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INNOVATION HIGHLIGHT

Rationale and Design of an Endocrinology Education Program for Primary Care in Maine: Initiation of MaineHealth Endo ECHO

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Introduction: Primary care practices manage common endocrine disorders with population health and quality of care initiatives that often include algorithmic and protocol-driven workflows. Endo ECHO® (Extension for Community Healthcare Outcomes) is a division of Project ECHO, a program that engages primary care physicians (PCPs) in didactic presentations and case discussions to augment conceptual (experiential, nuanced) rather than algorithmic (rote) learning.

Methods: MaineHealth Endo ECHO was designed using the Project ECHO model, which facilitates interactive learning opportunities by connecting specialty providers and PCPs to share best practices for delivering care via video-conferencing. Using a hub-and-spoke model, providers connect for an hour each month in sessions comprising a short didactic component and a 45-minute case presentation and discussion. For MaineHealth Endo ECHO, Maine Medical Partners Endocrinology and Diabetes Center served as a subspecialty hub that engaged eight spoke sites at eight hospitals in Maine and New Hampshire. In video-networked clinics, participants engaged in a didactic presentation providing state-of-the-art information on managing endocrine disorders followed by a discussion of complex patients presented by PCPs from spoke sites. Participants were evaluated for changes in their knowledge and confidence after the sessions.

Results: Feedback from surveys of PCPs at spoke sites revealed an improvement in knowledge of the topic and when to consult with a specialist, and increased confidence managing the care of the case.

Conclusions: Endo ECHO was successfully introduced as a feasible and sustainable program in Maine that improved physician knowledge and confidence. This program may be replicated for other specialties.

Keywords: population health, primary care, curriculum, endocrinology, program replication

To standardize care and prevent medical errors, quality initiatives in medicine that involve checklists and algorithms have been introduced with increasing frequency.[1] Execution of these quality measures requires clinicians to engage in algorithmic learning, which involves rote memorization and incorporation of workflow algorithms that adhere to accepted guidelines. Algorithmic learning does not prepare clinicians to manage patients who do not fit the criteria of the algorithm or who do not respond to application of the algorithm. Handling of these nuances and exceptions requires conceptual learning. Project ECHO® (Extension for Community Healthcare Outcomes) is a collaborative model of medical education generated at The University of New Mexico (UNM). The model promotes conceptual learning by combining didactic teaching and case-based discussion among specialists at "hub" sites and primary care physicians (PCPs) at "spoke" sites.[2]

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Project ECHO recognizes the truth of Meno's Paradox, an ancient Greek description by Plato. Socrates suggested that he and Meno search for an answer together. Meno replied, "How can you

search for something when you do not know what it is? You do not know what to look for, and if you were to come across it, you would not recognize it as what you are looking for."[3] In medical practice, it does not make sense for a clinician to follow a checklist or algorithm when he or she does not understand the disease they are treating. A better alternative is case-based, interactive learning among specialists and PCPs before the PCPs follow a checklist or algorithm. For example, in an endocrinology setting, a PCP could learn about thyroid nodules, the variation in their behavior and appearance on ultrasound, and the likelihood of malignancy for a patient, all before applying an algorithm to determine whether to refer the patient to a specialist or follow up with them in the primary care office.

Project ECHO was started with a focus on virology, specifically Hepatitis C, by Dr. Sanjeev Aurora in New Mexico. Similar to Maine, New Mexico is a rural state with a shortage of liver-disease specialists. Dr. Arora was unable to treat all patients with Hepatitis C, so he created this telehealth method to build capacity for regional providers to treat many of their Hepatitis C patients locally.

Project ECHO has since grown to address dozens of complex conditions. Unlike telemedicine, in which the specialist would assume care of the patient, Project ECHO is a form of telementoring in which the originating provider builds capacity and maintains care for the patient. Since Maine has rural attributes similar to New Mexico, the state can benefit from a model that spreads knowledge and builds capacity to care for patients locally by decreasing both the need for patients to travel and the wait time for more complex patients at specialty care.

An endocrinology version of Project ECHO (Endo ECHO) began in New Mexico in 2014. This division engages PCPs in learning the concepts required to manage difficult patients with endocrine and diabetes disorders.[4] To make advanced care of endocrine and diabetes disorders more available in Maine communities, the MaineHealth (MH) Center for Health Improvement, MH Telehealth, and Maine Medical Partners Endocrinology and Diabetes Center (EDC) partnered to initiate a hub for Endo ECHO within the state.

