

## Having a Heart Attack? There's an App for That! The Incredible Story of How Dr. David Albert Brought the ECG iPhone App to Market

In this interview with Dr. David Albert, we learn about his incredible journey in bringing the ECG app to market. Here are a few things we're going to learn in this interview with Dr. **David Albert**:

The amazing story of how AliveCor's iPhone ECG app helped save a man's life while on an airplane!

- Two disruptive features of the iPhone ECG app: Cloud and Cost
- The roller coaster ride Dr. Albert experienced in his pursuits to develop the ECG app.
- Five key lessons you can learn from Dr. Albert's experiences:
  1. Be stubborn
  2. Use sounding boards
  3. Protect your IP
  4. Stay patient and
  5. Make a demo.
- Dr. Albert's advice for ambitious doers:
  1. Believe in your ideas and
  2. Don't be afraid to swim against the stream.

**Scott Nelson:** Hello, everyone. It's Scott Nelson, and welcome to another edition of Medsider. This is the site where you can get your free personal medtech or medical device MBA. It's a show where I bring on dynamic and interesting medical device/medtech stakeholders so we can all learn a few things. Hopefully, there's some entertainment value along the way. Today's guest is Dr. David Albert. He is the founder of AliveCor and is infamous amongst other things for the iPhone ECG app that was, I think we're coming up here on the one-year anniversary of, I think it was dubbed the unofficial hit of the CES 2011 or the Consumer Electronic Show 2011. So, without further ado, welcome to the call, Dr. Albert. Appreciate your coming on.

**David Albert:** Thank you very much, sir, for my pleasure.

**Scott Nelson:** And so, let's start. I mentioned the iPhone ECG app. Why don't you briefly tell the story about Dr. Eric Topol and his experience with using your app on a recent flight with the person who was experiencing the heart attack?

**David Albert:** Well, it's an anecdote. So, Eric, who is a world-renowned physician-scientist, would tell you that this is not a clinical study, but it was an anecdote and a good Samaritan use of our technology. Dr. Topol had been at Bethesda at a conference with the National Institutes of Health, which was about two months ago, and left from Dulles Airport headed back to his home of San Diego and the Scripps Institute when 30 minutes into that flight they came on the overhead PA and said, "Is there a doctor onboard? We have a passenger who is in distress." Dr. Topol had several other physicians with him from Scripps but they were all surgeons, so they said, "Topol, this is your gig." So, he got up and went to where the passenger was.

The passenger was a gentleman, who will remain HIPAA-compliant anonymous, who had several years before had a stent placed for a coronary artery obstruction. At the time in the air, the patient had chest discomfort with sweating. So, they were trying to figure out if it was serious, what do we need to do? So, Dr. Topol, after talking to the patient, observing his distress, took out his AliveCor ECG for the iPhone and opened up the gentleman's shirt and placed it on his anterior chest, and what he told me, this is what Dr. Topol said, is that he had 4 or 5 millimeters of ST elevation. Well, I can just tell you, that's absolutely diagnostic that the guy was having an acute heart attack.

And so, he said immediately, "You have to tell the captain we've got to land this plane ASAP. This man's having a heart attack and no telling what's going to happen to him." So, they did, and they were somewhere near Cincinnati. I don't think it was the Cincinnati International Airport, which for those who know is actually in Kentucky.

**Scott Nelson:** Yeah.

**David Albert:** They landed at some other airport, and the gentleman was removed by EMTs and taken in and actually had another stent placed, and Eric told me he is doing well. So, that's good news, a happy ending. The not-so-happy-ending part of it was that the plane they landed, which is probably a 767, some larger kind of aircraft going cross-country, could not take off with all the people on the board from the airport they landed at. So, Dr. Topol had to bring other planes into shuttle people up. He didn't get to San Diego for 13 more hours in the middle of the night, the plane taking off in the morning, early in the morning. So, he said, "I don't think they're very happy with me." But he said, "The patient's alive and well," so all ends well with that story.

**Scott Nelson:** Right.

**David Albert:** You know, it's a great story, and we don't claim that our device should be used to diagnose heart attacks, it's not really what it was designed for, but in that kind of situation it was an appropriate use, and certainly when Dr. Topol saw what he saw, there was no question as to what the diagnosis is.

**Scott Nelson:** Yeah.

**David Albert:** So, it's not a replacement for a 12-lead ECG, one you get in your doctor's office or a hospital where they put the electrodes on you, but in this case, it was all you needed to know that this man needed urgent care.

**Scott Nelson:** Yeah.

**David Albert:** So, that's a happy ending.

**Scott Nelson:** Yeah, no doubt. So, the passengers on the plane, on one end they were like, that amazing ECG app, and then on the flip side, they were like, that damn iPhone app. It's costing us an extra 13 hours.

**David Albert:** Yeah, well, we're all slaves to time.

**Scott Nelson:** Yeah, that's right.

**David Albert:** And so, a lot of people had their schedules knocked back by that.

**Scott Nelson:** But a life...

**David Albert:** You know, I look at it this way. Dr. Topol had done this many times. I've been involved in a number of these things. The fact is if that was you or somebody you love; you want that plane landing.

