

Efraín Torres, PhD
Narrator

Kristen Reynolds
The Bakken Museum
Interviewer

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Efraín Torres -ET
Kristen Reynolds -KR

KR: ... Can you say your name for the record?

ET: 00:00:56 My name is Efraín Torres.

KR: 00:00:58 Thank you so much... Tell me a little bit about your early life, your culture, and how you became interested in biomedical engineering.

ET: 00:01:14 I grew up on the southwest side of Chicago in a small neighborhood, known as Little Village. It's primarily a Hispanic immigrant community. Both my parents and all of my family, except for our generation, are from Mexico. Everyone's an immigrant from Mexico, and Little Village is a very culturally beautiful community. It's very vibrant. It's very Mexican, in a good way of course. That's where I grew up. Both my parents, it's interesting because they met in Chicago when they immigrated from Mexico, which is a little unusual because people usually immigrate together as a couple. From there, I attended Saint Agnes Middle School and Saint Ignatius College Prep High School. What got me on the road to engineering and medicine is that I was always extremely curious. I loved science. In middle school, I had the assumption, which most middle schoolers do, that their science teacher knows everything.

00:02:20 At the time I was an adamant National Geographic watcher, and I would consistently berate my science teacher about dark matter. I was convinced that I was going to solve fusion, which has still not happened technically—actually, it has happened, but it's not scalable. I was always really into science. I was an annoyingly curious child, apparently.

I was fortunate to get a scholarship to go to Saint Ignatius College Prep, which was a very different experience from what I had growing up. My community is great, but it has all of the trademark issues of a lower income community—there’s a lot of violence, there’s gangs, and there’s drugs. Saint Ignatius College Prep is very close to downtown Chicago, and it serves mostly very wealthy white families. That was a very different experience for me. It was very motivating. It led me to want to do a lot for my community

00:03:21 It made me aware that the environmental factors there should not be normal. This is going to sound very simple. In high school, I was obsessed with solving problems for my community. I was dead set on medicine. What really frustrated me was that seemingly everyone in my high school had access to commonly available treatments, which were not accessible to my family or community. Even if the cure existed, it was unavailable to my people because of the associated price tag or location. That infuriated me in high school. I became obsessed with solving problems related to medicine. Ed, my AP [Advanced Placement] Biology teacher, told me, “If you want to solve problems, engineers solve problems.”

00:04:22 I said, “Okay, I’ll be an engineer” [Both laugh]. That’s a simple explanation. Ed did not know what engineering was, to be frank. Nor was I prepared for engineering in college—I only took Algebra 2. No one told me you needed math for engineering, so I just did it. I went to college to be an engineer and focused on biomedical engineering. Specifically, I studied bioelectrical engineering, which is a combination of biomedical and electrical engineering. My focus was on developing medical technologies for my community. It’s always been about my community, and still is. That’s what initially got me interested.

KR: 00:05:09 Can you tell me more about Saint Agnes and Saint Ignatius. Are those Catholic schools? How did you wind up there?

ET: 00:05:22 Saint Ignatius is a Jesuit school. Saint Agnes is a private Catholic school in Little Village. Like many of the poor communities in Chicago, the public-school system in Little Village was completely inadequate. Kids don’t have textbooks or access to many resources. My mom had a deal with the Saint Agnes administration. If she worked as a

lunch lady for a discounted rate, they let her kids attend school for free. It was not a good deal—I looked that up later [Laughs]. Either way, it showed her commitment to wanting us to have a good education. From there, Saint Ignatius usually offers one or two kids from Saint Agnes a scholarship or a position. Saint Ignatius was a test-to-admit school. If you pass the test, then you potentially get a scholarship to go Saint Ignatius. It's a ranked college prep institute in Chicago. That's how I got in.

- KR:** 00:06:49 Wow, that's huge. That's a big thing that your mom did.
- ET:** 00:06:54 Neither of my parents graduated from middle school, but they've always known that education was extremely important. I always knew growing up that I was going to college, even though no one really knew what college was. I'm the youngest of three, and my oldest brother was the first to attend college...My parents always knew education was very important.
- KR:** 00:07:29 Tell me more about your experience as a first-generation college student.
- ET:** 00:07:34 It molded me to be the person who I am today, but it was pretty hard sometimes. I went to another Jesuit institute, Marquette University in Milwaukee, Wisconsin. They usually take people from Saint Ignatius to do engineering up there. It was very different, again, because I was out of Chicago, and I was on my own. I was the first and only one in my family to move out of Illinois to go to college, including my entire extended family. You could tell that you were the only one of your kind, if that makes sense. There were a lot of people from Minnesota at Marquette. Everyone talked about lake houses, skiing, snowboarding, and ice skating. It was subtle. People say, "Oh, you don't know how to skate? You don't know how to do that? Blah, blah, blah..."
- 00:08:38 It was almost as if they were trying to signal to you that you don't belong very casually in conversations. I didn't know any of their music, their movies, their habits, or their hobbies. That was interesting for sure. You could tell that you were the only one of your kind, if that makes sense. There were a lot of people from Minnesota at Marquette. Everyone talked about lake houses, skiing, snowboarding, and ice skating. It was subtle. People say, "Oh, you don't

know how to skate? You don't know how to do that? Blah, blah, blah..." It was almost as if they were trying to signal to you that you don't belong very casually in conversations. I didn't know any of their music, their movies, their habits, or their hobbies. That was interesting for sure. My first year was very rough, as I mentioned. I was not prepared at all for engineering. I came in very gung-ho—I had the mindset that I was going to go to college, crush it, and develop technology for my community. The first semester I'm failing physics exams and not doing nearly as well as I thought. It was very hard when I went home for that initial month of winter break. I journaled about being disappointed and angry at myself because I thought I would be doing better in college. I'm a big journaler—that's one of the biggest gifts my oldest brother gave me.

