Clinical Minds: What is a Patient Equation?

Dan Poppy: You're listening to Clinical Minds presented by Medidata, I'm Dan Poppy. Trying to understand COVID-19 who's at risk, which treatments offer promise, the data can feel overwhelming. Today we're talking with Glen de Vries, the co-founder and co CEO of Medidata and the author of the upcoming book, *The Patient Equation: The Precision Medicine Revolution in the Age of COVID-19 and Beyond*. Glen will talk to us about how to bring together everything learned about COVID-19 to find treatments and vaccines and what can be done to make sure something like this doesn't happen again. Glen, thanks so much for b- joining us.

Glen de Vries: Thanks Dan.

Dan Poppy: All right. So first your book is called *The Patient Equation*. What is a patient equation and what inspired you to write about it?

Glen de Vries: The idea of a patient equation is let's figure out what really matters about a person, what aspects of their- their health. It could be your genes, it could be something else about your body, can actually be something about the- the environment that you're in, that we can use to make sure that you get the right therapy at the right time. And those exist today. They're just simple. So out of all these inputs, the idea of, well, let's make a decision on Glen's therapy based on, does he have high cholesterol or not? Yes, no, actually feels very, very primitive.

Glen de Vries: By the way, this is not to say that decisions like that are always wrong, but the book really starts to explore some of the things that we've seen in the research we've helped people do in Medidata, which is, is there a more robust set of data that we can use to really execute on the idea of precision medicine, give the right treatment to the right patient at the right time. Does that make sense?

Dan Poppy: It does make sense. And so this can be applied to what's happening right now. How does this all relate to COVID-19?

Glen de Vries: If you go back to the beginning of the year, I think everybody was talking about COVID-19 in terms of risk uh, as basically a graph with two axes, we were looking at age and we were looking at immune status.

Glen de Vries: So if you were like, let's say, you know, young is at the origin of the graph, the older you got the more at risk you were and the other dimension was immune status. If you had a nice healthy immune system, then you probably didn't have to worry too much about exposure to the SARS-CoV-2 turning into a bad case of COVID-19.

Glen de Vries: So in that kind of two dimensional model, low risk is towards the- the origin, the center, and you get higher risk as you go out. And that is what The Patient Equation is about. We had too simple a model for COVID-19.

Glen de Vries: The more we can look at a data on mass, the more we can take our blinders off of looking at a problem, like let's just look at a patient's cholesterol, or let's just look at their age and immune status. The more we can see that- that big view, we can start to identify trends. We can start to figure out what are potential independent variables, potential inputs to this equation that are going to result in the best possible outcomes for those patients.

Dan Poppy: You mentioned in the book that a friend of yours died, uh, quickly and unexpectedly from the virus, and I'm very sorry for your loss. Um, your friend was relatively young and healthy, which as you said, kind of upends the- the assumption about COVID. So you were talking about the models that are being used to build our understanding of the disease. You're- you're talking about a- a roadmap, essentially, a mathematical roadmap.

Glen de Vries: So- so yeah, I do, I do mention, uh, uh, a uh, friend of mine who was really kind of a- a wake up call. I certainly was not expecting that. Um, uh, and, but let me mention somebody else in the book, um, who- who also, uh, sadly has passed away, but- but actually the- the book opens, um, uh, with, um, some recollections about this guy, Jack Whalen, who was, uh, an amazing patient advocate, uh, and, uh, cancer sufferer. And- and he was engineer, um, like not just professionally, but just like really in a, in his heart of hearts. And when he was getting his cancer therapies, and this was years and years before people were thinking this way at scale, um, i- in our industry or in healthcare, he was starting to plot his disease progression on Excel spreadsheets. Uh, and honestly, a lot of the inspiration for this idea of thinking about equations comes from- from Jack and him showing me these spreadsheets.

Glen de Vries: And he would plot these various cancer markers and look at, as he got exposed to, um, different medicines, different, um, things that were in clinical trials, some which worked for a while, some which didn't work for long, some which didn't work at all. He could follow the progression of his disease. And so if you take that idea of thinking about that as an individual and- and Jack doing that under his- his own power with an Excel spreadsheet and start to think, well- well can we actually turn this into something that's much more systematic. Ca- can we take what was in this Excel spreadsheet and a relatively low dimensions and turn it into equations, software, systems, methodologies that are available, not just to the enterprising engineer who gets an unfortunate cancer diagnosis, but to, into tools that every practitioner, every patient, every pharma company, every payer could think about and deploy at scale.

Glen de Vries: Can we take this thing that was um, a- a great idea, and I'm- I'm 100% convinced, kept Jack alive for a lot longer than he would have been without his proactive tracking of these things and turn it into something that can- can really help a population. That- that to me i- is again, kind of the call to action. That's- that's what needs to be done.

