

JohnCarreyrou

Margaret Flinter: Welcome to Conversations on Health Care with Mark Masselli and Margaret Flinter, a show where we speak to the top thought leaders in health policy, health technology, and the great minds who are shaping the health care of the future. Today, Mark and Margaret will speak with Pulitzer Prize winning Wall Street Journal reporter, John Carreyrou, who spent years following the trail of Elizabeth Holmes, a young Stanford dropout, who convinced the world that her company, Theranos, had created a diagnostic device that could test for hundreds of potential diseases with one tiny drop of blood, bilking investors out of billions of dollars and putting thousands of patients in harm's way. Lori Robertson also checks in, the managing editor of factcheck.org, and we end with a bright idea that's improving health and wellbeing in everyday lives.

If you have comments, please e-mail us at chcradio@chc1.com or find us on Facebook or Twitter. We love hearing from you, and you can also find us on your favorite podcast platform or ask Alexa to play the program Conversations on Health Care. Now, stay tuned for our riveting interview with Wall Street Journal writer, John Carreyrou on the Theranos scandal on Conversations on Health Care.

Mark Masselli: We're speaking today with John Carreyrou, two-time Pulitzer Prize winning journalist at The Wall Street Journal and author of *Bad Blood: Secrets and Lies in a Silicon Valley Startup*. It's a detailed account of the dramatic rise and fall of Theranos, a multi-billion-dollar biotech startup that had promised to revolutionize diagnostic testing. Mr. Carreyrou joined the Wall Street Journal in 1999 where he covered business in international terrorism. He was named Bureau Chief for Southern Europe and later became the Health and Science Bureau Chief at The Wall Street Journal in New York. Mr. Carreyrou has earned numerous other awards, including the George Polk Award for Financial Reporting and the Gerald Loeb Award for Distinguished Business in Financial Journalism. He earned his B.A. in political science and government at Duke University. John, welcome to Conversations on Health Care.

John Carreyrou: Thank you for having me.

Mark Masselli: Well, you know, as I was reading your book, and it is a page turner, you know, starting to think about the American financial schemes, sort of Ponzi schemes, I started to think about Enron and Bernie Madoff and AIG and Lehman Brothers and, you know, I was thinking we hated all those people, but we loved Elizabeth Holmes and the sort of prospect of Theranos and what it offered the opportunity for. I wonder if you could just give our readers sort of the thumbnail sketch of what happened here.

John Carreyrou: Right. Elizabeth Holmes is a young woman who dropped out of Stanford in 2003 in the middle of her sophomore year. She was 19

years old, and she dropped out because she had a vision which was to basically pioneer a blood diagnostics product. At the time, she had these visions for an armband that would have these little micro needles that would draw blood and diagnose you with whatever, ALU, and then simultaneously cure you by injecting the appropriate drug. It turned out that that was pretty much science fiction.

She then pivoted to a device that she wanted it to be a more sophisticated and complete version of the blood glucose monitors, and she wanted it to be a machine that could do every test, every lab test known to man, and she wanted to do it off just a drop of blood pricked from the finger. By 2013-2014, went live with the technology in Walgreens stores. She had a partnership with Walgreens and the company sold shares in a fundraising round in early 2014 that valued the company at more than \$9 billion. Elizabeth Holmes became Silicon Valley's youngest female self-made tech billionaire.

It sort of fulfilled this desire that people had in Silicon Valley to see a woman breakthrough among all these tech visionaries and billionaires, the likes of Mark Zuckerberg and the Google founders. She was that first female tech billionaire for a little while. Then I came along and the Wall Street Journal came along and we revealed that things weren't quite as they seemed.