**Scott Nelson:** Absolutely.

**David Albert:** So, you know, it worked out fine and that by the way is in addition to the fact that we have completed three actual clinical studies of our technology now. One at the University of Southern California with Dr. Leslie Saxon, Chief of Cardiology at USC, and two, here at the University of Oklahoma, Dr. Dwight Reynolds, Chief of Cardiology, and former President of the Heart Rhythm Society. Between Dr. Topol, Dr. Saxon, and Dr. Reynolds, these are really world-renowned cardiologists, and the three studies have all resulted in abstracts that we haven't heard about but have been submitted, and we're very happy with the results of that data, which is used for our medical device CE Mark so that we can sell in Europe, and is being used for our FDA 510(k) applications, which require some clinical efficacy data.

**Scott Nelson:** Got you.

**David Albert:** We've actually done studies now and I'm happy to say they turned out really well.

**Scott Nelson:** Got you. Very cool. I want to come back and ask you a little bit about kind of that regulatory and reimbursement aspect of your device, but before we get there, people in our audience I have to imagine are thinking, wait, wait a second. Okay, so what I'm getting out of that story is, okay, so Dr. Albert developed an app that can actually read the heart rhythm. And yeah, I mean that's what we're talking about, and I'll definitely link up to your famous YouTube video when I post this interview on Medsider. But yeah, I mean patients that you're used to seeing, you mentioned the 12-lead ECG with the electrodes and the cables. You basically transformed that sort of technology in a sense. I'm somewhat exaggerating this a little bit, but in essence, you transformed that technology into an app on the iPhone and so why don't you just give the audience, give myself, a brief intro into what the iPhone ECG is?

**David Albert:** Sure. Today we also have it working on Android, although it's not nearly as well-developed as our iOS product. Currently, we have a case that is designed to fit the iPhone 4 and the iPhone 4S. That case is like a case you'd buy in the Apple Store or Verizon, AT&T, wherever you buy your iPhone cases to protect your beautiful, loved iPhone. It has rubbery sides and a hardback, but integrated into the back, the only difference you would notice, it really is no larger than a standard case, is that there are two dull electrodes on the back right underneath where the camera hole is. Those two electrodes are connected to electronics built into the case to

actually measure your electrocardiogram, and you can do that from a number of locations on the body. It is then combined with the app, which is a standard iPhone app which receives the wireless data.

So, the case actually speaks wirelessly. You can actually take the case off and have it fixed to 12 inches away from the iPhone and the ECG still shows up on the iPhone. So, it's wireless connectivity, and that's important because in medicine we have something called an isolation barrier. You have to keep what connects the patients and what connects the potentially AC power totally separate with a very high isolation barrier. So, we talk wirelessly between our case and the iPhone, and then our app takes that wireless data, turns it back into an electrocardiogram, displays it, processes it, stores it, and then uploads it to our secure cloud server.

It is an abbreviated part of a 12-lead electrocardiogram. In fact, when I hold it in my two hands I'm actually recording what's called Lead I, which is left-arm minus a right arm. That's the first lead in a standard 12-lead. In one of our studies, we did actually compare the one from a 12-lead to our Lead I, and they're basically identical. Ours is slightly noisier because you're holding it in your hand. It's not as good a connection as putting those sticky electrodes on, but otherwise, the data is absolutely identical. So, it's a combination of a case and an app. We also have, in a preliminary form what we call our iCard, and there's a video on YouTube about that, which is a credit-card-size version of the same technology that works with iPhones, Androids, iPads. It's basically a version of it that's not a case.

**Scott Nelson:** Got you. Okay.

**David Albert:** It's the same technology, transmits wirelessly. So, that's the technology. It allows literally 10 seconds after I finish recording, the ECG will be viewable anywhere in the world securely through a browser.

**Scott Nelson:** Wow.

**David Albert:** That's another part of the disruptive factor. It's available to your doctor almost immediately after you record it.

**Scott Nelson:** Got you. That's amazing. I mean, that's an amazing part, and I love the...

**David Albert:** Amazing is good, we have a lot of people saying "amazing" that just came back from CES 2012 or the mHealth Summit or Medica in Dusseldorf in November, and amazing is from a lot of people, a lot of companies, even a lot of doctors, they say "amazing." You know what, we worked very hard on this, and as I mentioned to you earlier before this call...

**Scott Nelson:** Yeah.

**David Albert:** ...this really is an evolution of an idea I had back in the mid-1990s...

**Scott Nelson:** Right.

**David Albert:** ...when the technology wasn't able to implement what we have today, but the idea was there.

**Scott Nelson:** Right. I'm sure you get that a lot, "This is amazing, Dr. Albert. This is amazing," but you used the word disruptive, and I think that's a really good description of the cloud-based ability to view these ECGs, these heart rhythms, anywhere in the world. So, from a practical standpoint, if my grandma has a pacemaker and she took a trip to California and I wanted to make sure her heart rhythm was okay, she used your iPhone app and I was able to view that rhythm wirelessly through the cloud-based browser, so...

