

Fixing Healthcare Podcast Transcript

Tyler Shultz

- Jeremy Corr: Hello, and welcome to season three of the Fixing Healthcare podcast. I am one of your hosts, Jeremy Corr. I'm also the host of the popular New Books in Medicine Podcast. With me is Dr. Robert Pearl. For 18 years, Robert was the CEO of the Permanente group, the nation's largest physician group. He currently is a Forbes contributor, a professor at both the Stanford University School of Medicine and Business and author of the bestselling book "Mistreated: Why We Think We're Getting Good Healthcare -- and Why We're Usually Wrong."
- Robert Pearl: Hello everyone, and welcome to the new season of our monthly podcast aimed at addressing the failures of the American healthcare system and finding solutions to make it once again the best in the world. In this is our third season, we turn to the world of politics and the role of government in healthcare. As always, we invite you, the listeners, to share your thoughts on this topic. Please take the new "Fixing Healthcare Survey" available on my website, robertpearlmd.com. We'll be reading and discussing the best listener suggestions throughout season three.
- Jeremy Corr: Our guest today is Tyler Shultz, a graduate of Stanford University, a current healthcare entrepreneur and former employee at the blood-testing company Theranos, where he worked for the now-infamous Elizabeth Holmes. After eight months on the job, Tyler suspected foul play and sent an anonymous complaint to public health regulators in New York. He would later play a central role in exposing Theranos as a fraud. He appeared in John Carreyrou's bestselling book, "Bad Blood," and in the HBO documentary, "The Inventor: Out For Blood in Silicon Valley." Tyler is now a leading voice on the topics of corporate governance, business ethics and the role of government and regulating healthcare.
- Robert Pearl: Welcome, Tyler. We're thrilled to have you on the show Fixing Healthcare.
- Tyler Shultz: Thank you. Happy to be here.
- Robert Pearl: Let me begin by asking you Tyler, what are you doing now?
- Tyler Shultz: Now, I actually started my own company. After Theranos, I went back to one of my professors that I had at Stanford, and I just said, I'm still passionate about diagnostics and I would just want to work on something that I find fun and cool and interesting. I just want to get my hands dirty with some new technology. So, I started working in this lab at Stanford, and I worked there for about three years and then we ended up spinning out a little company called Flux Biosciences where we're trying to essentially commercialize the technology that we are working on in the lab.

Tyler Shultz: One thing that Elizabeth did really well was sell me on the vision of changing diagnostics, and that's one that I'm still going after today. Essentially, what we have is a small circuit board and electromagnet that is able to measure biomarkers in blood, urine or saliva in point of care setting. So still in point of care diagnostics.

Robert Pearl: What'd you learn from your experience in Theranos that you're gonna apply to your new company?

Tyler Shultz: I learned a lot. I don't even know where to start. I think probably the number one lesson that I learned is that communication is so important in scientific communities. One thing that Theranos did was intentionally stifle communication between scientists and between different labs, and that is just not how good science is done. I would say you need a culture of being able to have a healthy way of disagreeing with people and that involves open lines of communication. That's probably the most important thing. The other thing that I learned is that, I think it's probably near impossible to upend the entire laboratory diagnostics industry in one fell swoop. So, instead we're just going after a very specific applications in specific markets and we will grow more slowly rather than try to put LabCorp and LabQuest out of business.

Robert Pearl: Sounds like a very logical approach. For listeners who may not be familiar with your background, maybe you could begin by telling them, when did you decide to work at Theranos and why?

Tyler Shultz: Yes, so I worked at Theranos right after I graduated from college, actually. I went to Sanford and I ended up meeting Elizabeth Holmes in my junior year. After my junior year, I did a summer internship at Theranos where I actually never saw a Theranos device. And then, I joined full time after I graduated. I joined just because when I met Elizabeth for the first time, she sold me on this vision of revolutionizing healthcare by giving patients access to their own information. She gave me the pitch of anything that could be done in a central laboratory, Theranos could do in a single drop of blood in point of care settings. The technology really seemed limitless. I was eager to get involved.

Robert Pearl: How much of the enthusiasm was about the technology and how much was it about her as an individual?

Tyler Shultz: Ooh, that's a good question. I would say it was probably close to an even split. I was super curious to know what the technology was. I really wanted to come up with new applications for it. The engineer in me just really wanted to work on the technology, but at the same time, Elizabeth had this extremely compelling story. She had dropped out of Stanford when she was 19 years old to found this company. She was very Jobsian, in that she was essentially married to her company. She wore black turtlenecks all the time, she had a lot of security detail. She really did feel like the next Steve Jobs and she was extremely motivating and extremely engaging. When she spoke to you, she made you feel like you were the most important person in her world in that moment, and that

you were so important to accomplishing this monumental vision that she had laid out for you.

