Demetri Kofinas:	00:00	Today's episode of Hidden Forces is made possible by listeners like you. For more information about this week's episode or for easy access to related programming, visit our website at hiddenforces.io and subscribe to our free email list. If you listen to the show on your Apple podcast app, remember you can give us a review. Each review helps more people find the show and join our amazing community. And with that, please enjoy this week's episode.
Demetri Kofinas:	00:48	What's up, everybody. My guest on this episode of Hidden Forces is Dr. Vivian Lee, President of Health Platforms at Alphabet Company's Verily Life Sciences and author of The Long Fix, a book about how to solve America's health crisis with solutions that work for everyone.
Demetri Kofinas:	01:08	I can't readily think of a topic that's been more explored and less understood by the public than healthcare. In fact, I'm not even sure if we even agree on what we're talking about most of the time. When I think of healthcare, the first thing that comes to mind is insurance. I think this is true for most people. It makes sense. We all need it. But the problems with America's health system run much deeper and the opportunities to reform it are much bigger than I think most of us realize.
Demetri Kofinas:	01:41	In today's episode, we tackle a number of these issues as part of a much larger conversation dealing with our fee-for-service healthcare model and how we might be able to transition to something that better aligns the interests and incentives of the three main parties involved in healthcare today: the doctors, the insurers, and us, the patients. I know it feels like we've been dealing with this issue forever and as the title to Dr. Lee's book suggests, there is no quick fix. It's a long road to reforming a system that's been with us in one form or another for generations. But I think the economic reality of what we're facing, the fact that we spend roughly 20% of our GDP on healthcare every year with an aging population that's going to need more of it, necessitates that we find a solution. Conversations like these are I hope, I think a step in the right direction. And with that, please enjoy this week's episode with my guest, Dr. Vivian Lee.
Demetri Kofinas:	02:52	Dr. Lee, welcome to Hidden Forces.
Vivian Lee:	02:55	Wonderful to be with you. Thank you.
Demetri Kofinas:	02:57	It's great having you on the program. We haven't had a chance to catch up at all. We're going right into this. But maybe for our listeners who aren't familiar with you, you're probably, I mean, you're definitely one of the most credentialed guests we've had on the program. Maybe you can give our listeners a sense of your background. Where do you come from and what do you do today?
Vivian Lee:	03:18	My background is in academic medicine. For most of my career I have been in the practice of medicine, educating and researching. My background originally was in MRI. I actually did a PhD in biomedical engineering before I went to medical school at Harvard and was really drawn to the engineering aspects of MRI. When I started as a junior faculty member at NYU, I was very successful in getting some research grants. And so very early on I was pulled into administration, kind of reluctantly, and became the vice dean for research there, and then eventually the dean and CEO at the University of Utah's healthcare system. That's when I really became, it was over that sort of decade

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that I became really passionate about fixing healthcare. That's what led me to write this book, The Long Fix.

Vivian Lee: 04:14   When I finished six years leading the University of Utah, I was looking at another health system, leading another health system, but I was drawn to this world of technology. I had a very influential mentor pulling me in that direction saying, "You know Vivian, if you go and lead another health system, chances are, if you're lucky, you might be able to have a positive influence there. But the world of health tech has really the potential to truly revolutionize healthcare. Why don't you dip your toe in that water?" And so, two years ago I joined Verily. Verily is formerly Google Life Sciences. It's an Alphabet company dedicated to advancing healthcare and life sciences, and I lead health platforms at Verily.

Demetri Kofinas: 05:02   What prompted you to write this book?

Vivian Lee: 05:05   I've spent over two decades on the front lines of healthcare in a wide range of roles, starting as a physician and educator, been the CEO of a healthcare system, the dean of a medical school. Then on board of insurance company. I've had a number of different perspectives and from those roles and from talking with people around the country, I've been really struck by the fact that we do have solutions to our rather troubled and complex healthcare system. Most of what I had read had been written about healthcare was about the problems. And so, I really wanted to write a book, a very positive book about solutions, about successes from across the country.

Vivian Lee: 05:51   And as I wrote these narratives and shared the success stories, it actually formed a relatively coherent picture of how we can really fix American healthcare. And that's why I wrote this book. I really wanted people, the general public, not just those who are in healthcare but everyone who's paying for healthcare, who's involved in healthcare, especially these days in the COVID crisis really thinking a lot about healthcare, to understand what's broken so that they can help be a part of the solution.

