



Episode 17: Leading by Serving the Underserved
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Geoff: Hello, and welcome to "Taking the Lead," the podcast from the Radiology Leadership Institute that profiles radiologists as leaders, seeking insight and inspiration from a variety of perspectives and experiences. I'm Geoff Rubin. Today I'm speaking with Daniel Mollura, the founder, president, and chief executive officer of RAD-AID International, an organization dedicating to improving and optimizing access to radiology in lower resourced regions of the world. While earning a bachelor of arts in government and concentrating on international relations at Cornell University in the early 1990s, Dan worked as an economic research associate within the International Trade Administration of the United States Department of Commerce.

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Upon his graduation, he began a three-year stint at Goldman Sachs as a financial analyst within the equities division of the Investment Research Department. He subsequently re-focused his career on medicine, returning to school for pre-medical science certification at Columbia University, followed by medical school, radiology residency, and nuclear medicine fellowship at Johns Hopkins University. A serial entrepreneur, Dan founded three companies during his residency and fellowship, including Now You Know Media, an audio publishing company, Front RAD Technologies, a PACS and imaging technology company, as well as RAD-AID International.

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Upon completing his training, Dan began a 10-year period as staff physician in the department of radiology at the National Institute of Health's Clinical Center, and as an imaging scientist for the National Institute of Allergy and Infectious Disease. During these years, Dan increasingly focused his nonclinical time on building RAD-AID. Endorsed in 2011 by the World Health Organization, RAD-AID's Radiology-Readiness tool provides for systematic data collection for assessing how imaging technology can be planned and implemented to match the needs and resources of a community, and has been a critical enabler on bringing on-site radiology services to the more than 30 countries in which RAD-AID operates today.

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Supported by more than 10,000 volunteers from 100 countries and 75 university-based chapter organizations, RAD-AID's massive global health footprint relies upon a dedicated team of volunteer operational, regional, and in-country leaders, with Dan serving as its president and CEO. My conversation catches Dan at a key moment in his life and in the life of RAD-AID, as he bids the NIH farewell to dedicate his professional efforts to RAD-AID on a full-time basis.

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Our goal in creating the "Taking the Lead" podcast is to support your leadership journey, and with that in mind I'd like to tell you about a new sponsor, Carnegie Mellon university's Master of Medical Management program. Carnegie Mellon offers this degree exclusively to experienced physicians to build expertise in evidence-based management, business strategy, and technology for the future of healthcare leadership. We'll put a link on the page for this episode. Be sure to visit to learn more about Carnegie Mellon University's MMM program.

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Geoff: Dan, welcome.

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Daniel: Thank you, Geoff, for having me. I really appreciate this opportunity to talk to you. Thanks for having me.

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Geoff: So Dan, let's start off with your childhood years. Where were you born and where did you grow up?

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Daniel: I was born in a town named Great Neck, New York, which is on the north shore of Long Island a little bit outside of New York City. Most of my family was in New York in the Queens, and Long Island, and Manhattan area. Yeah, so that's where it all, for me, started, in the town of Great Neck.

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Geoff: And did you have brothers and sisters?

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Daniel: Yes, I have three brothers and one sister, so there's five of us.

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Geoff: Excellent. Where are you in the pecking order, oldest, youngest, middle?

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Daniel: I am the runt of the family. I'm the youngest. My siblings are all about seven years and older above me in age, so my oldest brother is 16 years older than I am and my nearest brother is 7 years older than I am. So as my parents say, I was the big surprise and I kept them young by showing up at the end of the family.

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Geoff: And you have plenty of role models in your older siblings I imagine.

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Daniel: Yeah, I would say I'm a mix of all of them really. Every strength that each of them has, including my sister and my three brothers, I sort of am a mix from them. Because as the youngest you get to learn from everything they did right and everything they did wrong. They've always been the counselors that I turned to whenever I had questions. So in addition to my parents, because my dad was a physician, and my three siblings, I'd say I'm a mix of all of them.

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Geoff: So you mentioned that your dad was a physician. What type of physician and what kind of career did he have?

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Daniel: Well, I was greatly influenced by my dad. He was born here in the U.S. in 1930. We're Italian-American immigrants, so at the age of eight his family had to return to Italy because of economic reasons in 1938, you know, just the family not doing well. And there they were trapped in Italy during World War II. So he grew up in Sicily during the war and not really able to return back to the U.S. until after the war was over. So his defining experience is even though he was born here as an American, he lived his young life in Italy during the war. And because of that, once he did come back to the United States shortly after the war was over in 1947 at the age of 17, at that point he had forgotten his English, so in many ways he was an immigrant again.

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And he then decided that he wanted to go to medical school and return to Italy to be schooled at the University of Rome. So even though I'm a second generation, technically I really grew up with, kind of, that first-generation feeling because so much of my father's development came from his experiences of living there and then eventually coming here. Then once he was here, he really had a wonderful practice as an internist. He was a community doctor, took care of a lot of families in the Queens, New York area. And as such, you know, there weren't many Italian-American doctors during that time. This is the 1960s, early '60s. Medicine wasn't as diverse as it is now, so in his experience this was a blessing and an opportunity to become a physician.

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So he took care of a lot of families in the New York area, and his practice was quite large. And eventually he became Chairman of Medicine at what then was called Flushing Hospital, which is in Queens. He always loved that kind of blend of teaching medicine and being a community doctor. I worked there every once in a while in his office to help out. One of my most defining experiences, I guess, as an early radiologist was that I helped paint and refurbish the x-ray room that he had in his office when I was just a teenager. So I think it had a lot of impact on me how his career unfolded.

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Geoff: It sounds like he was very inspiring. How about your mom? Did she work outside the house?

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Daniel: My mom took care of this big family we had, but my mom was amazing. She also very influenced by her Italian origins, although she was born in America, too. So she took care of our big family. There were five of us kids and then there was a huge extended family that was always drawing upon her efforts. One of the things about my mom though is that when I was about 10 years old, more like 8 years old, she started getting involved in volunteer work for hospitals to raise money and to philanthropically benefit hospitals that were trying to provide better care to people. This was kind of her first real career effort, and she was a very gifted leader because people were very drawn to her very bright and energetic personality.

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She cooked the best Italian food ever, I have to say, but at the same time, she just had so much positive and optimistic outlook, and she would throw these great parties. So donors and funders who wanted to support the hospitals came to her events, and eventually she became president of the Volunteer Guild of St. Francis Hospital, which is in Port Washington. And she was the largest fundraiser that they had ever seen, and it wasn't because of any schooling in the area or a specific professional training for this role. She was just so gifted as a leader in conveying a message of trying to bring positive impact, so she became president of the Guild. So for example, even something

small, she made these angel pins that she would hand out to all the patients in St. Francis Hospital on Valentine's Day, and it made such an impact. All it was was an angel pin, and we still have...and so just something like that.

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So I have to say, her perseverance in this area, I mean, she never missed an opportunity to tell someone about her mission in these hospitals and how she was trying to make things better. And she was constantly out there trying to push the margins on how to get more people involved and interested in this kind of work. So yeah, she was a big influence in me. In fact, my first volunteer experience in a hospital was when she took me to be a volunteer at St. Francis Heart Hospital in Port Washington, New York. She gave me my first outfit to wear and I went with her to the hospital and I helped volunteer in that facility. So she was a great influence in me in terms of seeing the bigger picture about medicine, the role it can have in its community, and how you can positively impact people by just being very positive and conveying a positive message about what healthcare is about.

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Geoff: Wow. It sounds like both your parents were tremendously influential. Now thinking back to your first formal job where you actually earned income, what was it that you did?

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Daniel: I had a lot of jobs through high school. I was a lifeguard. I taught English at Berlitz. I had a lot of jobs in camps, and schools, and things like that. So if you're referring to the kind of odd jobs that you would have as a teenager, I helped my brother with a car washing company and would wash cars. I mean, I did everything and anything to just get some experience working. So those were, kind of, the first experiences were really as a camp counselor, a lifeguard, and those kinds of roles I always loved, being around the water, being around those kinds of things where you're working with people. So those were the first roles I ever had growing up.

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Geoff: Sure. And what do you recall being your first experience as a leader?

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Daniel: That's a great question, Geoff. I remember I had to do this book report and I was third grade, or something, fourth grade. And they said, "Here, you can give this book report. Just stand there and read it out there." It was just a basic report, but the thing is my dad had a little toy podium. I guess he used it for his own presentations he would give, so I borrowed that and decided to practice memorizing what was in the book report. And every day I would try to remember three or four lines of this book report, five, six pages. And so they expected me to read it, but when I got up and it just all came out of my memory, it was profound and it was so much fun. And I felt like I was just telling everybody my book report but it was coming from reading the words I had written and then just remembering what was in them.

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It was a very defining moment for me, and I still think about it because I remember, "What was I, crazy? Here I am trying to memorize this book report. Why am I doing this?" But I thought it would be fun. It made it fun to do that. So that was the very first experience I ever had trying to present anything in front of a room and finding that it was kind of fun to do it. I think later on when I was in high school one of the things I got involved in very early was called the Model United Nations. The

Model United Nations in high schools was kind of a simulator, role-playing type of program where you get to play the role of a UN delegate. And then they send you to these mock UN conferences where you, in a role-playing exercise, represent that country.

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So I got involved in that very early, like ninth grade or something like that. I absolutely loved it. The United Nations was an inspiration to me. This was such a great way to think about world problems. But we were in high school, and this was the 1980s, right? So this was still a bipolar world. The Soviet Union was still there. The United States had its role as a leading democracy, and there was the Iron Curtain, and all that. And so everything about international relations at that time was a very bipolar world of the Communist states and the democratic capitalist states in fierce conflict all over the world.

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So we would go to Harvard and Yale as the simulated UN meetings, and all the schools would come from all over the United States and the world really to do these role-playing exercises. So I represented multiple countries, and Geoff, I absolutely loved this, right? I would go there and play this role, and it kinda feeds back to that earlier story about memorizing the book report. Because I would essentially read everything I could about the country I had to represent and think about, "Okay, how would they act in this scenario, even if I don't agree with it?" Because my job in this kind of setting is to be the delegate that would be from this country. So sometimes it meant trying to represent things that weren't consistent with my own values, but in order to really understand countries and how they're going to cooperate and interact you need to know where they're coming from.

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So I did that. I became president of the Model UN at Great Neck North High School. It's funny to talk about this now, but it really was a defining experience for me because that's how I got so interested in national relations, and also got interested in the concept of how do countries organize themselves? How do they approach world problems? How do they then communicate, and what kinds of things really stand in the way between countries as they try to deal with each other? So that was the first leading, and when they elected me to be president of that Model UN group, I mean, I was so proud. I don't think I was a great big leader in high school. I wasn't president of the class or anything like that, but for me, that was my own little space, that the Model UN was my own little location for starting my own growth as hopefully if I could one day lead something.

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Geoff: Yeah, that is a marvelous articulation of your journey, and so many key elements early in your life that were hugely defining for who you are today and what you've done. It's fantastic. I wanna turn to your undergraduate education just for a moment. Majoring in government, and international relations, and working at the U.S. Commerce Department, what did a 20-year-old Dan Mollura envision for himself and his career at that moment?

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Daniel: Well, as I left high school there was a real dichotomy in my life about science and economics. These were the two loves of my life, science and economics, leaving high school. I love science and did a lot of even research and science things through high school, but at the same time was doing things with the United Nations as I just described, Model UN. I was really interested in countries and international affairs. So as I went to Cornell, the big dilemma in my life at that time

was, "Am I going in the direction of science, or am I going in the direction of international relations?" And you know, I feel focus is important. That was kind of an important thing for me, and I said, "You know what? I'm gonna go down the direction of international affairs."

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And so I chose to study government, which was what Cornell calls the "political science areas," and all of my courses were heavy on economics, and that goes back to the science-y part of what I was interested in. I love the numbers, and the graphs, and the theories, and the concepts, and the empirical proofs that would come from the discipline of economics. But the concept of political economy, the idea that these economic concepts do not exist purely by the laws of supply and demand but instead have people in them, so that's why political economy is so important as a discipline.

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So when I started at Cornell, all my courses were in that. I studied a lot of international relations, international economics. I was really interested in free trade, how countries trade with one another, how does that impact their economies? How did these economies grow? What makes one economy competitive? How do trade barriers come down? What does that do to populations as they adjust to new competitive pressures, and threats, and opportunities? So all this was really my passion, and so after my first year of Cornell, my first real internship in this was a place called the United Nations Association. They go by the acronym UNA, located right near the UN in New York. And this is an NGO that advocate for the activities of the UN. It's a promoter of international cooperation. So I was thrilled. This was, like, my big chance. I couldn't wait. I mean, this was it, so I worked there and did research on issues of the United Nations.

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And the big thrill at the time was they gave me the UN badge, and as a UN-affiliated nonprofit you were given access to the UN at the time. So this was in 1992, and I would often give tours to visiting dignitaries and got to see the floors of the UN. Now this was for the real time, right? The Model UN stuff, that was all, like, you know, hotel conferences led by universities like Harvard and Yale, but this was the real deal, right? You know, and I was walking around with my books, like, on international development and just floored by how big and expansive this kind of experience was, and looking at how complex it would be that all these countries would come together and have these discussions in this room. At the same time I was also aware of a lot of the cynicism, too, about the UN.

