

Demonopolizing Medical Knowledge

Sanjeev Arora, MD, Karla Thornton, MD, MPH, Miriam Komaromy, MD, Summers Kalishman, PhD, Joanna Katzman, MD, and Daniel Duhigg, DO

Abstract

In the past 100 years, there has been an explosion of medical knowledge—and in the next 50 years, more medical knowledge will be available than ever before. Regrettably, current medical *practice* has been unable to keep pace with this explosion of medical *knowledge*. Specialized medical knowledge has been confined largely to academic medical centers (i.e., teaching hospitals) and to specialists in major cities; it has been

disconnected from primary care clinicians on the front lines of patient care. To bridge this disconnect, medical knowledge must be demonopolized, and a platform for collaborative practice amongst all clinicians needs to be created. A new model of health care and education delivery called Project ECHO (Extension for Community Healthcare Outcomes), developed by the first author, does just this. Using videoconferencing technology

and case-based learning, ECHO's medical specialists provide training and mentoring to primary care clinicians working in rural and urban underserved areas so that the latter can deliver the best evidence-based care to patients with complex health conditions in their own communities. The ECHO model increases access to care in rural and underserved areas, and it demonopolizes specialized medical knowledge and expertise.

Modern medicine is in a maelstrom of ever-expanding knowledge. More medical knowledge has been created or discovered in the previous 100 years than in the last 5,000, and it seems safe to say that exponentially more knowledge will arise in the next 50 years.

Dr. Arora is professor of medicine and director, Project ECHO (Extension for Community Healthcare Outcomes), University of New Mexico Health Sciences Center, Albuquerque, New Mexico.

Dr. Thornton is professor of medicine and associate director, Project ECHO (Extension for Community Healthcare Outcomes), University of New Mexico Health Sciences Center, Albuquerque, New Mexico.

Dr. Komaromy is associate professor of medicine and associate director, Project ECHO (Extension for Community Healthcare Outcomes), University of New Mexico Health Sciences Center, Albuquerque, New Mexico.

Dr. Kalishman is associate professor and clinician evaluation director, Project ECHO (Extension for Community Healthcare Outcomes), University of New Mexico Health Sciences Center, Albuquerque, New Mexico.

Dr. Katzman is associate professor and medical director, Project ECHO (Extension for Community Healthcare Outcomes), University of New Mexico Health Sciences Center, Albuquerque, New Mexico.

Dr. Duhigg is assistant professor and psychiatry faculty, Project ECHO (Extension for Community Healthcare Outcomes), University of New Mexico Health Sciences Center, Albuquerque, New Mexico.

Correspondence should be addressed to Dr. Arora, Project ECHO, 1 University of New Mexico MSC07-4245, Albuquerque, NM 87131; telephone: (505) 272-2808; e-mail: SARora@salud.unm.edu.

Acad Med. 2014;89:30–32.

First published online November 25, 2013

doi: 10.1097/ACM.0000000000000051

Regrettably, medical *practice* is not keeping pace with this new medical *knowledge*. On average, Americans receive appropriate, evidence-based care when they need it only 55% of the time.¹ Nearly 80,000 Americans die each year because they do not receive evidence-based care for chronic conditions such as high blood pressure, diabetes, and heart disease.² Despite the availability of the world's most technologically advanced health care, including some of the finest hospitals and physicians, Americans are in danger of receiving poor care—regardless of their geography, rural/urban status, income, race, education, or health insurance status.³

To put it bluntly, we are not practicing what we know.

As implementation of health care reform continues, the already-taxed U.S. health care system will be expected to address ongoing problems of inadequate access, workforce shortages, poor and uneven quality, and rising costs. The United States has abundant health care resources, including health-care-designated dollars, medical knowledge, and technical expertise, but we need to better leverage these to provide more effective, efficient, and quality patient care. Failure to do so means terrible waste.

The residents of New Mexico who have hepatitis C have experienced this waste firsthand. Before 2003, an estimated 34,000 New Mexicans suffered from

hepatitis C, but fewer than 1,600 received treatment.^{4,5} At our liver disease clinic in Albuquerque, we had the expertise to treat patients with the disease; however, despite our knowledge and expertise, the capacity to treat patients with hepatitis C was available only in Albuquerque and Santa Fe.

Across the U.S. health care system, some of our most important resources are disconnected from one another. Specialized medical knowledge—such as that used to manage hepatitis C—is largely confined to teaching hospitals (i.e., academic medical centers or AMCs) and to other tertiary care centers in major cities. It rarely reaches primary care clinicians on the front lines of patient care. In addition, these same primary care clinicians who treat patients with complex conditions frequently must do so without the team support and assistance that specialists at AMCs enjoy. As a result, many community-based primary care clinicians lack the expertise and support needed to provide specialized treatment for their patients in their home communities—care they could provide if only they were connected to the necessary resources.

