

Support comes from AstraZeneca, working to change how cancer is treated with personalized medicine. Learn more at [astrazeneca-us.com](http://astrazeneca-us.com). Welcome to Yale Cancer Answers with doctors Anees Chagpar and Steven Gore. I am Bruce Barber. Yale Cancer Answers features the latest information on cancer care by welcoming oncologists and specialists who are on the forefront of the battle to fight cancer. This week, it is a conversation about improving healthcare access for underserved populations with Dr. Sanjeev Arora. Dr. Arora is the Director and Founder of Project ECHO or Extension for Community Healthcare Outcomes. He is a Distinguished Professor of Medicine with 10 years in the Department of Internal Medicine at University of New Mexico Health Sciences Center. Dr. Chagpar is an Associate Professor of Surgery at Yale School of Medicine and the Assistant Director for Global Oncology at Yale Comprehensive Cancer Center.

Chagpar Sanjeev, maybe you can start off by telling us a little bit more about project ECHO. What exactly is it?

Arora ECHO stands for Extension for Community Health Outcomes and our mission is to democratize medical knowledge to get best practice care to underserved people all over the world. We have a goal to touch the lives of 1 billion people by 2025, and we do this by a simple principle of moving knowledge instead of moving patients and providers. For example, in an area that you are familiar with, breast cancer, there have been increasing disparities in the United States. We know that African-American women had the same mortality, the same rate of death from breast cancer in the 70s, but now breast cancer mortality rates are 43% greater in African-American women than in whites. Similar disparities are there in colorectal cancer screening. For example, in federally qualified health centers, these are centers and clinics that provide care to underserved people in the United States, we have 11,000 of them, colon cancer screening rates are 34% even though we know that colon cancer screening saves lives. It is a very highly effective intervention to prevent cancer or diagnose it early and yet we are unable to implement these best practices. There is also the challenge that medical knowledge is increasing exponentially and the CDC has recently published in MMWR, Morbidity and Mortality Weekly Report, that these cancer disparities are continuously increasing, and so essentially with progress, the populations, the underserved populations, minority and poor people are not getting access to the various best practices in cancer or any other field in medicine. In terms of worldwide, the problem is that 6 billion people in the world do not have access to the right knowledge. And if you do not have the right knowledge, the right place or the right time, it is impossible for you to get the right care. Even if the medicine is existing, is generic, it is only a few cents, yet without the right knowledge, it is impossible to get the right care, and as a result, tens of millions of people in the world suffer unnecessary death, morbidity, mortality, which is highly avoidable and this is the problem we are trying to solve with ECHO.

Chagpar That sounds like such a laudable goal, but how exactly does it work?

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Arora What was happening was that I was treating hepatitis C at the University of New Mexico. I am a gastroenterologist by profession, and there was an 8-month wait to see me. Treatment consisted of a chemotherapy-like regimen with interferon and ribavirin, and New Mexico is a rural state in the United States in the southwest part, and people would drive 100s of miles making 12 shifts to see me, and even though 28,000 patients had been diagnosed and there was a cure, less than 5% had received treatment. So, I developed ECHO as a way to bring access to care for the patients in New Mexico, and then I knew that I would have a model that could be used for many diseases all over the world. The way ECHO works is that there are 4 key ideas. The first is, we use technology to leverage scarce resources. So, to manage hepatitis C patients, I needed a psychiatrist, a pharmacist, and a liver specialist. It is hard enough to get these together in an academic center. It was almost impossible in a rural area. So, we said we would use one-to-many video conferencing to make that work. The second key principle in project ECHO is to share best practices. So, we set up 21 centers of excellence for treating hepatitis C all over New Mexico. Five of them were in the prison system and 16 were in federally qualified health centers. We wanted to treat all 28,000 patients and that is why we set it up so that in every location in New Mexico, there was a center of excellence in treating hepatitis C, and in order to be called as center of excellence, you had to have a nurse practitioner, a family doctor or a physician assistant to be the leader, and they had to agree to become specialists in hepatitis C. So, we shared our protocol with these 21 sites, that is the second idea – sharing best practices, but no one can treat hepatitis C by just looking at a guideline. So, we said, how do I become an expert and I did my fellowship in gastroenterology in Boston, they put me in a patient room to see a patient. I would come out, present to my professor, I saw another patient, presented to my professor and after 2 years, they started calling me a gastroenterologist. So, I said, I would use the same model to make these people hepatitis C experts, and you call this third principle case based learning, and the fourth key principle is outcomes tracking, using web-based databases. The heart of ECHO is what we call a tele-ECHO clinic and what that is, is that every Wednesday afternoon at 3 p.m. to 5 p.m. I started an ECHO clinic in 2003, where all 21 of these primary care clinicians would join me on an interactive video network like Hollywood Squares, and one by one they would present patients of hepatitis C to me and my team and to each other. And over the course of 2 hours, we would co-manage about 10 patients in a de-identified way and I would give them a 15-minute lecture on hepatitis C. So, typically an ECHO clinic is mostly patient discussions, real cases. And what we found over a year that their professional satisfaction went up, their isolation went up, their self-efficacy went through the roof and it was producing joy of work for them, and they were having professional developments, they were becoming specialists. Over 18 months, the wait in my clinic fell from 8 months to weeks, anybody in New Mexico could get treatment for hepatitis