00:09:46 And I remember journaling about it and being very disappointed, almost angry at myself because I was like, I thought I was going to do the thing and I'm not doing well. At first it was very hard, but it was a pivotal moment for me. I came to the realization that I'm naturally smart enough to pass classes, even if I don't try. Even if I get C's or D's, I will pass and graduate. I know that my family will be just as happy as if I got straight As. It will be the same level of proudness. I mean nothing against my parents and my community, I love them all. But they don't understand the levels of success. I would know the difference. I would know that I thought it was too hard for a semester and then pulled back. Instead, I did the inverse and I signed up for senior-level classes my second semester. I came back very determined and pushed nonstop ever since. Like I said, it was a very pivotal moment for me.

KR: 00:11:44 When did you start at Marquette?

ET: 00:11:59 Everything is a blur, I started in 2014. I'm twenty-six years old. I started grad school in 2018 and I finished early.

KR: 00:12:54 That's significant because you said that you're graduating from your PhD program early. You're also in your PhD program when the COVID-19 pandemic hits. That delayed so many people. Hearing that timeline gives me a good sense of how driven you are to get through your academic programs. Tell me more about when you came back during your second semester of your freshman year, and when you

enrolled in senior-level classes. Who is advising you?
Who's serving in a mentor role for you in those moments?

- ET:** 00:13:32 I was trying to make my parents and my father proud. I wanted to prove to myself that I could do it. I still remember to this day; in high school I had a college advisor who told me to aim lower. I was always very passionate and very high energy. It was just about trying to prove them wrong, and trying to really do what I said I would do for my community. My oldest brother, as I mentioned, gave me the gift of journaling. I've been reflective for a long time and still journal to this day. I knew that if I really wanted to do the things that I journaled about doing, that I would have to develop myself and become that person.
- 00:14:33 The only way to do that is to force yourself to do very hard things. There's this clear upwards trend in my undergraduate classes and responsibilities since that first semester. I optimized each semester to be harder than the last. I maxed out on credits, and then I joined a research lab. I grew outreach programs and joined two research labs. Then I worked at a startup. All of this was in an effort to increase my ability to do things. For example, many of the people around me maxed their credits to 18 or 20. They would ace all their classes because they were smart, hardworking, and from good families. They stayed at that level, and that's great. I was of the perspective that getting straight A's was not the way to do it.
- 00:15:39 I have to have some B's because [that means] I'm stretching. I need failure as a part of each semester. My goal was never to get a 4.0 grade point average [GPA]. To circle back to your question on mentorship, a lot of me talking to myself to try to make my community and my parents proud. The people I look up to are not the Bezos, Musks, or Dorseys. It's the immigrant entrepreneurs. There's this middle eastern cafe near where I live called Mims Cafe. I really look up to the staff there. It's quite funny because they confuse me as being Middle Eastern, which is fine. It happens a lot, actually. I'm convinced they only love me because they're convinced I'm middle eastern [Both laugh]. I haven't told them and maybe they'll figure out I'm Mexican. Anyway, I go to Mims and order food quite regularly. It's always the same guy in the morning and the same guy in the evening. He works nine hours a day in the kitchen and is always happy. Never sad or upset.

00:16:57 My father is the same way. He works nights as a janitor. He's sixty-six years old. When I ask him, "How's your day going? How's your work?" And he says, "It's easy. Life's great." I'm quite connected to my Mexican roots, and I see immigrants around me working very hard to build their homes.

My family crossed the border. My grandpa and my dad worked in the fields in California. My parents have done hard, manual work and I can't help but admire that and see how almost easy it was to them to make those sacrifices. I think and I say, "If my family crossed the border, what I am scared of?" Starting a company [Adialante] at twenty-six is scary. There are moments of fear, but I remind myself of my family crossing the border and my dad working in the fields in a country that doesn't speak his language. Around people who probably look at him weirdly for not knowing English well. And I say, "What am I afraid of?" That's who I look up to.

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I never really looked up to typical entrepreneurs, but I read a lot of their books because they have lessons to pass along. Especially in their biographies, there's usually an introduction that says, "I did a friends and family round and I raised \$500,000." Clearly, we're from different starting points. I take the rest of their lessons though.

KR:

00:18:40 What I'm hearing you say is that your family's experiences and your community's experiences give you a sense of the stakes. It's a lot different to cross a border or to do the kind of work that they do than it is to start a business. The stakes are very, very, very different. It's astounding to me that if you test into this college prep school, you get a scholarship

to be there, you go to Marquette, and you're doing all this work. You're a second semester, first-year student in a senior-level engineering class. And nobody takes you under their wing?