Tyler Shultz: She was a very good motivator. I'd say I was split 50/50 about wanting to work with the technology and wanting to work for Elizabeth.

Robert Pearl: How do you think she learned to be that motivational?

Tyler Shultz: I don't think you can learn that. I don't know. I think some people are just born with that kind of personality. But I don't know.

Robert Pearl: Much of the media has focused on things like her deep voice and the fact that she rarely, if ever, blinked. Were those factors you think that impacted you or do you think that that's just her individual stylistic mannerisms?

Tyler Shultz: I don't know. They probably did impact me. I think her voice initially is almost, I don't know, it's very engaging. I found it to be very engaging. She has like a very serious tone and it's almost like hypnotic in a way when she's speaking. I think her voice was part of what kind of drew you in.

Robert Pearl: When did you first suspect the problem?

Tyler Shultz: I first suspected the problem, I would say about four days after I started working there full-time. Shortly after I started working there full-time, I actually started working with the Theranos devices. And as part of my training, I got to see one of the devices that didn't have the shell on it. You could see what was actually inside. The first time that I saw that was the first time that actually a high-level senior scientist was seeing it. In retrospect, that should have been a red flag that there were high-level scientists who have been working there for years who hadn't seen a Theranos device. That was a red flag, but it didn't seem like a red flag at the time. Anyway, as part of our training, we got to see this open reader and I was seeing it at the same time as a senior scientist.

Tyler Shultz: I remember she looked at the woman who was giving us the demo and just said, "Do you think this is cool?" The woman who gave us a demo shrugged her shoulders and said, "I'll let you decide for yourself if you think this is cool," and walked away. Really, at first glance, you can see that this thing is just a pipette inside of a box. There's no microfluidics, there's no revolutionary signal-transduction method. Everything that was in there was something any scientists had seen before. The technology was a bit of a let down.

Robert Pearl: What was going through your mind over the next days, weeks, months having seen this?

Tyler Shultz: Well, it was just extremely confusing. I like to make the analogy that it was almost as if there were two different worlds. There was what I call the carpeted world and there was what I call the tiled world. In the carpeted world, which is

where you had the lawyers, the product managers, the software engineers, the executives. People essentially worshiped the ground that she walked on. On the flip side, you had the tiled world. And in the tiled world it felt like nothing was ever working. Experiments were constantly failing, the devices were breaking down, variations were high. It just seemed like nothing was working. And so, it was really hard for me to kind of reconcile the differences between those two worlds. Elizabeth was amazing at being able to flip me on my head.

Tyler Shultz: I would be working in the lab thinking, oh my God, this thing is never going to work. It's giving us terrible results. And then, I would go and I would have one conversation with Elizabeth and I would leave thinking, "Wow, I'm going to change the world working at this company for the rest of my career." And then, I would go back to my job and I would just think, "Wait, what just happened? How is she able to do that?" She really just had this amazing way of telling you what you needed to hear to keep going. It was tough for me. I was seeing all kinds of red flags, and I was just trying to figure out what was going on, and that we were also holding out, or at least, I was holding out hope that the 4.0 version of the device would actually be something revolutionary, whereas we were doing assay validation on the 3.0 and 3.5. There was kind of a glimmer of hope that maybe the 4.0s would actually be something revolutionary.

Robert Pearl: Do you think she had any insight that it was all sitting on shifting sands and quicksand, that the technology being really a hoax, that there wasn't any-- or do you think she really believed that it was only a matter of a couple of months before this next version came out and it would all actually process hundreds of samples on two drops of blood?

Tyler Shultz: Yeah, that's the question. I don't know the answer to that question because I have a really hard time getting inside Elizabeth's head. Nothing really makes sense to me, but she was such a good liar that you have to think she believes her own lies. But at the same time, it literally takes one look at this device to know that nothing she's saying is true. She's saying that it can run hundreds of tests from a single drop of blood. These devices can only run one test at a time. Even if Theranos could run 300 tests and you ordered those 300 tests, that would have to be run on 300 different devices in order to give you results. On top of that, when I've joined the assay validation team, I think we only had one assay that was validated on the Theranos system.

