

# Multi-Grantee Technical Assistance Meeting: Alternative and Emerging Technologies in Health Services Research

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# 1. Background

The Agency for Healthcare Research and Quality's (AHRQ's) Health Information Technology (IT) Portfolio provides ongoing technical assistance to grantees in the form of Webinars, peer-to-peer teleconferences, and one-on-one technical assistance through the National Resource Center for Health IT (NRC). Webinars provide opportunities for grantees to communicate shared experiences, address common challenges, become informed of proven successful research methods, and share other considerations in an open format.

Alternative and emerging technologies, such as mobile phones, online education, and social media, are becoming an integral part of daily life for most Americans and present a ripe opportunity for health care interventions. Media, such as mobile phone texts and social networking sites, are familiar to patients, fit in with their busy lifestyles, and allow them to interact with similar patients if applicable, all while being a timely and low-cost way for health care professionals to provide valuable information to their patients. Mobile devices, online patient education, and telehealth technologies facilitate communication between providers and their patients who may otherwise have had concerns about access to health care or health information.

This multi-grantee meeting titled, "Alternative and Emerging Technologies in Health Services Research," was held on April 11, 2012, from 2 p.m. to 4 p.m., EST. The objectives of the Webinar are highlighted below:

1. Outline current and potential health care applications for specific emerging and alternative technologies of interest to health services researchers.
2. Discuss obstacles to use of these technologies in health services research.
3. Provide information on mobile technologies, telemedicine, and social media/networking as they pertain to health care and health services research.
4. Share experiences and recommendations among grantees.

Mark Belanger, M.B.A., of the AHRQ Technical Assistance Team, facilitated the Webinar. The presenters for this Webinar were:

- Joseph Kim, M.D., M.P.H., President of Medical Communications Media, Inc.
- Miriam Komaromy, M.D., Medical Director for the Integrated Addiction and Psychiatry TeleECHO Clinic, University of New Mexico School of Medicine
- Wesley Pak, M.B.A., Systems and Programming Manager Project ECHO, Department of Medicine, University of New Mexico Health Sciences Center
- Kamal Jethwani, M.D., M.P.H., Lead Research Scientist, Center for Connected Health, Partners Healthcare

## 2. Meeting Summary

### Presentations

The facilitator, Mark Belanger of the AHRQ Technical Assistance Team, provided a high-level introduction to the Webinar's topics and speakers, an outline of the event's objectives, a summary of alternative and emerging technologies, and examples of past and current AHRQ health IT research projects exploring use of these technologies.

***Presenter: Joseph Kim, M.D., M.P.H - President of Medical Communications Media, Inc.  
"The Evolving World of Mobile Health and Health Care"***

Dr. Kim's presentation on mobile health focused on various devices and applications for mobile phones that are already in use or are currently in development. He also discussed present and future security and privacy implications of mobile access. His company, Medical Communications Media, Inc., develops continuing medical education (CME) activities, and Dr. Kim is the founder of several mobile-health-related Web sites.

Dr. Kim began his presentation with an overview of the various ways in which providers and patients interact with mobile health. Providers use mobile health for both diagnosis and treatment in telemedicine, clinical decision support, communication between clinicians, CME, and social media interactions. Patients typically use mobile health for health education, disease self-management, and behavior modification.

#### *U.S. Food and Drug Administration (FDA) Regulation*

In July 2011, the FDA announced that regulation of mobile health was necessary and issued a draft guidance [proposal](#). It stipulated that any medical device or device tied to a medical device falls into the FDA's regulatory purview. This document did not address mobile consumer applications. The final draft of the proposal is scheduled to be released in 2012; however, Dr. Kim expects that the FDA will play a larger role in consumer application regulation in the future. An industry concern is that such a large number of consumer applications may make it difficult for any one agency to regulate them all.