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Some of the classes I took, for example, I was in international relations, the students at Cornell were saying, "Well, you know, these supernational bodies, they have no real lawmaking power. They're not an authority. These are just forms for discussion and dialog but they're not a government." So that really interested me, too, that real sovereignty is at the national level, the United States government, but the supernational part, like the UN and other international bodies, these have more of an advisory concept. But at the time I also got very fascinated by...well, at the time they called it the European Community. They were starting to see the beginnings of what would eventually be the European Union.

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Trade barriers were coming down, and this whole concept that the borders between countries were changing, and in some cases almost vanishing as new ideas would say, "Well, if you're gonna form an economic union, does that still make you a political union? And does that really make you a cultural

union?" Probably not, but political union, economic union, that kind of thing, these were all the concepts that were floating around in the 1990s. You mentioned, though, that one of my first internship jobs outside of the UN was then the Commerce Department. As I told you, my big interest was international trade and economics, so I worked in the International Trade Administration, ITA, which is part of the U.S. Department of Commerce. And their role was to study the impact of international trade on domestic U.S. industries.

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And at the time we were working on the North American Free Trade Agreement, and other trade agreements that were coming into play as the world was trying to liberalize some of its trade barriers and bring down more of those trade barriers so that those economies could have freer international exchange. And so for me this was also wonderful because this was brand new space, right, in the 1990s. Now we talk about these trade agreements. There's a lot going on even now about revising the NAFTA, and revising the way we're looking at international trade. The players are much different now, the system is much different, right? We don't have the bipolar world I experienced in the '80s, so trade has changed greatly. That was a fascinating time, and thinking about, "How does trade impact people?"

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This was the thing for me, though. How does it impact people? What happens to a person's job? What if the job that they had is now being threatened by international pressure? Shouldn't that person be invested in? Shouldn't they get new education? Shouldn't we support them? What happens to things like the environment, you know? The clouds that carry the acid rain across borders. Climate change is going on is a global phenomenon. It's not just one country and it's impacted by trade, so does a trade agreement have leverage over those climate issues?

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So at Cornell then I wrote a thesis for my international relations major on the balance between all those pressures that arise from human welfare that come from international trade. And I titled the thesis, "Striking a Balance." Because striking that balance between what trade and international exchange can accomplish versus its impact on the people and the environment, that's hard work. That takes a lot of thought, so it was called "Striking a Balance." And that was pretty much the paradigm that was in my mind at the time. It's great to talk about economics. It's great to talk about international exchange, but what happens to the people that are impacted by those concepts? Those theories are very high up, but then the human experience of going to work every day is another realm. And how do we balance those different forces?

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Geoff: So after graduation you head to the skyscrapers of Manhattan. Take us into the world of a 20-something financial analyst on Wall Street in the mid 1990s.

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Daniel: So it was a great opportunity because when I was graduating college there was a new industry being born. The internet was now forming, but back then we were still calling it the information superhighway, the ARPANET, and all the things. People hadn't really figured out even what to call it yet, so there was a lot of new industry changes happening. And I was recruited to join the group called the Broadcasting and Cable Telecommunications Group within Goldman Sachs in the equities division. And most of this telecom work was really arising from this industry where cable

companies were going to start offering telephone services, and traditional broadcasters were starting to think about internet content.

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So companies would cover, like, Comcast, for example, CBS. Disney was not in my group but it was in the group right over from me so there was a lot of communications about that. There was Turner Broadcasting. There was a number of entertainment and cable companies that were all in this flow for the forming of this new industry. And some of the projects that were on our desk was thinking about the financial projections of what would it take to invest in this kind of new infrastructure for cable companies to offer telephone services over the internet, for example?

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This is all passé now because people actually assume that telephone services can go over the internet, but back then it wasn't. And then how people would access email, would it come from a cable company? Would it come from some separate service provider? How would content be on the internet, you know, that kind of thing? So that's what I was coming into. This was my first job to think about. Part of our group was also cell phones, which is amazing, right?

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So cell phones also was making a major change at the time. People don't remember that in the 1990s only very rich people had cell phones, and they were usually these bulky things. They looked like the size of your shoe and they'd stick next to your ear and look like you were carrying a brick, and that was the cell phone industry in the early '90s. So that's what I came into, and it was an amazing experience because I remember when I first saw the trading floors and the stock exchange, and the energy going into it, and the passions that were coming out as this economy was just getting ready to roar in how to invest in this brand new territory.

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Geoff: Now working in equities research does not exactly conjure images of third-world altruism. How did your experience with Goldman Sachs provide you with valuable knowledge and experience in the development of RAD-AID?

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Daniel: Shortly before joining Goldman, I think the themes I touched one earlier about, how does the economy affect people? These were things I was starting to think about in the early part of college, but one of the defining experiences towards the end of college was that, as part of my involvement in my church, I went to the Appalachian region of Kentucky to volunteer there. I had never done anything like that before. I had volunteered in hospitals before, but that was kind of like a professional thing, an experiential thing, but this was the first time I ever went just purely with a charitable outreach point of view.

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And it was really a mind shaker for me to see rural poverty, and see isolation, and see the impact it had on American communities that were in Kentucky. And we would visit door-to-door, and our job there was really to spend time with people. Some people were homebound, some people were just not working. It was a depressed economy for that region of the United States in the Appalachian area. So I came out of that experience with my mind really upside-down already, like, "Wow, this is something I really wanna work on. I really want to understand how poverty affects people." And not

just from the standpoint I just wanna give everybody stuff and help them feel better, but it was more that I knew that it was a complex problem and that it would require a lot of thought and work to be present for those people and help them through what was very complicated, you know, many variables involved.

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So when I started at Goldman, it was a little bit of, like, "Gee, is this where I'm supposed to be? This is where my brain's training brought me, and this is where I should be based on those experiences and skills. But my heart is really with the human beings that are affected by the decisions that go on on Wall Street. So how do I manage that?" So I'm 22 years old and I really needed to navigate that better. How does that work? How do you synthesize what you feel towards the human question while your brain really wants to think about graphs, and numbers, and investments, and economic returns? Goldman Sachs was an amazing place to be because that's where the leaders and thought leaders were for investment and economic development in the future.

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What was not fulfilling about it was that it was separate from that direct human experience. But the tools I learned there were phenomenal because that's where I got to learn what it meant to build financial projections. That's where we figured out what companies were worth, and how were they organized, and how would they grow, and how would they attract investment? How would they make jobs? How would they be economic engines? And some were good at it so the stocks went up, and some were bad at it so the stocks went down. Your job ultimately on Wall Street was to figure out which companies were doing well and which companies weren't, and who were organized to be competitive and who were basically not competitive.

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I remember one of the experiences also that I had on Wall Street was the first time they told me, "You have to go call the chief financial officer of CBS and go over their business with them." And I thought, "You want me to call the CFO of CBS? I'm 22, this is absurd." And they said, "You have to figure out how to do it, just do it." And I remember that phone call like it was yesterday because I was terrified. I was calling the CFO of a huge, multi-billion dollar media company, and I was going to have to talk to him about, "How's business going? How are the ad sales? How are new content in the pipeline? How is the company organizing itself to be strategic for the coming year?" That kind of thing, the kind of thing that's very common on Wall Street, but you have to kinda grow up and say, "I'm a professional in this role and I may sound like a pipsqueak because I'm really just out of school. But I have to figure out how to do it and learn it."

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I honestly have to say, it's no different than what I had to do later on when I was in medical school. It's just like, you just have to do it until you can do it well. But it was that kind of experience at Goldman that I think framed what I was interested in. Because as I started to think about later on, like, the issues of poverty and international development, those tools for learning economics, and analyzing trade patterns, and economic investment were vital, and then being able to articulate that when you're talking with leaders of these industries and companies was a key part of that.

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Geoff: Yeah, that sounds like such a formative period and such an incredibly unique experience, particularly as you pivoted to the world that you're in now. Maybe we can focus on that pivot. Take us through the decision that led to your heading toward medicine.

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Daniel: As time went on at Goldman and I learned more and did more there, then needed to be closer to the human problem of poverty, illness, anything that was related to people struggling, that really just did not let go of me. That was just a core part of my heart that just would not budge. And no matter how much I loved the tools of business and the ways of thinking about economics, I just really needed to be back with that experience like I had in Appalachia where I was actually sitting with a person, or I was directly interfacing with the real problems that they experienced as individuals.

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You know, like any process of really reflecting hard, eventually I said, "It's time for me to make a big change. I have to re-tool myself at this age, and in a way, start over," which was very hard to do. It was a very scary moment. Even my family was a little unnerved by the whole thing, because while there I was at Goldman Sachs, right? It could've been this multimillion-dollar career that was really right there at the doorstep, and instead I was saying, "I really need to take stock of myself and possibly start over, and prepare for something that I think brings me closer to what I think other people might need me for."

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And medicine was a natural choice because it really was the ultimate combination of that scientific methodical thinking with, at the same time, being called to be that trusted person that the patient gets to talk to. There was no other job I could find that was like that, that someone trusted you with everything about their lives and their body, and at the same time you got to draw upon these incredible disciplines of science, and math, and all the things that we had learned in those disciplines. So it was a natural choice, but a scary one at the time. And so that's what made me decide to go to Columbia to start as a post-bacc.

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Geoff: That is really insightful at the age that you were to be forming your future and forming yourself in that way. I'm curious, you mentioned a few moments ago about your church, and how that led you to rural Kentucky. To what extent did your faith contribute to your sensibilities at this time? And maybe help us understand the role that the church has played in your life, and particularly at that time of your life.

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Daniel: I'm Roman Catholic, and my faith was a part of it, but it was never a driver. I was never a proselytizing kind of person. I was just always felt like it was an important part of me. It was an important part of how I saw the world in terms of helping others, and a source of growth. I think the experience, for example, in Appalachia really did show that what you're trying to do is put others before yourself. And so that faith was a big part of that transition, so it's a part of me and it's always been that way from a young age. And I don't know, it's not because I received any special training, or exposure to it, or anything. It just always seemed to resonate with me that what you do on this Earth really could be very impactful if you're putting others before yourself and somehow making a difference.

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I guess that's the real essence here, right, is just figuring out, is this something I can do that will make even a small difference of improvement for someone else? So in that sense my faith has always been

a close part of that. When I was at Goldman Sachs, for example, I used to visit a very small church that was, kind of, nestled between the skyscrapers. It was right across the street from where Goldman Sachs was located and I used to go and sit there, and think, and pray, and reflect on the things that were going on in my life. And it was funny because I still remember that vision, that image of this little church, kind of, stuck between the skyscrapers. It's almost like how I felt at the time, you know, I'm stuck between the skyscrapers. So it was a constant source of reminder about principle and a sense of strength about what I wanted to accomplish.

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Geoff: Fantastic, thank you for sharing that. So radiology, what led you to pursue it? You articulated the drive to be close to patients and to have that human contact as a main focal point of becoming a physician. Ultimately then you chose radiology. Take us through that decision.

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Daniel: Through medical school, Johns Hopkins was just a wonderful transformation. Remember, I had spent three years as a post-baccalaureate, so for a long time I had people looking at me like I wasn't even a real person. I was still in transition and they didn't even know what to call me. "Are you just on sabbatical? Are you gonna end up back on Wall Street? Who are you exactly?" So when I got to Hopkins it was, like, finally, the sunshine was open and I was really in the show. And I started doing the rotations, and I really loved a lot of things about medical school and the disciplines. I loved internal medicine and I loved radiology.

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So one of the things I think that drew me to radiology, I really, really loved that interface of the science and the physics of how images were produced and how radiologists would think about a differential diagnosis, how they had to think about all diseases. So they weren't really pigeonholed into one little focal area, they had to think about everything. Some people called the radiologist "the doctor's doctor," because they had to know everything as the consultant. And I was amazed by the level of knowledge that radiologists had. But at the same time, that part of me that was very interested in economics really loved the physics and engineering of how our equipment works, you know? How is an x-ray image made? How is a nuclear medicine image made? How is an MRI image made? All that, and then to produce this image and then extract from it a diagnosis was profound to me.

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And I think one of my most defining moments, too, in this whole thing is that I went to this conference at Hopkins. It was one of those case conferences where they showed a tough case where no one really knew the answer. And someone would present it at the front of the room, and then they would have long discussions about what they thought the diagnosis was. So there was a radiologist there, Dr. Siegelman, Stan Siegelman, so a lot of people know him as a famous radiologist. I've still got my short coat. I'm still in my formative [inaudible 00:39:48], things have still not been decided.

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And it was a case where there had been a factory worker who presented with some long periods of shortness of breath, and difficulty on pulmonary function tests and other things. So people were listing these big things on their differential, and it was Stan Siegelman that stood up. He said, "This is interstitial pneumonitis. It's from an exposure in the factory." And he just nailed it, and it was 100% correct and I was sold. I was like, "That's it, you got me." Look at that. It was like he was this magician or something, he knew exactly what was going on. Now I realize medicine is a

multidisciplinary effort. All the specialties have to pool their efforts together. Radiologists can't do everything, neither can any other specialty.