Margaret Flinter: Well, John, it's interesting looking back, but I do remember being pretty excited about the potential for that blood test, but I think what is most surprising to me about this story now is the number of very sophisticated high-level investors and industry leaders who were so quick to jump onboard based on little more than claims from Elizabeth Holmes as the company founder. We've read about the carefully orchestrated media events to promote the Edison MiniLab, the machine that could allegedly conduct hundreds of diagnostic tests on just this tiny drop of blood from a finger stick, but yet, as we understand it from your work scientists on the inside were actually pretty well aware that the technology just wasn't there, it didn't work. What made it possible for so many investors to be duped?

John Carreyrou: Well, she rolled out the blood tests in Walgreens stores and then used that really as a validation, sort of confirmation that the technology existed and worked because she had gone commercial with it. A lot of the investors who came and put hundreds of millions of dollars into the company in 2014 to 2015 did it largely on the strength of the fact that Theranos' services were available to the public. How that came to be is one of the most incomprehensible parts of the story when you think that Walgreens, the retail partner, got duped and didn't do really any due diligence.

There's a chapter in my book that explains that Walgreens actually hired a lab consultant to vet the Theranos technology and then didn't

really listen to him. He traveled to Palo Alto and met with Holmes and her boyfriend, Sunny Balwani, a couple of times, and he started smelling a rat and tried to alert Walgreens' executives. They basically ignored him and suddenly, Elizabeth asked Walgreens to exclude him from meetings and from these weekly video conference calls, and Walgreens ended up marginalizing its own consultants. As a result, Theranos was able to rollout in Walgreens stores and then the investors saw that and thought, well, this has got to be the real thing, right, because it's commercial.

Mark Masselli: John, you are a great investigative reporter and the book really highlights that, but I wonder if you could walk through how you found your entry point into unraveling the story. Obviously, in the backdrop, there were threats of lawsuits, rumors, intimidation within the company. Numerous claims made by Ms. Holmes simply didn't add up. Tell us about that journey that you filed your sort of investigative instincts and how that unfolded.

John Carreyrou: Sure. She had risen to fame pretty much in June of 2014 and the thing that really made her break out was this cover story in Fortune magazine, but she didn't come onto my own radar until about six months later when I read a profile of her in the New Yorker magazine. That story left me with a strange feeling. There were some aspects of it that were off to me. The notion that a 19-year-old college dropout, who had just two semesters of chemical engineering courses under her belt, had dropped out and pioneered groundbreaking new science. I didn't quite buy or at least I was skeptical of, and it's possible for that to happen in computers and software. You can pretty much teach yourself how to code at 10 years old on your father's computer, the way Mark Zuckerberg did, but in medicine, you really do need real training and you need to then put in years of research to really add value. That was probably the first sign.

That being said, I probably wouldn't have done anything with it if I hadn't gotten a tip about a month later. The tip came via a practicing pathologist who moonlighted at the time as the writer of this obscure blog called Pathology Blog, and he had read the New Yorker story too and knowing a thing or two about blood testing was immediately skeptical about the claim that you could do so many tests off just a tiny capillary blood sample. He wrote a skeptical item on his blog and was immediately contacted by this little group of Theranos skeptics, one of whom had been embroiled in patent litigation with Elizabeth Holmes, and that person's name was Richard Fuisz. It so happened that Richard Fuisz had just made contact with the laboratory director of Theranos, who had just left the company and was alleging all manner of wrongdoing.

So, when I heard this, my ears pricked up. I felt that if I could get to a primary source, namely this laboratory director, then this might be the beginning of a story, and sure enough, over the ensuing weeks, I did make contact with him. He was petrified because lawyers for Theranos were hounding him and threatening him, and so I agreed to grant him confidentiality. Then he started opening up to me.

Margaret Flinter: Well, John, what's really remarkable to me, I think, in this whole story is how far they were willing to go to carry out the fraud in the face of so much damning evidence about the failure of Edison to perform on any reliable level. I think what seems like where that cliff would be, is at the point that real life patients and real life medical decision making was involved. The most shocking part is that patients were actually put at risk. One of your sources, I understand, was a clinician in Arizona who was able to recount the number of patients who received false diagnoses and even underwent medical treatment that was not appropriate or not necessary based on what were considered valid lab results. Help us understand the real harm, the depth of harm that was foisted upon the individuals who ended up being directly involved in this.