- ET:** 00:19:26 I don't know if my advisor, Dr. Barbara Silverthorne, took me under her wing. She saw how focused I was and just let me do my thing. She said, "Clearly, you're on this path" and then signed the papers. I would show up every new semester with crazy classes—I ended up with two or three minors and a concentration in engineering leadership. She would just sign the papers. Honestly, no one met with me weekly to talk about my goals. There were other mentors that helped along the way. One was Andrea Gorman [Minkley], who is the Associate Director of the Engineering and Innovation Leadership Development program at Marquette University.
- 00:20:36 I met with her quite often and she helped me digest a lot of the difficulties I had growing up of where I did, because it wasn't all roses. She helped me and cheered me on. I'm always grateful to her. But if there was someone who put me under their wing and pointed me in a direction, it was myself. I was self-directed. I talked to my cofounder and to my partner about this. Because of the circumstances, talents, and opportunities I was born with, I was given a reason to do my work on a bronze platter. People always ask why. That's been clear to me for ten plus years, ever since high school. No one had to tell me what to do. I already knew. It was just a matter of figuring out the best way to do it, and then learning the tools and techniques.
- KR:** 00:21:47 What was the associate director's name?
- ET:** 00:21:49 Andrea Gorman [Minkley].
- KR:** 00:21:51 You said earlier that you didn't know how to do college and that nobody in your family knew how to do college. It sounds like you know how to do college better than most students [Both laugh].
- ET:** 00:22:05 I figured out, but it was a lot of flailing and moments of panic. I thought, "Am I going to fail?" And then saying, "No, no. Just take a step back and look at the syllabus. Go read books. Books will tell you what to do. Learn how to study on the internet." There's this joke that I make to

people, which is true—my life philosophy is that maximal effort and minimal skill eventually balance out if you just try.

00:23:00 I took AP Biology in high school, but no one taught me how to study. I read the textbook over and over again. And then I wrote the textbook material down for hours. I learned that that wasn't the best way to study. In classes they would suggest making flashcards. It was a lot of iteration, which was maximum effort and minimal skill.

KR: 00:23:29 Wow. I took neurobiology as a PhD student when I was still in the sciences, so I can't imagine taking neuro as a second-semester freshman [Laughs].

ET: 00:23:41 I got a decent grade, but it was crazy.

KR: 00:23:44 I bet. It was also wild when I took it as a grad student for the first time around. Again, it really sounds like you've got a beautiful, powerful personal drive that also emanates from your relationship with your parents and your family. You also mentioned something about failure a few steps back in our conversation. Can you tell me more about any failures you've had and what you've learned from making mistakes?

ET: 00:24:20 I consider my freshman undergrad a failure. My relationship with failure is interesting. People say that I did a good job in college, but I always felt like I was failing. In my junior year, I was in a resiliency workshop in one of my engineering leadership classes. They presented this idea of adaptation on a Gaussian curve. The middle is the comfort zone, and the outer edges are outside of your comfort zone. If you push to the right, and then come back to your comfort zone, your mean will eventually move to the right too. Slowly, you end up being more capable of tolerating things that you previously thought were impossible.

00:25:28 I think that was a key part of my relationship with failure—although people think I did a good job in undergrad, I really felt like I was failing and considered most of the things I did as failures. I think that's a good thing because I learned a lot. I did four years of undergrad research, and most of the time it was just me failing repeatedly—learning how to code, coding horribly, and then having to restart the entire project. I always struggle to pick out a single, huge failure

because there were so many of them. I just added them to the list. Even now, in grad school, I presented an idea on a new imaging technique to a math professor, and he pointed out a major flaw. I said, “Oh, I guess you’re right. I guess I’ve got to restart.” That was it, then I was restarting.

Besides my freshman first semester, I don’t have a single big, big failure I always come back to. Most of the time it feels like I’m failing, but I know that is how it is supposed to feel when you are pushing yourself out of your comfort zone. I’m very okay with that feeling. Even now, running the company and being in grad school, I have also trained for marathons. I am a very bad runner, but I keep doing them [Laughs]. I did a Half Iron Man, and I’m horrified of the water. I get panic attacks and I did the Half Iron Man to get over it. I had a panic attack at the front line and was the last person to get in the water. I clung to the canoe the entire way.

00:27:30 That’s a failure, I guess? But also, you have to do that if you want to over your fear of water. Probably...That was a bit extreme [Both laugh]. It’s par for the course. You know what I mean? That’s just what you’re supposed to do. I ran a marathon where it turned out I had the stomach flu. I won’t go into detail on that one [Both laugh]. It didn’t go well, but I still lumped my way across the finish line. It felt like a failure because the one before that was three hours and fifty-five minutes. This one after was five hours and thirty minutes because I limped most of the time.

KR: 00:28:01 They're all opportunities for growth.

ET: 00:28:03 If you tallied them up, you could count them as failures. Like I said, it’s just par for the course if you want to make yourself better and increase your capacity. It’s what you have to do. That’s what I think, at least.

KR: 00:28:18 That’s lovely and a great philosophy to have for life. It’s honestly not something that people come to until much, much later on. It’s good that you’re here already. What a way to navigate your fear of the water, by throwing yourself into a competition [Both laugh]. But you survived and hopefully you’re a little more comfortable with the water now.

ET: 00:28:38 It was probably a bad idea. Only moderately. Next time I'll do it better.

KR: 00:28:46 Next time! You're talking about getting comfortable with pushing yourself beyond your comfort zone. What I'm hearing is that you don't approach failure as something that says something about who you are as a person—it's just a part of life.

ET: 00:29:07 Yeah, yeah! You have to fail. There's this corny saying that failure is the first step towards success. It's very true. My brother asked me one time, "How do you run a marathon?" I told him, "A mile at a time." As corny as it sounds, it's true. That's how you do most of things in life. Sometimes it's one bad mile after another. Sometimes it's one bad week after another. Sometimes it's one bad experiment after another. But guess what? You close your eyes, and you open them, and the next thing you know, you're graduating. The wonderful and horrible thing about time is that it always keeps going, regardless of your feelings or your failures. There's this quote from Abraham Lincoln, "And this, too, shall pass away." That applies to everything—failures and successes. This interview—by tomorrow it'll pass, and then you'll be onto the next thing. If I really treated them as failures, there would be a moment where I'd have to take a break for a day. But because I don't really treat them as failures, it's just another day and I keep on going.