#### *Examples of Mobile Applications for Providers*

Dr. Kim described several current and upcoming mobile devices and applications that could offer benefits to patients, providers, and public health workers in developing countries. These strategies are cost effective, as most people already are in possession of a smartphone, and much of the required data storage and processing does not need to take place on the device but may occur centrally (e.g., Cloud computing). Dr. Kim discussed the following mobile devices and applications in his presentation:

- The Handyscope is an iPhone attachment for skin cancer screening. Although it is not currently approved in the United States, this device enables one to take a photograph of a skin lesion at 20x magnification and to transmit the photo for processing by a clinician.
- Researchers at the University of California at Los Angeles have developed a cell phone attachment that acts as a fluorescent microscope and is able to detect the presence of the bacterium *Escherichia coli* in food and water.

- At the Massachusetts Institute of Technology, the Media Lab has developed a camera attachment that scans the lens of a patient's eye and indicates the position, size, shape, and density of any cataracts. The attachment is also able to perform a refractory exam.
- Several existing mobile applications can detect heart rate and rhythm.
- An application that leverages the Global Positioning System (GPS) enables one to locate clinical trials for cancer treatments within a 150-mile radius.
- Applications are available for clinicians to continue to refresh their medical education. Clinicians can also interact with one another on several online medical communities to keep their knowledge base current. Providers can upload pictures of cases and discuss potential approaches to treatment with other clinicians. Three examples of such sites are Sermo, Quantia, and Doximity. Quantia provides CME and allows users to leave comments and engage in a dialog. Doximity displays real names and contact information for clinicians and facilitates referral creation with a Health Information Portability and Accountability Act (HIPAA)-compliant communication platform.

### *The Role of Texting in Health Services Research*

Dr. Kim highlighted several examples of the use of texting in health services research. A study performed by the Temple University School of Medicine and funded by Verizon targeted high-risk, inner-city patients in Philadelphia, Pennsylvania. The study attempted to overcome barriers to effective health information dissemination in a medically underserved community. The program was designed to educate participants on cardiovascular health by sending them weekly, targeted, customized e-mail messages containing facts on cardiovascular disease and tips for preventing the condition.

The role of text messages in medication adherence is also key for health services research and intervention. Dr. Kim noted several ongoing studies employing this approach, including studies in the areas of geriatrics, smoking cessation, HIV, diabetes, and schizophrenia. He emphasized the role of demographics in this type of study, noting that teenagers are an example of an effective target population, because text messages are a main form of communication for this group.

Several free mobile services are available for underserved populations that provide access to mobile phones and the Internet; greater access to the Internet provided by this technology minimizes barriers or limitations that could hinder study participation that researchers may encounter during the course of their projects. Dr. Kim provided the example of Assurance Wireless from Virgin Mobile, which is a Lifeline Assistance program funded by the Federal Universal Service Fund. This service is available for those who are income-eligible and/or participants in certain qualifying government programs, such as Medicaid, the United States Department of Agriculture's Supplemental Nutrition Assistance Program, and Social Security Income. In addition, free Internet access is available at most public libraries, community centers, and so forth.

### *Mobile Health Application Uses and Risks*

Mobile health care applications are not currently regulated, and some confusion exists regarding the difference between "medical" and "health" applications. Currently, anyone can create and release a medical or health application, and the information provided by a given application may be outdated, misleading, or inaccurate. Moreover, consumer health applications raise patient privacy and security concerns (as detailed in the following section).

Useful and reliable health applications do exist, and Dr. Kim highlighted Walgreens pharmacy applications as an example. Walgreens has developed a medication reminder application called “Pill Reminder Pro.” This application reminds patients to take pills and tracks medication names, dosages, and frequencies. Another application enables patients to refill prescriptions by scanning the bar code on the medication bottle and in return, they receive a text message when the prescription is ready for pickup. The application also provides information on the nearest Walgreens with in-stock influenza vaccines.

Some applications, however, are unreliable and can potentially cause harm. Dr. Kim provided the example of an application claiming to help diabetics calculate an appropriate insulin dose, but it does not ask the patient about concurrent medications or provide information about the type of insulin to which the dosage applies. Another example of a potentially harmful application is one for early detection of melanoma. Consumers take a picture of their suspicious skin lesion and are presented with a risk score. An erroneously low risk score could delay necessary medical attention. A blurry photo taken by the consumer can also result in an inaccurate risk score.

