THE DATA-DRIVEN BODY: THE FUTURE OF PRECISION HEALTH

Erin Brodwin 00:00

Good morning, everyone. Welcome to *The Data-Driven Body*. I'm Erin Brodwin, a healthtech reporter, and I'll be moderating today's conversation. We have a terrific group of people up here who bring very different perspectives on health and data, and how precision medicine is or is not shaping health care. I feel like I've already seen more Oura Rings on all of y'all than I have seen people not wearing navy blue or black. So, I think you know what we're about to get into. We have Geoff Cook, CEO of Noom here with me, Brandon Dawson, CEO of 10X Health, Beth Meagher, vice chair of federal health at Deloitte, and Sharif Vakili, CEO of UpDoc. We're going to explore not just what's possible with all this new health data, but what's actually working, what's still hype, and what it'll take to translate all this data into better health outcomes. So, let's jump right in. First question for all of you. Is more data actually better medicine?

Geoff Cook 01:03

Want me to kick that off?

Sharif Vakili 01:06

I'm happy to start. No.

Erin Brodwin 01:09

Okay.

Sharif Vakili 01:11

The question is how you use the data, and is the data tied to a consequence to give you information? Is it an association? Is it causative? And then how does it actually change what you do with a patient or an end user? Happy to dive in further, particularly how we think about that in clinical AI, but there's a lot of noise being generated by a lot of tools. I'm a primary care physician. I often have patients come in with data from various wearables and devices and ask how to interpret it. And my answer has to often be, "We don't quite have data yet on how to interpret the data." And so, the important thing is to understand what's signal and what's noise.

Erin Brodwin 02:03

Do you all agree with that?

Brandon Dawson 02:05

Yeah. Confusion creates failure. Too much information, too much data, not certain what to do with it. So, actionable data that you can effect a change will grab your attention. Too much data will create confusion and—

Erin Brodwin 02:19

How do you avoid that?

Brandon Dawson 02:20

How do you avoid it? By making sure you're measuring the right things that are relative to the right agenda or objective of an individual human being, versus based on averages and what friends are doing and other things. So, making it specific and actionable to an individual that then can take cause over their outcomes.

Beth Meagher 02:43

I think the upside of more data and wearables is you're democratizing it. And we're in a time now where the insights that we're going to be able to glean over time, I think, are going to be transformative. You heard in the opening plenary, there's issue with cost, quality, and access. And I think data that we get, that we are able to understand and work in partnership, is really going to help with access in ways that I think we haven't really imagined. And if you think about the patient, you think about the caregiver, having that ability to capture some of this data, I think we're in a phenomenal time. And you're right, there is a proliferation. We've got to figure out the signal. But the ability to really give insights to all of us in the room, as patients, as people that want to have longevity and well-being, I think it's a pretty phenomenal time that we're in.

Erin Brodwin 03:45

I'm going to push back on that just a little bit—

Beth Meagher 03:47

Yeah. Good.

Erin Brodwin 03:48

—because, for reasons that you might guess, a lot of people who have wearables happen to be those with the incomes to afford it. So, a lot of the data we're tracking with wearables is skewed towards the people who are able to afford those things. How do you see us getting from what we have now to democratization?

Beth Meagher 04:06

Yeah. I think the Veterans Affairs has been doing an incredible job. By the way, do we have any of our veterans in the room today? I know yesterday was a big day. Thank you.

[Applause]

Beth Meagher 04:19

Celebration of Veterans Day and for all the spouses as well. There's about four million veterans that live in rural communities and don't have access, don't have broadband. And this is maybe my thesis for everything is collaboration. So, the Veterans Affairs work with the VHA, the American Legion, so that in rural areas where there's no broadband access, the Veteran Affairs was able to get almost a million virtual visits by having those veterans go into those places. So, you've got access, you've got trust, you've got on-the-ground, and you're using technology in ways... Your question is right. Does it exacerbate the digital divide? It does when there's not collaboration across government, industry, and nonprofits.

Geoff Cook 05:15

Yeah. I would say the way we think about it at Noom is more data is helpful to the extent it drives better outcomes. And so, we have data coming in from diagnostics. We have data coming in from wearables. We have data coming in from the doctor interactions. And one of the better examples that I've seen so far of the democratization of care that's made possible by AI capabilities is the CMS ACCESS Model. And so, that's meant to provide democratization. In that model, there's outcome-aligned payments, where you take a baseline and then you're only getting paid as the ACCESS clinic if you show benefits versus that baseline in a year. And the patient is a Medicare patient, isn't paying for that at all. So that in some cases they're getting a wearable, they're getting a blood pressure cuff, they're getting real value. And so I think that's where it's going. I don't think it's about $500 wearable devices. That's probably not going to be the answer. But over time, I think you'll see the cost of that become more commoditized.

Erin Brodwin 06:27

Speaking of Noom, I know you've spent years focused on behavior change, then GLP-1s came along. I'm sure many of you have heard that term before. I'm curious what their success reveals to you about what we've perhaps gotten wrong in digital health.

Geoff Cook 06:44

Yeah. So, the way we think about how GLP-1 and behavior change kind of connect is, people fall off the GLP-1 at a very high rate, right? So, the amount of persistence to the GLP-1 at three years is virtually zero. It's like one out of 10 or less.