**David Albert:** It's funny you said that. It's funny you said that because one of our studies at the University of Oklahoma is with pacemakers. In fact, in the last few days, I've had some people comment on our AliveCor Facebook page, "How does this work with pacemakers and implantable defibrillators?" Well, the fact is we've used it with no problems with pacemakers. The device is put into airplane mode, so the radios are actually turned off, which you know, you're not supposed to walk around with your cell phone right next to your pacemaker, by the way. So, we turned the radios off, put it in airplane mode as if you were on an airplane, we were still able to record using our wireless technology. By the way, that's pretty cool.

**Scott Nelson:** Yeah.

**David Albert:** We have a study ongoing, but we've already submitted an abstract that we're able to tell if the pacemaker is functioning properly. That's really revolutionary and the most disruptive part of it is the fact that the product's only going to cost \$100.

**Scott Nelson:** Yeah.

**David Albert:** In retail. So, that's the disruption, is that this kind of technology, that this kind of capability, this kind of global connectivity, is going to be affordable for anybody. If you own an iPhone, you'll be able to afford it.

**Scott Nelson:** Right. Right, and I'm going to use the word, I don't know how else to describe that, but amazing. You talked about the disruptive nature of the cloud-based ability to view the rhythm, but that's another disruptive piece, is the cost. People spend more at Starbucks probably in a month than they would on this thing. So, that's awesome.

**David Albert:** It costs what a pedometer or even less than an iPhone-connected blood pressure monitor.

**Scott Nelson:** Yeah, because I actually...or go ahead. Go ahead.

**David Albert:** Well, I have the Withing's blood pressure monitor and I have the Withing's scale, and I love those devices. They're great. They both cost more than this than our device. I'll tell you one thing, Scott, you know a lot of people use this term mHealth.

**Scott Nelson:** Yeah.

**David Albert:** And mHealth's a great term, I'm a firm believer in mHealth but the reality is what we're doing and what the AliveCor ECG for iPhone is, is it's an m-medical device. mHealth devices are pedometers, scales, blood pressure devices you use, which by the way everyone needs to be using to keep yourself healthy. The reality is our device is a device for, unfortunately, the tens of now hundreds of millions of people around the world. Your grandmother with a pacemaker who will have a problem and will need to be monitored. We need to spend more money staying healthy, but the reality is we spend most of our money treating our illnesses.

**Scott Nelson:** Right.

**David Albert:** So, we look at our product as an m-medical device, not just a mHealth device.

**Scott Nelson:** Yeah.

**David Albert:** That's really what's disruptive, is we're going to bring a medical-quality, clinical-quality device for less than \$100 anywhere in the world, and that to us is exciting in terms of what we're going to do improve medicine around the world.

**Scott Nelson:** Yup. Yup. I mean, what I was going to say is I think I bought a Garmin watch that I think it has Nav and it has the ability to monitor my heart rate. I think I paid like \$200 or \$300 for that which is two or three times the cost of your device. So, very cool. You mentioned you came up with the idea in the early '90s. Let's dig into that a little bit. Walk us through how you came up with this idea, and then the story behind how you began to see this into fruition and kind of the rollercoaster ride until late 2010, I think, when you posted that YouTube video.

**David Albert:** Well, it's an interesting story actually. My previous company was called Data Critical, and we were a wireless healthcare company and sold in-hospital wireless systems, inevitably went public in '99, and in 2001 sold to General Electric Healthcare. In the mid-'90s, I had an idea that wasn't exactly in our main product line for a handheld ECG device using a, at the time, state-of-the-art handheld computer, which was a device by a British company called Psion, and it was called a Psion 3C. Inevitably, we got a patent on that device in 1997, and actually an FDA 510(k) around the same time, and that product was called Rhythm-Stat XL.

We really never commercialized that device because as I said, we got it built, we got it FDA-approved, we patented it, but it really wasn't in our business. So, that product wasn't exciting enough at the time because the technology, the handheld computer of 1997, you can't even compare it. It's like comparing a concrete wheel to an Indy racer.

**Scott Nelson:** Right.

**David Albert:** It's just not comparable. So, in the mid-2000s, so around 2005, an old-time friend of mine from Australia named Bruce Satchwell had developed a Bluetooth ECG device that worked with, at the time, the state-of-the-art Windows Mobile phone. He was selling them to researchers, although there wasn't really an opportunity. Windows Mobile was state-of-the-art

at the time, you wouldn't want to bring one out at a party today unless it was a party of archeologists.

The fact is that it was hard news. It had lots of issues. It was good for researchers. So, in 2007, when the first iPhone came out, he and I were excited. We conversed off and on Skype and we were both doing our own thing. We said, wow, this is cool, and when they opened up the app store and opened up the SDK to allow you to develop apps, I said, great. Bruce, you need to port your Bluetooth device to the iPhone. The only problem was that Apple made its Bluetooth connectivity very controlled, so he could not connect his Bluetooth device to it.