#### *Data Security and Patient Privacy*

HIPAA and other regulatory bodies do not provide clear guidance on mobile applications. To be HIPAA-compliant, information must be encrypted, including video conferencing and texting. Many people in the medical community are not aware that security and encryption are necessary both in the protocol itself as well as in the wireless infrastructure. Concerns have been raised about GPS in smartphones and how this information is being stored and tracked. Dr. Kim noted that Apple devices allow the use of services that can be HIPAA compliant, including FaceTime video conferencing.

***Presenters: Miriam Komaromy, M.D. - Medical Director for the Integrated Addiction and Psychiatry TeleECHO Clinic, University of New Mexico School of Medicine and Wesley Pak, M.B.A. - Systems and Programming Manager Project ECHO, Department of Medicine, University of New Mexico Health Sciences Center  
“Use of Telehealth Technology for Research: The ECHO Model”***

Dr. Komaromy and Mr. Pak presented an overview of the telehealth Extension for Community Healthcare Outcomes (ECHO) Model and its use in health services research. Project ECHO was AHRQ-funded, and involved a partnership of academic medicine, public health offices, corrections departments, and rural community clinics dedicated to providing best practices and protocol-driven specialty health care in rural areas. Dr. Komaromy is a practicing physician in addition to her role as Medical Director of the Integrated Addictions and Psychiatry Program at the University of New Mexico. Mr. Pak is the programming manager at Project ECHO and an expert in the field of telehealth adoption.

#### *Overview of the ECHO Model*

The ECHO model connects specialists in a hub (i.e., an academic medical center) with a network of dispersed individual health care providers in order to facilitate the provision of specialty care to patients in underserved areas. The mission of the ECHO Project is to safely and effectively treat complex diseases in rural and underserved areas through primary care provider (PCP) education. Telehealth technology is employed to leverage scarce health care resources. The structure of the model lends itself to the support of community-based research. With funding from AHRQ to set up Internet systems and support rural sites by training clinicians, Project ECHO has successfully built an online healthcare delivery system that provides quality care to low-income, rural populations in New Mexico.

Video and teleconferencing technology connects specialists from the University of New Mexico to PCPs around the State. Case studies are presented on complex conditions such as hepatitis C, addiction, pediatric asthma, childhood obesity, and high-risk obstetrics, and specialists provide feedback and share best practices. The ECHO system allows up to 80 different locations to participate in a conference through HIPAA-compliant encrypted technology. Users may also watch previously recorded conferences available in the online video library. Ultimately, PCPs in underserved areas can become a resource for the management of these complex conditions and help to educate the providers around them. In this way the ECHO Model serves as a virtual force multiplier.

Mr. Pak discussed the technical infrastructure and online interfaces that constitute the ECHO Model. A case review tool, iHealth, serves as a type of patient record. The ECHO provider team, located remotely or at an academic medical center, can retrieve information to help discuss a particular patient. Community providers can see an overview of a patient’s condition displayed in a single page. They can indicate areas of concern on a patient’s body through the use of graphics, and laboratory results trends can be displayed. An online TeleECHO management tool, iECHO, is available and functions to track clinician participation in the teleconferences.

#### *Project ECHO: Research Opportunities*

The ECHO Model has applications in studying outcomes of care and access to care as well as the dissemination of innovations.

An example of a study on care outcomes and access to care is a prospective cohort study conducted in New Mexico, the State with the highest rate of Hepatitis C infection in the Nation. The project trained PCPs in rural areas and prisons to deliver Hepatitis C care. The aim of the study was to show that Project ECHO improves minority access to care and that this type of care is as safe as care provided in a university clinic. Prior to Project ECHO, none of these physicians were treating hepatitis C, so the study comparison was between the rural participants and patients in a university setting. The study endpoint was sustained viral response (SVR), which is the condition of no detectable virus 6 months after treatment completion. There was no statistical difference in SVR between the care given in a rural setting and care given in the university setting, and minority patients in the ECHO cohort had a significantly higher SVR than those at the University of New Mexico Hospital. The study concluded that rural PCP-delivered hepatitis C care under the aegis of Project ECHO is as safe and effective as that given in a university clinic. The study also concluded that Project ECHO improves access to hepatitis C care for New Mexico minorities.