KR: 00:30:28 How does that translate into what you think it takes to be an innovator in medicine and technology today?

ET: 00:30:34 Right now, I think it takes a lot of patience—especially with what I want to do with the company that I'm leading. We're developing novel MRI [Magnetic Resonance Imaging] technology for communities in need, specifically Mexico and other regions as well. If I really want to get there, it's not a two-year play and it's not a five-year play. It's a ten, fifteen, twenty-year play. I would argue that innovation takes a lot of foresight, and it takes a lot of patience. Knowing that you're in it for the long haul. Medtronic is great, but Earl Bakken wouldn't have been able to do what he did nowadays because the FDA [US Food and Drug Administration] is here. You can't just go and put in a pacemaker in someone [Both laugh].

00:31:22 I'm glad he did because it worked out! But you can't do that anymore. Especially with an MRI startup, you have to raise hundreds of millions of dollars, and you have to have an evaluation of over a billion dollars if you want to achieve what you're setting out to do. Now we're talking five to ten years plus. I have to be very patient and diligent about continuing to progress myself so that I hit my goal to disrupt the MRI industry. I'm not currently capable of doing that, and I acknowledge that. But I have to take new steps every day—whether that is learning how to lead my team, attending workshops, reading books, talking to mentors, reaching out to people who've done it. I have to continuously do these things over and over and over again. I think it takes a lot of patience.

KR: 00:32:23 Along those same lines, as you're talking about the phenomenal amount of money that you have to raise for Adialante, can you tell me more about the business and how you're growing it currently? What are your goals for right now? What are the things that you're working towards?

ET: 00:32:41 Right now, we're doing our seed fundraising round. We've raised \$866,000 so far. We have a couple more leads, I have a presentation tomorrow, and I'm very confident we'll break \$1.1 million. I am quite proud of our team because we didn't give up any equity. It was all safe notes, which is a simple agreement for future equity. The problem will be for future equity, but it is a nice agreement for entrepreneurs because you don't have to shed your equity right now. You can work on your company to evaluate it later on. And grants. I don't have the official notice yet, but the NSF [National Science Foundation] director told us that he's putting us forward for getting an SBIR [Small Business Innovation Research] grant, which will be \$275,000 of non-dilutive money. Only ten percent of companies get it. We've also gotten a grant from the University of Minnesota, a couple more grants from NSF and \$415,000 of angel investments.

KR: 00:34:04 Two questions. You said the NSF is putting you forward for an SBIR? What is that?

ET: 00:34:09 That's a Small Business Innovation Research grant. It's for small startups—their definition of small is interesting, it's less than 300 people. These grants are like bids. You

submit a very long proposal, and most of the time it's a "no." As I said earlier, the acceptance rate is ten percent and you're competing against all startups across a huge field. The reason I can't say we officially have it is because we don't have cash in hand. According to my consultant, the NSF director is sending our proposal to the budget people and they're doing their accounting magic to give us the money. It's quite secure, I would say.

- KR:** 00:35:06 You were also an NSF GRFP (Graduate Research Fellowships Program) recipient? Tell me more about how the PhD grant process prepared you for the work that you're doing with your startup.
- ET:** 00:35:23 Yes, I was a GRFP fellow. I was one of the rare recipients who got the fellowship during my senior year of undergrad. That allowed me to do whatever I wanted to do for my PhD. Actually, I got two fellowships. I also received the CIC fellowship. Creative Inclusive Cohort, which is a Minnesota fellowship. Both of those gave me about four years of independent funding. That prepared me for the SBIR, but it's very different. I applied for a NIH [National Institute of Health] grant my second year of my PhD, just to go through it.
- 00:36:12 I didn't get it, which makes sense looking back [Laughs]. That was good practice for the PDIC grant, Pediatric Device Innovation Consortium grant, which I got in December. That December, I started working on the SBIR with Pat Dillon in Minnesota. She helped me a lot. She was instrumental in receiving that grant. Without her, we wouldn't have gotten it. There are so many bureaucratic structures to navigate. You have to register your company to certain organizations to get a number...
- KR:** What's an IEN and who is Pat Dillon?
- ET:** She leads a non-profit called MNSBIR, which is focused on supporting Minnesota startups through the SBIR journey. If you can get the SBIR, it's very good funding. There are two phases of SBIR. Phase one is \$275,000, which is a small amount for a hardware-based company.
- ET:** 00:37:16 But it's non-dilutive, so it doesn't dilute your equity and it doesn't dilute your investors' equity. Everyone loves it. If you go through the NSF, which is what we did, it's very

hard to get phase one funds. That's the [award] with the ten percent acceptance rate I mentioned before. Your odds are much more favorable for phase two, which has about a fifty-five percent acceptance rate. That is about \$1 million, which is also non-dilutive. As I've mentioned, I'm in it for the long haul for this company. I care a lot about my equity. I'm no fool. Can I get ousted from my company? Yeah, that's very likely. I'm twenty-six years old. Most people can't say my name. At the very least, people might want to install someone that they at least pronounce their name. I am not going to sit here and think that that can't happen to me. It can certainly happen to me, so I'm very mindful with my investors. I would bet with our technology and our IP portfolio, that we could have gotten multitudes of millions if we wanted to. But we were in it for the long haul, me and my co-founder and we care a lot about the company. We believe it's our life's work. We like these SBIRs a lot because they empower us to get to that place.