That was very frustrating because we then saw the 3G, and ultimately the 3GS. So, at the time the 3GS came out, I thought back to my 1997 product Rhythm-Stat XL and I said, well, Bruce, I have an idea. So, I built a prototype case actually out of a Mophie Juice Pack Air as an extra battery. I took it apart, took all their parts out, put a prototype circuit board in it, and I called Bruce up and I said, Bruce, your partner there can write iPhone apps. This is what I need him to do. He wrote an iPhone app, and it kind of worked.

**Scott Nelson:** Yeah.

**David Albert:** I say kind of worked because it just kind of worked. This is like 2008, 2009. So, we worked on it a little bit and got to the point where I thought I could go show it to people. Again, a handheld prototype, and I have it right now framed. My wife for Christmas framed that original prototype in a frame with the Scientific American article from December, where it was named one of the 10 world-changing ideas by Scientific American in the December issue. They handed those out, by the way, at CES, which is really nice for Scientific American to do.

So, I took this around to some of the companies I knew like GE, and they said, "David, it's kind of cute but we've done focus panels, we don't really think people want to look at their ECG. We don't think doctors, they have 12-lead ECGs and GE's the world leader around that technology," and having left as Chief Scientist of GE Cardiology in 2004, I totally appreciated that. So, I said I don't have focus groups. I just thought this was a cool idea and so I went off.

**Scott Nelson:** Yeah.

**David Albert:** And the good news is Bruce, and I are both very stubborn sons of guns, okay. So, while I had people tell me they didn't think it was a good idea, I actually got approached by a company, fast-growing venture-funded company that invited me to their headquarters in Houston, and they put up a slide showing a picture of my prototype and a concept drawing that looked exactly like it, and they said, "We had somebody do this. It said, 'Great minds think alike.'" So, what happened there was we were able to get a little seed capital from this company that enabled us to go to China and actually have some prototypes built-in 2010.

So, in October 2010, took the seed capital from this company, who by the way ultimately decided not to go forward with it. They later changed their mind but that was too late, sorry. So, on December 14th, 2010, which happened to be my birthday, I received a box from Hong Kong of

15 prototype iPhone 4 cases, and they were really cool. They looked really good; five white ones, 10 black ones. So, I was getting ready to go to the Consumer Electronics Show. Since the medical company had told me they weren't interested. I was going to go meet with a consumer company and see if they were interested. I mean, you could use it as a heart rate monitor...

**Scott Nelson:** Yeah.

**David Albert:** ...if nothing else, and not even mess with the FDA. It will be, by the way, incredibly accurate...

**Scott Nelson:** Oh yeah.

**David Albert:** ... just like a clinical ECG. So, on December 30th, getting ready to have New Year's Eve last year, I pulled out one of the cases and I told this story, and you can watch the videos. At the time, my 13 and 11-year-old sons, really my 11-year-old son, made YouTube videos as he modified his Nerf gun. There's a whole cult of Nerf gun modifiers, and so he knew how to do it. So, I said to him I'd done a couple, but I'd done them poorly, he said, "Dad, let me show you how to do this. You have to talk to the camera. This is how you do it. You want to edit it. You want it to be short." So, I listened to my 11-year-old. I went into my office, I took one of the cases, and I did a 4-minute video, no script, no preparation. I was sending it to two companies who weren't going to be at the CES the next week, and I just happened to click the box that said "Post to LinkedIn," and at the time I had about 500 LinkedIn connections, and I had about 30 Facebook friends and about 20 Twitter followers.

**Scott Nelson:** Yeah.

**David Albert:** Didn't have very many. I was at the time a 56-year-old guy, not a very socially connected dude. LinkedIn was my preferred network, business network system that I worked with, and so I just happened to click that, and I uploaded it and I went home, and within 24 hours my life changed. That story's been told now several times in print. My life changed, and whether it was CNN or Good Morning America or Fox or General Electric again or basically, name the company. They hounded us.

So, the next year was a whirlwind from forming a company of what was an idea that was no more than a hobby for Bruce and me to now raising money from the likes of Burrill and Company in San Francisco and Qualcomm, getting absolutely scrubbed on our intellectual property and technology. At the end of the day, we had people from AT&T and Qualcomm and Texas Instruments and GE and Apple who said, "Incredible. Cool technology. Well done." So, it's very satisfying that you know, an idea that began at least 15 years ago could now be realized and will very soon be on the market domestically as well as internationally, and has already shown its value to make life better if not save lives.

**Scott Nelson:** Got you.

**David Albert:** So, to me, that's the story.



**Scott Nelson:** Yeah, that's great, and there are a few points that I'd really like to highlight and even ask you a couple of further questions about that because my big take-away...

**David Albert:** Let's go.

**Scott Nelson:** ...obviously I've seen this story and read about it and it's been told a lot, but I get questions a lot, emails and even whether it's a physician or just a medtech entrepreneur that has these ideas. They've got all these great ideas but they're hesitant to either do anything about them or even share them with people. Your story is one of a great idea, but if you wouldn't have ever done anything with it, if you just kept it as that, an idea, and never really persisted and actually built it out, we never would have seen the results and the fruition of your labor. So, that really stands out, and also your persistence along the way because you mentioned you patented this idea back in the late '90s, it blew up in late 2010, in that CES 2011, which is really 2011. T 11 years, is that right? No, more than that, whatever that is, 12, 13 years, something like that, of persistence.