Erin Brodwin 07:04

Is that primarily a cost problem, or—

Geoff Cook 07:06

No. I think it's a human nature problem at three years. I think it's cost, it's side effects, it's human nature. But even if you look at other drug classes, the amount of persistence is relatively low, even for people who

you would think would persist. And so, I think where we see these things kind of interweaving—behavior change and GLP-1—is the GLP-1 is essentially this period of time—call it six to 12 months—when cravings are reduced for all food types actually, except fruits and vegetables, which is interesting. There's a study on that. And so, it's easier to make these healthier choices, right, during that period of time. And if you reduce the food noise, you turn down the volume on it, you reduce the appetite, it becomes easier to adopt healthier habits, and you're actually engaged in a program that's trying to design these habit recipes for you to take maximum advantage of that window, you can keep the weight regain to a minimum. And the weight regain is very real on the other side of GLP-1 cessation. It's 18 months, according to an Oxford study, to get full weight regain. But on behavior change, it's four years on average in the same study. And so, the whole essence of what we're doing is really to combine the behavior change with the GLP-1. And we are seeing some early signs of this. A Tufts study came out very recently, independent of Noom. Basically looked at standard of care, post-cessation, medically tailored meals, and Noom, and the weight regain was dramatically lower in the two supported programs. So, medically tailored meals and Noom versus standard of care. And so that's ultimately what we're trying to drive. That combination, we think it's much stronger together.

Erin Brodwin 08:50

I didn't realize the piece about fruit and vegetable cravings. Then again, I can't remember the last time I craved a fruit or vegetable, so.

Geoff Cook 08:57

I will say, I feel it. I microdose GLP-1, and I can't get enough blueberries, and that's a new development.

Erin Brodwin 09:06

Interesting. Okay. Let's see. Brandon, let's turn to you. Consumers are spending thousands on biomarker tests, and personalized health protocols. How much of that is supported by evidence of better outcomes?

Brandon Dawson 09:23

Well, I think that's where the big data question comes in. I think it's so new. I think you have a lot of personal anecdotal data. We see people transform their lives, but even with GLP-1s, what's on the other side of that? How do you replace the intervention with lifestyle? How do you replace what you're doing on a daily basis to retrain your body after you get off something that's assisting you? And I think that's where the big data's coming in. The data's important for us, because we're looking at it, and I think that when you see people significantly improve their life, and they get more actively engaged, they start working out, they start feeling better about themselves, they start changing that longer-term behavioral pattern. But they need more assistance. That's why we just launched a precision nutrition study where we map the DNA, the blood, the epigenetics, the mitochondria function, on an individual level, so they can replace, when they come off GLPs, they can replace it with something that gives them great nutrition in order to stay active and feel great. But I think that behavioral change part and us looking at the data and coming up with new interventions to support people is what's going to be important, and we've done it in around 47 countries. So, we have this huge dataset. And we partnered in Abu Dhabi with M42 to start launching, because they genome-mapped almost a million Emiratis, and they're not all wealthy, and they live in different parts. And so being able to provide interventions for them that can sustain their targeted goals and objectives is going to be important. And I think this is where the big data's coming in. We're all

consuming this data to figure out how to create new interventions and support people. But I think that it's still too new, because people can have these radical shifts and changes that cause other problems, and then they need to replace what they were doing with new interventions in order to solve for those problems.

Erin Brodwin 11:24

Can you give me an example of an intervention that you all have supported that has been shown to improve health outcomes?

Brandon Dawson 11:29

Well, that's the precision nutrition platform. One hundred micronutrients on a daily dose, precision IVs based on your genetics and your blood and your mitochondria function, and being able to start measuring these things so you can see what's happening in real time to an individual human being versus the averages, and putting them on meal planning and things of this nature. And that's again where data is so important, because it's one thing to eat healthy, but what's on your healthy food? You're eating your blueberries, but what have they been sprayed with? The more data we can accumulate and assimilate and distill down, and how that specifically intervenes with an individual human is where the big swath of data is going to be important. But still, distilling it down so me as a person can make one good choice. And that's where our precision nutrition intervention using microbead technology—so, in real time, every day, you can get high doses of nutrition that you're deficient in.

Erin Brodwin 12:26

How do you determine whether you're changing a biomarker, several biomarkers, or actual health outcomes?

Brandon Dawson 12:32

Well, you got to keep measuring, and you got to look at the behavioral change, you got to look at the physical impact, you got to talk to the people. This is the thing. You can't do it based on big, broad studies and averages. You got to get down to an individual person that's giving you feedback in real time. And that's where wearables and the things that you can see happening without actually having to talk to them. Because most people don't know. They don't know, when they're eating food, if they're eating something that has the right nutritional value or not. They don't know, when they're taking a handful of supplements that their buddy told them to take or a biohacker on the internet told them to start consuming. They don't know what's really happening. They just know in real time, do I feel better or do I not? And the problem is, a lot of these interventions, they could actually be shortening health and lifespan, thinking they're doing something because they feel so good, but they could be creating causation in the future without understanding it. So, I think it's going to take a lot of us looking at huge datasets, interacting with people—like what you guys do, what we do—and then collaborating on that data until we really get a finite... Because if you look at healthspan, the ability to control living longer and healthier, I think we all believe that possibility is there with cellular therapies, peptides, all these other things. But if you take them out of sequence without understanding where you're at right now foundationally, you're going to be shortening or reducing your quality of life or your healthspan. So, getting on top of this stuff is going to be really important. And that's what we're seeing with the interventions, but we're not seeing it across millions and millions because we're not big enough. We're seeing it across hundreds and thousands and hundreds of

thousands. And that's why I'm excited about all the studies we're launching in Abu Dhabi for her health, for oncology, for precision nutrition, for GLP-1 use, to offset some of the negative impacts so that you can extend the ability to do things bigger, better, faster as an individual human being.

Erin Brodwin 14:32

Anyone want to chime in?

Sharif Vakili 14:33

Yeah.

Erin Brodwin 14:33

Go for it, please.