- KR:** 00:38:40 And what's your co-founder's name?
- ET:** 00:38:41 Parker Jenkins.
- KR:** 00:38:43 Did you meet this person in undergrad, at Marquette?
- ET:** 00:38:47 We met at Marquette, and then he came here to the University of Minnesota for his master's in biomedical engineering. He stayed around for his PhD in the [Prof. Garwood Group at the Center for Magnetic Resonance Research]. Technically he's a second year PhD, but he's been here as long as I have been.
- KR:** 00:39:07 What brought you from Marquette to the University of Minnesota?
- ET:** 00:39:32 I had this very, very revelational moment in undergrad in my engineering leadership class. It was my senior or junior year, and we were learning about disruptive innovation. The class was taught by Kate Trevey, the Director of the Fotsch Innovation and Engineering Leadership Development [FIELD] Center. Disruptive innovation is when someone goes out there and develops a technology that completely changes the field. Think of the iPhone. Or a car, which completely changed the scale of transportation compared to a horse. I remember sitting there and thinking, this is what I've been looking for since I was in high

school. This is what I want to do—disrupt the industry. That’s exactly what I want to do. Disrupt the industry with technology that is much more affordable.

00:40:37 That was an awakening, you could say. This is exactly what I want to do, so I applied for the GRFP. I knew that if I got it, I could go anywhere in the world. Maybe the country, but you’re free because your competence has been tested by the NSF. The summer of my junior year, I sent a ton of emails to potential advisors and universities to see the labs and the technologies there. During these visits, I was always thinking about disruptive innovation—is this technology incremental? Is it going to increase the resolution of a phone, or is it going to make a whole new phone and change the world?

Michael Garwood, the professor I ended up joining, was by far the only person in the MRI field that was developing something creative. Others may disagree with me. He’s a very creative mind and eager to develop technology that could be disruptive. I considered him to be the only one doing something disruptive, so I went to the University of Minnesota only to join him.

KR: 00:41:57 Wow! You came here for Michael and your co-founder is also already here?

ET: 00:42:08 Yes, in the same lab.

KR: 00:42:09 The next question I have is about is how you land on the MRI. What drives you in that particular direction? And then what is driving you to prioritize the ownership of this company? Culturally, spiritually, or anything else?

ET: 00:42:46 I believe, as crazy as it sounds, that people like me are the only people that are going to actually disrupt the industry and bring technology to communities in need... That has such a strong imprint in my head. You can’t replace me with someone that has never met a minority in their community. My parents called me when my grandpa was dying. I went to Mexico, and I saw literal rats in his hospital room. That had such a strong imprint in my head. You cannot replace me with someone who hasn’t seen that. Someone else would just go and do what they all do. They will make the company extremely profitable and then pocket the profits after selling to GE [General Electric] or

Siemens. Those are great companies, but incumbents do not disrupt the industry. Small startups are ones that go in there and change the name of the same. I believe that there should be a cycle of companies, not the same big three—GE, Siemens, or Phillips—doing their thing forever. That’s not how it works. Change is one of the only constants in life.

00:44:18 Are you really going to tell me that these three companies are the ones that should be leading the MRI field? I would have a lot of logical arguments against replacing me with a GE executive. First, they don’t know the technology like I do. It’s my PhD research and I have four patents. And second, they may know more than me now, but give me a couple of years. My fiancée pointed this out. If you plotted my trajectory, I may be in the same position as other people right now. But you have to look at the slope. That’s what matters. Maybe another minority kid for minority community went to a high-performing high school and is not doing so well there. But if you look at the slope from one generation and then wait a couple of years as you support them, keep watching that slope increase and see where it’ll go.

00:45:28 I have a lot of strong feelings about being replaced. It’s something that annoys me because it gets brought up all the time. I’m like, “Are you kidding me? We’re eight months in!” My equity is very valuable to me! We could have raised much more money if I was willing to give up equity. We said no to more people than people who said no to us, which is completely crazy in the current startup space. Venture capital funding is drying up all over the country right now. There’s a lot of dry powder, as they say. A lot of companies that have done initial public offerings have had venture capital draw negatives for the first time in a while. A lot of startup companies aren’t getting yeses, and we are one of the few that said no to a lot of people. That’s because we care a lot about this company.

KR: 00:46:22 Not just the company, but the people that you can help with it. I love that you say, “look at the slope.” That’s such a math way to articulate that [Both laugh].

ET: I am showing my PhD in engineering [Both laugh].

- KR:** 00:46:35 But I love that, right? People don't think about it like that. They tend to think about where a person is, versus where they started. Like you said, look at the slope and look at the trajectory. That gets me to another question about MRIs. What is it about MRI technology that is so important for under-resourced communities?
- ET:** 00:47:02 There's a couple of logical things. First of all, why did I personally choose MRI? I did EEG [electroencephalogram] imaging research during undergrad, so I tried to be reflective on my inherent talents and skills. I like imaging and I was competent at imaging technologies. If I really wanted to create disruptive technology, I knew I had to work on something I was decent at. I couldn't disrupt the fashion industry because I wear a black shirt or a white shirt every day [Both laugh]. Because I can't disrupt that field, I'm not going to go there. I should align myself with a field that matches my competencies. And EEG is great, but it's not diagnostic. It's nowhere near as diagnostic as an MRI, which is the perfect technology to disrupt. Current MRI systems cost millions of dollars to install and maintain. Ninety percent of the world doesn't have access to MRI technology.
- 00:48:05 I'm biased, but I believe MRI is the best imaging technology because you can see inside someone with no side effects. You can get scanned every day for the rest of your life and you won't get cancer. That's different from CT [Computed Tomography] scans or X-rays, where there's hard limits on how many times you get scanned. CT scans have ionizing radiation, which is cancer causing radiation. Technically speaking, MRI is radiation, but non-ionized radiation. It is non-cancer-causing radiation, or radial waste. MRIs uses this really unique technology that's highly impactful. It can be used to detect strokes, lesions, or trauma on any part of the body. What's the problem? It costs millions of dollars. It has been stagnant as a field, I would say. In terms of the design of the system, at least. I shouldn't say the field because there have been tremendous innovations in the pulse sequences and AI [Artificial Intelligence]. If you show the MRI system right now in 2023, next to the one in 2003, it looks exactly the same.
- 00:49:07 What happened is what always happens—people designed the MRI system and went off to make basic improvements on the technologies I mentioned before, with pulse

