

Project ECHO demonopolizes knowledge from expert specialists in academic centres to healthcare professionals in rural areas

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Abstract

Physicians working in rural areas face challenges to keep up-to-date knowledge and skills, to form a community of practice to share resources, and to collaborate interprofessionally. Continuous medical education is available to doctors in the form of conferences, small group discussions, self-learning, and online accredited activities. However, these are usually not directly and immediately applicable to the complex problems that physicians encounter in practice. Project Extensions for Community Healthcare and Outcomes (ECHO) uses weekly sessions of videoconferences where an interprofessional group of specialists (the hub) is available to healthcare professionals working in rural, remote, and underserved areas (the spokes) to exchange knowledge. During these sessions, one member of the hub gives a short didactic presentation, followed by spokes who present their most challenging cases to the whole community for discussion and recommendations. ECHO was developed at the University of New Mexico for treatment of hepatitis C virus infection in 2004, and started in Canada for chronic pain and opioid stewardship in 2014. Research has shown that ECHO is effective in improving spokes' knowledge and to increase access to specialist care in remote areas. ECHO has expanded to 150 partners in the United States, 14 in Ontario, and internationally to 33 countries.

Healthcare professionals working in remote, rural, and underserved areas face challenges to keep up-to-date with medical knowledge and to maintain the skills necessary to treat complex cases. Moreover, practicing in rural settings requires additional training and experience that is unique to the reality of patients living in rural communities. Canadian medical doctors

are expected to demonstrate abilities in seven different roles according to the CanMEDS framework: medical expert (integrating role), communicator, collaborator, leader, health advocate, scholar, and professional.¹ Maintaining competency as medical expert and scholar requires ongoing lifelong commitment to excellence in practice through continuous learning and by teaching others, evaluating evidence, and contributing to scholarship. How a medical doctor achieves these competencies depends on the available resources to them and their commitment to the quality of care they provide to each and every patient they see.

Doctors, both family physicians and specialists, need to maintain their certification through continuing medical education (CME) and submit them to their respective colleges: The College of Family Physicians of Canada (CFPC) and the Royal College of Physicians and Surgeons of Canada (RCPSC). Activities that are eligible for CME usually are offered in grand rounds, conferences, lectures, workshops, or small group discussions. Doctors who work in rural or remote areas need to take time off their practice to travel and attend these CME activities or to register for online accredited activities. Although online activities offer the advantages of convenience and low cost, they usually lack the interpersonal effectiveness so necessary to the learning process. CME activities often involve a didactic lecture by an expert, and 20–25% of the time is devoted to interaction, questions, and discussion. Most doctors select CME activities that are within their areas of interest and based on their own perceived needs. However, there are many unrecognized educational needs that physicians are often unaware of until they are reviewed by an external colleague or by a College assessor.

Learning medicine involves more than reading textbooks, watching PowerPoint presentations, asking smart questions, and passing exams. There is something more that happens at the patient interaction that enables the application from theory to practice, a process that solidifies knowledge. Having a difficult and challenging case is what sparks curiosity and leads to a deep dive in medical textbooks, PubMed, or Dr. Google. When these strategies do not answer all questions, the doctor usually asks someone else – they might pick up the phone, send a text message, or shoot an email to a trusted mentor, someone who knows the answer, or knows someone who can find the answer. This type of peer-to-peer interaction is also important to maintain job satisfaction and one's perceived self-efficacy and competency.

In today's practice of medicine, being a doctor also involves working with other professionals in a collaborative manner. This is so important that interprofessional collaboration (IPC) is regulated under the Canada's Health Professions Regulatory System.² In 2007, the colleges were required to promote IPC, and in 2009,

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the colleges had to develop standards of knowledge, skill, and judgment relating to the performance of shared controlled acts and to incorporate IPC into their quality assurance programs. Learning to work interprofessionally is essential to the professional career of a medical doctor, and this learning may be even more important in rural and remote areas where there are fewer doctors.

What is Project ECHO?

