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Rapid transfer of knowledge for multiple sclerosis clinical care during COVID-19: ECHO MS

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ABSTRACT

Background: Healthcare providers caring for people with multiple sclerosis (MS) have had significant concerns about the intersection of MS and COVID-19. As a result, there has been an urgency to understand and share information about how to best provide MS clinical care during COVID-19. The Project ECHO model is well-suited for this challenge, as it provides a uniquely efficient and effective approach to sharing information in real-time using real cases. We report on the translation of the Project ECHO model for the rapid sharing of knowledge among MS clinical providers during COVID-19.

Methods: The ECHO MS COVID-19 Response Clinic was a videoconference-based education and case consultation program offered to providers in the U.S. who care for individuals with MS. The Response Clinic was offered as four sessions, each delivered by three regional hubs. Data were collected on participation and the self-reported impact of the program.

Results: A total of 132 unique providers participated in the Response Clinic, which consisted of 11 didactic modules and 43 case consultations. Participant providers overwhelmingly indicated that the program improved their knowledge, attitude, and skills for providing healthcare for people with MS during the COVID-19 pandemic.

Discussion: The Project ECHO model was successfully adapted to serve the needs of the MS community during COVID-19, suggesting the program could be continued or could be expanded to other disease areas for a similar purpose. More research is needed to objectively measure the impact of the program on patient outcomes.

1. Introduction

In recent months, significant concerns have surfaced about the intersection of multiple sclerosis (MS) and the COVID-19 pandemic. (Giovannoni et al., 2020; Vishnevetsky and Levy, 2020; Willis and Robertson, 2020) These include concerns that individuals on immunosuppressive disease-modifying therapies (DMT) may be at higher risk for poor COVID-19 outcomes (Giovannoni et al., 2020; Vishnevetsky and Levy, 2020; Willis and Robertson, 2020) and questions such as whether people living with MS are at greater risk of poor outcomes due to their higher rates of comorbidities, limited mobility, and/or higher likelihood of living in care facilities relative to the general population. (Marrie and Horwitz, 2010; Marrie et al., 2012; National Multiple Sclerosis Society, 2020) In response to these concerns, a significant amount of rapid innovation has occurred to leverage technology to use remote or digital health modalities to optimize patient care in order to limit COVID-19 exposure risks and unfavorable health outcomes. (Lavorgna et al., 2018; Bonavita et al., 2020; Moccia et al., 2020)

Just as there has been real-time adjustment to clinical care for COVID-19, there has been a parallel effort to understand and share information among providers about how to best provide care for individuals living with MS during COVID-19. As that information quickly evolves, there is a need to share it efficiently and effectively, recognizing the myriad barriers to data sharing, including the urgency of time; the limited ability to share information at conferences, seminars, or workshops as in-person events are limited due to COVID-19 concerns; and the
importance of delivering information in a way that is relevant and useful to the audience. Moreover, in the absence of clear, empirically-supported guidelines, there is the need to not only transfer information, but truly have providers share and discuss information to provide peer-to-peer support and practical help with medical decisions on the cases they see in their clinical practices.

Project ECHO (Extension for Community Health Outcomes) is well-suited to overcome these barriers. Project ECHO is designed for the “movement of knowledge...not people”, leveraging videoconferencing technology to reach medical providers nationally or internationally to spread information via didactic modules and engagement in case consultations. In contrast to conferences and seminars, Project ECHO emphasizes a case-based learning model, as well as bidirectional shared learning between and among the participating experts and learners. The goal of Project ECHO is to learn through real-life cases, using Project ECHO sessions to make both patient- and practice-level improvements in care provided by program participants. Project ECHO was initially established to improve the quality of care for infectious diseases that had large disparities in outcomes between specialty and non-specialty settings (e.g., Hepatitis C, HIV (Arora et al., 2007; Arora et al., 2010; Arora et al., 2014; Colleran et al., 2012)). Empirical investigations of the Project ECHO model indicate a powerful effect on reducing disparities in quality of care, (Arora et al., 2011) sparking a rapid growth in the use of the model to 69 topics areas across over 1600 programs at the time of this writing. (University of New Mexico, 2020) This includes one prior translation of the Project ECHO model for management of patients with MS, which resulted in participants self-reporting improvement in perceived knowledge, expertise, and provider behavior. (Johnson et al., 2017; Alschuler et al., 2019) A related demonstration project also showed the model could be used to aid an international audience in improving their knowledge of DMTs for MS that were newly approved in their country but had been utilized for a number of years in the U.S. (Alschuler et al., 2016).