Sharif Vakili 14:35

I think your question, Erin, gets to a really fascinating tension with precision medicine, which is that on the one hand, you can make the case that population-level studies miss precision medicine endpoints because it's geared towards the population, not the individual person in front of you. On the other hand, precision medicine can often be an avenue through which you can push things before there's data and evidence. And particularly, there's a lot out there that might have some kind of mechanistic rationale. But, before I—

Erin Brodwin 15:12

What do you mean by that?

Sharif Vakili 15:13

Yeah. So, before I ran UpDoc, I was an early-stage health-care investor, and I did a lot of biotech investing. And as a biotech investor, you look at in vitro studies, animal studies. You look at different drugs to see what could potentially work and what can work in your patient. And the number one rule you learn is to humble yourself tremendously to Mother Nature. Right? What you think can work, what you think on first principles makes sense, often ends up not working. We saw this just recently with the Lp(a) therapies that came out. Everyone thought it would work, and we all got humbled. Lp(a), for those who don't know, it's a cardiovascular individual risk marker that we are hoping still that we can lower to treat cardiovascular disease, and it's a genetic marker. But the studies that have come out so far suggest that maybe actually it's just a biomarker, not actual driver. And, this often can get mixed up in the big nutraceutical industrial complex around these different therapies that can be bespokely suggested to patients and consumers, that may not quite have that data to validate it. So, the question becomes, well, then how do we reconcile that, right? If we are stuck with population health data and we need to reach the actual individual patient, how do we bridge that gap? That's where I think part of what we do as a clinical AI company is help get the data on the individual patient level longitudinally, to understand the life of that patient, with regular clinical-grade interventions. So, what we do is we build autonomous clinical AI systems that do tasks that normally would be done by licensed clinicians. So, think of an agent calling a patient, starting a med, stopping a med, ordering tests. It's under the direction of the physician, so the physician's still always involved, and it's prescribed. And when you have that continuous digitized care delivery actually doing

clinical grade interventions and collecting those outcomes, you now understand much more deeply how to scale the individual patient in front of you. And you can mass-customize interventions, right? Two patients can have an A1C of nine, but one may have a very different metabolic life than the other based on—their sugars could be slightly out of range all day. Others can spike at certain times. Others might have certain adherence challenges. And so, to get that granular insight, you need a continuous care layer, and that's what we hope to be able to build so you can build out the evidence for the individual patient over time to help bridge some of that gap.

Erin Brodwin 18:03

Where do you see wearables, if at all, fitting into that paradigm?

Sharif Vakili 18:06

Wearables are very important in this, because wearables give you continuous data insights that historically otherwise would've been episodic.

Erin Brodwin 18:14

Right. Like CGMs, for example, with regard to the A1C example?

Sharif Vakili 18:18

Correct. Right. So, as a physician, typically, you adjust based on the blood pressure reading or the heart rate reading or the scale readings that you bring in, right? But we don't analyze trends. It may be impractical for a clinician to be able to ingest all the data that's necessary to be able to do that, to change how you're going to practice based on that individual instance in front of you. Wearables can help close that gap with a closed-loop system.

Erin Brodwin 18:52

Ideally.

Sharif Vakili 18:52

Yeah. Ideally. As long as the wearables, again, it has signal and not noise.

Erin Brodwin 18:57

Right. Since we're talking about AI-enabled care, can you give me a concrete example of where AI-enabled care has measurably improved a patient's outcome?

Sharif Vakili 19:11

I guess I can take this one, too. So, we had a randomized control trial, where we had patients with diabetes, median A1C were nine and a half. And these are very uncontrolled diabetes at Stanford, where I practice. And they were randomized to either be taken care of by the traditional clinical practice with primary care physicians, endocrinologists, clinical pharmacists, or the traditional practice also with a clinical AI system, an AI agent that is deployed by the clinician and delivering the care alongside the clinician. And

this was a short study, followed the patients for eight weeks, and at the end of that RCT, in the traditional care arm, 25 percent of the patients got glycemic control, which is not bad for this kind of population. In the AI arm, 81 percent of patients got glycemic control. And the simple reason was, in the AI arm, patients had on average 7.3 prescription changes, where in the traditional care model, there was 1.6. So, you just delivered way more care. Of course, if you give one patient population fivefold more interventions, they're going to get better outcomes by the end of it. And there was greater med adherence that we saw, and the interventions were more high touch and fine-tuned. That's one example of a study that was able to show this, and there's going to be many more to come as this model evolves. But that's one example I can point to.

Erin Brodwin 20:49

Okay. We'll get into how the economics of all that works or doesn't, in a little bit. But, Beth, I have some questions for you as well.

Beth Meagher 20:58

Great.

Erin Brodwin 20:59

We still haven't solved basic medical interoperability. Why should we believe we'll successfully integrate millions of new data points from all these consumer devices?

Beth Meagher 21:09

Well, I think it's the great question. We heard in the opening plenary, the technology isn't the issue. You're hearing about incredible innovation up here. You're hearing about cutting-edge science, the democratization of data. You're hearing the fact that we're now having all of these different wearables that are giving us a lot of insight. But without collaboration and without scale, I think it's going to be really challenging. And so one of the things that we're working on right now is the Cancer AI Alliance. We're working with four major cancer centers and all of the major technology companies on the frontier models, to basically put together a privacy-preserving platform. It'll be the first ever—it's been launched—Cancer AI platform. One of the biggest challenges is how do you secure the data? And so, now with federated learning, you're able to do that. You're able to bring larger datasets together to scale it, to be able to find insights. Think about how valuable that is around rare diseases and the various populations you've heard up here. Federated learning will help to bring that together. Now, the challenge is you have all the legal side of how do you share data? How do you work across major cancer centers? How do you work across all of these technology companies, AWS, Google, Deloitte, and bring those insights together? That's the hard part. And so finding a group of people and a group of organizations that are willing to work together to define endpoints that really help patients and caregivers, that's the goal, and that's the hard part. And so while we're talking about incredible innovation up here, both medically, clinically, scientifically, the human in the loop is the most important piece of all of this, and collaboration and scale to be able to drive insights around all of these different parts and pieces. That's where it's all at.

