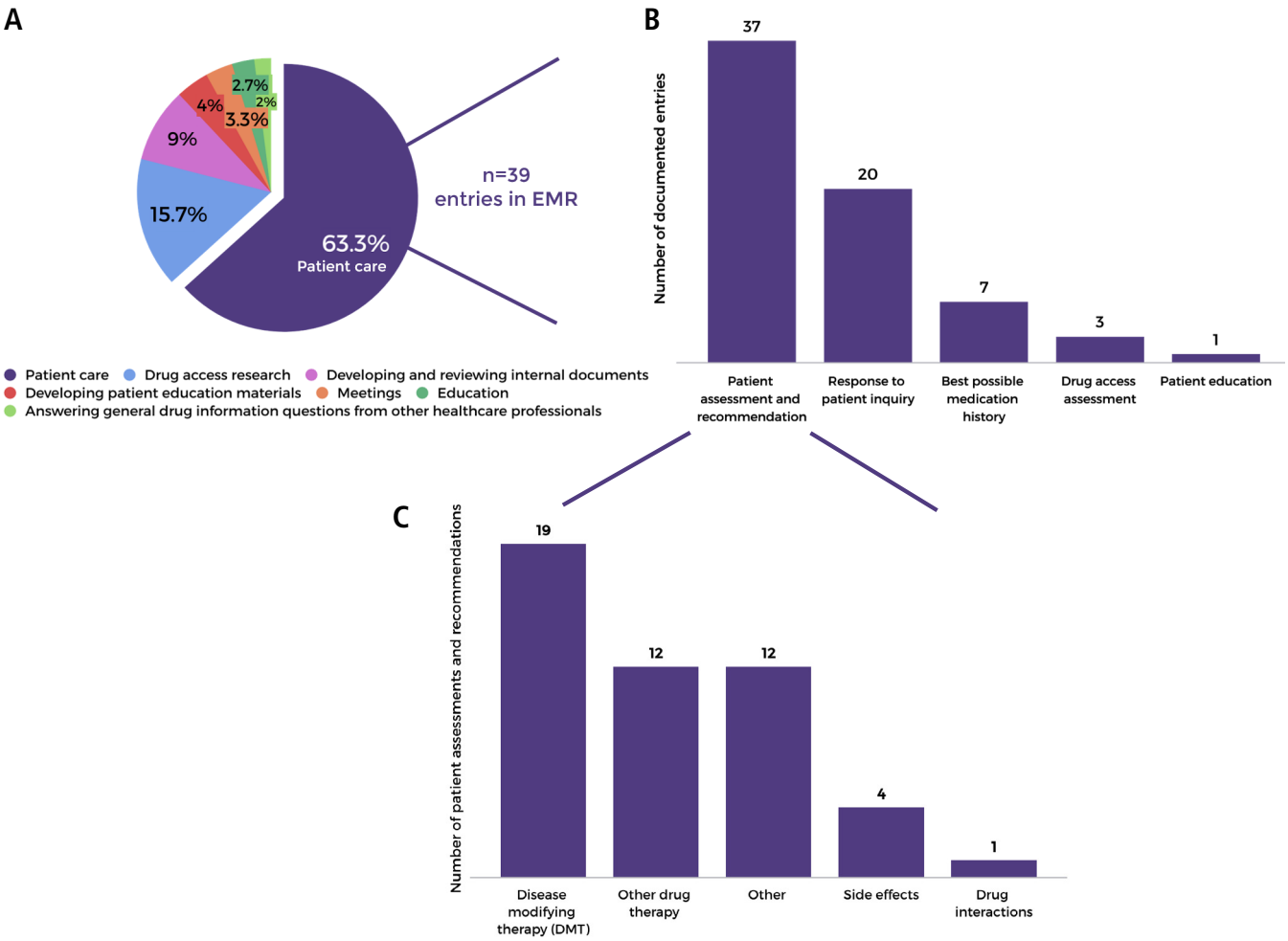

FIGURE 2. (A) Proportion of total time (75 hours) spent on clinical pharmacist activities. (B) Numbers of documented entries reporting various patient care activities, by category (total number of documented entries = 39; some entries reported more than one activity). (C) Numbers of patient assessments and medication recommendations, by category. The sum of categories is greater than the number of documented entries for patient assessments and recommendations because some entries mentioned more than one assessment and/or recommendation.