Project ECHO has been previously recommended as a model for facilitating the rapid sharing of knowledge during global health crises (e.g., Zika crisis (Heard-Garris et al., 2017)) and has preliminary evidence for utility with the MS healthcare community. Thus, the National MS Society sought to leverage the model to expedite knowledge sharing for the management of persons living with MS during the COVID-19 pandemic (“ECHO MS COVID-19 Response Clinic”). In this manuscript, we provide an overview of ECHO MS COVID-19 Response Clinic, and report on (1) participation in the program and (2) the self-reported effect of participating in ECHO MS COVID-19 Response Clinic on participants’ knowledge, attitudes, and clinical skill for providing MS care during COVID-19.

2. Methods

2.1. ECHO MS COVID-19 response clinic

Following from the success of the original MS Project ECHO, which was conducted regionally in the Northwest U.S., the National Multiple Sclerosis Society (NMSS) started preparing in late 2019 for the deployment of a national model for an MS-focused Project ECHO (“ECHO MS”) that could be leveraged to improve the quality of care for persons living with MS across the U.S. In the midst of that preparation, COVID-19 became the primary issue in healthcare worldwide. Seeking to support the NMSS’s mission to act with urgency, innovate, and continuously learn to help people with MS live their best lives, the decision was made to rapidly deploy a COVID-19-focused set of Project ECHO sessions (“ECHO MS COVID-19 Response Clinic”) to support the sharing of MS-focused knowledge related to the COVID-19 crisis.

Project ECHO is built on a hub and spoke model, with the presenting site(s) serving as “hubs” and participants as “spokes”. The NMSS worked in partnership with three hub sites distributed across the U.S. – Duke University (“East”), Washington University in St. Louis (“Central”), and University of Washington (“Pacific”) – to rapidly deploy the ECHO MS COVID-19 Response Clinic. Sessions were planned to run every other week as 60-90 minute sessions. Each session was scheduled to be delivered by each hub site on different days and times, providing participants the opportunity to choose a session that best suited their availability. The NMSS and three hubs collaboratively developed 15-20 minute didactic modules to be delivered at each session, covering topics such as DMT guidelines, telemedicine, employment resources, and updates from MS COVID-19 databases (see Table 1 for session-by-session detail). The remainder of each session was spent on case consultations and/or clinical practice questions which were collected from participating providers when they registered for each session. Thus, the content of the case consultations and clinical practice questions were designed to vary by site so as to be relevant to the unique subset of participants in each session.

Participating spoke sites were recruited by the National MS Society’s healthcare access team via personal contact and email advertisements sent to the NMSS’s large networks of MS specialists and community providers who care for individuals with MS. In contrast to prior MS Project ECHOs that focused on improving care provided by generalist neurologists or primary care providers who care for people with MS, the goal here was to rapidly share information among all providers who care for people living with MS. As such, recruitment included – and to some extent emphasized – providers with expertise in MS care and was open to physicians, physician assistants, nurse practitioners, clinical pharmacists, and any other clinical specialist who cares for individuals living with MS.

Participants signed up via online registration for sessions of their choice and were encouraged to bring a deidentified COVID-19-related case (e.g., treatment decision-making in the context of COVID-19, management of high risk patients, management of people with MS who are COVID-19 positive) from their practice for the case consultation portion of the sessions. Recruitment was conducted on a rolling basis, allowing new participants to enroll for any session. Recognizing that it was also unlikely that all participants would be able to or interested in continuing for all sessions, the program was designed with an expectation of a blend of new and returning participants in each session. There was no formal recruitment target, but Project ECHO sessions are typically suitable for up to 25 participants per session.

2.2. Measures

Multimodal data collection was carried out for the purposes of program evaluation. This included administrative data regarding program.

### Table 1

| Round | Topic | Hub Site | Participants | Cases reviewed |
|-------|-------|----------|--------------|----------------|
| 1     | DMT Guidelines & COVMS | Eastern | 25 | 1 |
| 2     | DMT Guidelines, Telemedicine, COVMS | Central | 19 | 5 |
|       |       | Pacific  | 23 | 3 |
| 3     | DMT Guidelines, COVMS data, Employment Resources for Patients | Eastern | 19 | 3 |
| 4     | COVID-19 MS data, COVID-19 registries, AMA guidelines for reopening clinics | Central | 10 | 7 |
|       |       | Pacific  | 17 | 3 |
|       |       | Eastern  | 16 | 2 |

Note: Hubs: Eastern = Duke University, Durham, NC; Central = Washington University, St. Louis, MO; Pacific = University of Washington, Seattle, WA.
participation and participant self-report data on the experience and impact of participation:

**Participation data.** The National MS Society’s program coordinator tracked the participants in ECHO MS COVID-19 Response Clinic sessions, including who joined each session, what topics were the focus of the didactics, and what cases were presented. Data were tracked with the iECHO database, a tool offered by Project ECHO® to track program administrative data.