Erin Brodwin 23:21

Yeah. What do you see as the single biggest barrier, if you were to name one? It doesn't sound like it's technology. Is it regulation or the fact that incumbents just have no incentive to share this data?

Beth Meagher 23:33

I think number one, creating a shared vision is critical. Figuring out what is the endpoint, bringing together—I mentioned the Veteran Affairs. I think that effort is phenomenal. You worked across the government that did the infrastructure. You worked across local nonprofits that have trust and are able to welcome the veteran in. And then you have the commercial organizations that are providing the technology. That's the win-win-win, and we need more of them. And to be honest, we have to think about collaboration first and think about multi-collaboration models that cut across public, private, and nonprofits, I think is really important. Otherwise, you're going to have really novel insights, and we're going to have the access issue. We heard it again in the beginning of the plenary session, that there are these incredible discoveries, and they're still not getting into clinical care, and they're still not being accessed by broad population. Collaboration is it. I know it's probably not the answer you want. It's the hard one, because you have to get people working together to have some shared alignment and shared outcomes.

Erin Brodwin 24:48

This one's for all of you, but primarily for you and you as well. Is there a fundamental conflict between building a profitable consumer health business and telling customers they don't need to buy anything?

Geoff Cook 25:02

That they don't need to buy anything?

Erin Brodwin 25:03

Mm-hmm.

Geoff Cook 25:07

I would say the way we've approached that at Noom is really to have a robust, accessible, free product. In only the last 12 months, we launched the first version of Noom as a free product. And the rationale we had for that was, our mission statement is: "Empower everyone, everywhere to live better, longer, every day." And so, we felt that it was critical that there not just be a flavor that's paid. And so I think certainly there's paths to the right intervention, whether it's a pharmaceutical intervention or whether it's an enhanced behavioral intervention. But you have to have—the way we think about it, whether it's both good business and it's good for the future member patient—if you have the widest possible funnel that can kind of meet people where they are in their journey, whether they have a weight journey or they're just looking for help with healthy aging. So, that's the way we've kind of built it, and we've invested significant effort in our free product.

Brandon Dawson 26:18

I think in our experience, when we launched our platform five years ago, we didn't realize almost 300,000 people wanted it immediately. And my personal experience—I'm a business builder—is people aren't hitting your funnel and they're not clicking on things if they don't want something different. And so, you have

different levels of free, of information. And so we certainly have newsletters and data that we can provide. But when somebody says, "I want a change," or, "I want a benefit," or, "I want a result," they're usually going through the assessments and answering the questions and driving their journey, which then our responsibility is to provide interventions and opportunities for them. And that comes at a cost for most of them because they're choosing to do something. And I think giving them access to that... Although I will say that in five years, a lot of those costs—I think you're seeing it too—are becoming more of a commodity. So, whereas things might have been $500 or $1,000 five years ago, you might be able to get it for $99 or $300 today.

Erin Brodwin 27:28

Like what? Tests?

Brandon Dawson 27:29

Genetic testing. Look, testing is the basis for the original dataset, right? You asked him about AI and where it's benefited. What we're seeing with our patients is when you have hundreds of biomarkers, hundreds of biomarkers across multiple tests, gut health, mitochondria function, blood, genetics, AI is able to distill that down to: this is what my objective is, and based on all this data, what is the thing I can do right now when I'm looking at this menu? And you can shoot the menu, and it can say, "Eat this," and tell them to take that off of it based on this particular diet that you're now on in order to attain your personal chosen objective. Right? So, that's what AI is allowing us to do. It's attack speed with data that's relative to me in a particular moment that's actionable. And that's what makes me excited about all the studies we're doing, because I think this is such new science. And then there's the question, do I trust the AI algorithm, and is it right? So, there's oversight, and there's a lot of responsibility here, to be honest, versus somebody just rolling out and saying, "Take this," or, "Do this," or, "Our AI model's perfect." I don't think anybody with responsibility would say that right now. I'd say that we're all exploring what the future could hold. And by working together and having big enough datasets across all spectrums, I would hope that your technology one day for a consumer could give them a majority of the information they need in real time without having to wait for anybody, in order to save a life or make an actionable decision that makes something I'm inspired and empowered to do. That's what I think we're all chasing. And all these interventions with peptides and cellular therapies and precision nutrition and new drug therapies, and it's all new. And without being able to distill it down to something fast, when I choose as a consumer to want it, it's confusing.

Erin Brodwin 29:33

[Clears throat] My apologies. I had a cold recently. Don't worry, I'm no longer contagious, but if you hear that. Do you ever feel like you're encouraging people to experiment on themselves?

Brandon Dawson 29:43

I think that's what we're trying to fight against, to be honest. And when we launched our company, I felt like, unfortunately, we didn't know what we didn't know, and we didn't know what people wanted. And peptides and things like this were new. And so, when we originally launched our company, and all of a sudden you post a testimonial out there on social media, everyone's hitting it, ordering it, and doing it. And that's concerning, as you get more data and you start to see the negative impacts of bad decisions. And so, I think, to be a responsible organization, you have to be driving towards specific data, and you have to care about the individual more than you care about selling the widget. And that was—to be completely frank

with you, that was a huge pivot for us because the sales took off and it was great, except for then when you go home at night—and I've got my physicians here—we'd all go home and go, "How do we know that that person that ordered that thing is actually going to have a positive impact?" And that has driven a higher responsibility into all these research projects and strategic partnerships, and going outside of our own little office, and going to Abu Dhabi and working with government agencies to look across the spectrum of the human genome, and things that we just honestly can't afford—because that's the other thing. We can't boil the ocean with everything because of the cost. We need collaboration. We need partners. Everyone needs to pick their lane, and then we need to come together and work together.