Demetri Kofinas: 06:22   That was actually going to be my next question, which was, what is the problem? And you're saying it's how to fix healthcare. I've been listening to this debate on healthcare since. I mean, as long as I can remember since the 1990s with the Clinton administration. And I never was able to quite figure out what we were arguing about. One of the sort of obvious political arguments has to do with universal coverage. But peppered in that debate of course is that our healthcare system doesn't function properly or it's a broken healthcare system. What is it that we're really talking about here and what is the long fix?

Vivian Lee: 06:57   The fundamental problem in healthcare in the US is that the business model is just backwards. We have a fee-for-service healthcare system, which means that we reward doctors and hospitals and healthcare systems for doing things to people, for doing procedures and operating on them and performing expensive imaging studies and so on regardless of whether they make people better. When you have a healthcare system or any business that is incentivized to do more, it does more. And so, what we invest in as a health system are things that generate fees because we're fee-for-service, and that might be imaging centers or operating rooms, surgery centers, cancer centers, and so on. We don't invest

in primary care. We don't invest in public health. That's part of the reason why we're in the crisis that we are in during this pandemic.

Vivian Lee: 07:55   As a result of incentivizing the system to do more and more, and I'm not saying that most doctors aren't trying to practice good medicine, they are. But nonetheless, you can't escape the fact that the economics are set up to incentivize overproduction, overdoing. As a result, the controlling part of the system is really insurance companies and payers. They try to push back from what they perceive as an excess of ordering, an excess of spend. And so, they put in barriers. They put in barriers like prior authorization, which is just stacks of paperwork for physicians, for example, in order to order an MRI, or they deny claims. And so, every year there's this massive, what I call a trillion dollar tug of war between providers and payers. It wastes an enormous amount of money and when they can't reconcile those differences, it falls down to the individuals and their families in the form of surprise bills.

Vivian Lee: 08:56   That's really fundamentally the problem. We've incentivized the system to do too much without generating the value, without really driving to better health. And as a result, in this country, we now spend two and a half to three times as much per person on healthcare than any of our OECD peers, any of our international peers, and we have much poor overall health outcomes. A baby born today in the US has a life expectancy that is four or five or even six years less than a baby born in the UK, in Germany, in France, in Japan, in Australia. It's really a system that is fundamentally broken economically.

Demetri Kofinas: 09:38   I want to drill into that. I have the rundown for today is kind of broken into two sections. One is diagnosis, the diagnosis of the problem, and then treatment. I mean, this of course I agree with you. I read your book. It's a great book, and I think you do a good job of highlighting the problem of incentives, that the incentives of the insurance companies are not aligned with the incentives of the doctors in the hospitals. And those incentives are also as a result not properly aligned with the incentives of patients. One way to do this is we could kind of drill down to the specifics of the fee-for-service model and how it's broken. We could talk about, for example, and I do want to discuss this, the medical insurance for patients. But I also want to look into malpractice, defensive medicine, stuff like this, because you do a great job in the book exploring pay for value models. And so, we can go in either direction. It's really up to you.

Vivian Lee: 10:33   I think it might be helpful to say a little bit more about the problem and then mostly talk about the solutions because I think the solutions are really what the book is about and I think that's where... most people are frustrated with the problems and the solutions is really where people need to focus the energy.

Demetri Kofinas: 10:51   Yeah, sure.

Vivian Lee: 10:52   On the problems part I think one of the arguments that I like to talk about is how the fee-for-service system is generating enormous waste and this challenge of getting to healthcare coverage for all, and are there really enough dollars in the system to do that? So that's kind of a fee-for-service based conversation. And then another piece of that is also the fact that I think some people feel that healthcare is an abstract issue for policy makers. They have insurance, and so