Tyler Shultz: To say that we could do hundreds of tests from a single drop of blood was just the furthest thing from the truth. Actually, on top of all of that, it wasn't even a standalone platform. Before you even put the cartridge and to the Theranos device, you would actually need to use a third-party machine called a T-can, which is actually a pretty large liquid handling robot that would pipette the sample out of the nanotainer and into the cartridge that you would then put into the Theranos device. The idea of sticking this in a Walgreens seemed logistically impossible. There are so many red flags that you just have to think that there's no way Elizabeth ever thought that this was going to work, and I don't know how she thought this was going to end.

Robert Pearl: Given your current knowledge, what regulatory and oversight bodies do you think should have examined the technology and tested to affirm the quality and results?

Tyler Shultz: Yeah. That's a great question. So they were regulated by CMS, and when the CMS inspectors came through to give Theranos their CLIA certification, they actually weren't even shown the lab that had the Theranos devices. They were only shown the lab that had the third-party equipment, because, like I said, most of our tests, almost all of the tests were run on third-party equipment and not on Theranos equipment. But that should have been some kind of a red flag to the regulators that they didn't even look at the Theranos devices.

Robert Pearl: Was the problem with the regulations under which they were working or the actual inspectors themselves?

Tyler Shultz: Probably that, I think the actual inspectors themselves should have, you know, they knew that Theranos was this highly lauded company who had supposedly come up with this revolutionary technology to do blood testing and then they go and do the inspection, but they don't even look at that piece of technology. It just seems very strange to me.

Robert Pearl: Any thoughts why?

Tyler Shultz: Well, I do know that we were told not to go in or out of the room that had the Theranos devices on that day. Theranos didn't want the inspectors to see a bunch of people coming in and out of the lab that had the Theranos devices because then the inspectors might say, "Okay, we want to see what's in that room." Or at least that's my guess as to why we weren't supposed to go in or out of the room on that day. They were intentionally misled, but it also seemed like they didn't really push hard enough or ask. They didn't directly request to see the Theranos devices either. At least, that's what my understanding is. I wasn't part of that inspection process, really. That situation always didn't really sit right with me.

Robert Pearl: Do you think there is new governmental regulation, probably congressional in nature, but maybe presidential through CMS that needs to be put in place to protect patients in the future?

Tyler Shultz: Maybe. Part of what allowed Theranos to operate was this, what is called a laboratory developed test loophole. Really, there's good reasons for it existing. Basically, what that law says is that if you're not selling devices, then you don't need to be FDA cleared. So, if you're making your own devices and you're developing tests on those devices, then you don't really need to go through an FDA process. That was really developed because they wanted to enable labs to have freedom, a little more freedom. If you're developing, say like repurposing a device to develop a very rarely used test, it wouldn't make commercial sense to go through FDA regulation to get a test cleared that is very seldom used. I think

that's why that this laboratory developed test law was created, but then Theranos completely exploited it and they were able to essentially get around regulation.

Robert Pearl: But how about when they put it into retail pharmacies?

Tyler Shultz: Well, they never actually put the devices in the pharmacies. They just collected the samples at Walgreens and then they shipped them all to Theranos.

Robert Pearl: Do you think the people at Walgreens recognized that what they were getting was not what they were promised?

Tyler Shultz: I think the patients could tell they were not getting what they were promised because they were promised a finger prick, and oftentimes, they were doing venous draws, so the patients weren't really getting what they were expecting. I'm not sure why Walgreens kind of just accepted that. Yeah, it seems like Walgreens also kind of dropped the ball here. There's a lot of systems that had to fail in order for Theranos to happen. One of those was a lack of due diligence on the side of Walgreens.

Robert Pearl: From my understanding of the events that transpired, there were quite a number of very smart people, very experienced people, who failed to recognize that something was wrong and failed to demand some kind of third-party examinations, some kind of proof. How could this have happened?

Tyler Shultz: Yeah, that's what everyone wants to know. How could this have happened? Again, there are a lot of systems that had to fail in order for Theranos to happen, but she somehow was I think she designed all of these systems to fail, and she could do this because she had an incredible amount of credibility. I think the source of that credibility started with the Dean of Engineering at Stanford, Channing Robertson, who was one of her first advisors and like a first employee at the company. Because by having the Dean of Engineering at Stanford be part of your company, she could get people like my grandfather to come on board and he got a lot of his other friends at the Hoover Institute at Stanford to come on board.

Tyler Shultz: Then investors would look at the board members and not really ask too many questions. And then, Walgreens might look at the board members and the investors and not ask too many questions. Everyone just assumed that someone else had done the due diligence. It seems like that vicious cycle started with the Dean of Engineering at Stanford, Channing Robertson. Actually, in a lawsuit, it turns out that he was being paid \$500,000 a year to be essentially an advisor. That was probably the first domino.