John Carreyrou: Right. I mean, that's one, the really big red line was crossed is when they went live with the tests in Walgreens stores, first in Palo Alto and then in about 40 Walgreens stores in the Phoenix area, and that was in the late summer and fall of 2013. By the time I came along and started investigating the company, its tests had been available at Walgreens stores for about a year and a half. In reporting the story, I went to Phoenix in the spring of 2015 and I talked to several doctors and came across several examples of patients who had received questionable test results.

One of them was a lady who had received test results showing that she had about six or seven abnormal values and her symptom was that she had ringing in her ears. When her doctor put the abnormal lab values and the symptoms together, he became really concerned that the patient was on the cusp of a stroke and sent her immediately to the emergency room. Then the patient underwent a battery of scans and various tests on the eve of Thanksgiving. Then finally, at the end of her stay at the hospital, they ran her labs again and all those values came back normal.

At that point, she was released from the hospital and she had several more MRIs over the ensuing week. Finally, a week later, she and her doctor concluded that it was a scare, that it was a false alarm. That's one of the examples that I recount in the book and it's one of the ways in which patients were affected by this giant unauthorized medical experiment.

JohnCarreyrou

Mark Masselli: We're speaking today with John Carreyrou, two-time Pulitzer Prize winning journalist at The Wall Street Journal and author of *Bad Blood: Secrets and Lies in the Silicon Valley Startup*. It's a detailed account of the dramatic rise and fall of the multi-billion-dollar Silicon Valley startup Theranos.

John, so many people were duped in this. Not at small levels, I mean, these were icons in American politics. Her board of directors was a Who's Who in America; Henry Kissinger, a former Secretary of State; Bill Frist, former U.S. senator, surgeon; Sam Nunn, a U.S. Senator served as Chair of Senate Armed Services; George Shultz. I mean, my God, this is astounding that she could have amassed all of this political capital to be on her behalf.

John Carreyrou: Right.

Mark Masselli: One, sort of talk a little bit about that, but also what's been the fallout?

John Carreyrou: Right. One of Elizabeth's tricks was to gain the support of people, usually older men with prestigious reputations. The first person in that category was Channing Robertson, her engineering professor at the Stanford School of Engineering. Robertson was well-known and had a good reputation, and he accompanied her to venture capital meetings when she dropped out and gave her credibility when she was just a teenager. Then she wrapped Donald L. Lucas around her finger, a pretty well-known venture capitalist who groomed Larry Ellison and helped Larry Ellison take Oracle public in the mid-80s.

When Don Lucas started developing Alzheimer's in 2011, she pivoted to charming George Shultz, the former Secretary of State, who crafted the Reagan administration's foreign policy. Shultz is someone who, in his 90s, has always been passionate about science and when he heard Elizabeth sort of unschooled her vision, he really bought into it and joined her board. Then he introduced her to all his buddies at the Hoover Institution, which is the conservative think tank housed on the Stanford campus, and that's how she met Henry Kissinger and Sam Nunn, and all these other aging statesmen; Bill Perry, who had been Secretary of Defense in the Clinton administration. That's how she came to have this very powerful board of older men between the ages of 60 and 90, who, by the way, had zero expertise or knowledge about laboratory science, and that gave her credibility with the investors that she conned.

She scrupulously avoided VCs who had any medical technology experience, and she targeted basically billionaires. Among them, Rupert Murdoch, who invested on \$125 million in Theranos in early 2015; the family of Betsy DeVos, our current Education Secretary, which put in \$100 million; the Cox family based in Atlanta of Cox

Enterprises, they put in \$100 million; the heirs of Sam Walton put in \$150 million, so that's how it unfolded. Then with what's going on now, well, she's been charged with fraud by the SEC, and she negotiated a settlement without admitting or denying wrongdoing, but there's also a criminal investigation spearheaded by the U.S. Attorney's office in San Francisco and that criminal indictments of Elizabeth Holmes and of her boyfriend, Sunny Balwani, are a distinct possibility.