Erin Brodwin 31:08

Yeah. Speaking of lanes, Beth or Brandon, sorry, not Brandon, Sharif—I was looking in the wrong place—do you have anything to share from a policy or clinical perspective on that?

Beth Meagher 31:17

Well, I think you asked a really good question. I think my answer would be more around, number one, what I'm hearing from my colleagues, and what I've shared, is really empowerment. Empowerment of patients, empowerment of data, empowerment of people's own individual health. And that's a pretty big provocative change if you look historically, right? So, we're in a moment where there's incredible data and technology and sort of understanding of our own health journey. So, that's positive. I think from a policy perspective, there is a role for regulation, there is a role for oversight, depending... You want to make sure that things are safe and effective. And I think there is a role for policy in that arena. Now, we're always trying to find that right balance, and I think that's something—it's all art. We're all in the middle of probably some more policy changes. But having some oversight is always good. And I think it helps to ensure the best for all of us. And, I think a lot of those policies are working on all of our behalf.

Geoff Cook 32:33

I think an example of this could be dose titration on GLP-1, right? So, this concept of, well, are you experimenting with yourself if you're not following, let's say, the standard protocol on dose titration? For folks who don't know, basically the standard protocol is you start at X, and four months later you're at 10X the dose. And there's a dose titration up at the end of four weeks for basically four months in a row. And of course, many people get sick or have their gastrointestinal issues at the moment of titration, or shortly thereafter. But at the same time, you have to think, well, why was that designed that way? Well, it was designed that way because in the RCTs and the trials that get shown, you need to have the maximum weight loss, because maximum weight loss is what's going to ultimately be the headline on the study. But when you're sitting in an individual patient's shoes, there's a clinician in the loop who's making a titration decision. And they're being guided by the actual rate of weight loss speed that that particular patient is encountering, and by their actual side effects that they're encountering. So, they're deviating massively from what the protocol is, which is just do this and just keep titrating up. And the vast majority of people will never even get to the highest dose in our programs. And I think even in standard of care. You're just not seeing doctors dose up that high because of the side effect profiles. And we're only now starting to see some evidence of what it looks like when you contrast those two populations, of those who are dosed up and those who aren't. There's a preprint, so it's not peer-reviewed yet, but Harvard and Tufts basically showed that if you lost 20 percent of your body weight in one year, you had three times the risk of falls, much worse lean mass loss as a percent than if you lost 5 to 10 percent in one year. So, the rate of weight

loss matters. Now, that's not as maybe a sexy headline for weight loss. Because it's not going to move maybe a drug maker's stock price. But you're better off losing one to two pounds a week than you are losing five pounds a week.

Erin Brodwin 34:55

Standard we've had for a long time. It hasn't changed too much.

Sharif Vakili 34:58

On the—

Erin Brodwin 34:59

Yes.

Sharif Vakili 35:00

Sorry. I was just going to say, on the regulation side, on the policy side, for our space, there are a lot of really interesting considerations on how you set up our payment system and regulatory system for precision medicine to take place with clinical AI agents. So, on the regulatory side, we have always gone through the FDA. We have, to my knowledge, still the only, or the first software medical device with a patient-facing language model that the FDA has cleared, the first agentic system that with a patient directly will adjust medications autonomously under a physician's prescription.

Erin Brodwin 35:38

Is that a De Novo clearance?

Sharif Vakili 35:40

No. This was a 510(k).

Erin Brodwin 35:42

Okay. Can you explain what that means, just in case anyone doesn't know?

Sharif Vakili 35:46

Yeah, absolutely. So, not to get into too many weeds on the FDA side, but there are new categories that the FDA creates for regulation that's called a De Novo, versus using an existing product category and code. The barrier to entry for the two may be similar or different, but for a 510(k), you have to show substantial equivalence to prior technology.

Erin Brodwin 36:15

It means there's something like it already that they—

Sharif Vakili 36:17

Precisely.

Erin Brodwin 36:17

Okay. Yes. Thank you.

Sharif Vakili 36:18

Yeah. And they're autonomous. So, for our system, it autonomously manages insulin. There are systems that autonomously manage insulin that have existed beforehand. Insulin pumps, classic, is usually what people think about. But the other piece of this that I also want to make sure is added to this conversation is that precision medicine does not need to only happen direct to consumer. And the payment systems that exist currently for health care currently pays for clinician time. And what I like to describe as the fee-for-service chassis, we pay for the time hammering, not for outcomes or for the outputs of care. And so in that world, agentic tools don't really have a place because they cannibalize the business of the legacy health-care providers. Which is kind of weird to think about. And so what you have are these direct-to-consumer tools that have populated, go directly to the patient, and the challenge with those tools is that they can end up stepping on the toes of the legacy health system. Because when an agent comes in as managed medications, it's a cook in the kitchen. It's entering the middle of a treatment plan. The other thing that is a consideration when there aren't payment models that support a cohesive care delivery model, is that the direct-to-consumer tools also are at risk of misunderstanding the full patient context, because it relies on what the patient tells them. The patient has to reconstruct everything that's going on, effectively do their own clinical handoff—if people are familiar with that concept that we do in medicine? Which puts you on the same league as a senior physician to do that effectively. And we saw this very tragically with a patient who had epilepsy, who got her seizure medications down-titrated and passed away. If you are not able to have—and giving the AI, by the way, the medical record context doesn't solve this either. Because the medical record says what's happening, not necessarily why things are happening or where accountability flows are or how things coordinate. The operating system for care needs to update for those autonomous care flows. So, we need payment policy reform—and ACCESS unfortunately doesn't yet do this, but it can—that strengthens those relationships and allows for a dyad between clinicians and AI to deliver care so you can have these precision medicine tools work across the health-care ecosystem.