METHODS

MH and EDC initiated an Endo ECHO hub in Maine on October 3, 2017. The creation of the hub required learning the Project ECHO model, determining the achievable structure of the ECHO replication locally, creating a draft curriculum, identifying interested spoke sites, determining the session schedule and content with spoke sites, optimizing videoconference technology, and completing "dry-run" practice sessions.

Learning the Project ECHO model

A physician facilitator of Endo ECHO was identified at the EDC. Seven months before the first educational session, the facilitator engaged Endo ECHO replication specialists at UNM.[5] Parameters of each ECHO session include a 15-minute didactic topical presentation followed by a longer period of case presentations and a question-and-answer session. MH sent a representative from the Telehealth team to UNM for an ECHO immersion experience. The EDC and MH representatives met to discuss the requirements for Project ECHO, the goals of replication in Maine, and details about replicating a hub site in Maine.

Determining the achievable structure of an Endo ECHO hub site in Maine

EDC clinicians approved a duration and schedule for ECHO sessions. The MH team surveyed PCPs for potential interest in Endo ECHO participation and queried the clinicians about the optimal duration, frequency, time, and day of the week for sessions. Clinicians were recruited based on their affiliation with the diabetes workgroup that convened through the MH Center for Health Improvement. The diabetes workgroup was focused on supporting providers in better managing diabetes patients. Clinicians were also recruited through affiliations with the MH Accountable Care Organization.

Curriculum development

The curriculum structure was based on that used in the Endo ECHO program at UNM. It contained topic "blocks", including a Diabetes Block, Thyroid Block, Bone and Calcium Block, and General Endocrinology Block that progressed over one year.

Videoconference technology

Project ECHO requires minimum technology for video-conferencing. The EDC ("hub") installed

a large video screen, camera, and microphone system in its diabetes classroom. Participating PCPs at spoke sites used existing cameras and microphones on computers, or they purchased basic cameras for desktop computers as needed. MH trained users at spoke sites as needed.

Endo ECHO started using "Vidyo" software and then transitioned to using Zoom technology, which is used by most ECHO projects nationwide.

Dry-run sessions

Two practice sessions were completed in the month before starting the ECHO curriculum. The first included MH Telehealth professionals to assure the function of the video network. The second included participants at primary care spoke sites. A member of the Project ECHO team at UNM joined one of the early sessions with the spoke sites to provide feedback on the conduct of the session.

Personnel of the Endo ECHO program

Personnel required for the ECHO program included a clinician facilitator (moderator of each session); an administrative coordinator; program management to ensure compliance with the ECHO model and act as liaison between the hub site and the spoke sites; a telehealth coordinator for maintaining the video network; specialist didactic presenters; and PCP participants.

Funding of the MaineHealth Endo ECHO program

While many ECHO programs seek and obtain grant funding to cover the time commitment of facilitators, administrative coordinators, program management, primary care participants, and information technology professionals, the MH Endo ECHO program was funded entirely by in-kind contributions of equipment and effort by the EDC, participating primary care practices, MH Center for Health Improvement, and MH Telehealth.

Using the ECHO model does not require up-front costs. MH Telehealth has a contract with UNM to implement Project ECHO that grants access to shared program resources and materials. The UNM provides Zoom access to all ECHO projects at no cost.

The technology costs were also minimal. At the hub site, a video camera, microphone system, and a flat-panel display (screen) were required. The approximate cost for the camera was $1,300. Additional costs were incurred if a newer screen was desired. At the spoke sites, a simple camera and headset/audio was needed. Most laptops or iPads were equipped with a built-in camera. For desktops, a camera was purchased for approximately $60. An existing headset or phone line could be used for audio.

Session schedule

MH Endo ECHO sessions occurred once a month from 7:30 to 8:30 am. Each session began with introductions and attendance for 5 minutes, and then moved into a didactic presentation for 15 minutes, question-and-answer session about the didactic topic for 10 minutes, and one to two case presentations with discussion for 30 minutes. These sessions are less frequent and shorter than the clinics in the Endo ECHO at the UNM, where 2-hour sessions occur weekly.

Session content

Following the Project ECHO model, the topic of each didactic presentation and the content of case discussions are not concordant.