sequences and AI. There's been tremendous innovation, but that initial design of the MRI system does not serve the world. The superconducting magnets that are required for MRIs need copper in the walls. Not only do you have to put copper in the walls, but you also need three rooms to support the MRI machine because of the various equipment and RF [radio frequency] amplifiers. MRI technologists need months of training. The machine itself needs tons of power and requires liquid helium. That's a precious resource that costs \$50 per liter.

00:49:55 The physics behind MRI technology is beautiful. You can image anyone and see inside of their body with a variety of different contrasts and filters. Because of the inherent technology, MRIs are caged in. Because guess what? It's extremely profitable. The reimbursement rates are crazy for MRI. Ultimately, I was drawn to MRI because it matched my competencies, but it is still so ripe for disruption. It's just waiting for someone to come in and redesign an MRI in a way no one has ever seen before, one that people thought was impossible and completely change the game. That's what drew me to it.

KR: 00:50:51 Wow, I learned a lot about MRI in a short, few minutes!

ET: 00:50:55 If need more, I can keep talking. I can pull out the whiteboard.

KR: 00:51:00 Honestly, that would be great. We should have thought about that [Both laugh]. I'm also curious about your desire to bring down the cost of MRIs and increase access to it. My partner needed an MRI and his insurance would not give it to him because it was expensive, but his doctor said, "This is the test that we need." Tell me a little bit more about that issue of cost.

ET: 00:51:30 MRIs cost millions of dollars, and the materials and resources are very engineering intensive as well. We're dead set on making MRI affordable, but I should give us more credit. Specifically, we are a value innovation. There are two recent low-cost MRI companies that both reduced the clinical value. In every MRI system in the world, cost and clinical value are tied. If you want to make MRI cheaper, you're going to have to reduce the clinical value drastically. This means it's less useful for clinicians, but others say it's good enough for other communities. I'm

from those communities and we want the good stuff [Laughs]. We want clinically valuable results.

- KR:** 00:52:32 You deserve it.
- ET:** 00:52:34 We deserve the clinically valuable technology at an affordable cost. Our product, my research, and the lab that I'm from—we're all dead set on value innovation. We're making the MRI in a way that is inherently cheaper by its sheer components. We fundamentally make it differently. To get more in the weeds, every single MRI across the world is built around three core components—a superconducting magnet, RF [radio frequency] coils, and gradient coils. Every single MRI, whether low cost or high cost, has those three core components. We don't do that. We build it fundamentally differently, which allows us to bring clinical value at a much lower cost. That's what sets us apart.
- KR:** 00:53:31 What I tell my friends sometimes when they say something that I think is really significant is, "Put it on a t-shirt." You deserve things that are just as good. You don't deserve the cheaper stuff just because folks are poor. I really resonate with that and thank you for saying it.
- You are on the cusp of graduating from your PhD program. You said you're eight months in to raising funds for your startup, so not even a year in. And you also said you were twenty-six earlier. What's on the horizon for you? What do you see in front of you in the next five years, because you have already accomplished so much? [Laughs]
- ET:** 00:54:14 I tell everyone that inquires that I believe Adialante is going to be a unicorn, multi-billion-dollar company. Money isn't everything, of course. I believe if you can control a company well, that can be a great vehicle for positive impact. If you think about Amazon, it could do so much good in the world if it had different management. But you have to grow, you have to hit the valuations, and then you hit the market. I believe Adialante is going to be a multi-billion-dollar company and I am fully preparing myself to lead a company like that. I know I mentioned that earlier. I'm not ready for it. I fully acknowledge that, but it's okay. It's not happening tomorrow, or even in five years. My ambitions and my goals are always sky high. Always.

00:55:14 But guess what? I hit every goal that I said we were going to hit. We legally started Adialante in December 2022, but it functionally started in May 2023 when we hired our first employee. We started fundraising a little earlier, in January 2023. Before we even started fundraising, I told everyone, “I’m going to break a million dollars in just safe notes.” And they told me, “No one likes safe notes because it’s not equity and you’re in a horrible economy. You’re not going to do that.” We’re about to do it. I was obsessed about graduating from my PhD program in four years, even though the mean is five and a half years. I got a concussion that made me useless for three months. I lived through COVID-19 and riots in the city after George Floyd was murdered. Through that, I was always telling my advisor and my friends that I’m going to graduate four years, “It’s going to happen.”

00:56:04 In September, when I graduate, it will be dead-on four years. I’m telling everyone we’re going to be a multimillion-dollar company, and people can laugh. People can say, “Who is this kid from Little Village? What’s his name?” I was called Evan the other day [Laughs]. I don’t really care what they think. Just watch, because that’s what I believe in the future for Adialante. I don’t really have a backup plan. My fiancée says, “You always talk about what you’re going to do for your community if it works out. What about if it doesn’t work out?” I just say, “Eh, I don’t really think about that.” [Both laugh].