Robert Pearl: Yeah. I've met your grandfather once. I have massive respect for him. I teach at the Stanford Graduate School of Business. As you know, he's very involved, to this day, at Stanford. He's a brilliant man. He would make sure every "i" is

dotted and "t" is crossed. And yet, even as I read John Carreyrou's book about the events that transpired, really to the very end of your protestations, he was still on the fence about whether you were accurate or whether Elizabeth was accurate.

Tyler Shultz: Yeah.

Robert Pearl: It was strange to me.

Tyler Shultz: It is very strange. I feel like it really wasn't until the SEC came out with the report and said that Elizabeth was guilty of a massive years-long fraud, that he really started to change his mind about Elizabeth and Theranos. That was in like 2018, so that's three years after the Wall Street Journal started reporting. So, it took him a long time to finally figure it out.

Robert Pearl: Yeah, and again, when I write pieces for newspapers like the Wall Street Journal, they want detailed proof and reference of everything I say. And yet, they don't bring in an outside expert to actually examine the machine, to do test samples. It's just so difficult to fully understand what it is that allowed everyone to march forward with this distorted perception.

Tyler Shultz: Yeah, I agree. It's pretty mind boggling. One thing to just highlight your point is that Elizabeth raised \$900 million, and not a single investor ever saw an audited financial statement, which is mind boggling. It's totally mind boggling. I started my company, I've had investors ask me for an audited financial statement and I'm trying to raise a \$1 million seed round, not \$1 billion. That point really astounded me that the investors just really didn't seem to do even the most basic type of due diligence.

Robert Pearl: When I read the media reports about Elizabeth, they sort of imply two things. One, that she was a master salesperson. I have no doubt that she was. As I said, I teach at the (Stanford) Graduate School of Business and I see entrepreneurs who are remarkable salespeople all the time promising this hockey stick, kind of tremendous performance in the future if only you'll give them some money in the transition. They talk about her allure and the fact that she was a young woman in the context of older men. And there's absolutely no evidence of any kind of impropriety. Every explanation in the media falls short of credibility. I think it's really an important question, because the most important question is how are we going to avoid this in the future?

Tyler Shultz: Yeah, and I think it's going to be very hard for this to happen again in the future. When I look at the round that Elizabeth raised, it really, to me, looks like the biggest angel round of all time. You had many very wealthy individual investors putting in more than a hundred million dollars each, which doesn't really happen. The venture capital community in Silicon Valley almost wears this as a badge of honor, because they had systems in place and those systems worked and they did not invest. To me, it seems unlikely that something like this will

happen again where you can get a handful of angel investors to give you hundreds and hundreds of millions of dollars. Yeah. I don't know. It doesn't seem likely.

Robert Pearl: Was it the board members who encouraged them and convinced them to do so or did Elizabeth reach out on her own and make the contacts and close the deals?

Tyler Shultz: That's a great question. I'm sure the board provided introductions, but I don't really know the logistics of what her fundraising process looked like.

Robert Pearl: There were quite a number of people, again, based upon the book, "Bad Blood," who were aware this thing wasn't working, and yet only you and one other person had the courage to step forward. Why could the two of you do it when everyone else couldn't?

Tyler Shultz: I don't know. I have a hard time speaking for Erica, but speaking for myself, I'd say that, I think being young definitely helped. I didn't have a mortgage, I didn't have kids, I didn't have student debt, I had no idea what I was getting myself into. And then, I had a personal relationship with Elizabeth, so by the time I started speaking up, she had been to three of my family Christmas celebrations. I'd been to her 30th birthday party. She had been to my grandfather's birthday parties. She was kind of becoming like part of the family. So, where I think a lot of other people had seen this trend of people speaking up and getting, essentially immediately fired, I thought that maybe I would be exempt from that rule and that Elizabeth would have to listen to me.

Tyler Shultz: I was in a unique position and it seems like I should use that to try to say what a lot of people would've loved to say.

Robert Pearl: And yet she, I'll say, sent her attorneys, at least we know they came over, to threaten you, and not to threaten you a little bit, but to threaten you a lot.

Tyler Shultz: Yeah, so after I started speaking to the Wall Street Journal, the Theranos attorneys surprised me at my grandfather's house. I met them under the pretense that I would be given a one-page confidentiality agreement to sign and they gave me a notice to appear in court. They gave me a temporary restraining order and a letter signed by David Boyce. That was just the beginning of feeling like they were essentially harassing me for months, threatening to take me to court. I never signed any of their affidavits, so things ended up working out pretty well for me. But it was a really bad summer, a period of like three or four months where it always felt like we were on the verge of going to court.