ECHO stands for Extensions for Community Healthcare and Outcomes, and this project was created to meet the needs of healthcare professionals who need the knowledge and skills necessary to treat complex patients right where they live.³ Often, these healthcare professionals live in rural, remote, or underserved communities. Project ECHO started in the state of New Mexico with Dr. Sanjeev Arora, a gastroenterologist expert in the treatment of hepatitis C virus infection (HCV). In 2004, there were more than 30,000 people infected with HCV in New Mexico who had no access to a specialist for treatment. The primary care clinicians and general practitioners were not trained to diagnose, treat, or manage these cases and therefore were not treating anyone. The most afflicted populations of patients either lived in rural areas or were incarcerated. Only a minority had access to the complex treatments of the academic clinic at the University of New Mexico (UNM) in Albuquerque where Dr. Arora works.⁴

Project ECHO links expert specialist interprofessional teams at an academic hub with healthcare professionals working in rural, remote, and underserved areas. Every ECHO session involves a short didactic session given by an expert in the hub team, followed by case-based discussions of de-identified real cases presented by the spokes. The case discussion involves rich discussion of the patient case, involving iterative discussions of clarifying questions and recommendations. ECHO facilitates the development of a community of practice where specialists and healthcare professionals

share knowledge and expertise. The hub team is composed of an interprofessional team of experts who are modelling IPC. In ECHO, everyone learns and everyone teaches.⁵ Figure 1 shows the hub-and-spoke model.

A prospective cohort study compared the patients treated at Dr. Arora’s HCV clinic with those treated by primary care clinicians at 21 ECHO sites in rural areas and prisons in New Mexico. The results showed that 57.5% of the patients treated in the academic HCV clinic and 58.2% of those treated at the ECHO sites had a sustained viral response. Serious adverse events occurred in 13.7% of the patient at the UNM HCV clinic and in 6.9% of the patients at ECHO sites.³ These results showed that the ECHO model was an effective way to teach rural doctors how to treat HCV infection in underserved communities.⁶

ECHO in Canada

The first replication of ECHO in Canada was for chronic pain and opioid stewardship in 2014, funded by the Ontario Ministry of Health and Long Term Care (MOHLTC).⁷ The goal of the ECHO chronic pain and opioid stewardship is to increase healthcare professionals’ competence and confidence in managing chronic pain, with or without opioids. The interprofessional team is represented by psychiatry, pain medicine, neurology, addiction medicine, family medicine, psychology, nursing, social work, physical therapy, occupational therapy, pharmacy, chiropractic, clinic librarian, and telemedicine technicians. This ECHO was evaluated by 3 focus group discussions⁸ and pre- and post-ECHO questionnaires.⁹

Since 2014, there has been a lot of interest in the replication of ECHO in Ontario and in other provinces. As of January 2019, there are ECHOs for a variety of conditions and diseases in Ontario as follows: autism, obsessive compulsive disorder, addiction medicine and psychosocial interventions, chronic pain and opioids (south), chronic pain and opioids (north), First Nations, Inuit, and