KR: 00:56:44 What is your fiancée’s name?

ET: 00:56:46 Sarah [Whillock Torres].¹

KR: 00:56:48 Did you meet Sarah here?

ET: 00:56:51 Yes, we met in grad school.

KR: 00:56:53 Is Sarah also an engineer?

ET: 00:56:55 She’s also in same program, but she does very different work. It’s interesting. Biomedical engineering is a very big umbrella term. I do more software and electrical engineering work, and she does more chemical engineering work. We’re under the same umbrella.

¹ Sarah and Efraín got married in between the interview and publication of the oral history project. Efraín also received his PhD in 2023.

- KR:** 00:57:09 This is a hard pivot, sorry. You mentioned Sarah a couple of times, and I wanted to follow up. What are y'all's conversations when you go home at the end of the day and you're talking about the work you did that day? What is that like having two engineers that are unpacking?
- ET:** 00:57:28 We're very logical [Laughs]. We don't argue a lot. If you present either of us with logic or facts, we both say, "Oh, you're right." It works out well because she's very similar to me in that way—we both can admit when we're wrong. She and I will cave when faced with logic, and we reflect on our mistakes or problems we've caused. We're humans, and humans are flawed. I would admit that I'm a little crazy in our day-to-day conversations. I'm very high energy and I probably have ADHD [Attention Deficit Hyperactivity Disorder]. My co-founder has ADHD, and my fiancée's sister is a clinician. They are all convinced that I have ADHD. I'm sometimes a bit of a nut job in terms of my energy levels, it's through the roof. I have a lot of fun just in general. Honestly, Sarah and I mostly laugh just a lot about random things that I do, and just life in general. I always talk a lot about my community to be honest with her. She's always very supportive of that. I think we're a great pair. I think she keeps me a little more grounded. She's an anchor to me. If I'm going a little too hard, she will pull me back. If I'm on my seventh day with five hours of sleep, she'll say, "You've really got to really relax. Relax dude." And I say, "Okay, you're right." That's mostly what we talk about and it's a great relationship.
- KR:** 00:59:12 I'm glad you said that because that was actually going to be another question. When and where do you find time for rest? I'm glad that you have someone in your life that reminds you to take a break.
- ET:** 00:59:23 If it wasn't for her, I'd probably just be in my room all day working, or in the office working. And it's very refueling to be around her and our dog, Chico. We both love animals, and my dog is kind of like my son. I treat him like my son. I can't have an interview if I'm not talking about Chico. To be honest, my life is very simple. I work, I work out, and I hang out with Sarah. That's all I do. I acknowledge I do not have much going on in my life besides that.
- 01:00:01 I knew that if I wanted to build a company and make a big impact, I needed to make sacrifices. You can't do this thing

and not sacrifice. I basically sacrificed basically everything except for that core, at least in terms of my hobbies. Someone will ask me, “What are you reading?” “About zero-sum strategy and how to build businesses.” “Oh, so nothing fun.” “Well, I like it.” My life is very simple, but Sarah is definitely part of that core in that keeps me going.

- KR:** 01:00:36 That’s lovely. I think simple is fine. I also think the way that you’ve described your work and your passion for it, and then this ten-year journey that you’ve been on—you’ve known for a long time what you wanted and what you felt called to do.
- ET:** 01:01:01 My brother has this metaphor that every one of my brothers—my parents had three kids, all boys—are almost like a flame or fire. We’re all very passionate. I’ve spent a lot of my life controlling that flame to be very, very productive for myself. In high school, I was very passionate, but I was also very angry. I was a teenager, thinking of all these injustices that one cares about. I had to learn how to control my anger. I have the same level of passion, if not more, but it’s very laser-focused on different things. It’s very helpful to me when I’m tired—because my passion is like a switch that I can pull out and not be tired anymore. [Both laugh]
- KR:** 01:02:00 I’m going to ask this question and you can choose not to answer it. You mentioned multiple times that people don’t get your name right. Can you talk to me more about that experience? I want to say in the workplace, but you’re creating your own workplace. But I want to hear about your experience culturally in navigating starting a business and navigating being a PhD student at the University of Minnesota. Can you talk a little bit more about those kinds of experiences?
- ET:** 01:02:42 It’s been really interesting because I still, to this day, have yet to meet another Latino entrepreneur. I’ve yet to have a Latino professor. I’ve yet to have a Latino coworker or mentor. There’s a couple other Latinos in different cohorts than mine, but it’s very clear that I am one of the only ones here. That has been brought up multiple times through subconscious or casual means, and through more apparent means. I’ve talked to other minorities about this, and my mentality towards it is, does it suck? Yeah. Is it not fair?

Yeah. Should there be more Latinos? Should people say my name, right? Should people at least not treat me differently?

01:03:57 Yes, all of that is true. The nature of the world, as it is today, that's how it is. I could get as angry as I want, but that won't change things. I am focused on being as productive as I can, despite all of those things, so that I can be in a position to change things one day. I was telling my co-founder yesterday that I really believe that my experiences as a minority bred me for entrepreneurship. I grew up in Little Village, where there was violence and shootings. A lot of times I fell asleep with people literally fighting outside of my apartment. I had to go through all of that of that stuff. It really bred me for entrepreneurship, because now I'm here and nothing gets to me. I have a list of all the names people have called me. I don't get hurt; I laugh at it.