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But that really pulled together the different aspects of how I wanted to serve people. I really loved the science, and engineering, and the physics of how imaging was produced. But I loved the idea that you were the consultant to all these other specialties, and at the same time you could make this powerful impact on patients through your ability to really see through all the noise and get to the diagnosis.

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Geoff: Yeah, that's marvelous. That really resonates with me in terms of how you describe the attractive elements of the field, and having Stan Siegelman, who blew me away as a young radiologist hearing him take unknown cases, that sort of formative vehicle is just fantastic. Now you were performing your training in radiology and nuclear medicine, you founded two companies outside of RAD-AID, which you operated for between one and five years. Can you tell us about those companies and what motivated you to found them?

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Daniel: Yeah, so by the time I had finished medical school and was starting the residency part, and I was an Osler resident so I did the full Osler Medicine year the first year out of medical school at Hopkins. It's funny how the see-saw goes up and down. So now the business part of me started to say, "Hey, remember me from Goldman Sachs and all the fun we had? Don't you think we should do something with it?" Because you would think I would've just, kind of, moved on into the clinical world and been a clinical doctor, and that was it. But now the nagging feeling was that I had left behind a different toolset, and remember, I loved that toolset. I just had other needs at the time so I wanted to focus on my medical career. And so now that I had graduated and I was set for my medical internship and residency, I got this nagging feeling that I really wanted to get back into the business side.

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So one of the companies is Now You Know Media. It's a media company. So I was very interested in education. I'd always been interested in education. But remember, you know, the industry I was part of for Goldman was the media industry, making of content, distributing it to users, having it be interesting and useful, you know? CBS, ABC, Disney, Comcast, these are the companies I followed in Goldman Sachs. And so I was very interested in, was it possible to found a education company that could bring scholarly and educational teaching to people? And I met another person from that industry who had also worked in, kind of, the educational media side, and we kind of decided to put our heads together about different ways in which we could form a company to do this.

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Now for me, this was also a personal adventure because even though I had done corporate work from the standpoint of analyzing industries, and working in the investment side of it, being an entrepreneur, this was like a whole new adventure. I really wanted to try it. What does that mean when you start something brand new? It took me back to a memory that I had at Goldman Sachs. I was once at a meeting where it was a big room. There were lots of PowerPoints and presentations being given by executives. Goldman used to call it the Communicopia, because it was a communications, big conference. So I was in the back of room, sort of, getting coffee, or a muffin, or something, and I happened to stand next to Ralph Roberts, who is the founder of Comcast.

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Comcast was a much smaller company back then, but now it's, you know, everybody knows Comcast. But at the time Comcast was still very big, and Ralph was there, and so I said, "Hi, Mr. Roberts. I'm Dan Mollura from Goldman, and it's nice to have you here." And he said something to me that resonated. He says, "You know, it's so funny to see everyone with their PowerPoints and their slide decks, because for me, when I started Comcast I would knock on a person's door, ask them if they wanted a movie in their house, and then climb the pole and hang the wire."

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For him, it was so elegant and simple. It was, like, a movie in your house and a wire on the pole. And he sold me that minute, like, 1995 I think it was. I was like, "I gotta be an entrepreneur. I gotta do this, because I wanna hang a wire and hand someone a movie," or something like that. "I wanna be able to create something that goes right into their lives and do it from scratch." And now he did it and he formed a huge company. I knew that I would probably never do it on the scale he did, but that sense of being able to create something and make an organization around it to effectively deliver it was the reason why I did that. So forming Now You Know Media, and then later on, Front RAD Technologies, which was a PACS company, these entrepreneurial efforts, and then of course, RAD-AID, was all part of that desire really to create something from scratch that could provide meaning and value to other people's lives.

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Geoff: Yeah, fantastic. So tell me, what was the natural history of your involvement with these two companies? Did you wind the companies down? Did you hand them off?

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Daniel: Yeah, so the media company is still around. It's now called Learn25, and we had great fun, and it's still a growing company. And it would make audio-based lectures for people to listen to, you know, in basic, general type topics. Some of them are history, or wine, or art. Some of the topics are, like, from theologians on the world religions, that kind of thing. So there the company grew and had its own infrastructure, so by the time it got into it after a couple of years, the CEO and the staff really were able to take it and grow it on their own. I'm a consultant for them and I continue to be very involved, but not on an operations day-to-day level, and that's because the company was well run and was growing on its own. When it first started the customer service line would ring on my cell phone. I was the customer service guy, so that was fun and also, you know, not sustainable, especially since I was still a doctor in training.

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The other company, Front RAD Technologies, eventually what happened there was that, because I formed it and I had a set of partners, by the time I got to NIH I couldn't own a private company in the PACS industry and be at NIH. There are ethics rules against that, so I had to divest Front RAD Technologies right as I entered into federal government service in 2009. So that company kinda went off on its own after that because I had to divest and couldn't really remain a participant. But I put together the initial construct for it, because a big piece of figuring out PACS was, what are the new architectures? At that time cloud storage was a brand new topic. That was in 2008, 2009. Using Cloud Webviewers were brand new at the time. You started seeing new ways of moving radiology images around, so I really enjoyed that experience of getting involved in the formative process for a company like that.

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Geoff: Before we turn to RAD-AID, I'd like to discuss your career at the NIH a bit briefly. You've been a practicing radiologist at the Clinical Center, and a scientist within the National Institute for Allergy and Infectious Disease for over 10 years. What led to your decision to begin your radiology career post-training at the NIH?

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Daniel: Yeah, so one of my mentors at Johns Hopkins was Dr. David Bluemke, who's now the editor-in-chief of "Radiology," and he was the head of MRI at Hopkins when I was a resident. And he became the director for radiology at NIH about 2008, I believe, which is when I was in the middle of my fellowship. He knew of my interest in infectious disease and also computing, like artificial intelligence, and machine learning, and other kinds of things like that. So he had mentioned to me when I was in my recruitment phase that NIH was starting to do more and more imaging research for infectious disease and might be a good place to start that kind of artificial intelligence laboratory. So for me, that was a match made in heaven really, because I would be able to go to NIH, do that research, but also be a practicing radiologist.

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So there I was able to do CT, x-ray, ultrasound, and the nuclear medicine modalities, and be a consultant for MRI cases. So it really was a wide range of clinical roles, and at the same time, a very strong research portfolio that I would be going there. NIH was also starting some big initiatives on new emerging infections. For example, ebola was one of them, H1N1, which was a very dangerous flu that we had back in 2008, 2009. So this was important work going on, because it also resonated back to my earlier thoughts about patient care and really wanting to be closer to the patients and the people. Because at NIH the patients are very special and they're very sick, and often it's rare cases. These are cases that often other options have run out, and conventional care, conventional hospitals are not in a good position with resources to take care of those patients.

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So NIH receives those patients, and often part of research protocols to see if we can innovate something new for those patients. So for me, it was a mix of great blending of wanting to be at the margins, the cutting edge. At the same time, really wanting to focus on people that would need us, because NIH had a very special community of patients that really did need us, because there was no real other alternatives. No conventional hospital could take care of these types of patients, often rare diseases. And at the same time, be able to work on the kinds of things that really only NIH was in a position to do. Things like caring for an ebola patient is not something that most of the healthcare sector could handle. So being able to think about, "What is the role of radiology in a dangerous flu, or a dangerous ebola outbreak," was really right up my alley. So David Bluemke recruited me at that time, and so I started at NIH in 2009.

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And through that decade that I was there from 2009 to this year, 2019, I did exactly what I just described. I started an AI lab. We did numerous publications on machine learning and using computer-based image interpretation for things like tuberculosis, flu. We did ebola work, because NIH even admitted ebola patients from Africa, for example. So we really accomplished a lot in terms of the research, but at the same time I was able to be very active in the clinical care components in the clinical center.

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Geoff: Yeah, this is really yet another substantial pivot. I mean, beginning with your interest in international relations and economics, your time at Goldman Sachs, and then your decision to pivot into medicine to provide more human connection, and human contact, and to serve underserved populations, you know? Now you're opening up the box about research, and as well as clinical practice, the focus on technologies which is yet another dimension. I think it's really interesting how diverse your involvement and engagement has been. One wouldn't necessarily have thought about a substantial research career for you after residency given all the competencies you carried out of residency.

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Daniel: Yeah, so it was a wonderful opportunity, because I think all along this career, I think, the theme that was, I guess, important for me was the creative element of being able to say, "Let's try this idea, let's try that idea." Every part of this career has really been an adventure of, let's try something out. Let's create something new. It doesn't have to all succeed, in fact, a lot of it doesn't succeed. But the fun of being able to say, "Let's work on this and see where it goes," that's where the adventure was. And so putting those things together, kind of, made sense for me at the time. And you're right, it's a lot of pivoting going on, but that was kinda the learning curve, the learning experience that I think has made a medical career just an absolute blessing to do. Because this is the kind of environment where you can pivot, and try this, and try that, and it's all for the good purpose of hopefully making a positive impact.

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Geoff: Yeah. So what was the motivating force behind your founding RAD-AID? I mean, we've heard a lot of background about why RAD-AID would seem to be the logical extension of where your career was going, but take us through exactly when this happened. Did it come to you as an epiphany? Did it develop over time? Was there an inciting event?

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Daniel: It's a combination of those things, but one of the things I had read about as part of my medical training, you know, when I was a fellow, it was 2008. The World Health Organization put out some reports that about 2/3 of the world didn't have access to radiology. It was really a small report but it was there. When I read it I was a nuclear medicine fellow. By that point I had already finished my radiology portion of the training and was just completing the fellowship. And it struck me, like, "Really, 2/3 of the world doesn't have any access to what I'm doing every day?" And by that point I knew that, well, radiology is impacting virtually every sub-specialty. I mean, cardiovascular patients undergo imaging, babies and mothers get ultrasound for prenatal care, mammography for breast cancer screening, CT for trauma, IR for so many of the procedures that radiology does.

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It was profound, so to me, to say that a half to 2/3 of the world didn't have access to radiology meant that there was this ripple effect of healthcare disparity. Now that's the brainy part, right? That's the intellectual part, but what struck the nerve inside me was, "Wow, that's international relations, economics, medicine, and technology all in one package," and that was me. That's everything I just talked about in this interview. Starting off in the days of the UN, going over to Goldman and thinking about economics, and economic development, and how countries trade with each other, going into medical science and clinical care, and then figuring out how to make hospitals better. So that concept, it seemed like a natural intersection between so many of the things that I already loved.

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So that gets closer to the real answer, and then really literally I woke up on July 2nd, and the word "RAD-AID" was in my head. And I went straight to a computer, and that's when the first file was written "RAD-AID" on the screen. And the entire mission statement poured out of me. It was 8:30 in the morning and I remember showing it to my wife, and she joked, "This is what you're doing when you wake up early?" I said, "I don't know, it was just there." So it was a combination of things that were starting to percolate into my head, and then the word "RAD-AID" came into my mind and made it to a computer screen, and the first thing I wrote was its mission statement.

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Geoff: That's great when those lightning-bolt moments hit, and even greater when you act upon them. For the physician or allied health professional operating within the United States, Europe, or the wealthier Asian nations, how do you convey the global health challenge?

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Daniel: Initially, you know, there wasn't much understanding in the public health community of what radiology's role even was. So we know it was radiologists, but we have a biased perspective in that sense, because we already know what our specialty does. So to be able to convey that to the public health community was more of a challenge. But when you realize that's the fundamental messaging that we do need to pursue is that, okay, what is going on here? These imaging technologies are vital for patient care, diagnostics, therapeutics, and then looking at response to therapy, and all that. So it's a big infrastructure element.

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Now what was happening at the time is that most of this was written off initially by people who responded to me as saying, "Well, radiology is too expensive, so there's nothing that's ever going to be able to be effective or go on in low-resource regions. It's just too expensive. It's too capital intensive." So initially when I formed RAD-AID, and RAD-AID is designed to bring radiology to low-resource regions, what are we going to do that's different? And this brought me back to the Goldman Sachs thing. Every company needs to select what it's gonna do differently than everyone else, and what it's gonna do better than everyone else. And one of the things that came in 2009 was the concept of Radiology-Readiness.

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Doing a lot of interviews with hospitals and other elements in the global health space, we found very often that well-meaning charities and well-meaning companies would often donate equipment that the receiving hospital really wasn't able to use, either because skilled personnel weren't there, or other infrastructure elements weren't there. They just had no way to effectively use this well-meaning charitable contribution. So as a result we started to think, "Well, we shouldn't be asking the question, 'Do these hospitals need radiology?' Needs assessment is a very common concept in the global health paradigm, but we should be asking the question, 'Are they ready for radiology? What is their readiness level?'" And that gets not into the issues of what they need but more in what they have. What do they have already that might be the basis for making radiology, if it were there, more effective?

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So that was the genesis of the Radiology-Readiness assessment, and that was in 2009 that that really got going for RAD-AID. The Radiology-Readiness assessment says, "Okay, what do you already have? What are your goals, and then what are the gaps that RAD-AID could help you fill in making what you have effective towards reaching those goals?" And that's what made RAD-AID very

different, and it gave us a method that we were able to scale into the world, and that's how it reached the 33 countries, and the 61 hospitals, and it attracted the near 13,000 volunteers and members that RAD-AID has. Because it made sense with our radiology paradigm that we would first start with this important due diligence step of saying, "What is the location ready for, and what can we add through a collaboration with that hospital to help them reach those goals?"