Secondary Outcome: Impact of Role on Patient Care

The clinic received 410 non-urgent phone calls from patients during the study period, 228 before and 182 after implementation of the part-time clinical pharmacist role. Of the phone calls received, 145 met the eligibility criteria for analysis (84 before and 61 after implementation of the clinical pharmacist role). Throughout the subsequent sections, numeric data for each variable are presented as raw data and percentages for the pre-implementation assessment versus the post-implementation assessment.

Categories of Medication-Related Calls

Each phone call contained one or more types of inquiry. Most calls contained medication-related issues (49 of 84 [58.3%] vs 42 of 61 [68.9%]). Requests for DMT enrolment appointments were also common (28 of 84 [33.3%] vs 10 of 61 [16.4%]). Some calls contained questions about medical clearance for continuation of DMTs (14 of 84 [16.7%] vs 10 of 61 [16.4%]).

Categories of Medication-Related Issues

Fifty-seven medication-related issues were mentioned in 49 phone calls in the pre-implementation period, and 47 medication-related issues in 42 phone calls in the post-implementation period. The categories of medication-related issues are summarized in Figure 3.

The DMT-related issues mostly pertained to safety and adverse effects (12 of 35 [34.3%] vs 13 of 29 [44.8%]) and medication instructions (5 of 35 [14.3%] vs 10 of 29 [34.5%]). Additional categories included bloodwork monitoring (10 of 35 [28.6%] vs 0 of 29 [0%]), drug access (3 of 35 [8.6%] vs 2 of 29 [6.9%]), DMT options (3 of 35 [8.6%] vs 1 of 29 [3.4%]), efficacy of DMT (1 of 35 [2.9%] vs 3 of 29 [10.3%]), and medication supplies (1 of 35 [2.9%] vs 0 of 29 [0%]).

Issues related to additional or adjunct therapy primarily involved dose adjustments (3 of 11 [27%] vs 3 of 11 [27%]), requests for prescriptions or approval to take a medication (3 of 11 [27%] vs 2 of 11 [18%]), and antiviral prophylaxis (3 of 11 [27%] vs 0 of 11 [0%]). The remainder

involved questions about natural health products (0 of 11 [0%] vs 2 of 11 [18%]), requests for medication recommendations (1 of 11 [9%] vs 1 of 11 [9%]), questions about duration of therapy (1 of 11 [9%] vs 0 of 11 [0%]), questions about drug coverage (0 of 11 [0%] vs 1 of 11 [9%]), and concerns about efficacy (0 of 11 [0%] vs 1 of 11 [9%]).

Vaccine-related issues included questions about vaccination schedules and requirements (3 of 6 [50%] vs 0 of 4 [0%]), vaccine clearance (2 of 6 [33%] vs 1 of 4 [25%]), and timing of vaccines in relation to DMTs (0 of 6 [0%] vs 2 of 4 [50%]), as well as requests for information about vaccines (0 of 6 [0%] vs 1 of 4 [25%]) and vaccine records (1 of 6 [17%] vs 0 of 4 [0%]).

Acute therapy–related issues included inquiries about initiation of steroids (1 of 5 [20%] vs 2 of 3 [67%]), discontinuation of steroids (2 of 5 [40%] vs 1 of 3 [33%]), and safety or adverse effects of steroids (2 of 5 [40%] vs 0 of 3 [0%]).

Turnaround Times

The turnaround times for initial call-back on medication-related calls and resolution of medication-related issues, the resolution rates for medication-related issues, and the number of medication-related issues managed by each profession in the pre- and post-implementation assessments are summarized in Table 1.

