Primary Care Cures

Episode 57: Bertalan Meskó

Ron: You know, most problems in healthcare are fixed already. Primary care is already cured on the fringes, reversing burnout, physician shortages, bad business models, forced buy outs, factory medicine, and high deductible insurance that squeezes the docs and is totally inaccessible to most of the employees. The big squeeze is always on for docs. It's the acceleration of costs and the deceleration of reimbursements. I want you to meet those on this show that are making a difference. With us, Ron Barshop, CEO of Beacon Clinics, that's me.

Ron: If you take 30 steps, you'll go 60 to 90 yards depending on your gait, but if you take 30 exponential steps, you first take 3, then 6 feet, then 12 feet, and by the time you get the 30 steps you circle the earth 26 times. Peter Diamandis and Ray Kurzweil discuss the singularity where the exponential growth is happening in, as an example, sensors between you and your car and you and your phone. You have hundreds surrounding you every day and eventually it's going to get into the millions. If you had a wearable, your sensors, like 65% of Americans do, this dataset explodes and you have a data exhaust behind you, just like your car has an exhaust, just like your life has an exhaust. So Moore's Law has worked out where chips and data storage are almost free. It's just a matter of time before your primary care provider has super powers through artificial intelligence, and as you walk into the waiting room, a heat sensor will measure your profile and detect tumors.

Ron: This is happening now. In fact, your home is going to potentially replace clinics and hospitals as a place where a full data set is going to alert you what you need to do next. Just like Uber was everywhere, just like iPods are everywhere, just like Amazon is everywhere, all of a sudden this will be a simple, elegant technology solution that will seem to appear everywhere.

Ron: The Star Trek tricorder is a real thing now. It's called a Butterfly Ultrasound, so today's guest is a human bridge between what is and what will be in your future, and you will want to hold your ear shut if you're investing in hospital stocks today. Dr. Bertalan Meskó PhD is the medical futurist and the Director of the Medical Futurist Institute, and will be analyzing the rest of his life how science fiction technologies can become reality in medicine and healthcare today.

Ron: As a geek physician with a PhD and Amazon top 100 author, he is also a private professor at a university I cannot pronounce in Budapest that sounds like Semmelweis. Did I get that right?

Bertalan: Yes, you did. Okay.

Ron: I've gotta keep reading because you have a very impressive resume with 500 plus presentations at Harvard, Stanford, Yale, Singularity University that I mentioned earlier is a future med course that I attended this past year in California at NASA Ames. He also advises 10 of the biggest pharma companies. And Dr. Meskó was featured in CNN, the world health organization, National Geographic, Forbes, Time magazine, BBC, the New York Times, and a lot more. He publishes analysis regularly on medicalfuturist.com. It's a fascinating read. You won't be able to get your eyes off of it. Now, I want to ask you how quickly ... Bertalan Meskó, first of all, welcome to the show.

Bertalan: Thank you so much for having me.

Ron: Yes. I have a question about how quickly are we going to see in clinical use all of the science fiction stuff that is in your writing in terms of what will patients actually see in the next two to three years in terms of technology changes that will be noticeable.

Bertalan: It's always really challenging to provide timelines, because there are many technologies of those that we write about that are already in practice. I'm not saying that we have artificial general intelligence already because we don't, but artificial narrow intelligence based algorithms, 3D printing solutions, cheap genome sequencing, variable sensors, many of these technologies have been in action at certain places in the world, so to reach a stage where this is just mainstream and it's in general use over medical practices worldwide, it was ... still takes some years, that's how optimistic I am based on trend that we have been seeing for the last decade or so, but we have to address the issue here that this whole change when it comes to healthcare that we all experience in the 21st century is not about these technologies. It's more about a cultural transformation that I think is a bigger thing than any milestone in the history of medicine.

Bertalan: And if you don't mind me just for a second addressing the Dr. Semmelweis who my medical school is named after, Ignaz Semmelweis was the physician who suggested to medical students and physicians back then 200 years ago that when they leave pathology and anatomy classes, they should wash their hands before helping women give birth, and it led to really amazing measures and also changes in mortality for babies and for the pregnant mothers. Actually he went mad because he wasn't accepted by the community and he died in asylum in Austria later. So, I'm very proud to be able to teach medical students in a medical school, which is named after a person who changed healthcare completely just by introducing disinfecting methods into the everyday practice. Because I think we live through a similar era right now through the culture of transformation that we call digital health.

Ron: Well, so I jump right into my number one question. Really, my first question should have been for you, Bertalan, what is it that motivated you to start visioning and visioneering the future for what healthcare looks like?