C. We treated thousands and thousands of patients, and then we did a head-to-head study which we published in the New England Journal of Medicine where we showed that these rural doctors and prison doctors could produce the same level of care as University specialists and actually better than specialists alone were treating in the United States, much better. Because by treating patients close to their homes in culturally appropriate setting by doctors whom they knew and trust, care was better. So, as we showed this, people came to us and said,

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look we want to do it for other diseases, so we started one for diabetes and then for rheumatology consultation and another one for HIV and another one for high-risk pregnancy and so on and so forth, and now we have 30 projects in New Mexico. But at some point, as we were rolling out one ECHO after the other and they were all working, we realized that the need is much bigger than New Mexico and that 6 billion people do not have access to the right knowledge and we had asked a question to our New Mexico rural doctors, is specialty access a major need for you, not hepatitis C, just in general? And they said, yes, 4.9 out of 5, they said we have a very hard time accessing specialty care for our poor patients. And it got me thinking, we have more specialists than any other country in the world here and yet we cannot provide specialty care to our underserved people. In Africa, they have 50 times less specialists and what is going on there, and as I have gone to all these countries and find that poor people have no access to specialty care, people die from simple diseases just because nobody knows how to diagnose them. That is when we set our goal to touch the lives of 1 billion people by 2025 by democratizing knowledge, which is what we do in ECHO. And in order to fulfill this goal, we decided that we will train other universities to do ECHO. That is why I am here today, training Yale University to do ECHO. They have already tested it for 1 disease area for child abuse, but they need to do many more, and they really want to and that is why they invited me. But all the other major Universities have also many, many ECHO clinics-- at Harvard, Mass General, Beth Israel Deaconess, John Hopkins does many ECHO projects, MD Anderson in Texas does 13 ECHO projects, University of Washington, University of Chicago does 8 and University of Colorado, and essentially every major university is now doing ECHO projects. The VA System has adopted ECHO. They have 11 academic hubs connected to 600 clinics for 39 disease areas. We also partner with the US Department of Defense worldwide, partner with US Aid and PEPFAR for AIDS control in Africa, global control of TB and now we have 170 University hubs in 24 countries, many in Africa, many in Asia, a very large presence in India where the government partnered with the Government of Northern Ireland and they have 30 ECHO projects for their 2 million people, so it has been spreading fast and furiously and I am just delighted to be here with you on this show and thank you for hosting me.

Chagpar Sanjeev, let us dig a little bit deeper into how exactly ECHO works and how you are achieving this goal. One question that our listeners might have is when they go to the doctor, especially when they go to a specialist, they really expect the specialist to do a physical exam and lay hands and may gain some insights and some nuances from actually seeing the patient, whereas here they are one step removed from the patient. The nurse practitioner or the physician's assistant in the clinic sees the patient and then in a de-identified way through computer monitor conveys that information to the physician. Has that been a barrier?

Arora You know, we have never actually found it as a barrier because of the fact that the patients we are trying to serve, there are many, many hurdles for them to actually see a specialist. Sometimes, they are uninsured or under-insured. Sometimes, they live too far away from the specialists and they do not have the money, the gas money, to go and meet. Sometimes, their work is such that if they take a day, they do not get paid for that work. Sometimes, culturally

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Chagpar Excellent. Well, we are going to take a short break for a medical minute and then come back and learn more about project ECHO with my guest, Dr. Sanjeev Arora.

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Chagpar Welcome back. This is Dr. Anees Chagpar and I am joined tonight by my guest, Dr. Sanjeev Arora. We were talking about project ECHO, which is really an innovative model for healthcare to bring specialty care to

underserved populations, particularly in rural and global communities. Now, Dr. Arora, before the break, we were talking about how this works, essentially providing care closer to where the patients are through either family physicians, nurse practitioners, or physician assistants who then consult with top-named academic institutions all over this country. You mentioned that these primary care providers on the ground in these rural areas have incredible job satisfaction and the patients are very grateful to be able to access specialty care that they could not access previously. But I was wondering, what is in it for the people at the academic institutions? Clearly, there is a motivation to help others and that is of course why we are all in this, but when you spend every Wednesday afternoon in your ECHO clinic, how are you reimbursed for that time or is that a philanthropic gesture on your part?