**Self-report data.** All participants were asked to complete a program evaluation survey after each session they attended on the SurveyMonkey platform. Participants rated the extent to which participating in ECHO MS COVID-19 Response Clinic impacted their knowledge of MS care, attitude about providing healthcare for people with MS, and skills for providing healthcare for people with MS during the COVID-19 pandemic; and inspired them to change their clinical practice. They also rated the quality of their overall experience and their interest in attending future ECHO MS COVID-19 Response Clinic sessions.

### 2.3. Data analysis

Participation data were examined via the Project Echo iECHO platform. Basic descriptive data were tabulated for session participation by site and in total, including attendance, topics covered, and case presentations. Participant self-report data were downloaded from the SurveyMonkey platform and were examined for completeness or other obvious errors. Means were calculated for self-reported impact on knowledge, attitudes, and clinical skill, as well as the perceived impact on changes in clinical practice.

### 3. Results

#### 3.1. Participation

The ECHO MS COVID-19 Response Clinic was delivered over 4 rounds, with each round offering similar sessions delivered by each hub (e.g., Round 1 was run three times, once by Duke University, once by Washington University in St. Louis, and once by the University of Washington). The sessions started on April 7, 2020 and were spaced approximately two weeks apart. The first two sessions were 90 minutes and the latter sessions were 60 or 90 minutes, depending on the hub site. The final session was run on May 27, 2020. A total of 132 unique attendees participated as spokes, with the average participant attending 1.51 sessions. The majority of participants were MDs (67%), with other attendees participating as spokes, with the average participant attending 1.51 sessions. The majority of participants were MDs (67%), with other participants being nurse practitioners (13%), physician assistants (9%), pharmacists (6%), and other (5%; psychologists, occupational therapists, students). Participation ranged from 7 to 25 spoke participants per session, with average attendance of 16.58 per session. A total of 43 cases were reviewed (3.58/session). (See Tables 1 and 2.)

#### 3.2. Self-reported impact and experience

A total of 100 responses were collected from a possible 199 session participants (50.3% response rate). The majority of spoke participants reported that participation in the ECHO MS COVID-19 Response Clinic improved their knowledge of MS care during the COVID-19 pandemic (58% strongly agree, 37% agree), attitude about providing healthcare for people with MS (53% strongly agree, 39% agree), and skills for providing healthcare for people with MS during the COVID-19 pandemic (56% strongly agree, 32% agree). Approximately 52% reported that participation in the ECHO MS COVID-19 Response Clinic inspired them to change their clinical practice. Participants indicated a positive experience with the sessions, with 87% reporting an above average overall experience. (See Fig. 1)

Qualitative feedback was uniformly positive. A high percentage of comments emphasized the uniquely interactive aspects of the model: “Great talk. I loved how interactive this was.” “This was an excellent seminar – well balanced and with a platform that allowed interactions on multiple levels.” Others noted an interest in continuing the program: “Please continue this series” … “This was great, let’s keep doing this.”

### 4. Discussion

During the COVID-19 pandemic, the ability to rapidly share new and evolving knowledge about best practices in MS-focused healthcare is critical to maintaining the wellbeing of the approximately 1 million individuals living with MS in the U.S. (Wallin et al., 2019) As reported here, the use of the Project ECHO model to deliver the ECHO MS COVID-19 Response Clinics was met with good participation, positive self-reported outcomes, and qualitative feedback supporting both the delivery model and the possibility of continued sessions. In contrast to traditional models of information transfer, such as conferences or webinars, Project ECHO provided an opportunity for providers to apply knowledge to existing cases through the case-based learning model, allowing it to be a particularly efficient model for knowledge sharing during the urgency of the global pandemic.

As anticipated, the ECHO MS COVID-19 Response Clinic was feasible and well-received. Recruitment was carried out over a short period of time but leveraged the National MS Society’s healthcare access team’s network of connections. The significant demand for this information to yield 67 participants for the first round of sessions with less than 2 weeks of recruitment. Participation remained good throughout the program, but did steadily decrease in parallel to the decrease in novel information emerging about COVID-19 after the first few months.

Participants overwhelmingly indicated that the program improved their knowledge, attitude and skills related to providing healthcare for people with MS during the COVID-19 pandemic. This is consistent with the variety of peer-reviewed publications that have reported on program evaluation data from Project ECHOs. (Arora et al., 2007; Arora et al., 2016; Arora et al., 2014; Colleran et al., 2012; Johnson et al., 2017; Alschuler et al., 2019) With that said, participants indicated a greater benefit in knowledge, attitude, and skills relative to the likelihood that it would change their clinical practice. While we initially viewed this as an unexpected finding, we recognized that participants in this particular series of sessions were primarily experienced MS providers who were generally already aligned in their perspectives but were seeking confirmation or consensus in an environment of significant uncertainty. This stands in stark contrast to the vast majority of Project ECHOs, including our prior efforts in MS, where the model is typically used to transfer knowledge to providers with less specialized knowledge or expertise about the target condition.