Bertalan: Two ways or forms of resources of motivation. The one it was that I'm really a geek. I lived all my life as a proud geek. I live with technologies. I love science fiction. I read or watch science fiction every day. So when I read you my child to dream of becoming a physician and geneticist researcher, I felt that something was missing of my life and that was my love for technologies. So, to now to be able to zoom into one particular trend or technology and trying to find out how that one could help facilitate or improve care worldwide, and so zooming out to see the big picture, on the same day is pretty exciting for me. That's one source of my motivation.

Bertalan: And the second source is I think quite obvious, that I got fed up with the notion that my life and the lives of my loved ones depend on luck more than on conscious decisions, even if healthcare today is really amazing, we could eradicate diseases and we have targeted treatments in cancer and many more things, but still our lives depend on luck. Whether we have access to a point of care, whether we have to wait for that doctor patient meeting for weeks or not, whether we get the right test or whether we can actually just quantify or obtain the right quality and quantity of data about my health or disease management, all these things contribute to receiving the right kind of care. I just got fed up with these notions.

Bertalan: What I really work on here is I don't try to predict the future. It really makes no sense, but what we are trying to do with the medical future is that we are trying to bridge the gap between what we can do today within the boundaries of medical science and what if this or that technology becomes more important or creates an ethical nightmare, and we're trying to provide context around these changes. So whoever tries to to understand what's going on, the patient, the physician, or a policymaker, they will have a better picture and thus they can make better decisions. That's our belief and that's why we talk about these issues every day.

Ron: Great introduction. I wish I would have started there. Let me ask you, Bertalan, what is that you have in your home for your family to make sure they're maximizing health and you're taking the best care using technology today?

Bertalan: This is not a fair question because I have 120 ish medical devices, but it gives like a picture that I'm an obsessive person about this. I guess I am. But the things we use every day is both my wife and I have a fitness tracker. So we track our sleep. We have a smart sleep alarm. That's why we chose one particular tracker to have the smart sleep alarm, which I think is the Holy Grail of health tracking. We track exercises and also general fitness every day. Both of use an EEG based head event. Sometimes when we want to meditate well, you can reach mindfulness with this thing on your head, but you can learn how to meditate better. We have

an air quality measuring device in our home because we realize that when the CO2 content is too high, we can't focus so well and just working and even discussions are not so lively because basically the CO2 to level is too high.

Bertalan: So we you know, learned as this thing about our lives, and besides these are the things that we really use every day, why we sleep. These things are on our arms all day long. But I've tested many more devices. I have a gluten and a peanut sensor device that can fit in my palm. I've tested about 50 fitness trackers, EEG trackers, ECG trackers. I also have an ECG device from Kardia and we do an ECG once a month, both my wife and I, and also of course blood pressure once a month.

Bertalan: But besides the gadgets that we have, we both had whole genome sequencing. Beyond the whole genome sequencing, we even did a whole genome sequencing service for our few years old daughter. And with our primary care physician, we designed a preventive plan. So I think we do many things to try to get the most out of our health and this disease management, but these are the gadgets that we use on a daily basis.

Ron: Well, so now I have a tool to tell my wife she's talked enough today with that CO2 tracker. Thank you very much. That was worth everything today. You'd said enough today, honey, there's too much C02 in the air.

Bertalan: Exactly. So, it's not my fault. It's not my fault, the day's bad or the weather is bad. It's simply the CO2 to level is too high in the room. So let's get some fresh air inside.

Ron: Okay, let's open the windows. Well that's really lovely. So it's interesting, everything you named, I think most of these devices are created in America. What is it about this country that produces so much innovation versus the rest of the world?

Bertalan: Well, the culture transformation we call it digital health originated from the patient movement and the e-patient movement. The e-patient movement originates from the US and we've analyzed this for many years and from many angles with many e-patient scholars around the world, like e-patient, Dave deBronkart. We came to the conclusion that the consumer is the approach which is quite common in the US and not so common around the world might be the reason why e-patients first appeared in the US, the first e-patient manifesto first came out in the US, the first inpatient paper first came out in the US, and that's why we think this whole industry was born in the US.

Bertalan: Then some of the gadgets, I guess, the fitness tracker and the EEG tracker rare US-based, but for the whole genome sequencing service, it was Italian. Though the service I used, a genetic test to tell me what medications I have a sensitivity for, it's Australian. I use a different ECG that's actually Hungarian, so it's getting

everywhere, but we see that maybe the biggest driving force can be seen in the US because of the Silicon Valley and because how many consumers the US healthcare system has, consumers who want to take charge of their health and disease management, and this is the single most important milestone in the story of medicine that patients are becoming proactive, and the US is showing away. Also, the FDA's, for me, one of my favorite examples about how we should create policies around digital health technologies.