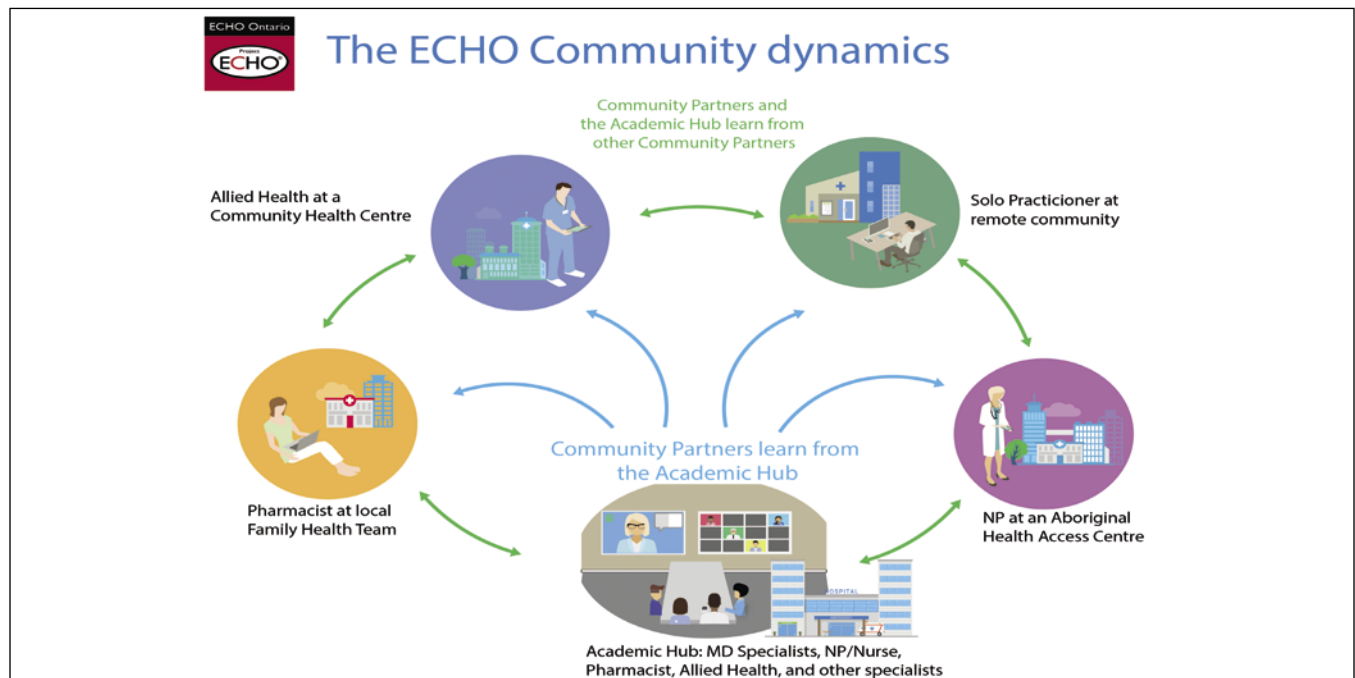


Figure 1. ECHO hub-and-spoke model.

Metis wellness, mental health and addictions,¹⁰ rheumatology, liver, child and youth mental health, pediatric, care of the elderly, epilepsy, and trans and gender diverse healthcare.

A systematic review published in 2016 evaluated the impact of the worldwide Project ECHO on participant and patient outcomes.¹¹ The authors found 39 studies addressing 17 medical conditions. Thirteen studies contained data from surveys and/or semi-structured interviews. In all 13 studies, participants indicated a high level of satisfaction with the educational program. Seven studies measured the change in patients' health status after Project ECHO implementation for HCV, dementia, and diabetes. These studies demonstrated benefits to sustained viral response for HCV, significantly lower restraint levels in long-term care residents with dementia, and improvements in the levels of glycosylated hemoglobin values of patients in a diabetes clinic. Two studies assessed the economic effects of ECHO and found that Project ECHO cost an average of \$8,300 per quality-adjusted life year gained, concluding that ECHO is a cost-effective program. In addition, another study for chronic liver disease showed that patients saved an average of 187 travel miles per person for a total of 28,597 miles saved. In summary, this review showed that the ECHO program was well received, changed patient outcomes, and can be cost-effective.¹¹

ECHO has some challenges and disadvantages. The focus group discussions conducted with participants in Ontario showed that time constraints were a barrier to participate in ECHO and some people encountered issues with the virtual connection, a problem that was later resolved. There were challenges to attract physicians to attend the weekly sessions, and most of the participants were nurses, pharmacists, and other allied health professionals.⁸

Future Directions

Medical knowledge is increasing at exponential rates. In 1950, medical knowledge doubled every 50 years, which decreased to 7 years in 1980, and 3.5 years in 2010. It is expected to double every 73 days by 2020.¹² While doctors are not expected to know all medical knowledge all the time, working with other professions enables knowledge to be acquired, transferred, and applied at a much more efficient and speedy rate. To cope with the growing amount of knowledge, ECHO is an ideal platform to demonopolize knowledge from a few specialists to a large group of front-line healthcare practitioners, starting in medical school curricula and post-graduate residency programs.

There is a need for high quality interprofessional collaboration (IPC) education, in which various professions learn together with the goal of cultivating a collaborative practice for providing patient-centered healthcare.¹³ ECHO offers an opportunity to practice and model IPC for each case that is discussed during the sessions.

Another future direction is the use of ECHO to implement clinical practice guidelines in rural areas. Every year, there are hundreds of clinical practice guidelines that are published or updated. It is almost impossible for every family doctor or general practitioner to keep abreast of every guideline. However, they are required by regulatory agencies to practice at the highest standards and to maintain competency, which is usually measured by the latest published guideline.

The future mission of Project ECHO will be to fill the gaps in many of these areas by:

- Improving access to expert specialist care in many isolated communities

- Rapidly disseminating knowledge to healthcare professionals at the right time, without moving people
- Increasing medical knowledge, awareness of clinical practice guidelines, and resources
- Reducing disparities and inequalities that are due to unequal knowledge among healthcare professionals
- Promoting consistent, evidence-based, and high-quality care
- Decreasing isolation, and improving self-efficacy, job satisfaction, and retention of highly qualified professionals in rural areas.