		it's not their problem. And so, I think that's another piece that I'd like to talk about. So maybe those would be the two directions and we'll go-
Demetri Kofinas:	11:26	Yeah. I mean, the thing is, I mean, for sure. I broke all these out because I am the son of a physician, the nephew of multiple physicians, the cousin of physicians. My whole family is doctors.
Vivian Lee:	11:39	I'm sorry.
Demetri Kofinas:	11:40	No. Yeah. I've lived with this. I listen to the holiday conversations of frustration of physicians and I hear what their issues are, which are actually in some cases aligned with the frustrations of patients and in some cases really have nothing to do with what patients interpret to be the problem. They have to deal with things like medical malpractice and the cost of insurance, administrative costs at hospitals. A lot of physicians are very cynical about the idea of borrowing protocols from other industries and applying them to the medical profession because they've seen it not work properly, or they feel like regulations are getting in between the doctor and the patient.
Demetri Kofinas:	12:19	I mean, all of those things you mentioned are great. I'm also coming at this from the perspective of someone who has amateur experience hearing about some of these problems in addition to all the ones that the public hears like pharmaceutical costs, like the overutilization of insurance and stuff like this. But I would, to the extent possible, like to explore the problems with the system because I do feel like the public doesn't actually have a perspective on this. What they generally hear is, the solution is we need to universalize coverage. But that really doesn't work if you don't get the costs under control.
Vivian Lee:	12:54	Universal coverage is tied to also the Medicare for All idea. And both of them are very politicized terms. And so, I'd like to break them down. Let's take Medicare for All. I'd like to break that down into for all and Medicare. For all is really about universal coverage. It's about should everyone in this country have access to healthcare. And typically, in order to get access to healthcare, you, in our system, need to have access to health insurance. And without a doubt, the data, the science is out there that people who have access to healthcare do better. They do better. An ounce of prevention is worth a pound of cure absolutely applies in this situation.
Vivian Lee:	13:43	We all know it anecdotally through caring for patients who, for example, were not able to take their blood pressure medications for whatever reason and they come in with a stroke or a heart attack in the emergency room and end up not only costing themselves individually a fortune in terms of their disability and their suffering, but of course they cost society an enormous amount. There was a very interesting publication in one of the preeminent journals in medicine, the New England Journal of Medicine, that came out more than a decade ago about what happened in three states: Arizona, Maine, and New York when they expanded Medicaid. And this was about a decade before the Affordable Care Act. So, this predates Obamacare or the Affordable Care Act.
Vivian Lee:	14:28	Those three states expanded Medicaid, and then 10 years later looked at the outcomes. Dramatic improvements in reducing mortality. In other words, people lived longer, they had higher quality of life. They felt better about their

health. And so, I think without a doubt most of the medical community, if not all, believes that providing healthcare for everyone does just simply make sense.

Demetri Kofinas: 14:58   It reduces system-wide costs. It's more efficient for the system on a macro level.

Vivian Lee: 15:03   It's more efficient to invest in the primary care of people to make sure that they have access to preventative cancer screenings, for example, to basic medications for chronic conditions, and frankly, an access. Just simply having access to care rather than what we're seeing now, which is that people are waiting until their appendix is about to burst before they show up in the emergency room. That leads to many more complications down the line that's much more costly. That I think is pretty clear. Where there is a lot of debate is in what should be made universal. And the challenge, I think, with the argument for Medicare is back to, I think, a point that you were making earlier, which is that Medicare right now is a fee-for-service model.

Vivian Lee: 15:53   Mostly a fee-for-service model is fraught with all the issues that we talk about in the long fix with overutilization, with waste and inefficiency. And so, we can't afford to scale Medicare across to the say, 10 million people who are uninsured in the country today, and the tens of millions more who are underinsured. It's just not cost effective right now to scale an inefficient system. I think that that's really one of the fundamental take-homes is, yes, let's think about how we can get access to everybody. I think that is critical, but the model that we're going to scale has to be one that is a value-driven model.

Demetri Kofinas: 16:35   Having read The Long Fix, I have a sense of what you think those most important opportunities are for cutting costs and making it possible to scale such a system and obtain some of those macro savings by expanding coverage. But maybe you can tell our listeners, what do you think some of those are?

Vivian Lee: 16:53   The Institute of Medicine put out a report probably a decade or more ago that said that about 30% of the healthcare dollar is wasted in the US, and then a more recent report came out in the last year or so that estimated that it was maybe not 30% anymore, but it was at least 25%. In a system that right now is around three and a half trillion dollars, that's a lot of money that we're wasting in American healthcare. And one of the challenges is really identifying where that waste is. I think it's tempting to say, well, I would love to scan all of healthcare, all the money where it's being spent and surgically remove that waste. Why don't we just do that? It's not as easy as that sounds because it's so embedded in the system that has been driven by fee-for-service for the last 50 years.

Vivian Lee: 17:50   And so, one of the points that I try to make in this book is that we have an enormous untapped potential in terms of engaging our physicians and clinicians in identifying that waste and at the same time, improving their ability to practice medicine and improving their quality of life. Because most, I wouldn't say most maybe, but I would say a significant portion of the waste in the system is actually creating inefficiencies and frustrating everybody. You talk about having a family full of doctors. Most of those physicians are really frustrated today. The national burnout rate among physicians is almost 50%. That's really surprising to most people because you think, well, being a doctor that has high status, it's usually reasonably comfortable life, economically pretty okay for

most people. How could it be that the dissatisfaction and the burnout is almost 50%?