Dan Poppy: During the season, we've talked with, um, patient advocates, we've talked with researchers, regulatory experts, technology experts. I'm curious, you are obviously well connected within the life science industry. What are you hearing from your peers about the response to COVID-19 and then what comes next? What have we learned?

Glen de Vries: I wish I had a, uh, something more- more positive to say about this. But it's kind of apropos to what I was saying before about, a- a w- we just, we weren't thinking about this problem and preparing for it in a way, um, that- that we were able to have a proactive response. Uh, I think in the conversations I have, if you, if you look at various journals, it's- it's this continuous series of really interesting new facts and surprises. Unless it's like a birthday party, surprises suck, um, more often than not.

Glen de Vries: And so the fact that we're sitting here and we're going, "Oh, look, look, what's happening in children. That's a surprise piece of data. Oh, look, maybe- maybe SARS-CoV-2 can- can get into the brain and cause all kinds of havoc there." Which is what's happening this week. And I know when you listen to this podcast, we'll see what happens um, with that, hopefully nothing, but we don't know. Like those are not the good kind of surprises. And so the more we can, we can really get away from these conversations, which are um, uh, unfortunately fascinating and get to the point that we can be much more predictive about what is going to happen again at- at a population level and at an individual level, that, that's the world that I wanna live in as a- a patient. That's the world that I want to be in as part of the life sciences industry, 'cause it means that every time we come up with something good, we proactively get it out to people.

Dan Poppy: From the patient perspective, it- it's really appealing to think about, we might be able to pull in these um, different variables to get a- a- a full picture of- of patient health, my health, your health, all that.

Glen de Vries: Yeah, so I- I, um, there- there's a lot of dimensions that we could discuss in- in regards to that. So, you know, i- if you can, if you can look at what in some ways are traditional measures, if I can look at the actual mutations that are happening in individual cells and somebody's tumor, um, that's really important information we're discovering, and- and that might actually lead to much more effective treatment of that patient specific tumor. But, um, I- I think another whole realm of things to think about in that regard is, as you- you said the words, like very nontraditional data. And from a patient perspective, I think that interestingly, some of that nontraditional data is the data that really matters to us as people. Um, and it has to do with cognition and with behavior. It has to do with quality of life. It has to do with how you're moving around, how you're interacting with the world.

Glen de Vries: And I just feel like we're- we're in this world where if we connect all the data the right way, it- it shouldn't be difficult to test these hypotheses in a lot of different cases. And if we can move the needle just a little bit, again, I'm not suggesting that you're- you're smart scale is gonna diagnose cancer. What I'm suggesting is that the more refined an equation we create, the better chance we have of giving you the therapy you need at the right time. Um, so that's where I think all that nontraditional data gets really exciting as well.

Dan Poppy: COVID-19 has exposed the fragility of the- the healthcare system. And I think also put a spotlight on some of the inequality for people's access to care. The Patient Equation implies that, you know, there's a lot more that we can be pulling in for- for all patients. What do

you think, um, what do you think that means for kind of impr- improving some of those inequalities in access to care?

Glen de Vries: We've been looking at things like diversity in clinical trials actually for while at Medidata and- and this is another unfortunate exclamation point that's being put on it. If you look at what has happened in terms of the- the profile, in terms of the ethnicity of people who have suffered from COVID-19 and- and passed away from COVID-19, it is not a even histogram across different ethnic groups. And one of the things that I think we really need to think about is quality of care and where, what I was just talking about from an access perspective is actually related to that. How are we making sure that, and again I wish I had all the answers to this, but if we start to be able to figure out in this patient equation style, what really matters to track, what really matters in terms of um, diagnosing and then providing the right therapies to somebody who has high blood pressure so that they don't have some kind of subsequent cardiac condition, then we need to make sure that we're able to measure those for everybody.

Glen de Vries: And if the strategies don't work, you change them. And I- I feel like as we think about this, um, I- I think worthy, but idyllic state of these perfect patient equations, and we start to then connect it to making sure that not only can we act on them, but can we actually get the right inputs? We've set some- some measurable goals around, do we know what those inputs are? How many times are we getting one of those unfortunate surprises and are we seeing more unfortunate surprises in certain groups that aren't getting access to the right kind of care and right kind of measurement, especially as we start to think about new systems in terms of doing things more, virtually more in home, et cetera, like this is the time to fix that stuff.

Dan Poppy: Glen, thanks so much for joining us today.

Glen de Vries: Yeah. Thanks so much for having me.

Dan Poppy: Glen de Vries is the author of *The Patient Equation: The Precision Medicine Revolution in the Age of COVID-19 and Beyond*. This has been Clinical Minds presented by Medidata. We're gonna take a little summer hiatus. So leave a comment wherever you get your podcasts and let us know what you think of the show and let us know what you want us to talk about in our next season. We'll see you soon. Okay, bye.