This disconnect applies not only to liver disease but also to a broad array of chronic complex conditions, ranging from HIV to mental illness. It is particularly pronounced in rural areas and among vulnerable populations who have limited access to health

care. Addressing this problem requires demonopolizing medical knowledge and creating a platform for collaborative practice among all clinicians that works across distances and supports lifelong learning and mentoring.

Such a platform can be created relatively easily, as those of us involved in a new model of medical education and care delivery called Project ECHO (Extension for Community Healthcare Outcomes) have discovered. Project ECHO links primary care clinicians practicing in local communities with specialist care teams—often at AMCs—which may include, for example, a hepatologist, a psychiatrist, and a clinical pharmacist.⁵ Together, the local primary care clinicians and the specialist team members can better manage patients who have chronic conditions requiring complex care. Project ECHO uses basic videoconferencing technology to conduct weekly virtual teleECHO clinics, or grand rounds. During these teleECHO clinics, primary care clinicians from multiple sites present their cases to the specialist teams and to one another, discuss new developments relating to their patients, and determine treatment.

Specialists serve as mentors and colleagues, sharing their medical knowledge and expertise with primary care clinicians while extending their professional networks and expanding their work portfolios. Primary care teams that participate in ECHO are part of a learning community through which they receive support and develop skills and expertise in a chosen area, such as hepatitis C or chronic pain. In turn, their participation in ECHO enables them to provide comprehensive, complex treatment for patients where they live. Although no patient is ever seen during these teleECHO clinics, together, university-based specialists and primary care clinicians in the field manage patients, providing the best possible evidence-based care.

Multidisciplinary teamwork is essential to the ECHO model. A holistic, integrated team approach ensures comprehensive and effective treatment for patients with complex conditions. In particular, we have found that integrating behavioral health care with primary care leads to better outcomes for patients with certain chronic illnesses who may be

prone to depression, which can interfere with treatment adherence. Several of our specialist teams—including those for hepatitis C, chronic pain, and addiction—include behavioral health care clinicians.

Project ECHO launched its first clinic (for hepatitis C) in New Mexico in 2003. Project ECHO, which has received

funding from the New Mexico State Legislature, as well as grant support from the Agency for Healthcare Research and Quality, the Robert Wood Johnson Foundation, and the GE (General Electric) Foundation,⁵ is currently embedded at 21 clinics that have been designated Centers of Excellence across the state.⁴ (Centers of Excellence are sites that accept referrals for treatment

Table 1
National and Global Replication and Expansion of Project ECHO (Extension for Community Healthcare Outcomes)

ECHO partner site (location)	Clinical specialties of site
University of Washington (Seattle, Washington)	<ul style="list-style-type: none"> • Hepatitis C • Chronic pain • HIV • Addiction
University of Chicago (Chicago, Illinois)	<ul style="list-style-type: none"> • Hypertension • Breast cancer • Attention deficit hyperactivity disorder • Childhood obesity
University of Nevada (Reno, Nevada)	<ul style="list-style-type: none"> • Diabetes and cardiovascular risk reduction • Sports medicine • Thyroid and diabetes care • Antibiotic stewardship • Mental health
University of Utah (Salt Lake City, Utah)	<ul style="list-style-type: none"> • Hepatitis C
Beth Israel Deaconess Medical Center (Boston, Massachusetts)	<ul style="list-style-type: none"> • Hepatitis C • Gerontology (ECHO AGE)
University of South Florida, ETAC (Evaluation and Technical Assistance Center) and Florida/Caribbean, AETC (AIDS Education and Training Center) (Tampa, Florida)	<ul style="list-style-type: none"> • General HIV care • Adolescent and pediatrics HIV care • Hepatitis C–HIV coinfection care • Psychiatry and HIV care • Spanish-language general HIV care
St. Joseph Hospital (Phoenix, Arizona)	<ul style="list-style-type: none"> • Hepatitis C
U.S. Department of Defense (worldwide)	<ul style="list-style-type: none"> • Chronic pain
Veteran's Administration Health System (11 regions in the United States)	<ul style="list-style-type: none"> • Chronic pain • Diabetes • Heart failure • Hepatitis C • Women's health • Nephrology
Community Health Center, Inc. (Middletown, Connecticut)	<ul style="list-style-type: none"> • HIV • Hepatitis C • Chronic pain
LA Net (Los Angeles, California)	<ul style="list-style-type: none"> • Nephrology • Adult psychiatry
Maulana Azad Medical College (New Delhi, India)	<ul style="list-style-type: none"> • HIV
Institute of Liver and Biliary Sciences (New Delhi, India)	<ul style="list-style-type: none"> • Hepatitis C
India Autism (Mumbai, Chandigarh, and Lucknow, India)	<ul style="list-style-type: none"> • Autism
Evi Med (Montevideo, Uruguay)	<ul style="list-style-type: none"> • Liver disease

from other clinicians in the community.) Through the ECHO network, local primary care teams, working in remote towns, prisons, and poor urban neighborhoods, have managed thousands of highly complex hepatitis C patients. The cure rate of hepatitis C care provided by ECHO-trained clinicians has equaled that of university-based specialists.⁶ In addition, cure rates among ECHO-trained clinicians have been significantly higher than those reported in previous studies of community-based treatment for patients with hepatitis C.⁶ Importantly, Project ECHO has reduced racial and ethnic disparities in treatment outcomes by bringing more services to minority communities. Finally, the community-based primary care clinicians have benefited as well; in surveys, they have reported that participating in Project ECHO has increased their knowledge, self-efficacy, and professional satisfaction.⁴