There were a number of unique elements of this deployment of the Project ECHO model that reflects favorably on the flexibility of the

### Table 2

| Hub Site | Total attendees | Unique attendees | Attendees per session | Sessions per unique attendee | Case presentations | Didactic topics | Didactic presenters |
|----------|-----------------|-----------------|-----------------------|-----------------------------|-------------------|-----------------|-------------------|
| Eastern  | 82              | 50              | 20.5                  | 1.64                        | 10                | 11              | 3                 |
| Central  | 43              | 31              | 10.75                 | 1.39                        | 18                | 11              | 3                 |
| Pacific  | 74              | 51              | 18.5                  | 1.45                        | 15                | 10              | 3                 |
| Total    | 199             | 132             | 49.75                 | 1.51                        | 43                | 32              | 9                 |

**Note.** Hub: Eastern = Duke University, Durham, NC; Central = Washington University, St. Louis, MO; Pacific = University of Washington, Seattle, WA.
model. First, as indicated above, we were able to use the model to rapidly transfer and share knowledge in this case among a group of experienced MS providers. Whereas Project ECHO has largely been focused on reducing disparities in care, here the focus was on developing greater consensus among experts, suggesting the model can be adapted for different situations based on the context and objectives. Second, the Project ECHO model is typically built on consistent participation over a series of sessions, during which the hub and spokes build relationships that support a learning community. Given the rapid deployment of the model during a particularly chaotic time in healthcare, there was little opportunity to build those relationships here as most individuals attended only one or two sessions. We believe that the facilitators mitigated the negative impact of this by devoting extra effort to facilitating discussion as opposed to expecting organic discussion to arise from established relationships. Third, while the ECHO MS COVID-19 Response Clinic used a traditional hub and spoke model, it was run by the NMSS, who served as a “shared services hub”. This unique approach to Project ECHO positions the NMSS as the coordinating center for the program where participants have voluntarily signed up for the experience.

While we report on the ECHO MS COVID-19 Response Clinic with great enthusiasm, we also recognize the limits of the supporting data. First, there is undoubtedly a selection bias, as is the case with any program where participants have voluntarily signed up for the experience. Spoke participants were providers who were interested and motivated to participate in the ECHO MS COVID-19 Response Clinic, increasing the likelihood that they would rate the program beneficial and impactful. Moreover, only 51% of participants responded to the survey, which may further bias the results. Second, this was not a rigorous trial, there was no comparison condition, and data were primarily self-report. Analysis was limited to data available from program evaluations. This educational program was purposefully open to any health care providers engaged in MS care; no data were collected on the quantity or nature of the patients cared for in participant providers’ practices, although we can anecdotally report that the vast majority of participants were heavily engaged in MS clinical care. In general, the literature on Project ECHOs is disproportionately comprised of this type of program evaluation data, with a small subset of data collected on objective outcomes. Future research on the Project ECHO model should move towards this higher standard of research, including research that identifies the impact of the Project ECHO model on patient outcomes. In summary, we found the Project ECHO model to be a suitable model for the transfer of knowledge among MS specialist providers during the COVID-19 pandemic. The model successfully attended to the urgent need for information sharing, rapidly transferring knowledge to MS providers across the U.S. The ease of participation, coupled with a format that emphasizes discussion and application to real cases was engaging and was met with positive feedback from participants. This is now the third iteration of an MS-focused application of the model, with prior efforts focused on non-MS specialist providers (Johnson et al., 2017; Alschuler et al., 2019) and an international audience. (Alschuler et al., 2016) All have achieved similarly positive self-reported and qualitative results, suggesting further development of the model in the MS community may be worthwhile. However, as with the Project ECHO movement at large, there remains a significant need for research on the objective impact of participation on provider behavior and, ultimately, on patient outcomes.

Disclosures

The authors have no disclosures relevant to the study described in the submitted manuscript

Authors’ contribution

Kevin Alschuler: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Supervision; Validation; Roles/Writing - original draft, review & editing. Gloria von Geldern: Conceptualization; Project administration; Roles/Writing - original draft, review & editing. Darren Ball: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Roles/Writing - original draft, review & editing. Kathleen Costello: Conceptualization; Funding acquisition; Project administration; Roles/Writing - original draft, review & editing. Mark Sken: Conceptualization; Roles/Writing - original draft, review & editing. Salim Chahin: Conceptualization; Roles/Writing - original draft, review & editing.
& editing. **Annette Wundes:** Conceptualization; Project administration; Roles/Writing - original draft, review & editing.

**Declaration of Competing Interest**

The authors declare no conflicts of interest

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