Margaret Flinter: Well, John, I think you've laid out such a picture of some of the weaknesses of human nature. This is an incredible illustration of what can happen. We want innovation, we want solutions to some of our vexing problems in medicine, and how badly things can go wrong in the fast-moving pace of innovation in health care. The real need, the absolute need for rigorous empirical analytics and data, but the company also pursued rapid approval from the FDA by circumventing certain distinctions and requirements. What can we learn from the Theranos story that helps us better balance the hoops of innovation in health care with the need for the evidence-based research?

John Carreyrou: Right. Well, I would say in Silicon Valley, and I would say even in American society at large, there's this reverence for entrepreneurialism and for innovating, creating startups that within 10 or 15 years become the next Googles. I would say that we shouldn't let this reverence excuse wrongdoing. This is Elizabeth, it's someone who idolized Steve Jobs and idolized Apple, and she wanted to be the second coming of Steve Jobs. She was going to do anything and everything to get there. On her way, she and her boyfriend committed wrongdoing. They basically committed fraud, and they put patients in harm's way, and our reverence for entrepreneurialism shouldn't mean that we let these people get away with playing by different rules to cut corners like they did. That's one of the big lessons of this story.

The other thing to bear in mind is that there's a convergence right now between traditional tech, the descendant of the microprocessor industry, and then medicine, and the two are quickly converging. The Theranos story is a lesson that as this convergence happens, we can't forget that the second you enter the medical realm, you're talking about patients and you're talking about patient lives. Therefore, you have to do things rigorously and scrupulously, and you have to abide by regulation. It's not by any chance that the health care industry is the most regulated in the country. It's for a reason. It's because ultimately, it's patients' lives that are at stake.

Mark Masselli: John, put on your psychoanalytic hat. Why did she do it? I mean, really. What do you think you've sort of got under her skin or psyche in some ways, what was the motivator here?

JohnCarreyrou

John Carreyrou: She was just someone with voracious ambition. I have an anecdote in the book where she's 9 or 10 years old and a relative asks her pretty much the question every boy and girl is asked at one point, which is what do you want to do when you grow up. Her answer was, "I want to be a billionaire." The relative said, "You don't want to be president?" She said, "No, the president will marry me because I have a billion dollars." That's really, it's no exaggeration to say that she wanted to be rich and famous.

Mark Masselli: Yeah.

John Carreyrou: It's a story of someone who pursued that ambition at all costs.

Margaret Flinter: We've been speaking today with John Carreyrou, two-time Pulitzer Prize winning journalist at The Wall Street Journal and the author of *Bad Blood: Secrets and Lies in the Silicon Valley Startup*. The book is available on Amazon and in bookstores, and you can also follow Mr. Carreyrou's work at the Wall Street Journal or follow him on Twitter at John Carreyrou. John, thank you so much for your tenacity, for your investigative journalism and for joining us on Conversations on Health Care today.

John Carreyrou: Thanks very much for having me.

Mark Masselli: At Conversations on Health Care, we want our audience to be truly in the know when it comes to the facts about health care reform and policy. Lori Robertson is an award-winning journalist and managing editor of factcheck.org, a nonpartisan, nonprofit consumer advocate for voters that aim to reduce the level of deception in U.S. politics. Lori, what have you got for us this week?

Lori Robertson: A false claim about Medicare eligibility and costs has been shared nearly 500,000 times on Facebook. The false claim says, "Why do seniors on Social Security have to pay for Medicare and a supplemental insurance and that the illegals get it all for free."