Robert Pearl: Do you think that Sunny pushed her in some ways or you think she just used him to be able to accomplish what she wanted in the company?

Tyler Shultz: That's a good question. I think that she just used him to accomplish what she wanted to accomplish. I think she wanted to be able to lay down the law the same way that Sunny did, but she also wanted to maintain the kind of like angelic image that she was creating for herself. So she couldn't be the person to fire people. A perfect example of that is when I left, I sent Elizabeth a fairly long email outlining a lot of my concerns, what I was seeing in lab, and then the response that I was getting from the management. She didn't respond to that email. She forwarded it to Sunny, and instead, Sunny responded saying that I was arrogant, ignorant, patronizing, reckless, and had no understanding of basic math, science or statistics, and that if I had any other last name that I would have already been held accountable to the strongest extent.

Tyler Shultz: I'm sure Elizabeth read his email before he sent it to me and I'm sure she approved it, but she just did not want her name to be attached to that kind of an email or that kind of an event. In the book *Bad Blood*, John actually describes it as dripping with venom, which is a great way to describe that email. That email that Sunny sent to me was just dripping with venom and Elizabeth couldn't be seeing as having done that herself.

Robert Pearl: I'm not up to date on what's exactly happening in the court hearings that are going on now, but from what I read in the media, Elizabeth seems to be, to some extent, duplicating her life once again with a new relationship and a new business venture and, at least as she's portraying it, unscathed by the past. Do you see it the same way?

Tyler Shultz: Yes, that's what it seems like to me. It's kind of funny. A couple of years ago, I actually went to a bar with some of my cousins after a hike, and I saw this woman who was wearing this all white flowy outfit and a sun hat, and she had a dog with her. I looked at her and I thought, "She looks so familiar. How do I know her?" And then, I saw Elizabeth's brother, and I thought, "Oh my God, that's Elizabeth." I was just staring at Elizabeth for a few seconds, unable to figure out who she was. It does seem like she's reinvented herself, whereas she was dating she was actually dating Sunny, the president of the company who was 20 years older than her. She's now dating somebody younger than her.

Tyler Shultz: They go to Burning Man together. They supposedly throw big parties in their apartment. Coincidentally, I read an article this morning that said that they have actually secretly already gotten married. Also, in that article it says that they have a stripper pole in their apartment. She's a completely different person than the person I knew.

Robert Pearl: I love that visual of going from the black turtleneck to the white gown. It's the Madonna look going from innocence and extreme guilt to pure innocence.

Tyler Shultz: Yeah, I had never seen her not wearing a black turtleneck while I worked at Theranos, not one time.

Robert Pearl: Do your paths ever cross outside of random bars?

Tyler Shultz: No. I've not seen her since then.

Robert Pearl: And your grandpa and all the other people you know are not involved either in any of this?

Tyler Shultz: No. Not anymore. No.

Robert Pearl: Do you think they're embarrassed to look back or do you think they feel as though, yes, they were taken in, but that happens all the time?

Tyler Shultz: That's another great question. I don't know. They should be embarrassed, but I don't know if they are. I have no idea.

Robert Pearl: A couple of last questions before I turn it over to Jeremy. In retrospect, if you could do something different, what would that have been?

Tyler Shultz: I would've gotten a lawyer much, much earlier. The second I saw the inside of the Theranos device, I wish I had gotten the lawyer and started getting advise on ... My first week Theranos, I wish I had a lawyer.

Robert Pearl: What do you think the lawyer would have done or recommended?

Tyler Shultz: Well, what I've learned is that there's actually much safer ways to blow the whistle. I think part of the problem was that I actually didn't even recognize that I was really in a whistle-blowing situation. I was really just reacting to situations and doing the best I could with the information that I had. I did contact federal regulators at one point, but it was not with the intent to blow the whistle. It was just, I was just asking a question, but I think if I had talked to a lawyer, they probably would have reframed that for me and said, "You need to recognize that what you're doing right now are actually whistle-blowing kind of activities and there are safe ways to do that." For example, if I were to have just taken everything that I had seen, any data that I had and I just went directly to the SEC, then I would have been protected and Theranos wouldn't have been even able to threaten to sue me over things that I had just told the SEC.