**David Albert:** Yeah, it's about 15 years.

**Scott Nelson:** Yeah, I mean that speaks to your story, and so what is it that kept you going or led you to not just keep this as an idea but actually kept just playing around with it and toying around with it. You mentioned that phase where I think you either brought your idea or your concept, your prototype, to a couple of companies that said, "No, we've had focus groups and this idea isn't working," but yet you stuck with it. So, are there a few things that you can pinpoint that led you to kind of persist in this?

**David Albert:** Yeah, first of all, remember what I said, is that my partner, Bruce Satchwell, and I are both really stubborn guys, okay? So, you can't get this far without—it's kind of like presidential candidates, I have enough ego to go around. So, despite having my friends, who I respect a lot, tell me that they're not sure there's an idea there, I felt there was, okay? So, mark one up for me, okay.

**Scott Nelson:** Right.

**David Albert:** I felt there was and that this could have real value, and by the way, it did. I won. So, the notion is being persistent. Winston Churchill, "Never, never, never give in," okay?

**Scott Nelson:** Yeah.

**David Albert:** If you believe you're right, never give in. Now, oftentimes, inventors' pride of fatherhood or motherhood will blind them to the reality that their idea's just not any good.

**Scott Nelson:** Yeah.

**David Albert:** Okay, I've been doing this for a long time. I have 33 patents. I've sold to companies. I've licensed my technologies to lots of people. So, I think I've got a pretty good view of what's valuable, and unlike the people I was talking to, I actually understand—they talk to people who

do practice clinical medicine, and I practice clinical medicine so I have a pretty good understanding of how the world works, and that's an unfair advantage of mine.

**Scott Nelson:** Yeah.

**David Albert:** And by the way, I want as many unfair advantages as I can get. So, understanding technology and understanding the clinical practice of medicine are both tools I use to validate an idea. I would tell any hopeful adventurous entrepreneurs out there that they need sounding boards because I've made license space and I have an entrepreneur's prayer by the way: "God grant me the wisdom to only make new mistakes," okay. Because I'm going to make mistakes, but I don't want to make old ones.

**Scott Nelson:** Yeah.

**David Albert:** I only want to make new ones. So, I would tell them that they need to have sounding boards. Now, does that mean you tell everybody your idea? No. The good news/bad news is the New Patent Reform Act means it's a race to the Patent Office. First to file wins, first to invent, and so on.

**Scott Nelson:** Yup.

**David Albert:** Because that means people need to be filing provisional patents, locking in their filing dates. They need to learn how to do that. Today, whether it's with legalzoom.com or whatever. Anybody can do that. I would always recommend getting professional help. But you can file a provisional patent application for not a lot of money, and that's available to people, and I would highly recommend to anybody who thinks they have a patentable idea. Also, the patent database is online and searchable from a web browser. So, you can do a priority search certainly a patent work. Anybody can do it from the local Starbucks. So, that's another benefit that I didn't have 15 years ago...

**Scott Nelson:** Yeah.

**David Albert:** ...or 25 years ago, or 30 years ago when I had my first patent. So, I would just tell you that you have to be persistent, you need to do your homework and you need to protect your intellectual property. Those are all pieces, and you need to have patience. I think this idea demonstrates that. Big companies oftentimes don't catch on quickly. It's not in their DNA, okay. So, if what you want to do is sell your brilliant idea to a big company, you better have a lot of patience, and oh, by the way, they understand how to negotiate.

If they look disinterested even if they're interested, they have an advantage because everything my friend, you don't get what you deserve, you get what you negotiate.

**Scott Nelson:** Right. Another cool aspect of this story, too, and one I'd like to point out is that early on you showed your device to big companies and then even venture capitalists and venture firms, and they basically turned you away. But the minute it blew up at CES, or through that

YouTube video and then at CES, you had venture capitalists and other companies and distributors come begging to you, and so that speaks to the idea that product does matter.

**David Albert:** Yeah, I will tell you.

**Scott Nelson:** I mean, the product really truly matters, you know? The idea of the product matters.

**David Albert:** Oh, it absolutely matters.

**Scott Nelson:** Yeah.

**David Albert:** By the way, nothing helps like making a demo.

**Scott Nelson:** Yeah.

**David Albert:** I would tell people, if venture capitalists, large-company product people don't have the world's largest supply of vision. So, don't go to them and say, "Imagine if you will." Uh-uh, that isn't going to work. You need to walk in and put it in their hands.

**Scott Nelson:** Right.

**David Albert:** In fact, today, the most powerful thing I can do is walk up, and by the way, after— yes, we had some venture guys turn us down because they said, "You know, we don't think your business model's sound. Where's your reimbursement model?"

**Scott Nelson:** Yeah.

**David Albert:** "How much are you going to get reimbursed?" I looked at them and said, "I don't want to get reimbursed a dime." They looked at me like I was from another planet. Now I will tell you, everybody, who said that I've been in the medical device business far longer than they have.