Arora It started off as a philanthropic gesture. What I found Anees is that physicians such as yourself and many of them encounter the same problem that I encountered, is that we spend sometimes a lifetime becoming experts in a particular area, but the only patients we could help are the ones that we see ourselves and the need is infinite. The need for your expertise is infinite. And so

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what ECHO allows me to do is to have an impact on the world, which is 100 times greater than I can do myself through other people, by making other people as good as me. So, we have never had a shortage of people who want to democratize their knowledge for human good, that is the purpose. Now, of course, there has to be some way to cover the time and many federal agencies, the Federal Government has given 150 grants out, many foundations support ECHO, state Medicaid programs in 8 states support ECHO projects at the University, the Department of Health in many, many states support ECHO programs because they have certain goals and ECHO helps them to achieve it faster, better, higher quality. ECHO is a disruptive innovation which can massively reduce cost and dramatically improve access and quality all at the same time and we have evidence for that. So, because of that reason, there are many, many possible sources of funding – the state of Missouri and then the University of New Mexico, the state legislature funds ECHO. The University of Missouri gets 3 million dollars a year, every year, to do ECHO. The government of Northern Ireland has started 30 ECHO projects. The government of Ontario in Canada uses 10 million dollars a year to fund ECHO projects. So, there are many, many sources, but most importantly is the ECHO Act, which in 2016 was presented to the US Senate and 97 – 0 was the vote. It went to the US House of Representatives and was unanimously passed, president Obama signed it into law. It is directing the US government to understand ECHO and the impact on chronic diseases and public health and disparities on rural health, access to care, cost of care and many, many other parameters and how to make it sustainable. And so, all of these are major ways. The only difference Anees from your practice is

that you probably get paid on a fee-for-service basis, but in ECHO, we think fee-for-service can actually produce some wrong incentives where the health system may not be perfectly aligned with the needs of patients. ECHO needs perfect alignment and so we do not believe in funding by fee-for-service because the goal of doing an ECHO project is to make people as good as each other, so it is a model of mentorship of inter-professional consultation, guided practice with the idea of teaching people to fish rather than giving them fish. So, therefore, the fee-for-service model does not work well for us because you are essentially trying to put yourself out of business. But it is working all over the world, the demand is amazing, we have 300 universities that have signed collaborative agreements, of which 170 have already launched, so that is how it gets funded.

Chagpar So, instead of fee-for-service, because clearly you are not providing service to many 100s of patients in the time that it would really take you to treat just a few patients, are you paid by time?

Arora Yes. So, what we do is, we go to a university and essentially the funder would buy 15% of the time of gastroenterologist, and they would in turn train 40 people to be as good as them, so their role at a very fundamental level is trying to re-imagine the role of an expert not just as a provider of direct service but to democratize their knowledge for human good. So, we are using it not just in healthcare, I know of course this is about Yale Cancer, but we also use ECHO to train school teachers in different parts of the world to be better school teachers – in math, in science, in 21:38 into mp3 file [https://ysm-websites-live-prod.azureedge.net/cancer/2018-YCA-0401-Podcast-Arora\\_330694\\_5\\_v1.mp3](https://ysm-websites-live-prod.azureedge.net/cancer/2018-YCA-0401-Podcast-Arora_330694_5_v1.mp3) college preparedness, and we use it in many, many diverse ways– in veterinary science and many other fields where a certain highly specialized knowledge is having a very hard time traveling to the last mile of healthcare, especially for underserved patients.

Chagpar When we talk about healthcare delivery though, only a part of it I would argue is actually the knowledge, part of it is do you have access to the right drugs, to the operating room, to specialized imaging, to advanced techniques, how do you overcome that barrier in these underserved populations?

Arora What happens is that the goal of ECHO is never to move care from a tertiary facility to a rural facility or an urban underserved facility. You mentioned rural, but ECHO works even better in urban underserved areas, like New Haven it would work beautifully. The issue is not to move care to a different location, the issue is the right care at the right place and at the right time. So, ECHO is an effective triage system. There are patients who will be seen in rural areas who will have to travel 100s of miles for the right care, but what we have found across the world is a lot of people, sometimes as many as 70% of patients make an unnecessary trip for problems which could be managed effectively. In your own practice, I am certain people come to you who do not need an operation, they could have been seen and managed in the remote area or in the local federally qualified health center in New Haven if you give them better knowledge to diagnose it, etc., but yes, the other problem that happens

is when there are 100 patients to be seen and the primary care doctor does not know what is going on with those patients, all 100 have to go and see a specialist and all wait in a line which can have tragic consequences. But the patient who needs to be seen right away has to have a way to get ahead of the line, which cannot happen if the primary care knowledge does not exist. So, ECHO serves as that triage function to solve the problem.