[01:02:14]

Geoff: Yeah, that's terrific. The Radiology-Readiness tool is something that I wanted to delve into a little bit further with you. The concept itself, was this one of the earliest elements as you were framing your vision for RAD-AID?

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Daniel: Yes, because it was really a shift. Because RAD-AID's getting started looked like any other nonprofit would. We're gonna bring radiology to developing countries, low-resourced countries, underserved areas. "Bring radiology," what does that mean? We weren't gonna be the first nonprofit in the global health space, and certainly weren't going to be the last one. So the idea that we would try to approach this in a methodologically scalable way was important. The other thing that I realized, and this goes back to my experience with multinational corporations when I was at Goldman in those years was that, you know, multinational corporations have to often deal with the fact that when you're scaled at a global level it's very hard to be relevant at the local level. How do you design any product for a local market if you're also going to be scaled at a global level?

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If you think about the example of a McDonald's or something, the food is going to be similar across sites, but it also has to be uniquely adapted for each location. So any global entity, any global enterprise at the corporate level really has to engage the question how to be globally efficient but locally specific. So in RAD-AID's case, recognized very quickly that Radiology-Readiness is a replicable, scalable method that produces a locally-adapted solution. So the method is always the same but the solution ends up being different at each hospital.

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And that's vital because that keeps you efficient at the methodological operational level, because you're always doing the same thing in terms of the assessment, and translating that assessment into a plan. But the end product, in this case the service to the hospital, is uniquely adapted because it's based on the data and experience we collected at that site. And that's how RAD-AID solved the..."solved," in our case with quotes really, the problem of being globally efficient but locally adaptable.

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Geoff: Yeah, that is really an important point, and I'm glad you articulated it so clearly. Because when you consider RAD-AID's mission at first blush, one could view it as almost an insurmountably massive task, like boiling the ocean. And it sounds like this framework really helped you overcome that sense that it is just so massive, where does one begin?

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Daniel: That's right. Radiology-Readiness is a living, breathing concept also. So we wrote the first assessment tools in 2009 and tried them out in the first series of hospitals where we were working, but that tool had to evolve. And that led in 2011, for example, to have a full-day discussion with the

WHO, the Pan American Health Organization, PAHO portion of the WHO, full-day discussion of the readiness assessment. And they were wonderful because they helped us with every question to, kind of, vet it a little bit. Because at that point Radiology-Readiness had already been around a couple of years. We had already been using it a number of sites, and the WHO doesn't endorse anything really. But to the extent that they were "endorsing," supporting this concept was very valuable to me. That was a major step forward to have any international health authority say, "This is a good idea and this is a good approach," and to actually vet the details of what was in it was critical.

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So 2011 was a major turning point, giving us a little more international recognition for that. But I think then as the years unfolded we then had to think, "Okay, that's your concept for Radiology-Readiness, but how does the organization itself get structured so that it can carry out this kind of assessment tool? It's one thing to send a team there, they do the assessment, but then what? How do you organize the organization to be able to actually do the work that the assessment says? And so that was something that's constantly unfolding and has really been fun to see it really take shape.

[01:06:57]

Geoff: Yeah, I can imagine. I do wanna get into some of these aspects of scaling in organizational development. Let me just ask you a couple of other things about Radiology-Readiness. Are there any stories in particular that you can share where the tool really came through for RAD-AID, where it really established its value in a circumstance where without it things could've gone horribly wrong?

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Daniel: Oh yeah, so there's a lot of that. So for example, in India when we started we did Radiology-Readiness assessments at over 10 institutions. And personally visiting these hospitals, and getting a sense of where they were heading, and it was easy to see at the macro level that close to 80% of the population lives far from the hospitals. But then 80% of the healthcare sector in India was inside these concentrated tertiary care centers. So the readiness assessment started to show that there was this disconnect between marginalized communities and these relatively well-resourced tertiary care institutions. So it helped us to figure out that, "Gee, a mobile solution, in reaching to those peripheries, would help to engage marginalized populations through education, through screening." Because we didn't have to go to the hospital and say, "Here, I'm gonna donate an x-ray unit." Well, what for? That hospital already had that.

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"We're gonna donate a CT scanner." Well, what's the point of that? That hospital has that. The problem is the patients are not getting here. They don't know you're here, or they can't get here, and that issue is multi-factorial, right? It might be due to family dynamics, economics, the poverty, the disease is too advanced. Lots of factors go into why a patient in a peripheral region never makes it to a hospital or a care provider. So that helped us design a solution, for example, that was focusing on mobile outreach. Now you'd say, "Well, that's specific to that." Well, it turns out the same dynamics exist here in Washington, DC. We have Ward 7 and 8 in Washington, DC, which has one of the highest poverty rates, and it turns out, one of the highest cancer and mortality rates. And it turns out that women aren't accessing mammography. Well, why is that?

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Some of the dynamics are very similar to what I just described in India. So our assessments enabled us to say, "Okay, we're gonna use a similar solution, a mobile program that outreaches to those communities." Now another example though, if we were a cookie-cutter organization I'd be talking

about all these mobiles everywhere, but a different example is in Ghana. At Korle Bu Teaching Hospital, we were invited to do a Radiology-Readiness assessment there, and what we found was a hospital that was delivering a lot of care, but all of its equipment was either not there or antiquated, and they really weren't able to do much effective radiology at the time. Now if we had just looked at that snapshot we would've said, "Okay, let's replace the equipment."

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But the Radiology-Readiness assessment at the same time showed us that the Ministry of Health for Ghana was putting in brand new equipment in 2012. So in that case we knew, "Okay, our assessment just showed us that new equipment is coming in." But then when our assessment also showed that that equipment was coming without any DICOM licensing for making that equipment digitally capable to interface with a network in a PACS. So we offered that hospital the solution that we will donate and install the DICOM licenses and start for them the first PACS to go along with the new equipment that was coming. So if we hadn't done those assessment steps, and we hadn't thought about what they have and what their goals are, I mean, we would've really been out to sea on this.

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We would've made a lot of mistakes, but instead we focused in on a PACS implementation and we got that done by 2013. And then we upgraded another PACS there in 2016, and then we even did the first RIS installation there, which is hardly ever done in most of these countries, in 2018. So major progress on the IT side because the equipment side had already some things in motion that we could work off of as a way of synergizing the solutions.

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Geoff: Excellent. Now do you find that when you're approached by representatives in country where there is a need that they've got a well-formed perspective in their own minds as to what they think they need? You apply the readiness tool and determine, "No, that's not what you need, you need something else." And then are you able to convince them to re-focus their efforts in order to obtain results, or do you sometimes just need to walk away because they're stuck on what they thought they needed and aren't able to understand what they really need?

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Daniel: Yeah, that's a great question because often what happens is that once RAD-AID engages a hospital, in the process of doing the Radiology-Readiness assessment, they already know that the spirit of the assessment is to be open to its outcomes, that the solution offered may be different than what will come in as their pre-expectation. There might be a difference between what they expected and what the outcome is. Now usually these things can align, but at the same time, by engaging the process of the assessment, because it's so collaborative...you know, when you use the word "assessment" it almost sounds like an audit, like some external team shows up and starts looking for dust and stuff. It's not really like that. It's a very collaborative process because they're opening their hospital to you as a step of trust.

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And you're responding by being their peer and their collaborator so that the spirit is already there to say, "This is a collaborative experience. We're not auditing you, we're trying to help. Maybe you'll disagree with the recommendation that comes out of it." But because of the collaborative nature of the process it usually is a very consensus-building exercise, that by the time you're done there's already a lot of alignment.

[01:13:17]

Geoff: Excellent. So it is remarkable how quickly RAD-AID was able to gain traction, and in particular, develop relationships with other key global organizations, like the World Health Organization. Can you talk us through a little bit about how you entered into the field on behalf of RAD-AID and made the connections necessary to begin RAD-AID's traction and growth? Were there key mentors? Were there key advisors that made this possible? What efforts did you take on yourself?

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Daniel: Sure. I think the outreach to other organizations was really simply telling the story, just as I've told it here. Half to 2/3 of the world don't have radiology. Well-meaning companies and charity organizations like to contribute radiology. There needs to be a clear method. Radiology-Readiness provides a way for us to have a method that scales, leverages the experience of radiology professionals, and is a collaborative, on-the-ground process for affecting change. It was a very clear story, and I enjoyed telling that story. And maybe part of it is that I enjoyed it so much others did, too, but it was pretty just straightforward. And so organizations started to see the value in that.

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Because, for example, the vendors in the space already knew about a lot of the issues I was describing, and the international health organizations knew the issues also. So there wasn't a whole lot of convincing that needed to be made. What was really important, though, was we could show them a roadmap that was relatively clear about how to pursue it. And it wasn't necessarily a roadmap that says, "Here, follow this and all your dreams will be made, and all your problems will be solved." Our approach doesn't really say that. It just says, "Here's the method that we can engage with so that we can learn through the process. And even if we don't get it right, it has a self-correcting method built-in, because we can always go back and think about it again, and re-assess our approaches, and make remedies as we need to."

[01:15:36]

Geoff: Super. So how does RAD-AID balance the pursuit of new opportunities versus deeper investment into existing programs? I mean, obviously there's a limited scope of resources, whether they be financial, or whether they be human resources. So talk us through the notion of when you say, "We're done here. It's time to take on new opportunities," versus, "Wow, if we just stay at this site or work with these folks a little longer we can achieve this much more," and potentially eschewing some other opportunity elsewhere in order to pursue that depth.

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Daniel: Yeah, it's a great question, because any scaled entity is going to have that problem, deepening its commitment to a location versus widening its geographic scope. So we're adding countries all the time, adding sites all the time, adding sites within countries now all the time. RAD-AID's 13,000 approximate supporters, and volunteers, and donors actually come from about 114 countries. Twenty-five percent of RAD-AID is from the low and middle-income countries themselves. So it's a very internationalized entity, so as a result there's constantly the requests rolling in to say, "Let's send the team there, and here, and there," and we'd like to say yes to every single thing and be able to send teams everywhere. So the core way we approach this, which in the past year has unfolded a lot, is what we're calling agile management.

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Now this is not a new paradigm in the management literature, agile management, but in terms of our approach, this is how it evolved. Because the concept of agile management is being able to have a very horizontal structure with a lot of feedback from your "customers," which in our case is either the volunteers or the hospitals we serve in. And then having short iterative cycles for looking at how a product, or a program in our case, is really working. So this is how the agile management literature has unfolded over the last 20 or 30 years. It came out of the software industry because they had to make short product cycles.

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So in our case, the way RAD-AID is organized is that we have two sets of leaders. The first is called the regional leaders in RAD-AID, and they're defined by the location, director of RAD-AID Kenya, director of RAD-AID India, director of RAD-AID Ghana, etc. So their authority, their decision making is to lead the teams and know the stakeholders when they go to sites and program at the sites. Then we have a second silo second track of leaders called the operational leaders. So instead of defining them by a specific region, instead we define their roles by areas of expertise, like informatics, nursing, technologists, radiation oncology, IR, ultrasound. So the idea here is that the operational leaders in RAD-AID can provide their operational expertise to the regional leaders that then deploy the teams. And this creates a good synergy between these two so that what they do at the sites has a good synthesis of operational and regional expertise.

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The regional leader is going to know the stakeholders, the culture, the hospital really up front and close. But as you know, no radiologist or any human being really can know everything about all the interdisciplinary things that go on in medicine. So being able to pull from this range of operational experts makes the perfect soup possible at each location. So they're able to say, "Okay, my team needs to have nurses, IT professionals, and a physicist for radiation safety," and they're able to pull from those areas of operational expertise. So what that does is that makes it possible to scale each program according to what we're seeing at both the regional and operational level. And that governs whether we deepen a commitment in a location or add more countries, because as long as that system, which is very agile because there's a lot of cross-communication.

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Now this is a very different approach than what we typically see in hospitals and universities, where we're used to things having a PI at the top, or someone at the top that knows everything and basically has a command structure of filtering decisions down to the base. That's not going to work in RAD-AID's structure because we really need to have much more cross-pollination. I'm talking to you now as the CEO of RAD-AID, but I don't know the details about Nigeria the way the director of RAD-AID Nigeria does. And I don't know enough about PACS the way the director of informatics of RAD-AID does. But my job is to synthesize those elements so that they get the perfect combination, that perfect soup, as I'm calling it, at the local level, so that my job is to shepherd that integration between regional and operational expertise so that we collaborate best at the local site level.

[01:20:50]

Geoff: Fantastic. Now what metrics do you use as measures of success, and to what extent are you able to apply the same or similar metrics across projects? Or do you need to customize the definition of success across a breadth of activities that you're undertaking?

[01:21:11]

Daniel: Success is ultimately measured by the metrics that are defined in the Radiology-Readiness assessment, because it's going to depend on what that initial project is looking to accomplish. So if it's going to be, like, a PACS deployment, for example, well, you're really going to look at, okay, how well is the PACS used? How many cases go on the system? How is it impacting patient care? Is it improving patient outcomes? What is the experience for that hospital in being able to train its users? These are the different metrics that go into it. If it's a program like a mobile screening program, like India, for example, that I mentioned, it's gonna be about the number of patients who are on that vehicle, how are they referred? How many cancers were detected? How many cancers were then treated? That kind of thing, so it might get into the granular level.