DISCUSSION

Primary Objective: Describing the Role

The pharmacist's self-reporting of clinical activities performed during the study period revealed that a majority of time was spent on patient care activities, followed by drug access research and developing or reviewing internal documents. The pharmacist's role was therefore utilized in the care of individual patients, as well as to facilitate

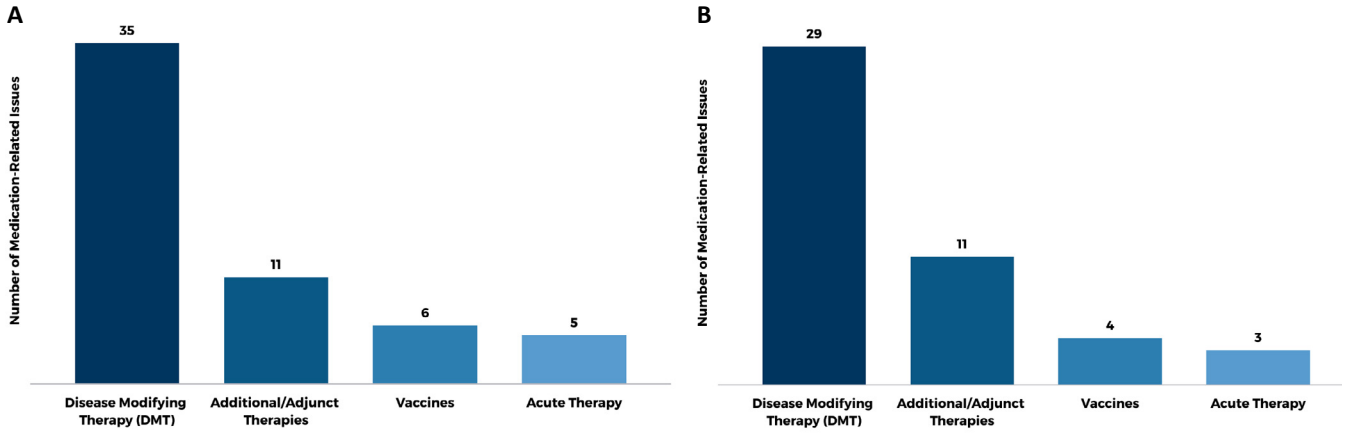

FIGURE 3. Numbers of medication-related issues, by category, in the (A) pre-implementation and (B) post-implementation assessment periods.

TABLE 1. Analysis of Medication-Related Calls before and after Implementation of a Part-Time Pharmacist on the Multiple Sclerosis Clinic Team

Variable	Pre-implementation (March 2022)	Post- implementation (June 2022)	*p* Value[a]
Median time to initial call-back, all medication-related calls (days)	4.6	2.2	0.09
Medication-related issues	*n* = 57	*n* = 47	
No. (%) resolved	53 (93.0)	45 (95.7)	0.48
No. (%) managed by nurse	50 (87.7)	31 (66.0)	Not tested
No. (%) managed by physician	7 (12.3)	3 (6.4)	Not tested
No. (%) managed by pharmacist	NA	13 (27.7)	NA
Median time to resolution of medication-related issue (days)			
Composite	4.1	2.9	0.016
Nurse	3.5	5.2	0.15
Physician	14.9	7.9	0.48
Pharmacist	NA	1.0	NA

NA = not applicable.
[a]Tested with 2-tailed, 2-sample *t* test.

access to MS therapies and improve clinic processes at a systemic level.

Patient care activities fundamentally involved conducting patient assessments and making medication recommendations, highlighting the value of the pharmacist's role on the clinical team. A pharmacist's fundamental drug therapy knowledge and training enable unique contributions to care, such as identifying and resolving complex drug therapy problems and optimizing drug therapy for each patient. Previous studies documenting the role of clinical pharmacists managing the care of patients with MS in the United States have revealed extensive involvement in patient care through recommending changes to DMTs, monitoring patients comprehensively, and managing MS symptoms.[6,8,9] These progressive clinical tasks align with the anticipated trajectory of the pharmacist's role at the BARLO MS Centre as it becomes more established.