Another benefit of Project ECHO is its potential to provide role modeling in effective interdisciplinary care for medical students and residents. We have partnered with family practice and residency programs in several rural areas of New Mexico where specialists are in short supply. Medical, nursing, and pharmacy students have participated in teleECHO clinics, through which they have learned about the model, about a complex disease and its treatment, and, importantly, about the collaborative interdisciplinary practice that is vital to the future of care delivery.

In addition to hepatitis C, Project ECHO has expanded to mentor rural and urban health care clinicians practicing in underserved communities who provide expertise for the following: chronic pain, integrated addiction and psychiatry care, rheumatology, HIV/AIDS, dementia, complex care, palliative care, women's health/genomics, diabetes, and cardiovascular care. ECHO also trains community health workers in the management of diabetes, addiction, and hepatitis C. To date, Project ECHO has provided more than 57,000 hours of continuing medical education to health

care clinicians in more than 300 clinical teams in 74 communities across New Mexico (internal data).

The model has expanded and taken hold in many other universities and health care systems (Table 1). In 2012, Project ECHO received a grant from the Center for Medicare and Medicaid Innovation to demonstrate cost savings and enhanced quality for the most seriously ill Medicaid-insured patients in New Mexico. Further, the U.S. Department of Veterans Affairs has launched a nationwide pilot of the ECHO model called Specialty Care Access Network, and Project ECHO is currently working with the Department of Defense to implement a global chronic pain management program called Army Pain ECHO. Additional federal agencies, university centers, and even institutions in other countries are in various stages of exploring or implementing Project ECHO. Project ECHO generates such interest because it represents a logarithmic expansion of the capacity to deliver specialized care in a rural or underserved area. By demonopolizing medical knowledge and creating collaborative practices between community-based clinicians and specialists, local primary care clinicians can become experts in a chronic condition like hepatitis C or HIV, and they can provide the best evidence-based treatments to many more patients. This “force multiplier effect,” as we call it, has the potential to reengineer health care delivery.

The ECHO model offers clinicians and other health care providers at AMCs an enormous opportunity to extend their technical expertise and medical knowledge. By providing education and mentoring to teams of primary care clinicians and community health care workers in the field, the model makes high-quality treatment available to many more patients. Clinicians everywhere are empowered to do more of what they want to do—that is, to provide better care to more people.

Expanding the reach of ECHO even further will require the leadership and engagement of our nation's AMCs. By

committing to an expanded mission of lifelong learning and collaborative practice, AMC leaders and health care providers can create knowledge-sharing networks that bring specialists, primary care clinicians, nurses, medical students, residents, and others together to practice regionally, nationally, and even globally.

As implementation of health care reform progresses, the U.S. health care system will be called on to deliver better and more efficient care. Leaders of AMCs should seize this opportunity and reposition their institutions to be the central nervous system of our health care system, thereby demonopolizing medical knowledge and expertise by sharing it with clinicians across the spectrum and improving our nation's health.

Funding/Support: The Robert Wood Johnson Foundation (HSC-12074), the Agency for Healthcare Research and Quality (5 UCI HS015135, 1R24 HS016510, 1 R18 HS018171), the GE (General Electric) Foundation, and Centers for Medicare and Medicaid Services have supported this project.

Other disclosures: None reported.

Ethical approval: Reported as not applicable.

References

- 1 McGlynn EA, Asch SM, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med*. 2003;348:2635–2645.
- 2 National Committee for Quality Assurance. The State of Health Care Quality: 2004. Washington, DC: National Committee for Quality Assurance; 2004. http://www.ncqa.org/portals/0/Publications/Resource%20Library/SOHC/SOHC_2004.pdf. Accessed October 1, 2013.
- 3 Asch SM, Kerr EA, Keesey J, et al. Who is at greatest risk for receiving poor-quality health care? *N Engl J Med*. 2006;354:1147–1156.
- 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;52:1124–1133.
- 5 Arora S, Kalishman S, Dion D, et al. Partnering urban academic medical centers and rural primary care clinicians to provide complex chronic disease care. *Health Aff (Millwood)*. 2011;30:1176–1184.
- 6 Arora S, Thornton K, Murata G, et al. Outcomes of treatment for hepatitis C virus infection by primary care providers. *N Engl J Med*. 2011;364:2199–2207.