**Scott Nelson:** Yeah.

**David Albert:** And sold many more things than they have. But that is the model of the traditional medical device business in the United States.

**Scott Nelson:** Is reimbursement, yeah.

**David Albert:** What's the reimbursement that you wish? And by the way, that got us into the problem we're in right now.

**Scott Nelson:** Yeah.

**David Albert:** The people receiving healthcare don't pay for it, the people describing it don't know how much it costs, and we've run an open-loop system and now we've got big problems, and everyone understands. So, venture capitalists are even more interested, "Well, how are you

going to get reimbursed?" And oh, by the way, reimbursement, whatever it is, is going to be on an inevitable downward slope.

I can just tell you, I had a very good, close friend of mine, a smart doctor. I said, "What do you think's going to happen to Medicare?" He said, "Well, if Obama gets elected, reimbursement's going to go down, and if Mitt Romney gets elected reimbursement's going to go down." He said, "So what do you think I'm thinking? Reimbursement's going to go down." So, if there's no money, there's no money.

**Scott Nelson:** Yeah.

**David Albert:** There are more people, there are more seniors, less money, and the same amount for more seniors and less money. So, reimbursement's going to go down. That inevitably is why you should look at companies like Medtronic. Omar Ishrak, the new CEO, is a friend of mine. I worked with him at GE and he is going to have to re-engineer a company that always thought people would pay more for better care.

**Scott Nelson:** Yeah.

**David Albert:** So, what I would tell you is, I had venture capitalists who said, "Cool idea technology, but we don't understand your business model." Today I would tell you, I had venture capitalists tell me, "I don't think your intellectual property's any good." They probably thought that all the way up until Qualcomm, probably the most intellectual property-focused company in the world. thought the intellectual property's fantastic and they want to invest. Okay. That's the ultimate IP validation.

**Scott Nelson:** Right.

**David Albert:** Qualcomm's business model is IP. So, you know, it's great to have them as a partner. We walk into their lobby and there's 6503 stories worth of patents, and you understand how they look at the world. So, we're very pleased to have them and really pleased to have the people, [38:39 inaudible], Steve Burrill, and the people at Burrill and Company who said that "We like your IP. We like your business model. We love your technology. We think this is going to be a big win." Now they've had a lot of people, I can tell you, a lot of venture capitalists, all say, "Hey, can we invest?" and I just say to them we renewed seven months ago?"

**Scott Nelson:** Yeah.

**David Albert:** So, you know, that just happened.

**Scott Nelson:** Yup.

**David Albert:** Venture capitalists are lemmings. They always want to be on the newest hot thing. But I had a venture capitalist tell me, "I'll tell you if I'm interested if you tell me who's interested." That circular logic is not lost on venture capitalists.

**Scott Nelson:** Yeah.

**David Albert:** So, the good news is we're funded, we have lots of people interested, lots of partners interested, and we basically have our head down now. Our product's about to be CE-marked here in the next month or so, introduced in the EU at the end of the first quarter, and then, hopefully, we'll receive our 510(k)s around the middle of the year, introduce it July, I would say, in the United States.

**Scott Nelson:** Yeah.

**David Albert:** So, really, global introduction in 2012 of our product, and that's a lot of work, you know.

**Scott Nelson:** Oh yeah.

**David Albert:** India, China, all over, is a lot of work for a little startup, so we're awful busy right now. Just hired a CEO. She's been on board for two weeks. She comes from mobile gaming. She's a former McKinsey partner, a lot of business organizational strengths, and she's got her head down now as we try to build up this business and really realize this vision that I kind of had 15 years ago of an ECG in every patient and every doctor's pocket.

**Scott Nelson:** Yeah. So, in terms of your strategy moving forward, you're obviously not moving towards a reimbursement strategy. This is a device that, it's a hundred bucks, so anyone can pay for it.

**David Albert:** That's right. We...

**Scott Nelson:** How does distribution work? I mean, will companies be selling this? Are you primarily relying on, at least for the iOS platform, are you primarily relying on the iTunes Store, or what does that look like?

**David Albert:** Well, I mean, first of all, for the app on the iPhone version, the apps have to be downloaded from the App Store, okay?

**Scott Nelson:** Yup.

**David Albert:** For the case part, you can imagine who we're talking to, who sells a lot of iPhone cases? They're cell phone carriers, and there's the manufacturer of the iPhone who has a firmly significant retail presence both brick and mortar and online. So, we see distribution as being from all channels.

**Scott Nelson:** Yeah.

**David Albert:** I think my CEO, Judy Wade, is much better talking about this than I am.

**Scott Nelson:** Yeah.

**David Albert:** But you know, obviously, companies like Apple or companies like AT&T or overseas, any of the carriers, are prime candidates. You'll be able to buy our products online. You'll have to download and obviously, when we introduce Android versions, again carriers, stores that carry smartphone accessories and online all become channels to distribute our technology. I think there'll also be VARs. We've had a lot of people come to us say, "Can we add value? Will you license us your tech...?" Because our technology's really pretty unique we have a lot of people coming saying, "Can you license us your technology?" I think we're considering what we call an alive-inside-type strategy where we license our technology and enable people to be VARs, to develop end solutions and take them through whatever their channels are.