The ECHO Addiction Treatment Program is a weekly telehealth clinic and has been in operation since 2006. The program addresses a number of addictions, but primarily focuses on expanding buprenorphine treatment for opiate addiction. New Mexico has the largest number of overdose deaths from alcohol and opiate addiction in the United States. The ECHO Model was used to recruit providers for training in buprenorphine treatment, to support their practice, and to track the resulting impact of this training and support. A total of 167 different community-based health care organizations throughout New Mexico participated in the ECHO Addiction Program over a 2-year period. Preliminary results from this study have been impressive; in 2005, New Mexico, with 21 providers, ranked 13th in the number of buprenorphine-certified providers per capita. By 2009, the State had risen to 5th place, with 258 providers. A survey of buprenorphine prescribers indicated that providers had experienced an overall positive impact on their practice and ability to treat opiate addicts.

Future plans for Project ECHO are to disseminate innovations and to study the uptake of these innovations. Dr. Komaromy cited a study that will apply an urban finding to a rural setting. A single Screening, Brief Intervention, and Referral to Treatment (SBIRT) was found to decrease driving while intoxicated (DWI) incidents for 5 years in heavy drinkers, with a stronger effect observed in Latinos. Project ECHO plans to implement this best practice in a rural New Mexico, predominantly Latino, community-based setting.

In summary, the ECHO model helps establish a network of rural PCPs with an academic medical center program; facilitates recruitment of rural, low-income, minority patients; enables high-quality data collection through iHealth and iECHO; and serves as a conduit for rapid dissemination of innovations and evidence-based practices. ECHO provides a valuable opportunity to study uptake; provider knowledge, attitudes, and beliefs; care outcomes; and impacts on health care and community health.

***Presenter: Kamal Jethwani, M.D., M.P.H. - Lead Research Scientist  
Center for Connected Health, Partners Healthcare  
“Social Media: Opportunities and Applications for Health Services Research”***

Dr. Jethwani’s presentation focused on the various types of social media and their applications for health services research, as well as the pros and cons of using social media for research. Dr. Jethwani leads the research and program evaluation initiatives at the Center for Connected Health. His research is focused on technology-based models of health delivery and use behavior change as a tool for preventive and supportive care in a tertiary health care setting.

*What is Social Media?*

When asked to define social media, most people automatically think of Facebook and Twitter, but social media is technically defined as any form of electronic communication that facilitates interactivity (e.g., blogs, bulletin boards, social networks). Social media can be used to facilitate provider-to-provider interactions, provider-to-patient interactions, and patient-to-patient interactions.

*Opportunities for Health Services Research*

Social media provides many opportunities and targets for health services research, including recruitment and engagement, observation of social interactions, direct interaction between providers and patients, crowd sourcing, and research dissemination. Facebook and Twitter have the largest number of users and therefore offer the largest pool of patients, which is ideal for recruitment of large sample sizes.

Social media is especially suited for recruitment of hard-to-reach populations such as patients with rare conditions who will likely be online themselves searching for support and information and networking with fellow patients. Patients with rare conditions tend to be highly organized and form online communities. Dr. Jethwani added that social media’s widespread nature also facilitates recruitment across a variety of sites and locations. Social media can also enable frequent contact with study subjects, if necessary.

*Patient Benefit*

Social media offers patients several benefits, including the ability to digest information and online content at their convenience and at a location of their choosing while maintaining anonymity. If the consent process for a given study is long and involved, researchers may consider having the process available online so that patients can complete the requirements at their convenience.