Secondary Objective: Evaluating Impact of the Role on Patient Care

Categories of Medication-Related Issues

In both the pre- and post-implementation assessment periods, most medication-related calls referenced medication-related issues, highlighting the need for a medication expert on the MS care team. The majority of medication-related issues pertained to DMTs, primarily regarding their safety or adverse effects. Some patients sought guidance in choosing between different DMT options, a task that is fundamentally aligned with pharmacists' deep understanding of available therapies and their ability to assess these in the context of patient values, risk factors, and comorbidities.[7]

Several medication-related issues corresponded to additional or adjunct therapies that are used to manage symptoms of MS, to mitigate adverse effects from immunosuppression, or to foster general health. The key themes for this broad category of medications revealed several possible points of intervention by the pharmacist due to their foundational knowledge and experience in pharmaceutical care, adverse effect and drug interaction management, and drug information.[7]

Patients sometimes posed questions about immunization requirements in the context of DMTs. Pharmacists are well positioned to provide guidance concerning immunizations, given their ability to navigate vaccination schedules and recommendations according to the patient's medications, consider any contraindications with respect to the patient's medications, navigate coverage issues, and counsel the patient on the benefits and possible adverse effects.[7]

A small number of acute therapy–related issues were raised in the patient calls, and these cases were not referred to the pharmacist in the post-implementation period. However, the nature of these questions revealed another area where pharmacists could effectively intervene, given their ability to evaluate and triage such questions or concerns on the basis of severity and urgency, as well as to counsel patients on their prescribed therapy. These encounters reinforced that patients who receive prescriptions for high-dose pulsed steroids in the treatment of acute relapses require education from a pharmacist due to the large number of tablets required (e.g., twenty-five 50-mg tablets for a prednisone dose of 1250 mg), potential adverse effects, and instructions for discontinuation of therapy.[2,7]

Turnaround Times

In the pre-implementation period, all medication-related calls received through the non-urgent patient care phone line were triaged and managed by the nurses. While the nurses continued to manage DMT enrolment appointments and medical clearance questions in the post-implementation period, medication-related issues were delegated to the pharmacist on the days that she was present in the clinic. On days that the pharmacist was not present in the clinic, the nurses employed the process that had been used in the pre-implementation period, which often required them to consult a physician. In the post-implementation period, the pharmacist managed 27.7% of calls with medication-related issues, and the nurses managed the remainder of the medication-related calls (with input from physicians as required). With this framework, the median wait time for patients to receive an initial call-back from the MS clinic team for any medication-related call was reduced from 4.6 to 2.2 days ($p = 0.09$). Delegating the most complex medication-related tasks to the pharmacist allowed the nurses and physicians to engage in activities more aligned with their own scopes of practice, thereby improving the efficiency and timeliness of care. The median turnaround time for the resolution of medication-related issues was reduced from 4.1 to 2.9 days ($p = 0.016$) with the pharmacist's contributions. Given that many medication-related issues are time-sensitive, faster assessment and delivery of relevant information can empower patients and lead to a better health care experience.

The processes employed for managing medication-related issues in both the pre- and the post-implementation periods achieved excellent resolution rates. However, the quality of the answers provided varied according to the discipline of the health care provider answering the question. For example, when a patient inquired about using natural health products for stiffness in their knees in the post-implementation period, a physician responded that there were no contraindications but did not comment on the evidence for efficacy of these therapies or suggest any alternatives. These types of inquiries (i.e., related to natural health products) might benefit from the pharmacist's involvement, as their skill set could be valuable in unearthing the patient's true question or concern, discussing the symptoms and medication history the patient is seeking to treat with natural health products, and using this information to

either recommend the most appropriate therapy for their needs or provide a referral to another health care provider.

Limitations and Challenges

The pharmacist's prior education (completion of baccalaureate degree and postgraduate Doctor of Pharmacy, certification from the Board of Pharmacy Specialties), 6 years of experience as an orthopedics/neurology pharmacist, and completion of a 4-week shadowing opportunity at the Rocky Mountain MS Center at the University of Colorado provided a strong foundation for taking on the pharmacist role in the MS clinic. However, due to delayed implementation of the role as a result of the COVID-19 pandemic, the pharmacist was only allowed a 2-month learning phase. This delay was also associated with a truncated data collection period for the descriptive case study and a short interval between the pre- and post-implementation assessments. In turn, these constraints likely led to a very conservative estimate of the pharmacist's impact.