Erin Brodwin 38:57

Yeah. To that point, what happens when a consumer health company gives a recommendation, physician disagrees? Who does the patient believe?

Brandon Dawson 39:06

I can tell you part of this. We can talk about giving consumers more choice, and the responsibility as a company like ours who are trying to help direct-to-consumer. But I will tell you, most direct-to-consumer are coming to us because they've been bounced around in the medical system not getting answers, and they're frustrated. So, when your kid has gut health problems and they're going to six or seven or eight or 10 specialists and everyone's saying, "We don't know. We don't know. We don't know," eventually you're going to rely on something you read, and you're going to rely on somebody other than the medical professionals you're going to see when your kid's crying awake at night because their gut hurts and no one can identify what's going on. And so—

Erin Brodwin 39:45

Yeah. That's a particularly vulnerable patient.

Brandon Dawson 39:47

That's right. And so then somebody takes responsibility and says, "I need to do something about this." The next thing you know, they go to a functional medicine doctor, or they go to more of a progressive that's working on new things, doing new tests, and they're like, "Oh, well, you have a gut health issue. Let's get your gut taken care of." All of a sudden, next thing you know, the kid's flourishing and prospering, and you no longer trust the medical system. I think that there's a responsibility in the current medical system to be able to appeal and attract to everyday people that want good quality care quickly.

Erin Brodwin 40:18

Right. Conversely, the kid goes to a holistic practitioner. They tell them something that isn't based in evidence-based medicine—

Brandon Dawson 40:25

This is the problem—

Erin Brodwin 40:25

—and the kid gets sicker.

Brandon Dawson 40:26

They can go both ways.

Erin Brodwin 40:27

Right.

Brandon Dawson 40:27

And it does go both ways. And I think one's a condition of the other, but then you look at it and say, what are the positives? What are the negatives? And then I think as organizations, you've got to have your own standard-of-care responsibility versus just talking about the one patient that had the one success, and then everybody tries the same thing, and it doesn't work for them.

Erin Brodwin 40:50

Yeah. Let's see. Who has the financial incentive to convince the patient that they need or do not need treatment?

Brandon Dawson 40:58

I think it's the consumer that's dealing with the problem or wanting an opportunity. They're the ones choosing to spend the money.

Erin Brodwin 41:06

The rest of you agree with that?

Sharif Vakili 41:09

From where we stand, we think the financial incentive should sit with the primary care physician and the health system, which is a very—primary care physician in particular is a pretty good market force on deciding what is appropriate for a patient, what might not be, and also in being able to have that discussion with the patient, to ensure that for their individual needs, they're utilizing the right thing and making an informed decision, as opposed to... Because there's a vulnerable relationship that often takes place in health care where there can be a lot of data asymmetry. AI helps a lot with this, thankfully now. Because that's broken some of those barriers. But that's like the gold standard, I think, relationship of engagement.

Geoff Cook 41:53

I would say part of the reason you've seen D2C platforms grow is because the existing system is flawed. Right now you have payers, plans who are making the decision on what to pay. You have doctors deciding—if you can see one, by the way—doctors deciding what to prescribe, and the patient is just kind of in the middle. And so it's a market problem. And so if you have health care getting closer and closer to the patient essentially means the patient is, especially in cash-pay markets, is paying, and they're expecting better service, they're expecting lower prices. And they expect some say in what they're going to take. And what you're seeing is, broadly, prices come down. The GLP-1 market is obviously right now the biggest consumer D2C market. What you're seeing is prices really just collapse over the last 24 months, and will almost certainly come down another significant amount. As more entry '27, '28, '29. And that's good for the patient. I would say, I do think it's the patient who has the financial responsibility at the end of the day. And if they do and they're making choices with their dollar, it's probably good for the health-care system, because what we have presently isn't working.

Beth Meagher 43:17

Yeah, I would agree. I think the patient is driving a lot of both the innovation. You're hearing—a lot of the innovation that my colleagues are talking about are based on unmet needs, right? They are reaching out because the current access to care or their outcomes aren't meeting their needs. And so ultimately, I do think the patient is going to be the consumer and will drive how they spend their dollars and how they show up in the system. I also think that you're hearing some of these incredible innovations that also we've got to figure out how do you scale them. And I do suspect sort of like the traditional markets and hospitals will absorb some of this, because of the incredible innovation, and we'll see that over the course of time. And so, I do think the ultimate piece here is with the patient and the consumer, and that's where the buck stops for all of us. I'm sure all of us feel that that is what—for those of us that are doing it for ourselves or for our families—being able to look at what are the options and how do I access them and how do I realize the overall benefits. That's really what ultimately I think, everyone in this room is probably playing a big role.

Erin Brodwin 44:42

I wanted to encourage all of you to ask questions. There is a QR code that you can scan. I already see some good ones coming in. Before we get to audience Q&A, I do have one final question for you, Beth. We've been talking a lot about downstream patient decisions. I am curious, in terms of AI and disease prediction—we're moving quite a bit, so I apologize. This is a question that I wanted to get to: If AI can predict disease years before symptoms can appear, who in your mind is responsible for intervening and then ultimately paying for that?