*Monitoring the Effects of Social Media*

Dr. Jethwani outlined several available tools for analyzing social media traffic and patterns. Web site trafficking tools, such as Google Analytics, allow researchers to analyze who is viewing what parts of a Web site and for how long. Researchers should also conduct “split testing,” which will show what parts of their campaign are more effective than others. For example, are patients responding to emails or are they spending more time on the study’s Facebook or Web page? What type of prospective patients are visiting the study’s page but not enrolling? Once this type of information is determined, researchers can tailor their study and/or recruitment efforts.

### *Patient Recruitment*

When using social media to recruit patients, it is important to distinguish between advertising on social media platforms and taking advantage of the capabilities of these platforms. For example, Dr. Jethwani clarifies that it is possible to “geotag” advertisements so that researchers can verify that the advertisements are being viewed by the relevant demographic. Various strategies are available for using social media to one’s benefit when recruiting prospective study subjects. Using the appropriate social media site is key, and researchers should make certain to focus on those applications used by the targeted demographic. Another option is the use of open forums. Health services researchers can visit a forum targeted to their population of interest and create demand for their study by discussing their research. Listening to conversations taking place on relevant open forums is also an effective way to generate recruitment leads. Dr. Jethwani emphasized another key aspect of social networks—the linked nature of social media. Taking advantage of the “network effect” is important because it can result in leads and referrals from people connected to those with whom you have connected.

Also important is paying attention to the effective use of social media. In general, users of social media are tech-savvy and will be drawn to marketing campaigns that are well-designed. Poor designs can reflect on the validity and professionalism of a study.

### *Patient Recruitment and Privacy*

When using social media to recruit patients, taking privacy issues into account is important. Dr. Jethwani noted several concerns, including the following:

- If a patient “likes” your Facebook page, can others see it? Patients’ health conditions may be unintentionally disclosed.
- Are you collecting any protected health information (PHI) without the knowledge of the patient? Such information may include IP addresses, contact information, and the identity of a patient’s friends.
- Are you adhering to the terms of use and privacy specified in the platform you are using?
- Once enrolled in your study, can the participants see each other? If so, the study is considered high-risk, and patient consent and institutional review board (IRB) approval are required.
- If patients’ access will be monitored and tracked (i.e., Web site usage analysis), is this included in the patient consent process?

### *Examples of Patient Recruitment Successes*

The Spontaneous Coronary Artery Dissection (SCAD) Study at the Mayo Clinic is one example of a study that effectively used social media to its benefit. The SCAD study focused on a rare condition with a concentrated and organized patient population. The study had no geographic constraints, and the researchers were able to take advantage of the Mayo Clinic’s widespread positive brand awareness. The researchers were able to complete their recruitment in less than 6 weeks through the thoughtful use of social media.

### *Recruitment Challenges*

Using social media for recruitment can present challenges. Be sure to take into account the study design and target population when considering the use of social media. Roadblocks may be

encountered when issues, such as demographics and patient privacy, are not thought through in advance. In general, social media users tend to be younger and more technically savvy. Researchers must consider if this demographic is appropriate for their study. Data collected via social media platforms may be self-reported and therefore not reliable, and the study design should take this into account. Another issue is the dynamic nature of social media. Platforms and applications are continually changing as improvements and additional services are rolled out. Dr. Jethwani noted that this could create an issue if a researcher's study is dependent on a particular application. Currently, there are so many users of social media that it can be difficult for one researcher or study to stand out in the crowd. It is important to be perceived as a reputable clinical study.

Dr. Jethwani provided an example of a study whose enrollment attempt via social media was unsuccessful. Pfizer wanted to conduct the world's first virtual clinical trial for 600 overactive bladder patients; however, researchers failed to tailor their campaign appropriately for the given demographic. In general, the average overactive bladder patient is less prone than others to navigate social media, more apprehensive about divulging personal information online, and less able to manage a complicated enrollment process. Ultimately, the researchers were unable to enroll the required number of patients.