Tyler Shultz: So the government will protect you. But I didn't even know about that. Well, I took a number of steps. I did talk to the New York State Department of Health. I talked to the Laboratory Investigative Unit at CMS. And then I talked to executives at the company. I talked to my grandfather who was a board member. But then, ultimately, I ended up talking to the Wall Street Journal, which is when things actually started happening. But I could be sued for defamation and trade secret violations and all that kind of things for whatever I told to the Wall Street Journal, whereas if I'd just taken that exact information and gone to the SEC, they wouldn't have been able to do that.

Robert Pearl: If you could give the listeners a set of advice or perspectives or learnings from your crucial, but I'll say difficult experience, what would your advice to the listeners be?

Tyler Shultz: My advice to listeners would be to trust your gut, and if something feels wrong, it probably is. One thing that I did, and I'm really glad that I did was I tried really hard to prove myself wrong about what I was seeing. I've ran lots of experiments. I talked to senior scientists, I talked to the vice president of Theranos, I talked to the CEO, I talked to the board member, I talked regulatory agencies, and basically none of them were able to make me think that I was wrong or that I wasn't seeing what I was seeing. I went through, you know, enormous efforts to try to prove myself wrong. When I couldn't do that, then I just trusted myself and knew that I was right. And no matter what kind of pressure or how strongly Theranos told me that I was wrong, that I was alone, that they would be vindicated, that I would never be able to work in the industry again, I just knew, with 100% confidence, that I was right, and that ended up working out for me.

Robert Pearl: I think that's great advice. I did some research in the past with a neurologist named George York, and we looked at how the brain functions during times of either great opportunity or great threat. What the research shows, both from psychological studies as well as functional MRIs of the brain, is that in these moments of either great reward or great threat, our perception changes and it changes because our brains have an internal shift that occurs, and rather than seeing external reality the way that it is, we begin to see it in a very distorted fashion, and I think Elizabeth was a master at it. She was able to create the fear of having your blood drawn with her own experience. She was able to create the reward, whether it was to Walgreens, whether it was to other investors, whether it's simply to people who are well motivated, who wanted cancer to be diagnosed sooner in a way that it never ever might have been or could have been.

Robert Pearl: She was just a genius I think at changing that perception, and the fact that you were able to see past it, I think is a real tribute to the person that you are, Tyler. Once again, I want to congratulate you on having literally saved the lives of people who would've had blood tests done with inappropriate responses and had unnecessary surgery or avoided having actual disease being identified and treated.

Tyler Shultz: Thanks. Yeah, I appreciate that, and I'm happy that I'm at a place now where I can openly talk about my experiences on podcasts like yours. It feels good.

Jeremy Corr: You talked about how you don't think something like this could happen again on a large scale, but what about to a smaller extent? Do you think it's even potentially somewhat common to have these cult of personality-type leaders who are just leading investors a stray and similar things going on?

Tyler Shultz: Yeah, that is a great question. I think part of the reason why this story resonates with so many people is that things like this happen all the time on a much smaller scale. I have people contact me on email or LinkedIn or in-person all the time saying, I experienced something very similar, not quite at the same scale, but very similar. I think it's exactly what you said. You have these leaders who are very charismatic and you're drawn to them because of their charisma, even if the actual underlying idea isn't all that good. I think we see this happen over and over and over again. Maybe a good lesson learned is to be wary of a charismatic leader.

Jeremy Corr: Something that this story reminds me of that I think will ... maybe the people that hadn't heard the story of Theranos before, who it might resonate with them. Have you ever seen the Fyre Festival documentaries on Netflix and Hulu where it seems like a similar kind of fraudulent cult of personality-type situation? Can you talk about any parallels there?

Tyler Shultz: Yeah, it was pretty funny when I watched the Fyre Festival documentary. I actually thought, "Wow, this reminds me so much about Theranos." There were so many parallels. Billy would like take off in his jet and fly back with more money, and it seemed like Elizabeth could raise money, even easier than that, and on a much larger scale. She could just take off and come back with a bucket full of cash. Yeah, I'm trying to think. I remember at the time thinking that there were a lot of parallels, but now I'm having trouble actually remembering the details. There was one funny parallel where ... I was actually watching this on a plane and then my girlfriend looked up Billy McFarland, and we read that David Boyce is actually his attorney, as well. So they have the same attorney. Same attorney as Harvey Weinstein too. They're all in good company.

Jeremy Corr: Well, one of the things that I found interesting from you and Robbie's discussion was the fact that you said that it sounded like she hadn't necessarily learned her lesson, and neither did he.

Tyler Shultz: Yeah. Elizabeth does not appear to be remorseful at all. She's out in the world, living life. There was a rumor going around for a while that she was trying to raise money for a new company. I have no idea what happened with that. I would have imagined that raising money was an impossible task even for her as she had criminal trials looming over her head.