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In Laos, for example, where we had to start a whole radiology department with Lao Friends Hospital for Children, it's a wonderful institution, but their radiology department was virtually empty when we started there. There it's gonna be about how many patients were seen. We donated an ultrasound. We supported their x-ray. We donated a PACS. We helped them get access to a nearby CT scanner. So it's all gonna be in the metrics of how many patients were then able to access radiology, and then what impact is it making on the patient care?

[01:22:34]

Geoff: So how frequently or regularly do you undertake performance assessment, and how do you aggregate such diverse activities and performance characteristics in order to use those assessments to guide strategy and execution for the company as a whole?

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Daniel: It's going to depend on the project, again, but it's gonna be in short iterative cycles, as I said before with the agile management paradigm, for example, that you're constantly getting that feedback. Every time we're sending teams in and every time there's communication between us and the partner hospital there's going to be discussions of impact, progress, and challenge, always getting a sense of what those are. Now the actual collection of numbers, that might happen on a quarterly or yearly level. But we're not as obsessed by, sort of, that auditing kind of quality of saying, "Okay, we gotta do this quarterly. We gotta do this semi-annually. We need to do this annually."

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It's more of a living and breathing process, because we try not to let the data collection part squeeze out all the oxygen in the room as we're trying to get the work done. So a lot of the feedback comes through the natural interface and communications with the hospitals directly, and so that they're able to always show us what the product is. And so it's not set on the interval but we're constantly getting that impact back.

[01:24:02]

Geoff: That's excellent. I love the analogy of not sucking the oxygen out of the room. I can't help but think back to your description of financial analysis and model creation, and it certainly conjures a lot of quantitative analysis. And it seems that you have learned to achieve a very effective balance between your desire and tendency to really want to analyze deeply in a quantitative manner, and giving space and room for the organization to develop more organically.

[01:24:32]

Daniel: Yeah, that's right. And it's similar in the sense, I guess I got this, kind of, experience with the financial analysis, because that's similar to how we did it then. There was a lot of ongoing communications with the companies when we were covering them from Wall Street, but then there was also those quarterly reports and annual reports when companies would report fully how things went. So that blend of formal and informal, periodic and short-run communications was always an important part of that. And being able to maintain that discipline of saying, "Okay, we still have to keep up with what's going." Because we're part of this, right? We can't just send it in and hope for the best. We have to continue as a collaborator, really be part of the discussion.

[01:25:16]

Geoff: Given the fact that it is such a geographically diverse network of leaders and participants, and you had mentioned the essentially matrix characteristic of the regional and operational leaders, what tools do you bring to bear to maximize communication and learning amongst leaders that may be geographically separated by great distances and not necessarily engaged in the same projects?

[01:25:45]

Daniel: That brings back that structure of the regional leaders and our operational leaders. Because, one, you always need a central point of contact and a central decision maker. And in RAD-AID's case it's the regional leader who makes those decisions and is the point of contact. Because they know the stakeholders, they often know the language, and they know the culture of the site that they're interfacing with. But they need that operational input from the operational leaders in RAD-AID so that there's always a flow of that expertise that they're going to need in those communications. So that keeps the clarity of the communications defined, but at the same time makes them high yield because you always have the source inputs. I found that global health organizations that blur the lines between these different contributors often can cause confusion among the stakeholders in the hospital, and then they don't know who to talk to.

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And we can see very easily if that ever starts to happen because the regional leader becomes very acutely aware when communications have started to blur and they don't know who the stakeholder on our side really is, and we so we quickly fix it. It has a self-correcting mechanism. So that regional leader, operational leader, kind of, agile structure of cross-pollination is how we've approached that challenge.

[01:27:05]

Geoff: It really comes across as cultural development for the organization to build this ethos of how regional and operational leaders engage with one another, where the handoffs occur. Have you had to engage in many course corrections for your managers and your leaders?

[01:27:27]

Daniel: There's always a learning process. There's always a self-reflection, and no organization gets things fully right. In fact, I find that the best companies, the best organizations, this again comes from the experience I had with Wall Street. The ability of a company organization to reflect and change is part of what will determine whether it's gonna succeed or not. If it can't pivot, if it can't adjust, or can't go with the flow and adjust to the information as it comes in, there's no way. Maybe you'll get lucky if you have a rigid structure that just happens to be right at one time, but eventually some challenge comes in. And the ability to flexibly respond to those challenges is important. So we have it

built into the fabric of how this is done and we're always gonna see those challenges and course corrections happen, but they're so part of the process already I don't even think we consider them to be course corrections because they're just part of the natural flexibility of the organization.

[01:28:30]

Geoff: Driving innovation is a component of RAD-AID's mission, and I think you've really articulated already how Radiology-Readiness represents a key innovation of RAD-AID. But I want to ask you specifically within this context, how does RAD-AID drive innovation? And what would you consider to be RAD-AID's greatest innovations to date?

[01:28:55]

Daniel: One of the most exciting things about RAD-AID is that it's in the radiology space, which means we are not a static industry. We have changed so dramatically as a profession since the very beginning. I mean, if you think of CT in the 1970s, and MRI in the 1980s, and then PACS as we got into the turn of the millennia, it's amazing how our profession is constantly changing. So unlike a lot of other charitable sectors of the nonprofit world, a radiology nonprofit cannot afford to stay with one set of technologies because we're constantly changing everything around, and we're constantly innovating. And now the new thing is artificial intelligence, how AI is coming into the practice of radiology because imaging is such a rich data source that our ability to create new software for healthcare is paramount. And you're seeing radiology now on the front pages of "Economist Magazine" and all kinds of popular press because we're really leading the way on AI.

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So this is just one of the most fascinating things for me, because as I said before, I ran an AI lab at NIH. I was doing technology research. It started off with a PACS company that I started a while ago, so for me these innovations really do have to fit with the rest of the picture for how radiology as a nonprofit can work. So when we think about how innovation comes into a marketplace for adoption, you know, there's always that early adopter thing. Some people adopt early, but in medical care we have to safeguard the patients, right? We can't just throw new technologies into healthcare and try it out as if there's no risk. There's a lot of process that needs to go into that, and again, Radiology-Readiness is built to do that because it can say, "Okay, will a hospital be able to adopt a new technology that could arise?"

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So artificial intelligence being a great example, a lot of it is still going through FDA clearance. We don't know how artificial intelligence will really impact patient care. Who's responsible for those outcomes? Patient confidentiality and privacy, really important things that need to be considered in AI because AI learns from data, and data comes from the patients. So our approach to this has been to embrace technology and be able to integrate it into how our teams interface with the hospitals. So I'll give you one example, you wanna hear about innovation. One of the things we found is that we've been deploying PACS since 2015. We've been installing these systems in hospitals, and this has been wonderful, right? It creates a whole new digital infrastructure for these hospitals.

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But what we also found, though, is that deploying a PACS is actually a very difficult thing. Because if you send servers to a place, it's expensive to send those servers. And then those servers often need air-conditioned rooms, so you have to invest in the infrastructure for that. And then there needs to be personnel there to maintain or startup that server. So a lot of things needed to be in place in order to

send even simple servers for data transmission. So one of the things we came up with is a very compact server that's temperature resistant, doesn't need a air-conditioned room, and can be pre-loaded with PACS software so that we can configure it here and then have it be a turnkey PACS solution at the hospital site. This concept became known as the RAD-AID Friendship Cloud. We deployed it for the first time last year, and it really transformed the way we were able to implement PACS.

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Now the cloud portion has been contributed by...Google Cloud was one of the first partners to do this. Ambra was a PACS partner to do this, and it was, kind of, the first, kind of, prototype for delivering this. And so now you have cloud solution integrated with this local, compact server. So why take a hybridized approach? Well, many hospitals still need something at the site where their data on a day-to-day basis is still being managed and accessible through physical hardware. But at the same time, now you can leverage cloud by doing batch transfers and other things when the bandwidth is applicable and appropriate for that. And in some countries if they can't use cloud for any reason, then you don't have to use it. You can just shut off that connection if you don't wanna use it and just use the local server instead. So again, it's flexible, but at the same time you have cloud and an on-site server.

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Now this also gives us then a way to introduce AI, because now we can introduce AI through either the local server or through the cloud to be able to teach AI tools to hospitals that have low resources. So now we have a whole pipeline that can teach AI. Because AI is still not ready for primetime. It's still got a long way to go before it ready to actually deliver patient care decisions. But if we can introduce AI as a teaching tool, a suite of tools that these hospitals can then learn and try out, they'll be able to participate in that revolution. So RAD-AID Friendship Cloud is one example of an innovation that's trying to integrate RAD-AID's ability to teach at these sites but also to be able to innovate some new technology platforms that can advance the hospital's capabilities.

[01:34:26]

Geoff: So let's talk a bit about technology. To what extent do you believe that the technology we use in the United States or other developed areas of the world is the best technology for developing nations?

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Daniel: Well, there's no one answer for that, because developing nations as a whole has a lot of heterogeneity to it. In low and middle-income countries, the regions, rural, urban, and the different locations will clearly have a lot of heterogeneity to them even in their medical practice patterns and radiology practice patterns. So one single form of adoption is probably unlikely. But in terms of where the state of technology is in the high-income countries, the efforts to adopt some form of that is one of the efforts that's underway or being considered. But it's really about how it will be adopted into low-resource regions is probably going to be a lot different, mainly because not only are the practice patterns different but the access to personnel is different. So for example, if you look at Kenya, for example, has about 4.5 million women are in the screening age population for undergoing yearly breast cancer screening.

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But there's only fewer than three fellowship-trained breast imagers for 4.5 million women every year. So in comparison the United States has a much larger number of radiologists reading mammograms.

So if they were going to read for volumes like that they probably wouldn't read more than 10,000 cases a year in a high-income country. Whereas a single radiologist in Kenya would have to read upwards of a million cases a year. So assuming that the same technology that a breast imager in the U.S. would use would be applicable in the same way in Kenya is a stretch, right? It doesn't really make any sense because the personnel difference, the volume difference is so vast, that disparity issue is so vast that the technology probably won't be the same because we're going to have to adopt to a much different circumstance that has fewer access to resources in the lower-income countries.

[01:36:58]

Geoff: Got it. Now how do you view the market for technology companies from the perspective allocating resources and program development toward developing specialized tools for the low-resource world? In other words, when you think about the big players that we know in the United States and in high-income countries, it might be hard for them to allocate resources toward developing unique products for low-resource environments. What does the market look like? Is it new entrants that are going to meet these needs? Is it going to be incumbents?

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Daniel: One of the issues with any of these technologies for radiology reaching low-resource regions is the issue of, what is the local ecosystem going to look like? So even a vendor of CT, or MRI, or x-ray, ultrasound, if they sell a unit into a low-resource region the issue of the ecosystem becomes paramount. Because, for example, if you have a warranty or a maintenance contract, who's going to provide a follow-up service for that unit? That's a major issue because if a large vendor is going into a space but that local ecosystem is not there, then how do you sell effectively to those hospitals to use that equipment? It's a very challenging circumstance. For example, RAD-AID is working in Guyana, for example, and in some cases the service contract and other providers would be coming from other parts of South America, not necessarily within the country.

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The same goes on in the Caribbean, that you may actually have the service providers be on continental South America, even though the vendor's equipment is in the Caribbean Islands. So that ecosystem is vital and is part of the new entrants' scenario. So when a vendor goes to a space like that, they're having to consider, you know, "What's the different interlocking pieces of how this will become a good product for the recipient, a service contract, software, hardware?" Now as we get into artificial intelligence, and advanced software, and cloud computing being involved and integrated into the radiology solution, we then get into the scenario that hardware is gonna need regular software updates. And so it's not enough anymore to just say, "Okay, I bought the unit. Now the unit is just gonna function."

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Assuming it doesn't break or anything, it'll just function. Well, that assumption is gone, too, because if you need to do software updates that means that there's internet access, or cloud access. And AI is an inherently learning piece of software. It uses data to get better, and learn, and make upgrades in its functionality. So even that has to now include some kind of access point for things like internet and cloud in order to maintain the level of performance that these products are supposed to deliver. So that interlocking scenario is a vital piece of how these markets seem to be unfolding, at least from the experience of RAD-AID being in these low-resource areas.

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Geoff: Yeah, I would've thought that internet and cloud access at this point in time would essentially be a necessity for Radiology-Readiness?

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Daniel: Well, you know, you could argue that, and the problem then arises from the fact that there's still about half of the world that doesn't have internet access, which is an amazing statistic. And that statistic is changing radically, but if you look at some of the world's access to internet statistics, it's not as highly penetrated as we might think. There's still large pockets of regions and communities throughout the world that do not have reliable access. And then when they have access to the internet you have to consider that there's bandwidth issues, right? Having access is different than having the kind of speedy, high-data performance access that health IT and health institutions are going to need. So that's part of that readiness, so that's one of the reasons why RAD-AID implemented something called a PACS Readiness assessment a few years ago.