**Scott Nelson:** Got you.

**David Albert:** So, you know, I think if there are home health agencies, that might be a VAR-type channel, and we're talking to companies in that, as well as fitness and sports. That's different than others. So, I can see a variety of channels. We're talking to a lot of people now. The good news is they're returning our phone calls.

**Scott Nelson:** Yeah. Yeah, which is a good sign, and I know we're kind of running short on time and I want to ask you one other question about this story as we reach towards the conclusion.

**David Albert:** Well, you wanted to talk about the FDA. You asked me about the FDA, too, so I can if you want to talk about regulatory.

**Scott Nelson:** I was initially going to ask you about that, about kind of the regulatory strategy and why you're pursuing two 510(k)s, well, actually just briefly speak to that because I think that's interesting...

**David Albert:** Well, it's very simple.

**Scott Nelson:** Yeah.

**David Albert:** It's very simple. The simple reason for that is that we're going to be filing a prescriptive 510(k), that is, prescription-only use. That means a doctor, a nurse, an EMT because huge numbers of EMTs around the world would be interested in the immediate assessment of say a victim that's in a crash and they can't get the big defibrillator up there. So that use will be one, and then, the FDA has come out with an over-the-counter ECG recorder category and we'll be filing for that so that someone can buy it for instance from the Apple Store or Verizon or AT&T stores, without a prescription.

So, we're going to file for both 510(k)s. The hardware will be identical. The apps will be slightly different because the FDA has some requirements. So, we're going to file for two, and that gives us the broadest reach. So, you can go buy one for your grandma with a pacemaker.

**Scott Nelson:** Got you.

**David Albert:** Or, the physician can say, “Mrs. Jones, here’s a prescription, you can go buy one yourself.”

**Scott Nelson:** Yup. There...

**David Albert:** So, there you go.

**Scott Nelson:** There you go. That's, yeah, simple enough. One is prescription versus one is over-the-counter. Yeah, that makes sense. The other question I was going to ask you, and it's kind of a small story but I think it's interesting because it's easy to gloss over, but in late 2010, like the fall-ish kind of timeframe in 2010 when you went to China to actually have your prototypes built out, I'm curious, it's easy to gloss over because it seems somewhat monumental. How do you even go about finding a company in China that would actually build out these models? The reason I ask is that I remember hearing an interview with one of the founders of [44:54 inaudible], he actually cold-called I think the guy who founded the iRobot, like a vacuum thing...

**David Albert:** Yup. Yup.

**Scott Nelson:** ...and actually that's how he came across his manufacturer in China. So, I'm wondering if you follow a similar path or something.

**David Albert:** So, that was Ben Rubin calling Rodney Brooks, okay?

**Scott Nelson:** Got you.

**David Albert:** And I know Ben. So, what I will tell you is I had already been working with the company we used in China. That's why they built those prototypes for free.

**Scott Nelson:** Okay.

**David Albert:** They actually built them without me paying for it because I had spent a lot of money with them building some consumer safety, health safety products, and so I knew they were very high-quality. I also knew they had FDA 510(k) approvals and were GNP-compliant, so I knew they could theoretically build an FDA CE-marked medical product, and they also build products for companies like Omron, Nike, Adidas, Timex. So, very high-quality consumer and consumer health brands relied on them. I knew the senior executives and the senior management, and so I was very fortunate I'd had previous experience, and they've been a great partner. They're called IDT International in Hong Kong with their factory in Shenzhen and they've been just a first-rate partner for us.

**Scott Nelson:** Got you. So, relied on experience and previous business relationships to get that done.

**David Albert:** Yeah, relied on previous experience.

**Scott Nelson:** Got you. Okay. Real cool. Kind of lastly, you've got obviously an incredible résumé, an incredible background, a lot of experience, and we can probably go on if you would be willing to give me the time to go on for hours and hours to talk about some of these stories because I imagine there's even more to uncover, but where does this interest come from? Because you have your MD. Have you ever or are you still clinically practicing? Where does this interest in these gadgets come from?

**David Albert:** No, I haven't practiced in, well, that's actually a very long story. I was a medical student at Duke University in the late 1970s, and at Duke U, after your second year, you get to spend your third year if you want to work in a research lab, and I worked in a research lab. At the time, my father had a heart attack, and I came back and saw him as he was convalescing, and as part of his rehabilitation they wanted him to exercise, and he was in his early 70s. So, they wanted him to exercise and say, "Take your heart rate up to 100."

Well, at the time, this is before a Polar chest strap or anything, there really weren't any heart rate monitors. So, I had a friend of mine who was a classmate, he'd been an undergraduate in biomedical engineering at Duke and he was a classmate in medical school with me, and he introduced me to a grad student at Duke in biomedical engineering. That grad student, I paid this guy to build me a heart rate monitor that I could give my dad. So, I paid \$200. Now, you have to understand, if you remember what it's like being a student, \$200 is a tremendous amount of money.