Jeremy Corr: One of the other things I'm curious about is, reading it and even watching the HBO documentary, the high security around the workplace was something that was very interesting to me too. Can you talk a little bit more about that?

Tyler Shultz: Yeah, so I think that's actually part of what gave Elizabeth this aura of importance, was that she was surrounded by bodyguards all the time. The new building, which I actually never moved into, but their new building had bulletproof glass on the windows. I think it added to her aura of importance and then it also just shows you how paranoid she really was. That's something we didn't really get into, but Theranos had a very, very intense culture of secrecy.

The labs weren't supposed to talk to each other. There were barricades up all over the place or locked doors. And then, you had bulletproof glass, bulletproof windows.

Jeremy Corr: With this level of security, was there any water cooler talk at all among colleagues or among coworkers about things here that are going on aren't right, or was everybody too scared to talk? What was that environment and overall culture like?

Tyler Shultz: Yeah. People definitely did talk about it, but I would say that if almost, more than anything, it seemed to manifest itself in the form of jokes. I remember there was an instance where Elizabeth was walking through the lab with an older man, and a senior scientist just turned to me and just said, "Well, there goes somebody's inheritance." And then there was an incident where we actually did ... we were validating a syphilis test and we did finger stick versus venous studies, and an alarming number of our colleagues actually tested positive for syphilis. We did that and everyone just kind of laughed it off.

Tyler Shultz: Then, there was like the running joke that when she gave a demo, there was just like a blue glove inside of a box and people said the blue glove would go and run it into the lab, which was almost not even a joke, because I think that actually did happen sometimes. It was just a joke. The device and Elizabeth was just a complete joke. I think in the validation team, people would more openly talk about it with each other, but people from different labs, there wasn't a whole lot of kind of like cross pollination.

Jeremy Corr: I guess, what was it like emotionally for you being so young and becoming a whistle-blower? Were you ever worried about anything beyond your legal safety? Were you worried about your long-term reputation that you'd never be able to get trusted by any startup or tech company again? What was going through your head during that process?

Tyler Shultz: Yeah. That's another great question. I was extremely stressed. I was almost debilitatingly stressed during that period of time, where I would wake up in the morning and just think that today is going to be the worst day of my life. I wish I didn't have to get out of bed, but somehow I'd pulled myself out of bed and I would charge forward. I would get stubborn, I would get angry again, and I would refuse to sign whatever they wanted me to sign. I knew I had private investigators following me. Erica had private investigators following her, so it was definitely scary. Yeah, it was definitely scary. There were instances where I would hear a rustling outside of my window at night and my heart rate would go up to like 180, and I would wonder if tonight's the night that Sunny whacks me.

Tyler Shultz: I would really peer out my window trying to cautiously see what was making the noise. Eventually, I'd see like a deer raccoon or something, but I did sleep with a knife next to my bed and I carried pepper spray with me pretty much anywhere I went. Not that that would really do anything, but it was something of a pacifier.

Jeremy Corr: So you were genuinely concerned for your life?

Tyler Shultz: I wouldn't say I was like really concerned, but it definitely ... my safety, for sure, crossed my mind.

Jeremy Corr: What's some of the last contact or most recent contact you've had with former coworkers? What kind of things have they gone to do? Are you cordial with them? Can you talk about those relationships?

Tyler Shultz: Yes. For the most part, I pretty much stopped talking to everybody from Theranos, and for a while, it was just because I think people were just so afraid of the litigation that was going on. But I still keep in good contact with Aruna who was one of my managers and with Erica Cheung, who was another whistleblower. Aruna is leading a team at Roche. She left a long time ago and she's leading a team at Roche that actually worked at for a while, so she's doing great. And then, Erica went to Hong Kong and she was working at a tech accelerator, and actually, more recently, she's now quit that job and focused on doing a nonprofit full-time called Ethics in Entrepreneurship. She's trying to take the overwhelmingly negative experience of their nose and turn it into something positive, to try to make sure that things like this don't happen again, and that when entrepreneurs are starting companies that they are thinking about ethics.

Tyler Shultz: Yeah. So, Aruna and Erica are both doing great things. I don't really keep in contact with many other people.

Jeremy Corr: Do you think what happened with Theranos, can you talk about the lasting impact of that might've had on investing in health-tech startups and people's level of trust in them, from both the consumer level all the way up to the investor level?