Session logistics

PCPs at spoke sites submitted patient cases between sessions. The cases were entered on a simplified entry form using REDCap software. If cases were not submitted, the administrative coordinator solicited cases from the PCPs 1 to 2 weeks before the next ECHO session. They also sent an email invitation with a link to the Zoom session (video link) on the day before the ECHO session. The day after the session, the coordinator sent an email with a link to an evaluation for continuing medical education (CME) to all participants.

Feedback

Apart from CME evaluations, the health-network liaison sent a survey semiannually to evaluate spoke participants' self-efficacy in endocrinology and diabetes, and to solicit opinions on modifying the curriculum.

Evaluation

After every session, a retrospective evaluation was administered to all participants asking them to assess their knowledge and confidence before and

after the day's session. The three primary evaluation questions were: 1) pre-/post-session self-estimation of knowledge about the endocrinology/diabetes topic discussed (i.e., advanced knowledge, moderate knowledge, minimal knowledge, or no knowledge); 2) pre-/post-session self-estimation of knowledge about when it is appropriate to consult with a specialist for the case(s)/condition(s) presented in the ECHO session (i.e., advanced knowledge, moderate knowledge, minimal knowledge, or no knowledge); and 3) pre-/post-session confidence of the participant in their ability to manage the care for the case(s)/condition(s) presented (i.e., extremely confident, fairly confident, somewhat confident, or not at all confident).

For all three measures, we evaluated the magnitude of change in knowledge or confidence pre- to post-session [how many responses stayed the same (0), moved up one (1) or two (2) levels, or decreased (-1)].

RESULTS

The MH ECHO program conducted monthly sessions continually for one year between October 2017 and September 2018. An average of 13 participants attended each session, with between 8 and 19 participants attending each session. A total of 36 unique participants attended at least one session; 8 of those only attended one session.

There were 91 evaluation surveys completed over the 12 months. Twenty-five participants completed at least one survey and contributed to the data (Figure 1A). The average response rate for each session was 60%.

Regarding knowledge of the topic (Figure 1B), 64% of responses showed no change in knowledge, 35% showed an increase in knowledge (magnitude of change was 1), and 1% showed a greater increase in knowledge (magnitude of change was 2).

Regarding knowledge about when to consult with a specialist (Figure 1C), 64% of responses showed no change post-session, 33% showed an increase in knowledge of when to consult post-session, and 2% showed a more significant increase in knowledge of when to consult post-session. Only one response reported a decrease in knowledge of when to consult post-session.

Regarding confidence in the ability to manage the case presented (Figure 1D), 52% of responses showed no change post-session, 45% showed an increase in confidence to manage the case presented, and 3% showed a more significant increase in confidence in ability to manage the case presented.

DISCUSSION

Endo ECHO was the first application of the Project ECHO model in Maine. We found that Endo ECHO effectively increased the knowledge and confidence of PCPs in understanding endocrinology concepts and patient management. After participation, clinicians reported an improvement, categorized as advanced or moderate knowledge and confidence almost without exception.

Our experience is consistent with other reports showing that case-based learning effectively increases knowledge and confidence in healthcare professionals.[6] Though the superiority of case-based learning to other educational methods remains controversial, the case discussion method used in Project ECHO was more enjoyable to the learner than lecture alone.

We found that starting a Project ECHO hub site requires approximately one year of planning from the time the local ECHO program is considered until the first sessions begin. We expect that once systems are in place, planning for subsequent ECHO projects will take less time because each project can build off of previous lessons learned.

We learned that building a hub site is a team effort. While support of the team requires funding, we funded MH Endo ECHO with in-kind contributions of time from the MH Center for Health Improvement, MH Telehealth program, and EDC, as well as from the individual primary care practices that set aside clinician time for participation. We recommend engaging a project manager within the health system to assure timely progress with planning, assist with outreach to potential spoke sites, and to engage experts in nonclinical areas (e.g., video-network technology) as needed. Simultaneously, a clinician specialist should be identified as a facilitator and organizer of sessions, and an administrator should be appointed to orchestrate scheduling, case submission, continuing medical education, and communication with spoke sites.

The strength of the MH Endo ECHO program was its ability to complete more than one year of ECHO sessions with good spoke participation, despite use of in-kind rather than earmarked funding. The sustainability and favorability of the program is likely due to the involvement of spoke participants in planning session frequency and timing. The allocation of CMEs also likely helped engage clinicians in participating.