Chagpar Now, you mentioned this really audacious goal and I commend you for it of reaching 1 billion people by 2025, and presumably many of those people are in low- to middle-income countries. You mentioned Africa, India, other parts of the world where there is incredible poverty and where access to care is severely limited, and so clearly there can be advantages in terms of spreading medical knowledge, especially when there is a brain drain in many of these countries. One question I have is that, your platform requires technology, have you found that to be a barrier, particularly in some of these low- to middle-income countries that might not have that technology, might not have the bandwidth?

Arora Actually, I was surprised that we have not found it as a barrier because of the fact that most countries now have 3G or 4G cell phones and in low- and middle-income countries a lot of the participation of the clinicians in the rural end occurs on cell phones. The other thing is that, yes it would be difficult to be get broadband access enough for video conferencing in a village in Africa but the district hospitals have it. So, what happens is that often either by cell phone or finding a location such as a hospital which has broadband for some other reason, we can overcome that

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barrier. The other issue of course is that 3G is going to 4G and 4G is going to 5G in almost every country in the world right now and all we need is a 3G platform. We provide a video conferencing solution that you use at Yale – Zoom, and we have a worldwide license for that, which essentially all our ECHO partners can participate in Zoom and it is very mobile friendly. So, for that reason, we are able to do this even in Africa, and of course, places like India have sufficient bandwidth, China for example has 4G in every village now and so it is becoming a non-issue for us.

Chagpar And when we talk about the impact globally, are you finding that it is more international collaborations, in other words you will have an ECHO clinic with somebody in Nepal or do you find that it is more within country, so many of these low- to middle-income countries will still have major academic center – India for example has Tata Memorial, which is a phenomenal cancer hospital in its own right. How are those collaborations happening, are they happening more intra-country or more cross-country?

Arora Our goal is always intra-country, that means we are trying, most countries have some specialists who know how to do it, even in a country like Zambia, I was talking to a doctor at Yale and there were 17 million people and they have

1 rheumatologist who actually is very good, and we have set up an ECHO in Tata Memorial for example, is one of our cancer partners in India, and they use ECHO for that reason because they have all world-class specialists at Tata Memorial in Mumbai, but they do not exist in the smaller towns and so they do ECHO and they do many, many ECHO projects for different cancers to train oncologists, to provide best practice care and surgeons to provide better care for cancer, but we also have one out at Bangalore, for National Institute for Mental Health and Neurosciences for addiction, mental health disorders and from PGI Chandigarh for hepatitis C treatment and psychiatry and many, many others in India, and similarly, we in every country find the local experts and build ECHOs around them. Now, in certain circumstances, we have made an exception to that rule where no expert resides, in which case we can actually use ECHO to train the experts first and then build ECHOs around them.

Chagpar It sounds like it could snowball into this amazing network of specialists providing best-practice care as they continue to train others. Have you found that it has actually made an impact in terms of outcomes in these low- to middle-income countries, thinking about places like India, where the government provides free transportation if you have a cancer diagnosis, you can get a free train ticket, but is it making a difference? Arora Yeah, in many, many countries now we have data, so in Punjab, India, there is a very famous institute called Post Graduate Institute, was treated about 1200 hepatitis C patients in a year, set up ECHO and in a year, they have treated 32,000 patients in all the district hospitals. Cure rate is 93%. In the country of Georgia, we did the same for hepatitis C elimination. They have treated

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40,000 hepatitis C patients with very high cure rates like in Punjab. In Namibia, evaluation by CDC for HIV is showing massive physician learning, so we have multiple outcomes all over the world and in the United States we are showing improvement in the health of the populations.

Dr. Sanjeev Arora is the Director and Founder of Project ECHO or Extension for Community Healthcare Outcomes. He is a Distinguished Professor of Medicine with 10 years in the Department of Internal Medicine at University of New Mexico Health Sciences Center. If you have questions, the address is [canceranswers@yale.edu](mailto:canceranswers@yale.edu) and past editions of the program are available in audio and written form at [YaleCancerCenter.org](http://YaleCancerCenter.org). I am Bruce Barber reminding you to tune in each week to learn more about the fight against cancer here on Connecticut Public Radio.