Vivian Lee: 18:51 And again, I point to a lot of the challenges that our healthcare system is facing, and those challenges if we could address them, could also improve what we were talking about before reducing cost, improving quality, as well as improving the livelihood and the lives of our physicians. One example is in the fact that in a fee-for-service, we are really only rewarding people for doing things. And so, as a result, hospitals or medical groups or wherever these physicians are employed are incentivizing them to do as much as they possibly can to patients in order to generate that revenue for the system and for the business. That's how we get to the point where a primary care physician is on average spending about eight minutes per patient.

Vivian Lee: 19:39 Primary care, many of these patients have many complex issues. Let's take a typical Medicare patient who might have more than one chronic condition, maybe on five or six different medications, and then maybe seeing you for a new ailment. And on top of that, you're supposed to be recommending all their routine cancer screening, prevention guidelines, and flu vaccines. It's impossible to do that in an eight minute visit. Fairly frustrating for physicians who are really trained, we're here, we're in the business to care for people, especially those who go into primary care are there to provide primary care for those patients.

Vivian Lee: 20:14 And so as a result, we've created a system where there's enormous frustration. At the same time, I think that's why we're seeing some of these new models like Medicare Advantage, or like a subset I guess of Medicare advantage where Medicare, instead of paying fee-for-service, instead of paying the doctors to do as much as they possibly can, they're giving them just a fixed amount of money and saying, "Okay, keep those patients healthy. You figure out how to spend your money and how to spend your time." And with those Medicare Advantage models, we're saying that physicians have really stepped up and demonstrated, I think, the kind of initiative that is what we need more of in healthcare.

Vivian Lee: 20:56 They're saying, "Okay, well, if you give us the latitude to make decisions, we're going to spend more time with our patients. We're going to spend a half an hour to an hour with our new patients. We know it's so important to see them. We'll offer transportation, shuttle service for example. Pharmacies are really important getting access to their medications. So, we'll have some onsite pharmacy. We will offer mostly generic drugs because we want to keep costs down because you've given us a fixed amount of money, Medicare, and if we spend more than that it's our dollar. And so, we're incentivized to be very economical with that money. We'll even offer Tai Chi and yoga classes because we know falls prevention for our seniors is really, really important and that's cost-effective."

Vivian Lee: 21:38 They've built new models that spend more upfront on the primary care part. And what they're showing is what most of us would expect, is that they have many fewer hospitalizations. And those hospitalizations are incredibly costly and they also generally are setback for our seniors, especially our frail elderly patients. So, they've created a win-win, an alternative model of healthcare, and I think they are really great example of this untapped potential in our physician workforce.

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Demetri Kofinas:	22:08	Let's drill into that. That's the pay for value model. I think you open the book with ChenMed, but there are other examples as well. How does this work? Give us an example, walk us through what a successful deployment of this actually looks like in practice.
Vivian Lee:	22:22	Well, I'll give you an example that we had in our own system. I've talked now about Medicare, so I'll give you an example of Medicaid. At the University of Utah, in 2012 we were told that the state's Medicaid program was going to pretty radically change the way in which they were going to pay all of the health systems that were providing care to Medicaid patients. Just as a reminder, Medicare is administered through the government centrally, federally out of Washington DC. Medicaid programs are mostly run state by state. Every state can have their own policies within some boundaries, of course, but they can make decisions about how they want to change payments. So, there've been some very interesting experiments across the country.
Vivian Lee:	23:14	Utah was one of those. What that meant for us at the University of Utah was that as of January, 2013, instead of getting paid fee-for-service, which is how it had been, meaning every Medicaid patient when they came into our emergency room, we saw them, then we sent a bill over to the Medicaid office and then we got paid. As of January, 2013, we were going to get paid in what we call a capitated fashion. They were going to pay us a fixed amount of money per Medicaid patient for the whole year. Now, the amount that they were going to pay us depended on the patient's underlying condition. So sicker patients we'd get paid more, healthier patients we'd get paid less. But after that, it was really up to us to stay within that budget and to keep those patients healthy. We were going to be evaluated based on their overall health and some quality measures.
Vivian Lee:	24:02	That radically changed our thinking. All of a sudden, the woman who had been in our emergency department 52 times in the previous year, 52 separate visits. In the previous year, every visit after she left, we said, "Ah, we really should be doing something about her. She really needs a primary care doctor." But then we would bill Medicaid and we'd get paid for that emergency visit. And so, 52 times later, we actually made a lot of money off of that patient. But as of January 1, she now was going to be "our problem" in the sense that we were going to get paid just a fixed amount of money.
Vivian Lee:	24:39	So we changed our behavior radically. We looked at why she was coming into the hospital that many times, we assigned her a primary care doctor. We even provided transportation to make sure that she could get to see that primary care doctor if it became an issue for her, if it was a challenge for her. As a result of our intervention, we were able to lower her costs of care. We were able to get her healthier, frankly. And I think that's another example of how now at a state level and in the Medicaid program we're seeing across the country a lot of opportunities to move to this value based care.
Demetri Kofinas:	25:13	I'm curious about two components of how that works. One is, how do you measure success in this case? That seems to be an issue or a challenge. And then the second one is, I'm curious, mechanically how does this work? Because for example if your hospital, let's say if you run a hospital where you see a patient in an emergency room and you can bill a lot of money for that patient. In order to benefit from this, there's all the care that need to be integrated. How