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As an add-on to the general Radiology-Readiness assessment we added this PACS IT AI Readiness assessment tool so that we could start to look at these questions before we deploy equipment and deploy any kind of solutions to look in advance at these types of issues, how fast is internet? Is it there? Is it not there? What kind of network is there? Who manages that network? Because that's going to be a very diverse question.

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Geoff: And for the programs that RAD-AID has already helped to develop, what would you say is the distribution of them with respect to their internet connectivity? How many of them have no internet connectivity? How many of them have really very poor bandwidth?

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Daniel: It's hard to exactly quantify, but I will say this. Once RAD-AID has engaged hospitals and begun to have these forms of dialogue about the issue of radiology equipment and the importance of network connectivity, some institutions have invested in that connectivity, I won't say as a result of, but at least in parallel with our discussions with them. That has recently happened even in scenarios like in Peru, near the Andes Mountains where we were dealing with some rural clinical contexts where there hadn't been some local networks there and now they're there as we're planning more of a roll out of imaging services. So I think that's something that happens, and it can occur in parallel, and you can get progress as you're developing it. I think most of the institutions that are engaging RAD-AID do have some form of internet access, but there are issues of outages and connectivity that do come up from time to time.

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So it's hard for me to put an exact number on what portions don't have anything, because there usually is some form of bandwidth. The real issue is, is that bandwidth in connectivity up to the speed and performance level that you would expect of an advanced health institution? And that's where you find a little bit of a diverse response.

[01:43:54]

Geoff: Right. Now can you offer any examples of specialized technologies that have been particularly effective for RAD-AID but are not used in the United States or other high-income countries?

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Daniel: Let's see, there's a number of examples. I wouldn't say they're not effective in high-income countries but there's an overlap in use and there seems to be at least an apparent higher applicability in the low-income region. So one example is the handheld ultrasound. Ultrasound units have become smaller, less expensive, so we've seen some of these units that are even attachable probes to a tablet or a phone. And that's impacting the use and availability of ultrasound. Now some would say this is a lower price point. It enables access to ultrasound like never before, so this is an example of increasing the accessibility based on that cost decline.

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At the same time, though, it presents a challenge, because increased access in use of ultrasound when there hasn't been proper training and certification measures actually raises an ethical and legal problem about who's using ultrasound in low-income countries, and have they been properly trained? Are they licensed? Are they certified? What forms of regulations should appropriately exist around the use of an ultrasound? So if you think back on your own medical training, no one gave you a license to carry a stethoscope. Many medical professionals, doctors, nurses, etc., use stethoscopes, and we don't carry a piece of paper that says, "You can use a stethoscope." But as technology changes or ultrasound, there are some that would argue that ultrasound is just another type of stethoscope. It's just another tool in the white coat. And you can use it like an extension of the physical exam, just like we do the stethoscope.

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But here's where that analogy doesn't apply anymore, because like I said, we don't have a license for stethoscopes, but many countries do require a license for an ultrasound. So there needs to be some form of training, and certification, and competency measurements behind that increased accessibility. So I think that the increased applicability of ultrasound in low-income countries, it raises that opportunity, but at the same time it's a challenge. Another example is potentially AI. It has big upside in low-resourced regions, partly because there's the issue of scarce personnel. So if you can automate the interpretation or triaging of imaging or triaging of that work list, you can make a big impact in areas that have a scarcity of personnel because you can increase the efficiency of the available personnel so that they can focus on maybe the highly abnormal cases. They can do screenings where the ones that are normal can easily be filtered out by AI interpretation.

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Now this is all theoretical. We're not really doing this yet. AI is not ready for primetime in that kind of way. But that's where the applicability and the upside of AI is tremendous, in regions that really have scarce personnel. But like I was saying about ultrasound, with that opportunity comes the big challenge. The big challenge, though, is that if you have most of the world still not having access to computers, or if these health institutions don't have PACS, for example, which 2/3 of them don't have PACS, is there a pipeline or a platform where they can even have access to AI? Will AI even reach those institutions?

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And if you go back to that Radiology-Readiness concept, are these institutions ready for AI if they don't yet have health IT and PACS first? Or can there instead be some kind of leap-frog event? So I

use these examples of ultrasound and AI as having tremendous upside potential as these technologies change and reach low-resource regions, but they bring with them amazing challenges that are exciting to deal with. And that's why I'm so happy that RAD-AID is in this space because we're excited to grab onto those challenges. But they do exist, and those challenges have to be taken very seriously.

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Geoff: Yeah, that makes a lot of sense. And interesting that just providing a technological solution is not the final solution, that there's so many other characteristics and features that need to be realized. I wanted to ask you, what is highest on your wishlist for technology development that has not yet been realized? It sounds like that might be AI, understanding that there are certain infrastructure characteristics that need to come along with it, but let me just, sort of, toss that out to you again and ask if there's anything perhaps that you didn't address?

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Daniel: There's lots of wishes for this space, because we wish we could make every piece of equipment lower in cost, more accessible, more sustainable, more service, all that kinda stuff. So without the pie-in-the-sky, sort of, thing, I think my immediate, real wish would instead be a really reliable structure for having low-resource hospitals be able to participate in AI development through a highly secure and confident system for data anonymization and sharing. Hospitals that are participating with RAD-AID and which we've developed and implemented PACS, we know how to anonymize cases with them. And we've even had discussions about creating, kind of, an open-source data trust so that low-resource hospitals can contribute anonymized data and participate in a nonprofit system for AI development that would finally include the developing world, because there's such a challenge going on with data diversity.

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And if we had data coming from Africa, and Asia, and Latin America, for example, what a great contribution to AI that would be. But one of the challenges that's blocking that at the moment is the controversies going on with data anonymization, data privacy, and patients' rights, which we have to really figure out. Because if we can't confidently, securely anonymize data, well, there's no real way to create such a mechanism for hospitals to participate. And I know that anonymization is something that goes on all the time. There's plenty of mechanisms out there already for doing it, but it's those small breakthroughs. It's like the small moments where the data is not completely scrubbed down, you'll get a few cases out of a thousand that might still have personal health information, PHI, still on them.

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And I wish that were solved today, because if that were solved, and we knew that we could still take care of patients perfectly well, and yet still have a great ethical, and legally compliant private mechanism for enabling that data to push the margins on technology development, we would be able to move much faster than where we are right now. So that would be my first step, because I think the other things will follow shortly behind. But that's one of the things that a lot of us are trying to work on, so that those hospitals with low resources could really contribute and be a part of this AI revolution that's going on in radiology.

[01:51:44]

Geoff: Great. Now is RAD-AID participating directly in facilitating technology development? Or do you draw the line at technology development and seek to accept technology as it's developed from

partners, but focus RAD-AID exclusively on more service delivery, and infrastructure, and setting up programs?

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Daniel: Yeah, it's a great question, because RAD-AID is not a tech company. It's not a software maker. We're not an IT firm. RAD-AID's approach is to integrate three important pillars. One is clinical education, two is infrastructure, and three is AI and IT development. So to just get into those three pillars just briefly, so the clinical education part is the hands-on, on-site work that RAD-AID does. We send a team, they go to the hospital. We work shoulder-to-shoulder with their personnel, help take care of patients through a teaching mechanism. They're still taking care of their own patients but we serve as teachers and supporters of that effort. So that's number one, and then number two is infrastructure, so that means helping them acquire, procure, and implement a new scanner, a new x-ray machine, a new CT unit, a new MRI, new mammogram, new ultrasound, or in some way enabling the infrastructure for the radiology enterprise.

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And then number three is integrating AI, and PACS, and other software tools into that flow. Now only by interlocking those three pieces do we feel at RAD-AID can we be effective at this. So if you would imagine, there are some that would just throw software and say, "Here's AI. Here, take it." Well, that's a very incomplete solution on its own, right? You can't just hand software to someone and say, "Here, use it to take care of patients." You need to empower the user and teach the clinician, the radiologist, radiology professional, radiology technologist, radiology nurse to use that software effectively in their clinical practice. Because these technologies inherently change the way in which we practice radiology and the way we take care of patients. So by empowering the user and teaching them, we can then introduce these other elements as an interlocking set of activities. And so that's RAD-AID's space.

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The AI companies will make the technologies, the software. PACS companies will make their stuff, CT makers, MRI makers, etc. But what RAD-AID can do is stitch these pieces together by empowering the users at the core and teaching the users, the radiology professionals how these things can be integrated into better patient care. Now you raise the right point, when you're empowering all this stuff, you're putting infrastructure, you're putting PACS, and you're teaching users, is there a point where you're getting really close to being co-developer? Because you're doing so much at the leading edge that you are, in a sense, right there inside that ecosystem that's trying to develop the new technology. You get kinda close, but in the end it is coming from an entity that's focusing exclusively on that development and on that innovation. We don't try to get into that space, but more to empower it.

[01:55:13]

Geoff: I read a quote of yours stating that RAD-AID's work is not just about helping other countries and the poor, but RAD-AID also aims to cultivate a new generation of health leaders who can think outside the box in charitable and innovative ways. How does engagement with RAD-AID lead to the development of leadership skills?

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Daniel: I'm impressed you found that quote. It's one of the things I'm very passionate about in RAD-AID, and I stay true to this. It's that we're not only serving the hospitals that we work in but we're also empowering a whole generation of radiology leaders. So if you think about the typical education of a

radiology resident, or even a technologist, and I think back on my own training, a lot of it is very much you're in the reading room, you're shown images, you learn how to diagnose, you learn how to interpret. Or if you're in IR, you're doing procedures, so you're learning a craft based on a set of assumptions, a set of parts that all work together inside that hospital where you did your training. And you start to become so comfortable in that interlocking space that the images will arrive in front of you and it's almost like you don't have to think about it anymore. You're just looking at the image and just dictating out your report.

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When you step outside of that box and go to a low-income country, you can't make those assumptions anymore. There might not be a PACS. There might not even be a technologist. When you do an IR procedure here in the U.S., you can make certain assumptions about sterility, and conditions, and post-op care, and all the kinds of things that go on in a hospital that has high resources. But then when you go to a low-resource region all those assumptions need to be suspended. So when we train radiology residents, when they come to RAD-AID and they go to a low-resource region, and for the first time now all those assumptions are suspended, and they now have to operate like they can't take anything for granted about any of those processes.

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And that by building capacity in that country in that hospital, they're now going to have to think about, "Okay, who is the technologist? What is the image quality? What is the radiation safety? How will this procedure be performed? What is the referral network? How will this patient receive end care if I diagnose something on the imaging?" All those pieces. So what you're doing is you're creating a new type of leader who's willing to step outside of all those assumptions and systems that we have in place here, and make them lead by saying, "Okay, how can I solve some of these deficiencies? How can I train the technologist that might be missing? Or how can I put in place the radiation safety program that might be absent?" Those kinds of things, and that's what's exciting.

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So then that radiology resident, or whoever it might be in their training, whether it's a radiology nurse or a technologist, by doing that step of getting outside of it, they're now a leader like they never were before. And they have to think about all the different stakeholders in the radiology enterprise, and think about new goals, and new ways to get things done, and who they can work with, and who's gonna collaborate with them, and create a whole plan for getting something done. And that's essentially what all the volunteers in RAD-AID do. When they go abroad in their projects they work as a team and that's how they operate. So that's the kind of thing that now 13,000 people in RAD-AID are now able to do, and we're empowering them by giving them the experience that stirs that leader from within. And I've seen it numerous times, Geoff, it's amazing, people who've even said to me, "Oh, I've never led anything. I can't lead. I don't know what I'm doing."

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And then you put them in these scenarios and they turn into these resourceful, visionary, effective people, effective leaders that they never even thought they were. And it's an amazing process. It's a real inspiration to see, and I've seen it numerous times.

[01:59:22]

Geoff: That's very exciting. It sounds incredibly inspiring. How would you describe the typical phenotype of a RAD-AID volunteer?

[01:59:33]

Daniel: That's a great question. I'll say, first, there's no typical anything, but I know the ones that are very effective and successful. The first thing is, they come in with a sense of humility, and a sense of exploration, and a desire to help, but in a way that's very gentle. And it's hard to even quantify the kind of personality we're talking about, but that gentle leader who listens carefully, takes in information, and is extremely diplomatic, and knows that when they go to a low-resource hospital that you're a guest, and that you listen, and that you're there to help. And you're very diplomatic about how you're offering your support for their work, that you're there as a secondary person and not as a person who's a know-it-all or something stepping off a plane to say, "Here, I'm gonna show you how it's done." That's definitely not the case. That's definitely not the phenotype.

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And this has happened over and over where the person who operates like that, then in addition to that humility and diplomacy comes a sense of very keen observational skill. They'll be able to notice the things that are missing but also the things that are there, the strengths of a hospital, the strengths of a low-resource radiology department, and then be able to see solutions. And then be able to, kind of, stitch together the different pieces that go into it. Now not everybody gets into that role. Some volunteers, they're not there to become large enterprise leaders. They just wanna help out in a way, and so that humility and that willingness to help out comes absolutely first. Then being able to astutely observe the things that they can fix and address, that's kind of the next level up, you know? Now you're getting a person who's really thinking outside the box a bit on how they can make things better at that institution.