Other strengths or "value-add" components that were mentioned throughout the year included: PCPs feeling less isolated in their practice, PCPs having a direct and more personal connection with a specialist, specialists experiencing a personal connection with PCPs and clinicians via video/phone.

Weaknesses of the program include its low frequency of sessions, which limited the number of topics that could be addressed and did not allow time to discuss all topics of interest to spoke participants. In the future, we plan to increase our session frequency through a new MH Endo ECHO focused on diabetes management.

MH Endo ECHO had considerable in-kind funding. While this funding was an asset to the program, it could also create a barrier if there is not leadership support for implementation and participation.

In future work, we will collect data on actual acquired clinical information and whether MH Endo ECHO modifies clinical outcomes in Maine patients.

Figure 1A - 1D. Evaluation results from participants after attending ECHO sessions. Data reflect 91 responses from 25 participants over 12 ECHO sessions in 12 months.

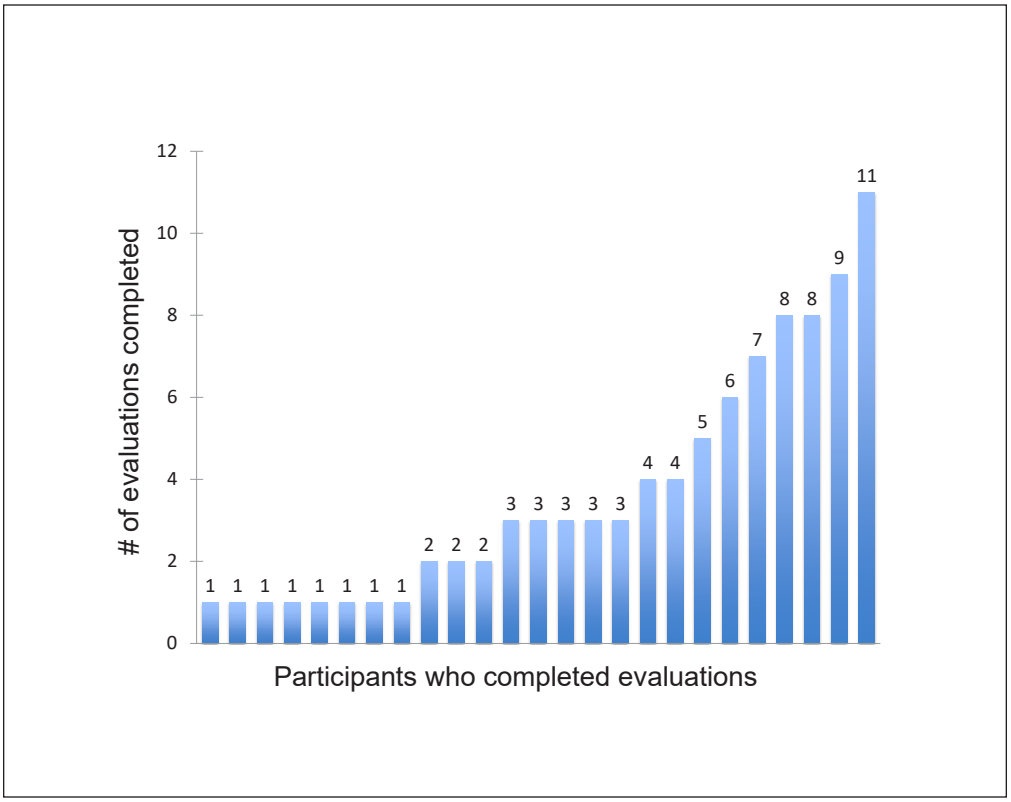

Figure 1A. Number of participants completing evaluations and number of evaluations per participant.