does that work, I guess, to incentivize the local facilities to actually go with such a model?

Vivian Lee: 25:44 It's really tricky to change from a fee-for-service business to a value based business. That's really the metaphor that was going around when the Affordable Care Act was being adjudicated in the Supreme Court, was like having a foot in two canoes because with a fee-for-service model, as you're suggesting, you just want to keep seeing more patients and you want to see as many as possible and you want to do as many things to them as possible. You want to order an MRI even if they have back pain that might be just something that'll go away with rest. And if the back MRI shows something, you might want to recommend a surgery because that's where you're going to make money rather than sending them home with some recommendations for rest and physical therapy, for example.

Vivian Lee: 26:34 On the other hand, if you're in a value based world, you want to help do the right thing and try to keep them healthy and out of the hospital. So, it's very difficult to run a business with a foot in two canoes. That's why I think some of the most successful examples are in these Medicare Advantage models where an entire clinic converts to that kind of program, or for example in the military health system or in the VA health systems that I really highlight in The Long Fix because they are systems where as a whole the entire system is set up to be value based. The entire system is on a global budget where the doctors are not incentivized to do more, for example, to patients.

Vivian Lee: 27:24 You ask about how to measure outcomes and measure quality. That sort of really difficult problem because we haven't had that as part of our core DNA in healthcare. It's really one of the most surprising things I realized as I got into hospital and healthcare administration, was the fact that the whole system, because it is really motivated to generate revenue based on productivity, what we call productivity in a fee-for-service business, just simply meaning how many procedures are you doing. All of our measurement tools are really designed around measuring productivity.

Vivian Lee: 28:03 I would walk around the halls of the hospital and I would see posted in the hallways and in some of the departments, let's say in a particular medical specialty like cardiology, you would see a posting of all the cardiologists and how many procedures they each did. How many catheterizations did they do? How many echos did they do, echocardiograms? And you would never see in the hallway a posting of the best health outcomes. How many lives were miraculously saved or how did they compare with each other there when I started? Over time because of some of the changes with the Affordable Care Act and also some of our own internal desire to really focus on quality in outcomes, we saw more and more of those kinds of data being valued and being prioritized and being made more public. But your question is a really good one because we don't have, I think, as a nation, a sophisticated way of thinking about how to measure outcomes.

Vivian Lee: 29:01 One example is that the outcomes measures right now that Medicare holds us accountable to are not probably what most patients would expect. They're mostly about bad things not happening. So, when a hospital is being evaluated for quality, some of the most important things are that we don't cause an

infection when you're in the hospital, that we don't do the wrong operation when you're in the hospital, that we don't give you the wrong medication. Of course, those are all good. I mean, I wouldn't want us to do any of those things. We shouldn't do that. But you would expect a little bit more than that.

Vivian Lee: 29:37 For example, when we are asked about quality for a patient who undergoes a hip operation, nowhere in there is a question to the patient about, are you able to walk and climb a flight of stairs and play around with golf or whatever it is that you expected to do after your hip operation? We actually don't really ask patients about their own perceptions of their own health. That's something called patient reported outcomes. It's really just starting to get going now in healthcare.