Ron: I'm looking forward to working with you professionally. We don't have a relationship today, but it is my hope a year or two or three from now to have many clinics, many primary care physicians who will be tuning into you every 90 days to talk about what the patient should be employing and deploying in their homes, on their wrists, in their living rooms, and in their bathrooms to make sure that they're on top of the technology cutting edge of what they can do to improve their health.

Ron: Because in the end, they're going to only see my doctors 1% of the time of their life at best. 99% of their time is spent in their home with their life, with their food, and their refrigerator, their grocery, their sleep habits, all of that is really something that you can help move the dial for more than my doctors can, frankly. I think in partnership it's quite a nice partnership, but we will plan to have a channel, a Bertalan Meskó channel so that our doctors can tune in and find out exactly what patients should be using. Why do you think it takes 17 years for good ideas to get out into the clinical marketplace?

Bertalan: I think that the biggest reason is how we medical professionals are trained for a job. I mean, we've checked and there are about 5 to 10 medical curriculums worldwide, including the course I teach at Semmelweis Medical School where we really prepare medical students for the digital health based work. So when 200 years ago the first stethoscope was invented, which was a hollow wooden tube from a French physician named Laënnec. He came up with the idea because saw his kids playing with these wooden cubes and it could augment the sound, and he wanted to help other physicians to augment cardiac and lung sounds, because that time positions had to put their ears to the back or chest or patients and still it took him 30 years to get this message across the world because physicians claimed that they didn't want to work with the gadget while practicing the art of medicine.

Bertalan: And now if you have a stethoscope around your neck, you must be a medical professional. So eventually we adopted the technology, but if it takes 30 years for one wooden tube to be accepted, then what happens when there are 30 technologies coming out every day and some of them are now machine learning, deep learning based, really complicated algorithms and no curriculum is preparing, which just a few are preparing physicians for this kind of world. I think the whole issue originates from this, that we are not prepared and it's really challenging now to prepare physicians to be able to not just adopt these technologies but to make their own assumptions about the technologies and to

understand that the cultural transformation that's going on that leads to an equal level doctor/patient relationship is far more important than which microchip comes out next year.

Bertalan: Because, if we put all the really state of the art, digital health devices and technologies into hospital today, I guarantee that the quality of care did not improve even six months from now, because people over in that system and they have to adopt these technologies. Some of them you reject, some of these, so we people have to acknowledge the importance of the cultural changes that are going on. Maybe that's why it takes so long to adopt new things in healthcare.

Ron: My last guest last week, Morris Miller, with Xenex Technologies has a robot that goes into the room and it disinfects the room with light, Xenon Ray light. And the beautiful thing is that with this Corona virus and the headlines, and this ... I mean it's pretty scary that we have five Americans right now that have coronavirus and we don't know how many others come from that region of China that are planted here now. And same with Austria and same with the rest of the world. It's a very scary thing, a pandemic, especially when we don't have a solution out there right now.

Ron: So the deployment of robots just took forever. He sold 500 hospitals, but really until Mayo Clinic bought last year and the year before, there wasn't really a lot of traction with a technology that is just so obvious. Do you think some of this technology adoption has to do with skepticism that it works?

Bertalan: Actually I cannot think of any other reason than there is that people work in the system, and when you don't have a healthy relationship ... I'm sorry for using the word healthy here, but I think individually we need to have a healthy relationship with technologies, and that only happens if you start using them. You will hate some of them. You will love others, but you will know your place in the system and how you react emotionally when a certain new technology comes into the picture. Therefore, as people are working in a system that's why they might reject new typologies.

Bertalan: Plus they have, I guess most people, most physicians receive zero incentives from their governments, health systems, providers, insurance companies to at least get some motivation to try to adopt these new technologies. And I'm so glad you mentioned the Corona virus outbreak because we just wrote an article on Medical Futures that come yesterday about what digital health technologies are helpful in managing and tackling this outbreak, and I think this is one of the best examples ever that these are examples of why we should keep an eye on those technologies, because they help predict these outbreaks and help manage them.