01:05:02 I know that if I let it get to me, it will all get to me—the names and the fact that if I start speaking in Spanish, people look at me weird even though Spanish is technically my first language. It's always been like that, and I'm no fool because it'll probably continue to be like that for a long time. For at least ten years. I'll mark on the calendar the first day that I meet another Latino entrepreneur in tech. My co-founder and I were talking about this the other day too. When the media portrays Latinos in dress shirts and suits, it's when they're in the cartel. Not when they are in tech leading a company. I'd be lying if I said that sometimes it doesn't make me angry or upset. But the vast majority of the time, I use it to remind myself that because of these barriers that I've overcome, I am much stronger than my counterparts. They just don't understand. It really gives me strength, I would say.

KR: 01:06:17 Thank you for answering that. That's actually an excellent segue into the last question. You said you know about Earl Bakken, and I'm assuming you know about Medical Alley as well. I'm curious about with your presence in the medical technology scene, how do you hope the landscape of technological devices in Minnesota will change?

ET: 01:06:53 I hope people embrace risk a lot more. I think that investors in Minnesota are proud of their brick-and-mortar investments. There is a certain mentality that their investments hold up of time, and I've heard this in several

investor calls now. That's great for slow growth. But if you want to actually change the world, you need another Silicon Valley. But it's Medical Alley in Minnesota. You have to invest in risky ventures. You have to be willing to lose money, as an investor and as a state, before you see those wins. I think that's one thing that's lacking. Maybe it's the Midwest. The Midwest is very conservative when it comes to risk. That has frustrated me a little bit because I am gung-ho to pursue the highest ambitious goals. It always feels like investors here are relaxed, or that your ambitions are making them uncomfortable. That has happened to me a lot in Minnesota. I've talked to people in California in Silicon Valley and it doesn't happen over there. They're like, "Hell yeah, dude! Go build the unicorn. Go hire five hundred engineers. Go do that!" Here in Minnesota, they say, "You should relax." I think that's what needs to change.

01:08:19 If you want to keep on making startups that are acquired by the big companies here, that's going to keep happening if investment keeps going this way. But you have to embrace risk if you want to make startups that will become Medtronic, and be surrounded by companies that will become the size of Boston [Scientific], GEs, and Siemens. You have to embrace risk. A lot of the entrepreneurs that go into the MedTech scene want to get acquired. They are not making a product to help people. I think that's wrong, because if you're going into medical technology, you want to make a product to help people. You don't want to get acquired. I get it—you get acquired, you make money, and you move on. But is that really what this is about? Money is nice and it has benefits. Of course, I think it's foolish to purposely live in poverty if you have the means not to. But it's not all about that.

01:09:22 People need to embrace risk. People need to get away from acquiring companies over and over again. What if Google was acquired three years in? Or Amazon? Or Medtronic? They wouldn't be where they are. The pacemaker probably wouldn't exist. There are so many problems and delays when you acquire a company, especially as other company learns about their technology or maybe even shelves it entirely. That's what I would hope for Medical Alley—to embrace risk a lot more and to be in it to build startups that are going to change the world, not startups that are going to get acquired.

KR: 01:10:09 Thank you for that. I think that's an interesting approach, and an interesting philosophy for tech and innovation to have. In closing, what's something that we didn't ask you about that you would like to talk about, if anything?

ET: 01:10:37 Let me think.

KR: 01:10:38 Take your time [Both laugh]. It's not an easy question.

ET: 01:10:42 We've covered a lot of my life and the company. If I were to add one more thing, I'm not sure if it would make the final cut. I have this really weird, but helpful perspective, towards life. I realized that my life is finite, and I try to look at life through that lens. You can Google "Little Village, Chicago" and if you go to the news section, you start scrolling through shootings. There are kids got shot and killed at thirteen, fourteen, nine, twelve—pick your year. Maybe it was being around that so young, or maybe it's because I read a lot of philosophy books, but I'm very aware of my own mortality. I'm almost in a rush to get things done. That also applies to appreciating my fiancée. I know that life is unfair.

01:11:57 Twenty-year-old people die all the time. Thirty-year-old people die all the time. Do people die too young every day? There are billions of us. Of course. It's going to happen. It's statistics. I think people forget that. I like to joke that I'm immortal until proven otherwise, but I don't actually believe that. I know I'm mortal. I think that's an interesting perspective, although it's a bit morbid. I think it's helpful to look at life through that lens. If you wanted to, you could entertain yourself all day on the internet and probably not remember anything. But you could entertain yourself for hours, for days, for weeks, and for months. But every day you lose, you're not going to get that back. Is that what you want to do? I am a victim of it. Everyone's victim of it. You go on YouTube to watch random videos, and you don't remember what you watched. It just happens. I have a couple of mentees, and that's what I tell them all the time. It's weird to say, "Remember, you're going to die one day."

KR: 01:13:08 I'm going to ask you one last question. So how many people are you mentoring?

ET: 01:13:14 I mentor two people, one in community college and some from undergrad as well. You learn a lot from trying to mentor students. It's also a bit of pressure to actually help people like that.

KR: 01:13:37 I think that's lovely, and a great place for us to close. I think Freud called it a "death drive," which people might think is morbid. It is sometimes a helpful reminder to know that tomorrow is not promised.

ET: 01:13:56 I annoy my fiancée with stoicism. If you're familiar with stoicism—the philosophy, not the stoic. It's different. It's a very practical philosophy that I love.

KR: 01:14:11 And it's obviously serving you, so as long as it's serves you!

ET: 01:14:14 As long as helping me, I'm not trying to hurt anyone. Exactly.

KR: 01:14:18 Exactly. Thank you so much, Efraín. I really appreciate your openness in sharing so much, and I learned a lot today...I'm just really grateful that you agreed to do this interview.

ET: 01:14:35 Thank you for having me.