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And then the third piece I would say is the teamwork aspect, that they're part of a bigger initiative, that it's not just one person heading somewhere, taking a bunch of photos, coming back and saying, "Look at me, I went to X, Y, Z countries." But it's more that, "I'm here on behalf of a bigger initiative from radiology to help low-resource countries, or low-resource hospitals." And they see themselves as part of that spectrum of continuity, that when they first begin they know that they're reading the reports from the previous RAD-AID teams that were there. And then when they get back, they're now writing a report so that the next team can continue building on what they were doing. And that's another typical phenotype that we see that someone knows that they're part of a bigger initiative, bigger team, and they're willing to be a contributor to that continuity.

[02:02:26]

Geoff: That's beautiful. Those are characteristics that benefit leaders in all kinds of environments, but your articulation of them is just right on. A particularly unique characteristic of RAD-AID is its affiliation with radiology training programs. RAD-AID currently lists 78 university-based chapters, which is a remarkable degree of penetration into a diverse community. What do you see as the common thread across these connections, and what justifies the effort required to maintain so many partnerships with a constantly rotating pool of radiology trainees?

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Daniel: The Chapters Network you're referring to, the RAD-AID Chapters Network has been a really stunning portion of the portfolio that RAD-AID leads. It started in 2012, and it was kind of a hypothesis. Because if you look back at the literature of radiology training, the radiology education and residency training literature, you had something like 40% to 50% of internal medicine, surgical, and family practice residencies offered a global health curriculum, so it was about 50% of them, sometimes even higher than that. But then the radiology residencies, around the first decade of the

2000s it was closer to 5%. So basically there was almost no global health curriculum training for radiology residents in training in the first five years after the year 2000. So what RAD-AID did was created the RAD-AID Chapters Network as kind of a way for us to fast-forward radiology's participation in global health.

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We knew that a few institutions already had global health, but most of them had no touch with it at all. And so what the Chapters Network established was, okay, now as a chapter you can leverage the relationships that RAD-AID has with 61 hospitals. We provide project guidance. We provide tools for you to travel, and be safe, and carry out a project in a low-resource region, be part of a medical imaging team that RAD-AID would send. Because RAD-AID has MOUs and contracts with these hospitals to receive our teams, all the kind of medical, legal stuff is already figured out. So essentially it's a fast track to establishing that global health curriculum.

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So any department where a chair, a program director is willing to approve it, they have the RAD-AID chapter and off they go. They have this turnkey curriculum. We do monthly webinars for the chapters that they can learn about different countries and the different radiology services in those countries, and really learn how to be better global health radiology advocates. So that's how the penetration grew so rapidly. It started off as a hypothesis, "Let's see if anyone's interested." And I would've been happy, Geoff, if, like, 5 or 10 signed up for this, and instead now we're closing in on the number 80. Because it's been such a rapid progress of wanting to have global health in their programs, and in addition, I think seeing the value add that RAD-AID can provide.

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Now these chapters are all very different. Some are very highly energized and resourced, and some of them struggle a bit, you know, where maybe they don't have a lot of people in them or a lot of resources yet. But they're all trying, and through that mechanism of engaging us through this mechanism they have the opportunity to really do these great projects that are tailored to their own specific interests. So I think that's one of the reasons why that this has really accelerated. And now I would argue that we're surpassing internal medicine and surgery. Not that this is a competition or anything, but I think that with almost 80 institutions participating in this in the U.S. and Canada, we're actually now surpassing some of the other specialties, because in global health we can be so impactful. And that's been a great step, because now we can say that not only is radiology in global health, but it's even taking on a leadership role in global health.

[02:06:40]

Geoff: Yeah, amazing. You have espoused multidisciplinary thinking such as economics, technology, international policy, public health, for delivering on RAD-AID's vision. How do you see your leadership training amongst RAD-AID's priorities, and in particular the extent to which you attempt to educate and train your volunteer leaders to achieve this multidisciplinary perspective?

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Daniel: Well, first we do a lot of pre-project orientation with the volunteers. So when someone is selected for a RAD-AID project they get involved in that team and they see that the team is meant to be a microcosm of our own departments. There's a technologist, there's a nurse. There's maybe a physicist, there's IT. It's a little microcosm of our own radiology department. So that's the ideal type of team that RAD-AID would send, and this is another thing that distinguishes us from other professional societies, which where things are a little more siloed by whether you're an MD you'll be

in one society, or tech will be in a different society, or nursing will be in a different society. As an NGO or a charity, we can have that interdisciplinary mix, and it's part of our fabric to be so interdisciplinary.

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And then that training comes about because part of the pre-project orientation is for these team members to really be talking to each other about their perspectives. And this is also a great form of nurturing way to grow your own career, because how many of us in our regular practices really get to set down with nursing, and technologists, and physicists, and really exchange ideas about how to unfold our project? So this is a great opportunity to, kind of, unfold into that interdisciplinary side. Now one example is medical students wanted global health radiology opportunities, and RAD-AID revised our medical student program last year to first include an online self-directed tutorial sessions where they're able to sign up and do online tutorial in different aspects of radiology global health.

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So they'll learn things like assessments, and the different modalities, and the problems of scarcity, and how you deal with public health, and ethics. There's a module for each of these topics. So we structure this so that the medical students to really engage radiology and global health in one organized body of information. So they do the tutorials and they do the quizzes, and at the end we give them a certificate for having completed that training, and then that makes them eligible to do field work on a RAD-AID team. Now not everybody who completes the online self-directed tutorial piece will then go onto field work, because some of them don't have time, or resources, or whatever the issues might be. But many of them would like to do the service project on top of the online self-directed tutorial education. So this is one way in which we've structured this.

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The one reason why we did this is because when we got medical students who would apply to RAD-AID, we didn't always know what background they were coming from in terms of prior radiology experience. Some medical schools offer clerkship, some don't, some make it a requirement, but some don't. Some people may do radiology as an elective in their medical school but maybe do it at the very end closer to graduation. So you never really know where medical imaging was. So this is, kind of, the equalizing effect of giving them one curriculum to train them in multidisciplinary radiology global health. And that way when they then participate in a RAD-AID project, we know that they've now covered this entire curriculum going in, and we know now what their baseline knowledge is going to be that they can bring to a project, and this makes it much richer for them and richer for us. So it's a very mutually beneficial experience to do it this way.

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So this is one example I would give of trying to provide interdisciplinary education so that someone comes in with a set body of information. And it's based on the radiology and global health textbook that RAD-AID wrote. The first edition was in 2014. We just published the second edition in 2018, so everything that's in this curricula are there in a published format even so that they can even read the book on top of those things.

[02:11:18]

Geoff: Thirteen thousand people from 100 countries. Can you give us some perspective on who these 13,000 people are, and how does RAD-AID coordinate the efforts of such a large and diverse labor pool?

[02:11:37]

Daniel: So first we can talk about the composition by professional background. So about 65% are technologists. So that's a very meaningful portion of how RAD-AID functions, because the technologists, as you know, are so critical to the radiology enterprise, performing the imaging when the patients are at the modality. So that's number one. About 25% to 27% are radiologists, MDs. About 10% are coming from nursing, and engineering, and business. About 20% would self-report as sonographers, and sonographers often includes MDs and technologists, so it's sort of an overlapped category there because ultrasound tends to be a modality used by techs and MDs. And about 10% would describe themselves as educators in their day jobs. Even though all of us in the medical profession, we all teach in some way whether we know it or not because it's such a learning profession that we're in, 10% would say that they're teachers by definition in their background job.

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So that's, kind of, the mixture in terms of who they are and in terms of what they do. I would also include about 10% to 15% are coming from the informatics portion. Now that's another overlapping category because some technologists, for example, would call themselves superusers, which means they train other people to use IT platforms. Some MDs also are superusers, and some are informatics specialists, where these are engineers in the IT world who are not medical professionals but instead focus on IT. So that's the composition by virtue of their expertise background. Then you get into, where are they coming from? So approximately 53% are inside the U.S., and about 8% are Canadian, about 7% or 8% are British, about 6% continental Europe and Australia, and about 25% are from low and middle-income countries themselves.

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Now this is a great statistic, because when we started out you could say, "Well, is this an American NGO?" And yeah, it was started here and it had mostly Americans in the initial phases. And then it really internationalized as a community of people so that now a 1/4 is coming from the low and middle-income countries themselves as donors, supporters, volunteers. And this is great because then this sets up a real internationalized component of our teams. Because you'll get a volunteer from Ghana wanting to help out in a team that's working in Nigeria, and we've seen that before. And so the so-called north, south now has south, south efforts at making contributions to each other. So that's the mix, and it's very exciting to see how it becomes so diverse over the 11, almost 12 years that we've been operating.

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Geoff: Wow. I imagine that there is no shortage of passion and drive amongst RAD-AID's volunteers, but that doesn't mean that they're prepared to enter a poorly resourced region of the world and attain objectives, let alone avoiding putting themselves or a project at risk. What are the essential competencies that health professionals need to be effective in global health initiatives, and how does RAD-AID prepare these volunteers for success before entering the field?

[02:15:13]

Daniel: Like I said before, the pre-project orientation is a big part of that, getting to know your team, getting to know the team agenda. Like I also said before, that our structure for team and project delivery is this interface between our regional leaders and our operational leaders. With the regional leader, director of RAD-AID Kenya, director of RAD-AID Tanzania, etc., you know, that person is the team leader for going in and knowing the agenda, knowing the stakeholders, knowing the culture, and preparing the team for those local circumstances. And then the operational leaders, ultrasound, IT, nursing, etc., will input key areas of expertise and mentor the volunteers that are on the team in

certain key areas where they need that support. So that if an IT person is going on the project, they have our entire operational informatics team ready to mentor them and support them even as they head out into a project. That's how we structurally handle that.

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Now in the end, one thing I think we've all discovered about these types of projects is that you have to expect the unexpected, that things are never as easy as you think they're going to be once you're there. There's always things you wish you had prepared for but you didn't, because these are fast-changing circumstances and a lot of variables of uncertainty are present in them. So we get back into that humble, diplomatic, patient person phenotype again, because that person will know to go slow with it and take their time, and be diplomatic in how they address those circumstances. Because if you have that, even if things are not accomplished on that trip, on that project, we'll get to it. We'll get to it later. We'll get to it on the next trip. As long as you keep that collaborative spirit intact, we can always build things and move forward. That's an important thing.

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And I think one of the tools we use is we have an ethics training format that is available to our volunteers, for example, where they're able to learn from the ethics and etiquette of different countries before they go. This was donated by a company called Aperian. They have a product called GlobeSmart, and this trains you in the etiquette of the different countries where you are so that before you go there certain things about how you say hello, how you exchange business cards, how you receive and give gifts, all those kinds of things are known ahead of time, which are important. Because in the end, what you really want is that relationship to build. Even if you don't get to all the tactical things on the agenda list for the project, at least that etiquette is still there, that relationship is still there. And we can always come around again later on to get to some of the other tactical items.

[02:18:17]

Geoff: I wanna reach back to some of the things we spoke about early on, which was your formative period, and just to ask you, how does your background and financial analysis inform your approach to running RAD-AID today?

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Daniel: The basic tools of running any business is in the architecture of knowing that an organization is a legal entity, a financial entity, and an operational entity. And I had to learn that very quickly in the experience that I had at Goldman Sachs. First of all, as a legal entity what you're doing to structure your organization so that it's complying with domestic and international laws, so that it's doing agreements and contracts with other entities, and that you're an actual living form, in a sense, that as a legal entity...an organization is a breathing, living thing in that way. It's a separate existence almost from the person that may have founded it. So that's number one.

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Number two is the finances, income statements, and balance sheets. I equate them in these medical conversations to almost learning how to read an EKG. You have to look at it and know what's there. There's revenues, there's expenses, there's profit, there's losses. How do we do that? And even though in a nonprofit sector we look at these entities differently than a private sector entity, because private sector entities have shareholders and equity, and there's actually an enterprise value assigned to for-profit entities. Nonprofit entities don't have any of that. There's no equity, there's no shareholder. There is no actual enterprise value that's monetary. So being able to know the different ins, and outs,

and bloodstream of the organization through those financial statements definitely is something I have to draw upon. Now it doesn't make me an accountant.

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It doesn't make me the most experienced financial analyst, but it means that when you're looking at those numbers to know that, "Okay, there's gotta be ways to really dig into that." And then I think the third is organizational structure. I got the experience of seeing how different companies structure themselves, how they're managed. Some are very hierarchical structures, a CEO, a C-suite as they call it, really having a very triangular, pyramid-like command structure where someone at the top is commanding to the bottom. Some organizations are flatter than that. There's also franchised models and things like that that really inform a structure. In RAD-AID's case, as I said before, we use a process that we didn't really even know it was considered agile when we put it together. I mean, we put it together because it met a need, which was we had to have team leaders who could easily cross-pollinate across regional and operational levels of expertise.

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And we needed to have a lot of cross decision making, because no one at the top could possibly know all the countries, all the sites, all the stakeholders, and tell someone at the front line exactly how they should do that. And so I think that how you structure an organization is really important. So those formative years for me, I think, were very defining in saying, "These three elements, legal, financial, and operational come into defining what your strategy is, what makes you good at what you do, what makes you different than others? What value can you bring to the world that's unique?"

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Geoff: I would hazard to say that your perspective and experiences are a big factor in RAD-AID's success, and your leadership approach unquestionably. So it's fantastic to hear how you translate those early experiences to RAD-AID today. How does your tenure at the NIH inform your approach to RAD-AID? Anything in particular that you take from your experience at NIH that you apply?