Beth Meagher 45:15

Wow. First of all, let's hope that's the case, right? That's the ultimate goal, right? We are all largely a part of a system that treats sick care. And I think for us, the home run is how do we move all of our collective efforts upstream to be more predictive and be more insightful so that none of us are getting sick, or if we are, we're taking interventions more quickly. The current system right now isn't set up for that, and that's the reality of it. And so, unless you're having some genomic tests and you're able to get it funded and paid for, the reality of it is a lot of this is going to have to come from—again, I go back to our collaboration—one is: How are the consumers driving the demand for these capabilities? Two: How are they working across the public, private, and nonprofit organizations? And I do think that ultimately we all know that the cost of health care is skyrocketing. And so how are we changing what we pay for and by whom? But these are massive entrenched projects and programs and issues, and it's essentially why all of us are in this room, because right now I would suspect everybody's attacking it slightly differently. And that's good, but it's also challenging because I do think there's going to be incredible breakthroughs that's really going to help drive more healthspan.

Erin Brodwin 46:48

In terms of who intervenes, do you have an idea of who that would be?

Beth Meagher 46:53

Well, I think the buck stops with the individual. So, I think having the insights. I know how I am with my two kids and my husband. I feel the responsibility, along with my husband, for us to be looking at our overall health and well-being. But I'd be remiss to say—you can't do it alone. You talk about the primary care physician. If you get a set of data and you don't have somebody to help you interpret it... Imagine the ability to actually action it. So, I know I've said it a few times, but I'm going to say it again. We have to all work in collaboration. I don't want to make decisions without my primary care.

Sharif Vakili 47:39

Yeah. Maybe one way to think about this is—because it is definitely the case, there's a role for consumer-directed care for sure, and not everyone has the luxury of having access to primary care, tragically, in this country in particular. But think of the primary care doc a little bit like a stylist, right? You can try to go pick your own clothes and dress yourself. I'm very neurodivergent as it comes to style. I could really benefit from a stylist who can help inform you on how to shop and think about what you individually might benefit from. That might help a little bit as we're trying to think about where the buck stops and how this engagement can happen.

Erin Brodwin 48:22

Okay. I was curious where you were going to go with that one.

Sharif Vakili 48:24

Yeah, yeah.

Beth Meagher 48:26

I think you landed the plane on that.

Brandon Dawson 48:27

Yeah. Yeah. Good job.

Erin Brodwin 48:30

Okay. This question came in really early, so props to you for submitting it. I saw it there and knew I was going to ask it. Patients are walking into appointments with data from their wearables and at-home tests. What has to change so clinicians can actually use that data in care rather than treating it as noise?

Brandon Dawson 48:46

I think that's the biggest issue, what you talked about, what you've talked about.

Erin Brodwin 48:50

So, what has to change?

Brandon Dawson 48:52

My mother-in-law is a physician. She's been her whole life. But all this data and the speed in which it's coming to an actionable solution, they're not trained or equipped at the micro-market level to be able to assess all this and action it.

Erin Brodwin 49:08

So, training?

Brandon Dawson 49:08

Training for existing medical professionals and the new medical professionals. They'll be trained much faster and much more wider with AI and the advancements in technology.

Beth Meagher 49:20

I also think humility. I think it's important, right? I'll take it from the mom lens. If I'm going into my doctor with a bunch of data, I am presenting a whole bunch of information. I think, number one, hopefully that my doctor, the one I'm choosing, is going to want to collaborate with me. And number two, I think the doctor knowing that they're working in partnership. This isn't an "or" situation. It's an "and." And I do think the

mindset that we bring in this moment is really going to be helpful. Otherwise, everybody's going to get entrenched into the current state, and it's not working.

Erin Brodwin 50:01

So, you agree with the changing of the training curriculum?

Beth Meagher 50:05

I think that it's on both ends. If I'm going in with this much data to my doc and presenting it in a way that I know the answer, and I really don't, I think you're not going to get a good outcome. I do think the doc that I'm working with, I do expect that we're going to be able to talk about it, and he or she will be able to help me glean from all of that what is helpful and what isn't. So, training is helpful.

Geoff Cook 50:32

Yeah, I think it's training on the doctor side, but on the side of the, let's say, the wearable maker or whoever's providing the diagnostic. There's some role to play for making it interpretable. And also seeking validation on those metrics. So, if you're just throwing over, "Well, here's the HRV," but you have no validation study that the HRV connects to anything. Then it is noise. So, it's incumbent on really showing why the—

Erin Brodwin 51:01

HRV meaning heart rate variability.

Geoff Cook 51:02

Heart rate variability, right. So, why is this something that is relevant to the doctor? They need to be able to access it and then read something about it, ideally with some form of study or validation.

Beth Meagher 51:15

I do think the study and the research is critical. As there's this proliferation, how are we setting up studies so that we're able to understand what is the signal within all of this data?

Brandon Dawson 51:28

And I believe what he's building—the average physician, if I'm a patient and I trust my physician, I want somebody to look me in the eye and hold my hand through the process. And I think his tools will both empower an individual, but also inspire and empower a physician to be able to hold the hand through the process as well.

Unidentified Speaker 51:47

I agree.

Erin Brodwin 51:50

Anything else on that note? Okay, let's see. Okay, this is a good one. Sharif, you gave a good example of pharmacist intervention in an RCT setting—that's randomized control trial. Sorry, I keep harping on the letters—in this area of PCP, primary care physician shortages. How can pharmacists support validation of data from wearables and communication to primary care providers? I think this one's really for everybody, but...