Tyler Shultz: Yeah, so I think one impact that it would have had is that due diligence will definitely be done. I think this was a very good story of what can happen when you don't do due diligence. I think that's a great thing. And then, the health of ecosystem as a whole, I've actually had some people talk to me and say that when Theranos was at its peak, it was almost impossible to raise money in diagnostics because investors would ask like, "How could you expect to compete with Theranos?" Now that Theranos is gone, I've heard that some of these other companies are having a bit of an easier time actually raising money. It seems like Theranos may have been able to show how valuable this market was and now has left a void.

Jeremy Corr: What was the last kind of contact, last conversation you ever had with her?

Tyler Shultz: The last conversation I ever had with her was actually a Thanksgiving dinner after I had quit. Yeah, so after I received that venomous email from Sunny, I quit, as you may have expected, but the following Thanksgiving, she actually came to our family's Thanksgiving. It was a very intimate setting. It was just me,

my parents, my brother, Elizabeth, her parents and my grandparents. It's not like there were 100 people at this Thanksgiving dinner. It was a small dinner, and at the table, Elizabeth raised her glass and gave a toast and said, "I just want to say that I love and appreciate every member of the Shultz family." I remember lifting my glass and my hand was literally shaking because of all of the emotions I was feeling at the time. That's the last time I talked to her. Other than that, it's all been through the lawyers.

Jeremy Corr: How do you think your parents felt at that moment?

Tyler Shultz: Pissed. I think my parents were pissed, disgusted. I would maybe even use the word violated. I think we all felt violated.

Robert Pearl: Tyler's experience and the third dose debacle serve as powerful warnings about the failures of government oversight and what can happen when clinical experts are not involved in the creation or evaluation of new technologies. During my time as CEO in Kaiser Permanente, a group of non-clinical leaders have been approached by Elizabeth Holmes, and like many others, they were eager to purchase from Theranos. I remember telephoning the pathologists at our regional laboratory at the time, and asking whether they thought the company's technology would work. In a matter of minutes they said, the claims are impossible. You can't run 200 tests with reliable accuracy and just a few drops of blood.

Robert Pearl: Had the investors of Theranos thought to consult with clinical experts, they wouldn't have lost hundreds of millions of dollars. Thankfully, no one died from these failures of oversight or human logic, but many could have, and that's why I say, thank you, Tyler, and to the other whistle-blowers. Before we go, let's take a few minutes to hear some of the many suggestions we've received from listeners who weighed in on this question: How can the US government best improve health care? Don't forget, there's still time for you to add your ideas at robertpearlmd.com.

Jeremy Corr: We heard from several listeners about the government's role in making prescription drugs both safer and more affordable for Americans. Ed Yap wrote us with the suggestion for Congress to decrease big pharma's influence on the U.S. drug policies and prices. Josh Quaas said the government should be able to negotiate drug costs directly with pharmaceutical companies. We also heard from healthcare author and entrepreneur Dave Chase, who points out that, even now, the United States prescribes opioids at five times the rate of most countries. He believes that the government can help by intervening and preventing prescription drug abuse before it starts. Robbie, here we have three very different takes on the role of government when it comes to regulating prescription drugs. What do you think about our listener's suggestions?

Robert Pearl: Our listeners once again have offered powerful and valuable ideas. As Ed recognizes, the pharmaceutical industry is our nation's largest donor to political campaigns and elected officials. For the past two decades, they've consistently

lobbied for and successfully passed legislation that maximizes their income and profit, both at the expense of patients. In addition, as John suggests, one solution to the exorbitant cost of drugs in the U.S. compared to other industrialized nations is to allow the government to negotiate prices on behalf of all Americans. All other the nations do so for their citizens, and our country currently is paying the price. Finally, like Dave, I'm appalled by the ways drug companies have pushed addictive medications. For decades, they have misled doctors and hurt families. I believe individuals in these companies need to be held criminally liable for the tens of thousands of people killed as a result of their actions. That's the best way to discourage similar behavior in the future.

Jeremy Corr: Once again, thanks to Ed Yap, Josh Quaas, Dave Chase and everyone else who has participated in "The Fixing Healthcare Survey" on robertpearlmd.com.

Robert Pearl: Please subscribe to Fixing Healthcare on iTunes or other podcast software. If you liked the show, please rate it five stars and leave a review. Visit our website at fixinghealthcarepodcast.com. Follow us on LinkedIn, Facebook, and Twitter @FixingHCPodcast. We hope you enjoyed this podcast and will tell your friends and colleagues about it. Together, we can make American healthcare, once again, the best in the world.

Jeremy Corr: Thank you for listening to Fixing Healthcare with Dr. Robert Pearl and Jeremy Corr. Have a great day.