Medicare isn't available for people living in the U.S. illegally. It is available only to citizens and lawful permanent residents who have lived in the U.S. continuously for at least 5 years and meet other criteria, such as being at least 65 years old and having paid Medicare payroll taxes. There are four parts to Medicare. Medicare Part A covers inpatient stays at hospitals and nursing facility. It is funded largely through payroll taxes and those who paid into the system for at least 10 years or are married to someone who paid into the system, don't pay premiums.

Medicare beneficiaries can purchase additional coverage for doctor's visits and outpatient care through Medicare Part B or through a private insurance provider with Medicare Advantage. Part B is priced on a sliding scale. Most people who receive Social Security benefits

and use Medicare Part B pay \$130 per month. Those living in the U.S. illegally may actually provide a net contribution to the Medicare Part A trust fund through taxes. From 2000 to 2011, such immigrants contributed an estimated net total of \$35.1 billion to the trust fund, and that's my factcheck for this week. I'm Lori Robertson, managing editor of factcheck.org.

Margaret Flinter: Factcheck.org is committed to factual accuracy from the country's major political players and is a project of the Annenberg Public Policy Center at the University of Pennsylvania. If you have a fact that you'd like checked, e-mail us at chcradio.com. We'll have factcheck.org's Lori Robertson check it out for you here on Conversations on Health Care.

Margaret Flinter: Each week, Conversations highlights a bright idea about how to make wellness a part of our communities and everyday lives. Tel Aviv computer scientist and developer, Oded Ben-Dov, has been coding since he was six years old, and he's always been interested in hacking systems to make them better. So, when this young entrepreneur unveiled a hands-free gaming system on Israeli TV, a local quadriplegic in the viewing audience took notice. The former Israeli naval officer contacted Ben-Dov and urged him to think about adapting this hands-free gaming system to help quadriplegics interact with their smartphones by using simple head movements. Ben-Dov couldn't resist the challenge from Giora Livne, who'd been paralyzed for 8 years following an accident.

Oded Ben-Dov: The guy on the call said, "Hello, my name is Giora. I can't move my hands or legs. Could you make me a smartphone I could use?" That really cut my ear, it cut my heart. It was a chance to apply all my techy knowledge towards a greater good.

Margaret Flinter: The two have partnered together on the project, deciding to call the device Sesame phone, as in Open Sesame.

Oded Ben-Dov: Gradually and iteratively, we added more and more configuration parameters to the program, so someone could opt for big head movements or very small head movements. You can play around the cursor size and feed it. We really tried to make it as wide as possible for audience.

Margaret Flinter: Ben-Dov says he has literally seen both children and adults formerly locked in by paralysis come alive.

Oded Ben-Dov: It's so emotional, someone immediately calls his wife, children rush to the most popular game and play that.

Margaret Flinter: The Sesame phone now has hundreds of users around Israel, but they're gathering funding to make the smartphone software available around the world. Ben-Dov says they've got bigger plans for

JohnCarreyrou

developing this and other systems that are geared to assist the handicapped community.

Oded Ben-Dov: We broadened our vision, which is currently equality through technology. As the time goes by, we see we're positioned well within the special needs space, and we need to keep supporting and developing our current product, but we can definitely use new technologies and opt for a completely different product.

Margaret Flinter: Sesame phone's tagline is "Touch is Overrated." Sesame phone, a simply devised hands-free interface that allows the paralyzed and physically handicapped to interact with their world through their smartphones using simple head movements, allowing them a new level of independence and a new chance at self-driven social interaction. Now, that's a bright idea.

Mark Masselli You've been listening to Conversations on Health Care. I'm Mark Masselli.

Margaret Flinter: I'm Margaret Flinter.

Mark Masselli: Peace and Health.

Female: Conversations on Health Care is recorded at WESU at Wesleyan University. Streaming live at chcradio.com, iTunes or wherever you listen to podcasts. If you have comments, please e-mail us at chcradio@chc1.com or find us on Facebook or Twitter. We love hearing from you. This show is brought to you by the Community Health Center.