Demetri Kofinas: 30:10 Yeah. For me this seems to be a big one. I've had to go through the health system for a very serious thing some years ago, and my experience of that was really eye-opening. It was for a brain tumor and I met with a variety of different neurosurgeons at the top hospitals in New York City as well as consulting with a number of other places outside of New York. Each physician offered in some cases dramatically different diagnosis or outcome as well as treatment. And so, my experience of this is that so much of this really comes down to the unique interaction between the patient and the doctor. And on top of that, the outcome also depends so heavily on the patient, right? Like the sort of unique qualities of that person, his or her disposition, physical, mental, et cetera. So, it seems like a very, very, very difficult thing to try and quantify; like more so than anything else that I can sort of readily think of from other industries. Is that kind of the issue that you're touching on?

Vivian Lee: 31:17 Definitely a huge opportunity. There's a huge opportunity for making medicine more of a science. It's not that there isn't always going to be the art of medicine and the human touch and the ability to really engage with people at a very personal level. That is always going to be, I think, a core aspect of the way in which we practice medicine and healthcare generally. But it doesn't have to be mutually exclusive in the sense of, we can definitely be generating more insight and more rigor around our medical decisions. I'm glad to hear that you have done well out of your brain tumor experience. That must have been incredibly stressful and challenging, but I'm so glad to hear that.

Vivian Lee: 32:09 But we probably have a lot of data. If you look across the country at all of the experience, even people who have relatively rare conditions and disorders, we've now been caring for people, been doing imaging studies, had biopsy data, so pathology data, various drug treatments or radiations or whatever the treatments have been. And if we were able to collect all of that information in a way that could be studied by researchers and then fed back to the practitioners, the people who are actually clinicians on the front lines, to inform their medical decision making, we would be able to practice much better medicine.

Vivian Lee: 32:51 My own example of this is from being an MRI radiologist. I would sit down, I'm not practicing now anymore but for years I'd sit down and I'd look at all these MRI scans of patients who had a wide range of different conditions, some of which were very straightforward. You could see gallstones in the gallbladder and know that there's an inflamed gallbladder and the patient needs to have that out. That's very straightforward. Or an appendix that's inflamed that needs

to come out. But often we would see complicated cases, rare cases, especially in an academic medical center, an unusual tumor, an unusually appearing lesion in some organ.

Vivian Lee: 33:31 The number of times on which I actually got feedback about what those cases turned out to be was not the majority of times, unless I sought out that information. I'd have to track it down, and sometimes I'd end up at a different hospital in New York, for example, and I could never find out what actually happened to that patient; much less even understand what treatment did they get and how did they do. So, let's say we discovered that it was an unusual liver tumor. If we actually had what we call a learning health system, we would be able to compare that unusual tumor that I saw, for example, and whatever happened to that patient with the 50 other people that year who had it around the country or even the world. And we'd be able to start to say, "Oh, you know what? Actually, with those patients, the ones that received this drug or that radiation treatment, they actually did the best."

Vivian Lee: 34:26 And that would be really accelerating our learning and the practice of medicine. And that's something that we're talking about is called real world evidence. But it's really been slow because our electronic medical records where all the data are stored have been designed to be essentially giant billing machines. We've invested in digitizing our electronic health records over the last decade. But for the most part, at least in the beginning, they're really being used to generate revenue for hospitals because they're very expensive to implement.

Vivian Lee: 34:59 But one of the chapters that I write about in the book is really about how they are massive repositories of data. And if we could get data standardized so that we could actually compare data from different hospitals and compare the outcomes of patients with unusual conditions, for example from across hospitals, we would have an enormous amount of information and maybe those doctors who saw you would have that information and be able to say, "Oh, you know what? The last 10 people with your condition or the last 2000 people with your condition across the world, this is actually the best recommendation." So that you don't have to try to figure it out talking to five different experts, right?

Demetri Kofinas: 35:39 Yeah. Well, you raised a lot of good points. One, I would say though, the issue that I faced was that in this case, the head of neurosurgery at Columbia University, the head of neurosurgery at Mount Sinai and the guy that actually did my surgery at Weill Cornell Medical on the Upper East side, they were all familiar with one another. The issue I think is ultimately that the doctors practicing at Columbia and Mount Sinai couldn't do the procedure that the doctor at Cornell did. And ultimately what were they going to do, I guess, in their mind. I mean, that's my sort of sense of it. They wouldn't tell me to go to him. I mean, it was a bit more complicated. But you raised a lot of really good points around big data.