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Daniel: I think that in learning how to run a lab and seeing where the field was going, and being an active radiologist, taking care of patients clearly shaped me as a radiologist, as a person in this space, kind of, looking at how the field is growing, how it's progressing. That definitely shaped me. Now a government institution is a much different type of entity than a nonprofit or a for-profit entity, obviously. It's got a much different position in the world because it's not exposed to the same competitive pressures, and as a government it is meant to be, sort of, an arbiter, and a, kind of, protector, in a way, of that public aspect to it, that it's welcoming to all invitees, and all that. So it's different than the nonprofit and for-profit spaces, where you're not in that government role, but instead you're an actor within sometimes a crowded market space.

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Government, by definition, is, kind of, a monopoly of a certain position in a market. And we need that, because in that sense it's creating that ethical construct and the legal construct around which the other actors have to play. So I think that seeing the difference in the government structure versus private sector and nonprofit has informed me at least of being able to say I've worked in all three environments. And seeing how each has different structure to it, I think having a perspective where you're able to say, "Okay, these are the strengths and weaknesses of being in government, these are the strengths and weaknesses of being in for profit, and here are the strengths and weaknesses of being in a nonprofit." And then being able to look at that.

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But I think that from a substantive level of being able to run an AI lab, that has been very informative. Because I'm not an IT specialist. I'm not a computer programmer or a computer scientist, but I'm a radiologist with enough experience in how to put people together, and to see some needs. And being able to be knowledgeable enough of how useful these technologies can be of how you can empower a team to do a unique AI project and then bring it to fruition, and publish something that might be useful to the ongoing industry, I think that that's been one of the things that's been most impactful.

[02:24:50]

Geoff: RAD-AID has been operating for 11 years now. How would you summarize RAD-AID's key accomplishments within this time?

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Daniel: One of the key accomplishments, and again, there's others in this space so it's hard to direct these things. I'm not the type to say, "Okay, RAD-AID did this itself, or this is a direct causation," because there's many nonprofits that act in this space. But I would say that one of the things that we've contributed to is the recognition that radiology is an important part of global health. This past year RAD-AID won an award from the United Nations, which came from the task force on non-communicable diseases. This was a task force put together by the UN to look at entities that were trying to deal with non-communicable disease, such as the big ones being cardiovascular disease and cancer. When we received an award from the UN, it really was a recognition that we were here, and we're here to stay in global health, that radiology is a big player.

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They gave us this award because we were training health workers in low and middle-income countries that were trying to increase the availability of these vital technologies and make healthcare better through the application of medical imaging. That's one big thing, because I think that 11 years ago when this all started, I had meetings with public health officials that weren't yet a believer that radiology could do this, or that radiology had any place in the low-income countries, because of all the issues that we discussed before. It's capital intensive, knowledge intensive. Can we really be there and be sustainable, that kind of thing? So that's number one.

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I think a second major accomplishment is the fact that we've created the chapter system and we've been able to help universities to become global health advocate in their radiology training programs, that we can make opportunities available to the trainees. That includes the MDs as well as the technologists, and the nurses, and the physicists, etc., that want to do these projects. Now they can. We've put this type of resource platform, because in a sense, RAD-AID is a platform. It's not gonna claim responsibility for doing this or doing that, but it's a platform for others to create and channel their own creativity into these projects. So in that sense, I think we have accomplished that, of creating a platform where others can really channel their best expertise into this.

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And then I think the third is that we've created a really energetic dialogue about AI and how it can impact low-resource regions. It's all just forming. It's brand new stuff, and the idea that we can contribute to this as it arrives, I think, is a major contribution now, being able to say that AI could be

an empowerment of low-resource hospitals, and here's some methods we could add to that discussion. It's not as much an accomplishment as it is, kind of, a resource for potential future accomplishment. But I consider it to be an accomplishment that we're even in that dialogue, because otherwise I think that train would be leaving the station and we wouldn't be ready for it. But I think we're ready now to engage it fully.

[02:28:10]

Geoff: You're winding down a 10-year career as a physician and scientist at the NIH in order to pursue leading RAD-AID on a full-time basis. What led to this decision at this moment in time?

[02:28:24]

Daniel: It was mainly the growth of RAD-AID, the fact that it is now nearly 13,000 supporters, donors, volunteers, etc. The sheer size of the organization, 33 countries, 61 hospitals, it just seemed like, okay, at some point I need more time and more focus so that I can give my very best to the organization as it really unfolds this. So that's part of the answer. The second answer is that I think the arrival of AI, and technology development, and cloud, these are such exciting areas that I want it to be my full attention, because I just love this whole thing. I just love this question of how we're going to teach the users of radiology, radiology community of professionals, how are we going to transform them so that they can deliver and integrate AI into those components? That's a transformation that is just so exciting and I would love to focus on it more. So that's a second piece of why I think that this transition occurring now is at the perfect, correct time.

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So it's the size of the organization and the nature of things that we've accomplished. We've deployed PACS. We've started already integrating some pilot features of AI in some of these locations, and it's just very exciting to see the opportunity. So for me, it was, kind of, an easy decision, like, "Okay, it's time for me to put my whole self into that question."

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Geoff: It's astounding that you have led this organization to where it has gone within the context of a part-time role, truly astounding. As you make this transition, what would you say are your near-term, say, one-year goals that you would like to realize through this newfound opportunity and time to devote?

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Daniel: One of the near-term goals is to re-invest and re-configure how we are engaging the 13,000 volunteers. For example, we are currently rebuilding our entire IT platform within RAD-AID for how volunteers apply and how they find projects. That's been something I've worked on now for over a year, because creating such a platform is not easy. When someone applies into RAD-AID and they tell us their skills, and their interests, and their abilities, and where they'd like to go, and which projects, matching them to the 61 hospitals in 33 countries, etc., that's a complex task because our teams are constantly heading out. And being able to better engage our volunteers is a big priority for 2020. I really want to be able to say that we're faster in responding to the applicants, and more efficient at really matching them to the projects that maximize their interest. So that's number one.

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Number two is, you know, last year we did these PACS deployments using the RAD-AID Friendship Cloud, which I described earlier, this compact system bypassing that whole air-conditioned room,

now making it possible to deliver pre-load PACS with a cloud component. And then being able to introduce AI through that cloud and into a hospital through a very integral system that's very dynamic. In the coming year I would like to see that scale up, more sites having RAD-AID Friendship Cloud. And then be able to do more introductions of AI and teaching tools, and being able to see the feedback at the locations.

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I'm hoping that that's something that we can do more of in 2020 and then really try to improve the way we're doing this interdisciplinary connection of clinical education, infrastructure build, and AI introductions, so that we can see clearly how that model works or doesn't work and then fine tune it. So I would say those are the two main goals in 2020 that I think we really need to sink our teeth into.

[02:32:33]

Geoff: With such a commitment and focus on a large and diverse organization, it seems like it might be challenging to find the time for the people that you love in your life, for your family in particular. Talk to us a little bit about how you find a balance, and how you make sure that you're providing quality time for your family.

[02:33:00]

Daniel: Well, that's a great question because those folks are the love of my life. My wife Laura, we have two children, Anna and Daniella, and we are both in love with them, so that's a pretty important thing. Anna's currently seven, Danielle is five. And, you know, this is such a priority to me now. One of the things that's the balance is really just finding a way to carve out time and make sure that time is spent with family as family time, and make that priority. That's one key thing. Funny thing is, my family is very aware of RAD-AID because it's always around. My kids are so aware of it because they see all the pictures from different places. One of my offices is in the home, so they can see where all the people are going. I think one thing as a parent that is great in this respect is that I'm also giving to them this sense of this work being important.

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And I hope I'm instilling in them the sense that one day when they select whatever profession they have that they'll invest the same passion in that work, that hopefully that's a model for them. Now the other thing is my wife leads a nonprofit, too. She runs a nonprofit for trafficking victims in Maryland, and her work is an inspiration to me. Because she's out there right there in the community trying to battle a major human rights travesty that's everywhere. Now she's an attorney by background, but she brings to that work her own passion.

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So together we try to balance all of this together by really creating an environment where, look, these global issues are important, and at the same time our family is a priority. And you just put it all together right there in our own interactions and make it work. Because I think that the children take this into their hearts, I think, and they can see that. Just the way I took my own father's model, and my mother's model into my heart, I hope that mine goes into theirs.

[02:34:59]

Geoff: Leadership can be stressful. What do you do to unwind and recharge?

[02:35:06]

Daniel: Well, I like to run, that's one thing. That helps a lot. Spending time with family is a big help for me, so that's definitely a second thing. My mom did teach me how to cook Italian food, so that's a big thing for me that relaxes me whenever I need to. All I have to make is some of that stuff from Sicily that she taught me how to make, and that really helps me to find some peace and helps me to reconnect with her memory because she's gone now. So when I can recreate something she taught me how to cook, then it's like she's there in the room again. So for me, these are the different elements.

[02:35:43]

A big thing for me is that I do go to church. That is part of my life, and I meet spiritual people from all over the world who've made faith an important part of their lives. It doesn't need to be an external thing but more of an internal thing of just re-centering me about why the work is important and why I'm trying to make a difference. So that matters to me, and does recharge me a bit. Because it's easy to get tired, it really is. Especially since with this work we do in global health, it's often two steps forward, one step back.

[02:36:15]

You'll make two steps forward but there's always that thing that happened that's one step backward, you know, something that didn't get done, or something that's a challenge and we're stuck on, or something like that. And to try to not get discouraged by that one step back is a really important piece of this whole thing, is to remember that, "Well, you did make progress and here it is." You remind yourself of all the things that are still good and moving forward, even when something else is challenging, and try to put it all into perspective. Because sometimes I find that, look, sometimes you just gotta step away from the work. Just take a break and not think about this, and some solutions start to arise after you've rested or done something else a little bit.

[02:36:58]

Geoff: Well, Daniel Mollura, you have done remarkable work in building an organization that has truly global impact, that has represented a mixture, an amalgam of so many influences that you have articulated beautifully to us, the examples from your parents, your early experiences in a diversity of domains that have come together to really produce some magic. And your insights, your introspection into your leadership of the organization and what helps to make it tick and perform so well is just so valuable for us to hear. I wanna thank you very much for joining us today on "Taking the Lead."

[02:37:51]

Daniel: Thank you, Geoff, for having me. This has been a wonderful opportunity to talk to you and others who may listen to this. It's work that's dear to my heart, and I hope to continue doing this work, and I thank you for your interest in it. So thank you for having me on.

[02:38:13]

Geoff: As we close this episode of the RLI's "Taking the Lead" podcast, I want to once again thank our new sponsor, Carnegie Mellon University's Master of Medical Management program. Offered exclusively to physicians, this professional degree from Carnegie Mellon builds expertise in evidence-based management, business strategy, and technology for the future of healthcare leadership. To learn more about the MMM program, please be sure to check out the link on the page for this episode. Please join me next month when I speak with Theresa McCloud, the first woman appointed to serve as a section chief in the Department of Radiology at the Massachusetts General Hospital, and the first woman from that department to hold the rank of professor at Harvard University.

[02:39:00]

A Boston native, Dr. McCloud received her bachelor of science degree from Boston College, and her MD degree from McGill University in Montreal, where she also completed her residency in diagnostic radiology under the tutelage of the eminent thoracic radiologist, Robert Fraser, the founding president of the Fleischner Society. She went on to work with Richard Greenspan, another one of the eight founding members and past president of the Fleischner Society, completing a chest radiology fellowship and serving as an assistant professor at the Yale University School of Medicine.

[02:39:35]

After two years at Yale she moved to MGH, where she has been a member of the radiology faculty for 44 years, serving as chief for the section of thoracic, and later thoracic and cardiac radiology for 19 years, and then vice chair for education, and director of the MGH diagnostic radiology residency program for the past 23 years and counting. She has blazed a trail as either the first or second woman to serve as president for a number of professional societies, including the Society of Thoracic Radiology, the Fleischner Society, the American Roentgen Ray Society, and the Radiological Society of North America. An internationally renowned expert in the imaging of lung disease, a dedicated educator, and one of the longest tenured residency directors in the county, Theresa's perspective on leadership within the field of radiology is unique, insightful, and always refreshing.

[02:40:31]

If you've enjoyed this podcast I invite you to do three easy things. Subscribe to the series so you need never miss an episode. Share the link so your peers can listen, too, and like or rate every episode so more people will discover it. "Taking the Lead" is a production of the Radiology Leadership Institute and the American College of Radiology. Special thanks go to Anne Marie Pascoe, senior director of the RLI and co-producer of this podcast. [inaudible 02:41:02] for production support, Linda Sowers for our marketing, Ryan Russell for technical support, and Shane Yoder for our theme music.

[02:41:11]

Finally, thank you, our audience, for listening and for your interest in radiology leadership. I'm your host, Geoff Rubin from Duke University. We welcome your feedback, questions, and ideas for future conversations. You can reach me on Twitter at G-E-O-F-F R-U-B-I-N, or the RLI at RLI_ACR. Alternatively, send us an email at rli@acr.org. I look forward to you joining me next time on "Taking the Lead."