The novelty of the role was also associated with challenges, as its full potential may only be realized when other health care providers are fully aware of the pharmacist's scope and expertise. Because pharmacists have historically been underutilized in the clinical setting, many health care providers may lack this awareness, especially if they have not previously collaborated with clinical pharmacists on health care teams. Over time and through repeated interactions, they may become more familiar with the role, allowing it to evolve and achieve a higher impact.

This study was not blinded, and there may have been inherent flaws associated with the pharmacist's self-reporting of clinical activities for the descriptive case study. Several data were excluded in the pre- and post-implementation assessments of medication-related calls due to a lack of traceable documentation. The difference in volume of calls in each period may have been due to seasonal patterns. These factors may have contributed to shorter median turnaround times in the post-implementation assessment period, although the median turnaround time for resolution of medication-related issues by the nurses did not decline in the post-implementation assessment, which may offer value as a control measure. The slight increase in the nurses' turnaround times for resolving medication-related issues in the post-implementation period may have occurred as a result of several factors (e.g., fewer data points, higher variability in turnaround times, selection of medication-related issues requiring additional considerations or supports, seasonal considerations delaying response time for physician consults) but appears to have been due to chance ($p = 0.15$).

Future Directions

To the best of our knowledge, this paper is the first description of a clinical pharmacist's role in a Canadian MS clinic. Due to current limitations in funding and distribution of resources, the greatest impact of the role may initially occur through careful selection of pharmacist consults for cases with complex therapeutic considerations. In the future, the pharmacist's scope may broaden with respect to patient care, allowing them to practise in a more independent manner. In many outpatient neurology clinics in the United States and the United Kingdom, collaborative practice agreements allow pharmacists to order and review results of blood work for monitoring of therapy.[7,9] The pharmacist's extensive role in DMT teaching has also been documented.[10] These initiatives may greatly benefit patients and the clinic team through the unification of medication management activities.

Additional studies are required to assess the impact of the pharmacist's role in MS care in terms of patient and provider satisfaction (i.e., through surveys, interviews) and to determine other concrete end points such as potential cost savings (e.g., reductions in medication-related adverse events, reductions in emergency department visits) or the acceptance rate for medication recommendations made by the pharmacist.

CONCLUSION

The results of this study highlight the potential benefit of pharmacist involvement on MS care teams. The pharmacist made several contributions to MS care, with the greatest proportion of time spent on patient care. The clinical tasks delegated to the pharmacist were congruent with her scope and training, highlighting the true need for the role. The pharmacist's involvement on the clinical team improved the efficiency and timeliness of care, which are 2 domains of high-quality health care. The full potential of the role has not yet been reached due to the early implementation stage, but these findings affirm the overwhelmingly positive effects of the pharmacist's role in MS care.

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Competing interests: Gabrielle Busque received a scholarship from the Consortium of Multiple Sclerosis Centers (CMSC) for travel to the organization's 2023 annual meeting, where this project was presented as a poster. In uncompensated roles not related to the study reported here, Sharon Lail was a member of the Viiv Digital Advisory Board (2022–2023) and was Secretary of the Canadian HIV/AIDS Pharmacists Network (CHAP) in 2023/24. No other competing interests were declared.

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APPENDIX 1: Electronic medical record template for clinical pharmacist documentation and capture of patient care activities directly within patients' charts.

The pharmacist has the ability to input free text (data, assessment/plan), as well as to make a selection with regard to the clinical pharmacy service provided. For "type of pharmacist assessment" (options designated with circles), the user must make a single selection. For "clinical pharmacy service provided" (options designated with boxes), the use can select as many as are applicable for the patient. D = data, A/P = assessment/plan, MS = multiple sclerosis.