Demetri Kofinas: 36:23 Verily is an Alphabet company. We had Eric Schadt on the show. I believe he was episode 15. He's the chair of the Department of Genetics and Genomics Sciences at the Icahn School of Medicine at Mount Sinai. That was a fascinating episode for me. It was eye-opening because we discussed the challenges of trying to run a business like Sema4, which is his genomics company. There are regulatory challenges. Most companies don't face science challenges, business

challenges, and regulatory challenges, and they face all three. The regulatory challenges of actually getting this type of data, and you mentioned the electronic health record system. I know that a lot of that was mandated or advanced with the Affordable Care Act. How challenging is that? What are the challenges and bottlenecks to doing that and doing it in a way that not only meets people's expectations, but also protects their privacy? Are those things mutually compatible?

Vivian Lee: 37:20   One of the projects that I think is really interesting is an example of what you've just asked about. It's called Project Sentinel. It came out of the FDA after the Vioxx scandal where we discovered that a number of patients actually had cardiovascular complications with an arthritis drug that was being widely prescribed. And so the FDA became very interested in collecting data from hospitals, this kind of real world evidence data, meaning not from clinical trials but actually from patients who are taking the drug after it's been released, after it's been made commercially available and then studying what happens to them and determining early on if there are adverse effects, if there are side effects that were maybe unexpected or worse than expected.

Vivian Lee: 38:19   And so they put forward this project and Rich Platt, who is a physician in the Harvard Medical School is one of the leaders of that program. What they've done is bring together a number of resources. Major health systems including Kaiser Permanete are participating. Some of the major insurance companies are actually collaborating in this. They have created a system where the investigators can look at data across all of these different systems in a way that also maintains the privacy and security of the people, let's say the Kaiser patients. The way they've done it is very clever. They actually have, and it's probably more complicated than I fully understand, but they have set it up so that it's kind of a federated system.

Vivian Lee: 39:13   What I mean by that is if they have a query, let's say we want to look at this new drug that just came out on the market maybe a year or two ago. They actually will send that query. They'll send a list of questions like what happened to the patients with this drug? Did any of these side effects happen? They'll send it to each of those hospital IT, information technology leaders of those hospitals, and they'll let them run the query locally. So, the data don't get moved. You don't have to worry about shipping some information that's really private and protected in some way. They do the local query and then they come up with answers and then they de-identify that data and share it with the Sentinel folks.

Vivian Lee: 39:54   There are ways that people can pull the information as well as provide data security and privacy, address those concerns. It's not that straightforward, but when there's a will to do it, when there's a clear need to do it, which I think we can see in for example looking at adverse effects of drugs, there's definitely systems that have been established now. And I think that if we can build on those, we can start to understand much more about how effectively drugs work across populations.

Vivian Lee: 40:25   We've just seen it now with dexamethasone, a very common steroid, and how we've discovered that it's actually beneficial for patients with COVID-19. They're going to be many other examples of that where drugs that might be used for other purposes turn out to be beneficial for new applications that we never

realized before. And it's hard to figure that out with two or three cases in this one hospital or one or two cases in that hospital, but if we could actually pull that information in a way that does respect the data privacy and security, we could learn a lot more.

Demetri Kofinas: 40:55 Who is, I mean, are there European countries that are taking the lead on this or doing it better or are the countries that are really doing it the best more authoritarian ones?

Vivian Lee: 41:06 I'm not sure if anyone is doing this particularly well right now. What is happening is that there are these collaborations and consortia that have been forming across the country and in some cases across the world. One of the biggest challenges in this space has been the lack of standards. When the data aren't collected in the same format and the same standards aren't used, then it's much harder to compare information from different systems, not even across the world, much less across the US. And so, I think we have a little bit of a, it's like the old Sony VHS kind of challenge where the standards are creating a barrier and that's-

Demetri Kofinas: 41:54 That's a huge issue, right? I mean, I've heard that one a lot from physicians.

Vivian Lee: 41:57 It's a huge issue, and one of the reasons is competition. Some hospitals are actually trying almost deliberately. I don't know, that makes it sound so intentional. But certainly, if you have a patient's medical record and it's in format Sony or in your special format, let's say your secret special format, it makes it harder for that patient to pick up their records and go to the rival hospital across the street. There are some business incentives for avoiding standardization, and that's where really, I think we need some regulatory intervention. I mean, there are some things that just simply have to be standardized, and this is one of them.

Demetri Kofinas: 42:42 And this is like, I want to continue on this thing about how we can improve our electronic health record system because it's also miserable for physicians because they spend, as you've noted in the book as well, they've spent an enormous amount of time entering data. And these are highly paid professionals who are doing the work that should be done by or could be done by even an intern, but certainly a more low-level staffer. Where are we there? How has this progressed since the passage of the Affordable Care Act?