Bertalan: The first real announcement about the outbreak didn't come from the WHO or CDC. It came from a company called Blue Dot, and they use an artificial intelligence based system that tracks all the global health epidemic data from

WHO, CDC, national CDCs around the word, and also airline ticketing data. And on the 31st of December they publish an announcement that the outbreak is imminent. So an AI knew it before even the biggest organizations in the world even heard about the potential outbreak. This is not threatening, this is not ... this is exciting that now we can prevent, either try to prevent this from happening or we can catch these outbreaks as early as possible. We saw the tele medical robots in action when physicians tried to examine and discuss the issues with many patients at once by the physician isn't a safe place and a tele medical robot can walk around in a clinic without any need for this infection.

Bertalan: We've seen interactive maps where global health and physicians and researchers can track everything that's happening out there. So the these technologies, the more data that AI systems can analyze but we people cannot, it's possible that maybe the next outbreak is going to be really different from the one that you're having now.

Ron: You're really describing a world where you have sensors in the ocean, and when there's a major earthquake under some obscure sea that we know that the tsunami is going to hit two days later. So we have plenty of warning time to get people inland, and that's what you're saying happened with the Corona virus. We have now artificial intelligence and sensors that can tell us exactly before the outbreak gets to 500,000 when it's going to be 5.

Bertalan: Exactly. We don't even have to go that far to talk about such a huge things on a global scale. Let's talk about us. I think that health care, even though, again, healthcare is amazing with what we achieved in healthcare in the 21st century, but still healthcare today is like what if you have a car and when you sit in your car and you start driving it away, you see zero data about the car. So it works, but you don't see the engine lights, you don't see the speed, you see nothing. Just you know that it works. But when you take it to a service and they plug it in, then you can check all the data that you want, and then when you remove it from the service, again, you see nothing. That's what we have in healthcare today.

Bertalan: It's ridiculous that I cannot obtain as much information as possible about myself or that my healthcare system cannot get access to some of these. So when there is something wrong or something about to get wrong, I have a chance to take some measures to prevent it from happening, to catch diseases early. And even though I know it might a privacy nightmare scenario, I would be more than happy to ... and actually I have been more than happy to let some of my privacy and private information leaking out of my system in exchange for a chance for a longer and healthier life, and that's the real promise of digital health that it makes patients the point of care.

Bertalan: The vision we have about the future is not shiny, modern hospitals where I go in and they have cameras everywhere and they can check whether I have tumors or my temperature right away, but things that are on me, digital tattoos, fitness

trackers, genome sequencing services in the background, anything I can get access to and when there is something about to get wrong, I get a notification so I can reach out for medical help, because even being a physician, it's really easy to get lost in the jungle of data I can measure about myself, and without the help of my professional, my primary care physician and her expertise I would be lost in the system. But this partnership, it is equal of a partnership, we are trying to get the most out of my care to have a chance for a long and healthy life, and imagine still how much of my life depends on luck, even by measuring so many things about myself.

Ron: You know what? So the service you're really providing as a medical futurist is that of a navigator. If somebody were to go to the Las Vegas CES show, they would just be blown away by too many options. I remember there's restaurants that used to open in the 70s and they had 20, 30 pages. I just want my favorite meal. Don't make me go through 20 pages and pick. It's too many choices.

Ron: Then the other thing that you're doing besides curating the best of the best, is you're also ... and you just mentioned that you're recognizing the partnership that exists between the PCP, the primary care provider and the patient with these sensors and these technologies. Because in truth, no doctor has time to be watching your data exhaust to see, Bertalan, how you're doing. You, however, as the alpha health care giver in your family being a doctor can spot that in your daughter and you can spot that in your wife and you can then alert the authority the minute that you need that assistance. Is that what you're saying?

Bertalan: Exactly. That's what we're trying to do. We're trying to show the example so then governments take notice and we can verify with them for free. That's what we work for here. We are trying to get through many doors that when a policy maker wants to adopt a good digital health policy, the offer services for free because that's why they work hard. We helped the government of New Zealand create a digital health policy, and that the kind of example I'm trying to show here to be really practical here is what happened to me a few months ago.

Bertalan: I got this test back from an Australian company showing that my medication sensitivity for 150 medications and the lab test showed that I have a higher cholesterol level, so I went to my PCP discussing it and the issue came up that I might have to take cholesterol lowering medications, and he checked and for the five major medication that they use in Hungary, my chance for having a side effect of cardiomyopathy will be 95%, so we concluded that let's not do that, but let's stick to a diet change. And I had a microbiome test and I learned even more about the kind of diet I should have, and they keep on doing the diet change and my cholesterol now is normal and I think we avoided a quite serious hospitalization just because not knowing what's already inside of me.