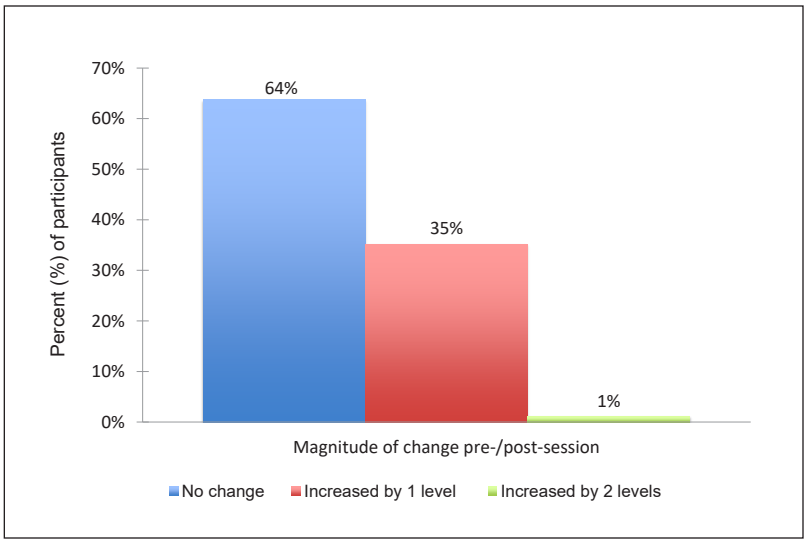

Figure 1B. Change in knowledge about the topic presented.

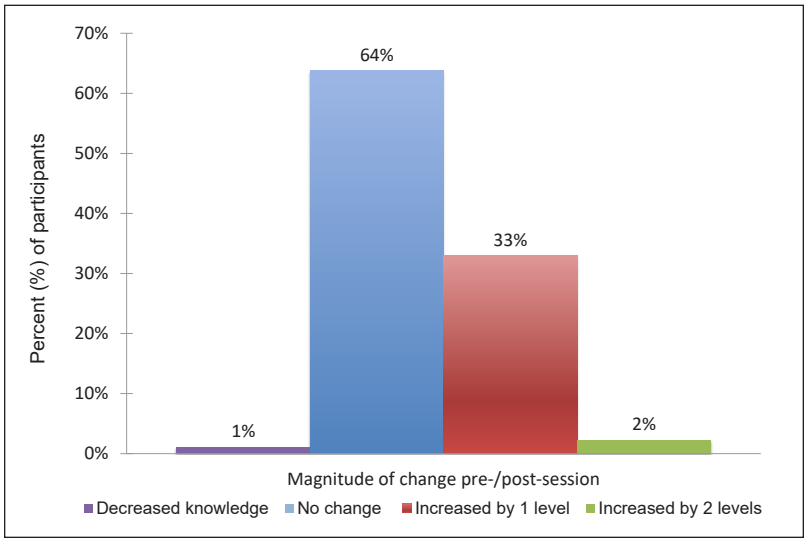

Figure 1C. Change in understanding of when to refer for endocrinology consultation.

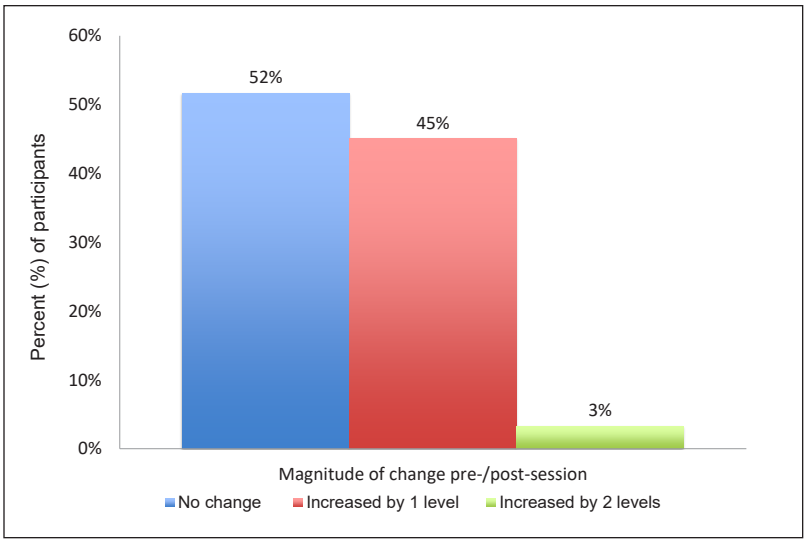

Figure 1D. Change in confidence in managing patients.

CONCLUSIONS

MH Endo ECHO was an effective replication site for Project ECHO in Maine. The project was proven feasible, sustainable, and capable of improving clinician knowledge and confidence.

Conflicts of Interest: None

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