Sharif Vakili 52:17

Pharmacists play an incredible role. If you have the luxury of having a pharmacist—sorry, I should also explain this. When I was referencing clinical pharmacists, these are not the pharmacists behind the Walgreens counter. These are clinical pharmacists in clinic who you see as a patient, and they do medication management. They do everything, but they don't have that stethoscope around their neck. Warfarin clinics are the classic area people might think of, and they do a lot of the heavy lifting, and it's such a luxury if you can have it in your practice to make sure a patient gets controlled. And so, they can be a really helpful source for adopting innovation in the chronic disease space, because they do it day in and day out. And I would say generally, physicians tend to be a little bit more entrenched in our ways, and behavior change is a lot more challenging, compared to our APP colleagues who might be a little bit more up to date and have been a little bit more focused on the latest and greatest, both on clinical guidelines and technology, too.

Erin Brodwin 53:22

I've got a question from Aisha Rahim from Johns Hopkins. Thank you for submitting your name with that. You're saying that you have a challenge personally, a patient or member—Johns Hopkins has a patient or member engagement. It's proven that AI helps to achieve outcomes and close gaps, but members are not engaged and hence not able to use AI. My screen just went blank, so please submit your questions verbally from now on.

Geoff Cook 53:51

Yeah. So, on patient engagement, so I'll go through the lens of behavior change. One of the things that Noom does have is a significant enterprise business, where we're selling into large plans or large brands. And then all the employees at that company will get access to Noom. And the brand matters for something like that. The sense that you're getting something that has some value, something you've heard of, for free from your employer is what actually drives activation of the thing. It's a constant battle to try to get the member, as you can imagine, to stay engaged with a behavior change program. And so, the thing that we pay attention to, one of the metrics, is how many people are engaging on day 30 who came in day zero, and how does that compare to our competition? And then how do we move it? And one of the things we're most focused on right now—and by that measure, Noom does quite well, but it's been many years building that—but one of the things we're most excited about right now is really deepening with the wearable integration. In part because we think from an already high—

Erin Brodwin 55:08

Any in particular?

Geoff Cook 55:09

Yeah. So, the way we're thinking about it is we got to meet you where you are, and then for everyone else, we need to have a solution that's very accessible, maybe even bundled. And so that's where we're heading. We're testing various solutions right now. Nothing to announce today, but ultimately, it's not about selling some expensive add-on. It's about bundling it in, because ultimately, why are you putting a wearable in? The reason you put a wearable in is so you get some other signal, like sleep, which is critical to losing weight.

Erin Brodwin 55:47

That reminds me of another company called Omada.

Geoff Cook 55:50

Oh, are Omada bundles wearable?

Erin Brodwin 55:52

Yeah. They do sell CGMs and things like that.

Geoff Cook 55:54

Oh, CGM. And we do bundle weight scales today.

Erin Brodwin 55:58

Okay. Yeah. Got it. Okay. Let's see. "The current data system is designed for claims adjudication and reimbursement. Where are we seeing data systems redesigned for patient agency rather than a patient portal added superficially on top of legacy systems? And how do we get there?" This might be our last question because we've only got three minutes. It's a good one.

Beth Meagher 56:23

It is a good one. So, I'll take a first shot at it. Firstly, let's go back to the VA and the DoD, right? So, tracking current military, then going to the VA, about half of those records have gone over and fully integrated. The challenge right now is obviously the size and scale. And so I think the first move is the baseline integration. The technology's there. The challenge will be to do it skillfully over time. There were three parts to it. What was the second part?

Erin Brodwin 57:02

Yes. Indeed, there were.

Beth Meagher 57:04

It was very well done, but I don't want to miss a piece.

Erin Brodwin 57:07

I swear I can use technology, but I cannot use this screen. It doesn't move. I'm sorry. I believe the question was centered around... The second part was around incentives.

Beth Meagher 57:18

Incentives. Well, I think the number one is when the outcomes can change because of data integration, I think you will see more incentives. Right now, we haven't been able to have the incentives at scale nationally because we still have wildly fragmented data. Sharif mentioned—what did you say? Clinical handoff of the—

Sharif Vakili 57:41

Yeah, the clinical handoff.

Beth Meagher 57:42

Yeah. You still have a lot of that going on, and as we see greater integration more holistically, you will see better outcomes. And that's where I do think additional technology can then be layered on to drive greater insights.

Brandon Dawson 57:58

This is why we went to Abu Dhabi and worked with M42 and American hospitals there, and working with large systems, because they have massive datasets, and being able to API and work together and collaborate across these different studies is going to be critically important, and I think that's where the collaboration comes in.

Sharif Vakili 58:13

Yeah. Maybe one thing I'd add to this is—people usually think about clinical AI, or sometimes people say AI doctors, like it's just an agent that chats with you. That is the tip of the iceberg of what goes into creating clinical AI. The bigger part of the back end is updating all the plumbing and operating system of the US health-care system for an autonomous workflow task. And that takes a lot of collaboration. ARPA-H actually has taken the lead in this, this program called ADVOCATE, bringing together so many different stakeholders that's necessary to update this operating system.

Erin Brodwin 58:48

Who has? Who was that?

Sharif Vakili 58:48

ARPA-H.

Erin Brodwin 58:49

ARPA-H. Got it.

Sharif Vakili 58:49

Advanced Research Projects Agency for Health, going after big moonshots. And the EHR vendors are part of this, because they have to—as well as the health systems. ONC, Office of National Coordinators, involved around data standards. And so, there's a lot of work to be done till we can make sure these systems operate safely and effectively.

Erin Brodwin 59:11

Great. And we are perfectly out of time. Thank you so much for joining us. Thank you to all of you. Appreciate it.

Disclaimer: This transcript was reviewed by individuals for accuracy and serves as a reference. However, it may still contain errors or omissions. Please verify any critical information independently.