Ron: Yeah. That, that story should be on every billboard in front of every medical office. So the beautiful thing about what's going on here in the future is that really

we are going to have two kinds of doctors, and tell me if ... I'm just going to make two statements and tell me if they're true or false and we can get into a discussion after. True or false, primary care physicians are not going to be replaced by AI. They're going to be replaced by PCPs that use AI.

Bertalan: If you mentioned any other professional, I would say yes, and it's still the case, but primary care is the ... I think that the primary care line, the initial line will be chat bots based on AI. Then the secondary line will be the primary care physicians we have today. So, we won't get the chance to get to a doctor patient visit with any kind of health issue right away because of doctor shortages or you know, 5 million healthcare workers worldwide. But it's true. Just it's what would be called secondary care.

Ron: Okay. So you'll have to go through a screen to make sure you actually need the doctor is what you're saying?

Bertalan: I think not because it's good like that, but because it's going to be a luxury to have access to a physician right away.

Ron: Okay. And we don't, anyway. We about a 29 day wait for a PCP if you were a normal patient with a well care visit, if you have a sick care visit, it could take two days. If you go decide to wait in a sick room and hope your kid gets seen with that pink eye, you could wait all day. So you've lost a day of work. Or you can lose two or three hours and then it takes an hour to get them out of school, to get them back in school. Now everybody else can get infected. You're worried all day so you're not really present at your job. So it is an all day affair if your child gets sick. Yeah.

Ron: Okay. So let's talk about the second question. The artificial intelligence of the future is going to help be almost like a personal doctor for us real time, kind of like Iron Man had his little special assistant in his helmet.

Bertalan: It's hard to argue against it, but the time scale is the one thing that matters here. But it means it's almost artificial general intelligence, and it's decades away from now. But if we talk about certain tasks such as sporting the tumors on an x-ray or CT scan or getting data from my fitness tracker an my heart rate and so on, and making conclusions about that, that's artificial narrow intelligence, that's coming in years, for sure.

Ron: There's a real gigantic barrier to this technology. Bertalan, we had a on who is with Lepu in China and his product with millions of Chinese proven, if you get a CT scan, you can actually predict with 99% certainty whether you're going to have a cardio incident downstream, and actually how quickly you're going to have it. So it's extremely predictive, extremely accurate. Mayo did a study in America of 250,000 patients and found the same exact numbers, and it costs $2 or $3 to add to the CT scan.

Ron: However, if you haven't got the right thought leaders in America that have bought in, if you don't have the right hospitals that have bought in, if you don't slowly get this technology rolled out, even though it's proven in China, proven in America, you don't have any traction. That's the problem with new technology is you don't ... even if it's amazing, like the Xenex robot bathing the room in light, even if it's a CT scan that can literally save and triage millions of heart patients, it's not going to be deployed because we have this slow moving train to get everything into the system. It just doesn't happen over night no matter how magnificent it is.

Bertalan: Absolutely. And I know I am always more optimistic than I should be. First, evidence based medicine still takes that much time, and we know that we can only use solutions that are proven. I think the FDA has taken the right measures in this space by creating the De Novo pathway and also the premarket certification. So now they realize that they can't approve each algorithm one by one, but they can approve the companies making the many algorithms, and I think that's the right path. So they are getting there, but if you think about that five years ago saying just the sentence that artificial intelligence has held diagnosing this or that condition better than healthcare professionals, it's sounded like something from science fiction and you'll literally see many studies losing every single day now in papers.

Ron: Bertalan, on my final two questions are, where's the best beer in Budapest?

Bertalan: It's called Hops, H-O-P-S, and it's a really scary, they get the best beers from Denmark and from Belgium and it's a very dangerous place. I mean, not physically, but for the seeing the long night that's ahead of you and the kind of beers that you can try. It's a dangerous place to be, but it's worth it.

Ron: Bertalan, if we could fly a banner over America with one single message that would get through to Americans, what would that message say?

Bertalan: There is nothing more important today in healthcare then how patients can become the point of care through digital health technologies, and if anyone acknowledges that it is a cultural transformation that's just initiated by but not driven by advanced technologies then I think we're on a good path of really bringing science fiction to the medical practice today.

Ron: Listen, I know the time difference, Bertalan. This has been a struggle to make this work, and I'm really excited to have this interview and can't wait to do this again with you. You've been such a fine guest and we just tip of the iceberg with what I wanted to talk about, so we'll do this again soon. Okay?

Bertalan: All right.

Ron: Thank you for listening. You want to shake things up? There's two things you can do for us. One, go to primarycarecures.com for show notes and links to our

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