**Scott Nelson:** Oh yeah.

**David Albert:** I was going to give this to my dad as a present. Well, it didn't work. It didn't work, and that really pissed me off. The guy said, "Hey, dude, you only paid me this much money. I'm not going to work anymore." So, I decided that I was going to build it, and that began an inevitable march towards my becoming technically proficient. I actually went back to school at Duke and took undergraduate, and then graduate courses in electrical and biomedical engineering, and developed a heart rate monitor that later was the object of a license by Timex, a wrist-based heart rate monitor, really revolutionary.

If you're familiar with the new [48:46 inaudible] watch, well I had probably the first patent in the whole area of wrist-worn heart rate monitors from 1981. Then, I developed an ultrasound machine at the same time I'm finishing medical school and going to practice. So, I then came back to the University of Oklahoma for training and, inevitably realized that maybe I had some skill at this inventing thing.

**Scott Nelson:** Yeah.

**David Albert:** So, I decided that I essentially drop out of practicing and start a company, and I did. I sold the first company, and then I started the second company and inevitably sold that to GE and started the third company, and who knows where this is going to end. But I have to tell you one secret. I promised my wife of 27 going on 28 years that this would be my last startup. Because I'm going to tell you, a startup is way too hard and you really need to be a young man like Ben



Rubin in his 20s or in your 30s to do a startup, not a guy in his mid- to late 50s. So, this is probably my last startup, but it helps that I've had a lot of experience, that I can call up the people at GE or Philips or Medtronic. They know me very well, and I can absolutely say that today when I say something somebody usually takes my word for it, let's put it that way.

**Scott Nelson:** Right.

**David Albert:** So that, you know, was a long story and it wasn't a direct path. It was kind of a circuitous path how I got where I am today, but today I'm just known as Dr. Dave...

**Scott Nelson:** Yeah. That's right.

**David Albert:** ... or probably the gadget guy, and you know my mantra, saving lives one invention at a time.

**Scott Nelson:** Right.

**David Albert:** So, that's my mantra.

**Scott Nelson:** No, I like that. I like the fact that you told a story about your wife, how she's ridden the train, she's ridden the rollercoaster. It's 27, 28 years now. That's a testament in and of itself. That's great. That's great to hear. Yeah.

**David Albert:** Four children and three companies later, we're still married so we've got something going for us.

**Scott Nelson:** I laugh, but that truly is a testament to a quality relationship that stands the startup life.

**David Albert:** God, I married way over my head, so I'm blessed to have married way over my head. But I appreciate your interview and I appreciate this and thank you for the time.

**Scott Nelson:** No, absolutely. Just really quickly before I officially hit kind of the stop record button. People listening to this, I'm sure they're thinking, what an incredible story. Like I said earlier, amazing technology. What's the one piece of advice that you'd leave someone that's listening to this if you can narrow it down to just one thing?

**David Albert:** Well, I think, believe in your ideas, okay.

**Scott Nelson:** Yeah.

**David Albert:** I talk about our thought on innovation, and that is, most of the time people in a given area are all going in the same direction, and I have had great success now multiple times by standing at 90 degrees to their perspective and looking and saying, "Is there a different way to look at this?" Oftentimes people, like the people I talk to, will say, "Oh no, no, that's not going

to work.” That’s alright. That doesn’t mean it’s not going to work. That just means that you’re not basically ruled by conventional wisdom.

**Scott Nelson:** Yup.

**David Albert:** Don’t be governed by conventional wisdom. Stick to your guns. Believe in what you’re doing.

**Scott Nelson:** Awesome. I love the swim against the stream aspect. So, anyway, I know you have to get going, but thanks a ton for doing the interview, Dr. Albert.

**David Albert:** My pleasure.

**Scott Nelson:** Really appreciate your coming on. For everyone listening, thanks for your attention. Dr. Albert, where would you direct the audience to if they want to learn more about AliveCor, about iPhone ECG, or even just to come into contact with you?

**David Albert:** Well, you could Google it, but you can certainly send me an email. I actually give out my email. I’m drdave, D-R-D-A-V-E, @alivecor.com, that’s A-L-I-V-E-C-O-R.com. Go to our website, [www.alivecor.com](http://www.alivecor.com), register your email, and we’ll keep you posted with updates to our products. Then if you Google search it, they’ll find lots of articles and videos on YouTube, and I think you can learn a lot more. We have a lot of new things coming out in 2012, so it’ll be an exciting time for us.

**Scott Nelson:** Awesome. Awesome. So, there you have it, folks. Thanks again for listening, and again, just a quick reminder, if you want easy access to the interviews, Medsider interviews are on the iTunes Store, so just do a search on the iTunes Store for Medsider, the free podcast will come up. You can download the podcast for free. That way the interviews will automatically sync to your iTunes account without you having to do anything. So, there you have it. Thanks again, Dr. Albert, for coming on. Really appreciate it. Until the next.

**David Albert:** Scott, my pleasure.

**Scott Nelson:** Yeah, absolutely. Until the next episode of Medsider, everyone take care.