Conclusions

Being part of an ECHO community allows each participant (hub members or spokes) to do what they do best and maintain a better work-life balance. Participants are more aware of their own knowledge gaps and they allow others to ask them what they need. ECHO enables an environment where it is acceptable not to know the right answer, as well as to enjoy colleagues and celebrate each other's successes. The ECHO movement is growing very fast. Currently, there are more than 150 partners replicating ECHO in the United States, and another 95 partners in 33 countries.¹⁴ The goal of ECHO worldwide is to touch 1 billion lives by 2025.

Acknowledgements

Dr. Furlan would like to acknowledge Jane Zhao for editing this commentary and Ralph Fabico for creating the figure. Dr. Furlan would like to acknowledge funding from the Ontario Ministry of Health and Long-Term Care for Project ECHO, and the Canadian Institutes for Health Research (CIHR) for funding the research of ECHO.

References

1. Rourke J, Frank JR. Implementing the CanMEDS physician roles in rural specialist education: The multi-specialty community training network. *Educ Health (Abingdon)*. 2005;18(3):368–378. doi: 10.1080/13576280500289413.
2. Regan S, Orchard C, Khalili H, et al. Legislating interprofessional collaboration: A policy analysis of health professions regulatory legislation in Ontario, Canada. *J Interprof Care*. 2015;29(4):359–364. doi: 10.3109/13561820.2014.1002907.
3. Arora S, Thornton K, Jenkusky SM, et al. Project ECHO: Linking university specialists with rural and prison-based clinicians to improve care for people with chronic hepatitis C in New Mexico. *Public Health Rep*. 2007;122 Suppl 2:74–77. doi: 10.1177/003335490712208214.
4. Arora S, Kalishman S, Thornton K, et al. Expanding access to hepatitis C virus treatment—Extension for Community Healthcare Outcomes (ECHO) project: Disruptive innovation in specialty care. *Hepatology*. 2010;52(3):1124–1133. doi: 10.1002/hep.23802.
5. Arora S, Thornton K, Komaromy M, et al. Demonopolizing medical knowledge. *Acad Med*. 2014;89(1):30–32. doi: 10.1097/ACM.0000000000000051.
6. Arora S, Thornton K, Murata G, et al. Outcomes of treatment for hepatitis C virus infection by primary care providers. *New England Journal of Medicine*. 2011;364(23):2199–2207. doi: 10.1056/NEJMoa1009370.
7. Dubin RE, Flannery J, Taenzer P, et al. ECHO Ontario chronic pain & opioid stewardship: Providing access and building capacity for primary care providers in underserved, rural, and remote communities. *Stud Health Technol Inform*. 2015;209:15–22.
8. Carlin L, Zhao J, Dubin R, et al. Project ECHO telementoring intervention for managing chronic pain in primary care: Insights from a qualitative study. *Pain Med*. 2018;19(6):1140–1146. doi: 10.1093/pm/pnx233.
9. Furlan AD, Zhao J, Voth J, et al. Evaluation of an innovative tele-education intervention in chronic pain management for primary care clinicians practicing in underserved areas. *J Telemed Telecare*. 2018;1357633X18782090. doi: 10.1177/1357633X18782090.
10. Sockalingam S, Arena A, Serhal E, et al. Building provincial mental health capacity in primary care: An evaluation of a project ECHO mental health program. *Acad Psychiatry*. 2018;42(4):451–457. doi: 10.1007/s40596-017-0735-z.
11. Zhou C, Crawford A, Serhal E, et al. The impact of Project ECHO on participant and patient outcomes: A systematic review. *Academic Medicine*. 2016;91(10):1439–1461. doi: 10.1097/ACM.0000000000001328.
12. Densen P. Challenges and opportunities facing medical education. *Trans Am Clin Climatol Assoc*. 2011;122:48–58.
13. Centre for the Advancement of Interprofessional Education (CAIPE). Interprofessional education - a definition. *CAIPE Bulletin* 13, p19.
14. The University of Mexico School of Medicine. About ECHO [Internet]. New Mexico; 2019 [Date cited 2018 Aug 15]. Available from: <https://echo.unm.edu/about-echo/>.