Another example of use of social media without ample forethought given to privacy is the "Tastes, Ties and Time" study, from Harvard University, which analyzed how friendships and tastes evolve over time. Undergraduate research assistants downloaded 1,700 anonymous Facebook profiles; however, they had privileged access to their friends' profiles. When the cohort was publicly released, it was soon evident that the sample was a particular Harvard undergraduate class because all identifying information had not been removed (e.g., names of students' Harvard dormitories). Conclusions regarding participants' friendships and tastes were made public without their consent.

### *Research Design*

Today, 59 percent of all adults seek health information online, making the pursuit of health information the 3rd most common online activity<sup>1</sup>. Patients go online for various health care concerns, including the following: information on treatments (especially in the case of rare conditions); information concerning adverse events; and support and information on social implications of disease conditions. Social media provides researchers with a readymade laboratory to study important issues such as health seeking behaviors, what questions people ask, how people help each other, whether social media can be used to improve care delivery and engage certain populations, and whether social factors impact health.

The following are additional benefits of using social media:

- The data are already public, which can imply consent in some cases.
- "Surfing" online data for screening is more efficient than sending preliminary questionnaires to patients.
- Data on social media may be relatively free of certain biases such as social desirability bias (especially when anonymous).

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<sup>1</sup> Pew Research Center. The social life of information, 2011.  
[http://pewinternet.org/~media/Files/Reports/2011/PIP\\_Social\\_Life\\_of\\_Health\\_Info.pdf](http://pewinternet.org/~media/Files/Reports/2011/PIP_Social_Life_of_Health_Info.pdf). Accessed March 1, 2013.

### *Privacy Concerns*

When using social media for research, it is vital to protect and hide all identifying information and prevent researchers with access to participants' information from tracing it back to the subjects. Patients must be aware that their data can and may be analyzed. If the study employs subcontractors, these entities must also be HIPAA compliant. Various information technology considerations must be addressed such as location and duration of data storage, ability of data to be completely de-identified, ability of data to be destroyed, ownership of data, and how public the data is. IRB approval is paramount, but ultimately researchers are responsible for knowledge of and compliance with privacy regulations.

### *Examples of Health-Focused Social Media Sites*

PatientsLikeMe (<http://www.patientslikeme.com/>) is a helpful social media platform for patients with chronic conditions. Users can find patients with similar conditions and participate in discussions and support groups concerning social support, side effects, and clinical trials.

CureTogether (<http://curetogether.com/>) focuses on under-funded or under-researched conditions as well as patient-driven research. The site provides diagnosis and treatment options based on user input. CureTogether is a crowd-sourced platform and presents live, dynamic data. Each user of the site contributes his or her own anonymous information, and the database is continually updated based on this information.

### *Social Media and Research Dissemination*

Social media platforms provide an instantaneous, no-cost outlet for research dissemination with readily available feedback from users. In order to disseminate information meaningfully, researchers should target certain populations and consider collaborating with a sponsor who may have access to a full-time marketing department.

### 3. Questions and Answers

*Question 1: We have been hearing quite a bit about security and mobile devices. What is different about mobile devices, and Why are they causing the paradigm to break down?*

Dr. Kim replied that this is the classic case of the stolen laptop. Portable items such as laptops and mobile phones are easy to lose. Several issues must be considered, for example, the location of data storage. Is data stored remotely or on the device? In addition, consumers are often unaware of who has developed applications they are using. Is uploaded information stored in a different country? Is it stored indefinitely?

Dr. Jethwani pointed out another issue: the involvement of several vendors in mobile transactions. Data is often collected and transmitted at multiple points, creating several opportunities for error. Wireless carriers own and store data such as text messages and the user is unable to destroy it. This data may be available for others to access.

*Question 2: How does reimbursement work in the case of telemedicine?*

Dr. Komaromy clarified that Project ECHO has been grant funded to date; however, the project has recently had success with Medicaid in New Mexico. Medicaid is providing incentives for clinicians to present complex cases, and ECHO has provided added value for Medicaid in terms of reducing redundancy.