Vivian Lee: 43:14 The electronic medical records are one of the biggest areas of opportunity in healthcare. In every other industry, big data has really unleashed enormous amount of insight, enormous amount of value in the industry. I talk about Netflix as a really great example, right? Netflix has taken consumer preferences about films and just created a whole huge new business model about it as well as a new movie industry out of that. Healthcare data is one of the largest data sets in the world and the least tapped into, and where a lot of that data reside is in the electronic medical records right now, which as I alluded to earlier is kind of really been more of a billing system, a charging system for how hospitals can get reimbursed.

Vivian Lee: 44:12 And so, as a result what has happened is that many of the physicians that are spending a couple of hours every night, a couple of hours in the morning, we

call it pajama time, just entering more data into those electronic records, are not necessarily entering high value data into the records. That's what's so frustrating about it is that it's what we call garbage in garbage out. We're entering in data that enables the system to get paid often. And instead, one of the things that we discovered when I was at the University of Utah was opportunities for how we could actually use the data to provide really meaningful and useful information back to the physicians. And when we started doing that, it really changed at least some part of our thinking about the electronic medical record.

Vivian Lee: 45:02   I'll give you one example. The example that we were focused on was trying to reduce the costs of care. One of the really surprising observations that I made when I first became the CEO of the healthcare system there was while we've been hearing endlessly about how costs have been rising in healthcare, what I discovered was that if you ask any physician who is essentially running a business, it's a healthcare business that we're practicing in, what does it actually cost you to care for an individual patient, especially in the hospital? What does it cost you to perform an appendectomy? Cost you, meaning the healthcare system. It's like going to a Jiffy Lube store and saying, "What does it cost us to actually do a tune-up for a customer?" And then of course you charge a little bit more, and the difference is what you're making your profit.

Vivian Lee: 45:54   In healthcare, if you ask a room full of hundreds of physicians, very few of them will be able to tell you what it actually cost. I couldn't tell you what it costs to perform an MRI, for example. Well, we worked it out. We actually said, well, if we're going to be asked to be responsible for the cost of care, partly for example for the Medicaid change that we had talked about before. Medicare was rolling out some new payment models with bundled payments, another reason that we needed to understand our cost of care. When we started using our electronic medical record data to look at patients, we could actually figure out for all of the doctors how much it cost us as a business to produce that service and to look at the patient outcomes, because of course you want to look at both.

Vivian Lee: 46:43   You may have not cost very much, but the patient may not have done well. That's not good. So, we would only want to look at the cost data in the context of whether patients had a really good outcome. And once we started doing that, we could actually give individual doctor's feedback about the patient experience and how well they did. We actually asked the physicians, "Hey, tell us how you would want to measure patient outcomes." In some cases, we had to use of course what Medicare required us to use. We had to make sure that the patients didn't have an infection and didn't have a complication when they were in the hospital and so on.

Vivian Lee: 47:17   But then the doctor starts saying, well, I want to know was this patient able to walk? Were they able to ambulate, walk after their operation? Or how were they physically there? Or how did they actually feel about the overall outcomes, these patient reported outcomes, of whatever care we gave them. When those data started being put into the electronic health record, and then we were able to extract those data from the electronic health record to provide meaningful feedback back to the physicians, it just completely transformed our thinking

about that data. And that's the kind of transformation that still needs to happen nationally.

Demetri Kofinas: 47:56   Dr. Lee, I want to move the second half of this conversation into the subscriber overtime. The thing you mentioned about the costs is absolutely fascinating. I mean, you make the point in the book, in no other industry can one readily imagine a situation where some of the most basic products even the head of the company cannot tell you what they cost to manufacture or produce. The thing I really want to get into in the second half is how to make this transition happen because people have listened to this conversation so many times, and I don't know that people get a meaningful insight.

Demetri Kofinas: 48:32   For regular listeners, you know the drill. If you're new to the program, Hidden Forces is listener supported. We don't accept advertisers or commercial sponsors. The entire show is funded from top to bottom by listeners like you. If you want access to our premium content, which includes transcripts to every conversation we've ever had on the program, copies of my rundown which are elaborate show documents created by me ahead of every episode, or if you just can't get enough of the podcast and you want to hear more from my guests, head over to patreon.com/hiddenforces and subscribe. Not only is the content worth it, but it's a way of showing your support for the show and the work we do. Dr. Lee, stick around. We're going to continue the second half of this conversation in the overtime.

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