*Question 3: Is it possible for a group of researchers who have successfully worked with an IRB to come together and create an IRB template for mobile technology? This would help researchers to better understand what they need to consider throughout the IRB approval process.*

Dr. Jethwani explained that there is no standard for IRBs in terms of research using social media, and different IRBs are handling the issues differently. Dr. Kim noted that this Web site, <http://mhealthsummit.org>, provides information about IRB issues and mobile technology.

*Question 4: Dr. Jethwani, what is your favorite application or device that has had an impact on changing behavior?*

Dr. Jethwani responded that the combination of social media with mobile devices and GPS to track users' locations and provide feedback accordingly has significant potential to change behavior. He provided the example of an obesity study using GPS with teenagers. The mobile device offered advice on healthful food options each time it detected that the teenager was entering a restaurant. The participants found the feedback useful and followed the recommendations 50 to 60 percent of the time.

*Question 5: Are there applications that allow parents to track vitals in NICU infants? We are working with Northwestern University to develop such a tool. We have found one application; however, we are not sure if there will be concerns with privacy or issues with IRB approval.*

Dr. Kim advised the researcher to contact the developer of the application with his concerns. He noted the importance of determining the type of data the application is storing and where it is being stored. Researchers need to know this information to obtain IRB approval. Dr. Kim also pointed out that the application may change at some point and that might present issues for the study.

## Appendix A: Presenter Biographies

***Presenter: Joseph Kim, M.D., M.P.H.—President of Medical Communications Media, Inc.***

Dr. Kim is the president of Medical Communications Media, Inc. Established in 1995, his company develops certified continuing medical education (CME) activities in joint-sponsorship with accredited organizations. He is also the founder of several mobile health Web sites such as MedicalSmartphones.com and MobileHealthComputing.com and currently serves on the medical advisory board of Doximity.

Dr. Kim holds a B.S. degree in engineering from the Massachusetts Institute of Technology, an M.D. from the University of Arkansas College of Medicine, and an M.P.H. from the University of Massachusetts Amherst School of Public Health.

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***Presenter: Miriam Komaromy, M.D.—Medical Director for the Integrated Addiction and Psychiatry TeleECHO Clinic, University of New Mexico School of Medicine***

Dr. Komaromy is a practicing physician, board certified in both internal medicine and addiction medicine. She launched the addiction treatment arm of Project ECHO in 2006 and has been serving as medical director, Integrated Addictions and Psychiatry Program Project ECHO, University of New Mexico Health Sciences Center since its creation. Dr. Komaromy is also the medical director for Turquoise Lodge Hospital, an addiction treatment hospital funded by the New Mexico Department of Health. Her main research interest is in studying the use of telehealth technology, in the form of the ECHO model, to expand access to health care for traditionally underserved communities.

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***Presenter: Wesley Pak, M.B.A.—Systems and Programming Manager Project ECHO, Department of Medicine, University of New Mexico Health Sciences Center***

Wesley Pak is a systems and programming manager at Project ECHO at the University of New Mexico. He received a B.S. degree from the University of Maryland, an M.B.A. from the University of Phoenix, and is currently completing his Ph.D. at the University of New Mexico. His areas of research are telehealth adoption and knowledge management and dissemination.

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***Presenter: Kamal Jethwani, M.D., M.P.H.—Lead Research Scientist, Center for Connected Health, Partners Healthcare, Instructor in Dermatology, Harvard Medical School***

Dr. Jethwani currently leads the research and program evaluation initiatives at the Center for Connected Health. His research is focused on technology-based models of health delivery and use of behavior change as a tool for preventive and supportive care in a tertiary health care setting. His work at the Center for Connected Health has spanned from designing and implementing clinical trials to leading efforts in predictive modeling using behavioral parameters.

Dr. Jethwani's research has evolved over time to include exploration of newer health delivery models, such as employer-based health programs and electronic social network based programs. He is also exploring newer tools to deliver feedback to patients, such as simple text message-based platforms, applications for smartphones, and so forth. The ability to personalize care and understand behavioral motivations that dictate health choices remains central to all of his work at the Center.

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