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# Introduction to XPRIZE Healthspan

**Tom Marron:** The goal of the XPRIZE is to improve health span. So it's not to make people live longer per se, it's to make people live more healthy years.

**Fanny Elahi:** First is de-noise the literatures. Tell everyone that we actually can use the methods for which we tested cancer drugs and neurodegenerative disease drugs. The same exact methodology can be applied to the condition of aging and you're not alone.

**Shruti Naik:** Hi, welcome back to The Vitals, Mount Sinai's video podcast where we go inside the science shaping your health. I'm Dr. Shruti Naik, a scientist at Icahn School of Medicine at Mount Sinai, and your host for this episode in our special series on healthy aging. Medicine doesn't move on hype. It moves on proof.

Today is about what proof looks like and the global effort forcing the field to deliver it. The XPRIZE Healthspan Challenge is pushing teams to show in a clinical trial that we can measurably improve how [00:01:00] people age across immune function, muscle strength, and brain health before disease takes hold.

Joining me are physician scientists Dr. Tom Marron and Fanny Elahi. We'll explore new blood tests that flag brain aging early, imaging that detects disease before symptoms, and immune measures of resilience.

# How Clinical Trials Work

**Shruti Naik:** You know, I wanna get started with the basics of how you know when an intervention is working.

You're both medical doctors. Uh, you treat patients. How do we know which medicines work and which don't?

**Tom Marron:** So the way that every single drug that we're giving people right now, you know, is approved is we study it in clinical trials. And those clinical trials, typically they start in trials like I run, which are very early phase trials where we're taking brand new medicines that we develop in mice and monkeys, and we put it into humans for the first time and say, you know, "Is it safe and does it work?"

But eventually, before the FDA will sign off on a drug, we have to do a trial that really shows that it's [00:02:00] working, and the only way to do that is what we call a randomized trial. And so that's really where you take, you know, 100 people. 50 people get the drug, 50 people don't get the drug, and we see if the people who got the drug do better.

And a lot of the times the people who aren't getting the drug, they might get a placebo, which a lot of people are, you know, afraid of the idea of a placebo, which I totally understand. But i- there is a real thing called the placebo effect where, you know, if you give somebody a sugar pill, all of a sudden, you know, they feel better.

And so to be, you know, very precise about it, we had to do these sorts of trials and, you know, there's a lot of examples of medicines that, you know, initially we used to kind of rush them through the trials and give them to patients. Then all of a sudden, 10 years later when we did these randomized studies, we said, "Oh, the medicine's not actually working."

So you need clinical trials in order to get, you know, a drug FDA approved. The issue is that a lot of the medicines that you can buy over the counter on Amazon or at CVS, all these supplements and vitamins, those aren't FDA approved in the same way that, let's say, a cancer drug is FDA approved or a cholesterol drug is FDA approved.

So [00:03:00] they don't go through the same rigorous, uh, sort of, uh, exercise in investigating how they work and what the best dose is, and they're also not as regulated in how pure the drugs might be. And so while, you know, i- if, if you're getting a, a drug for cancer, let's say, that factory is inspected by the FDA.

We know that the factory is clean. We know exactly how much of the medicine you're getting. But a lot of the times when we're getting supplements, you might getting one milligram of the drug or you might be getting 100 milligrams of the drug even though the bottle says 10 milligrams because they're not being regulated in a very strict fashion.

And so that's the real difference between, you know, drugs that are FDA approved and that go through clinical trials and then a lot of the supplements that probably are the majority of things that people are taking these days.

**Shruti Naik:** I mean, so it sounds like there's a lot of really critical parts between deciding if something works, something is dangerous, um, you know, or something is just fluff.

Um, and the clinical trial is this essential tool that doctors use to understand [00:04:00] if it works.

# Medicine Before Clinical Trials

**Shruti Naik:** What was life like before this clinical trial existed? Like do you have some sense of, you know, how did people do medicine before it, and is this something that sort of changed how we do medicine?

**Tom Marron:** I think absolutely.

You know, when I was training in oncology, we had some of the old-timers, so the 95-year-olds that were still practicing, and they were the ones that really started the field of oncology. And they would tell me about the ways in which they developed a lot of the chemos that we use today, and it was very much throwing spaghetti at the wall and saw what stick.

So they would be giving every cocktail under the sun, different doses, different schedules to different patients, and it was very anecdotal. And so that's the issue with medicine that's not done in a very well-controlled, you know, scientifically sound clinical trial is, is we're practicing anecdotal medicine.

So, you know, it's like if somebody says, "You know, I wasn't feeling well yesterday, and then I ate a three-leaf clover, and all of a sudden I felt better, so now all of a sudden everyone's eating three-leaf clovers," that's anecdotal medicine. It's just I had this, you know, experience that was an N of one, and, and now we should give it [00:05:00] to everyone.

N of one studies are an interesting thing where, where, you know, one patient gets a drug or a intervention or a special type of tea, and all of a sudden they have, you know, this effect. But to really know how a medicine's gonna affect the population at large, especially since we're all different, you know.

I'm totally different from you, and so we're gonna metabolize drugs differently and we're gonna respond to drugs differently. We need a large group of people, kind of a mixed group of people to really say, "Oh, this is a medicine that helps

50% of people with, you know, cancer X or, you know, high blood pressure in this situation."

**Shruti Naik:** Yeah.

# Placebo Effect and Biomarkers

**Shruti Naik:** So this... You brought up sort of two things, N of one, I want to get a, a deeper dive into that, and placebo, which is sort of like you think something's working but really it's not or... I, you know, that's kind of my idea of a placebo. Maybe you guys can talk a bit. Fanny, maybe you can talk a bit about what is N of one.

Um, we've touched upon this in the series before, but it's good to flesh it out here 'cause it seems a little bit different than randomized clinical trials. And what is the placebo effect and how do we combat [00:06:00] against it?

**Fanny Elahi:** Yeah. So everything that Tom said is really laying down the structure for the ultimate experiment in humans, which is a clinical trial.

We've now come to realize that time and over we can actually make a mistake if we don't have a control group, which means that you intervene with what you think should be helping the disease process or, or the problem that you have, and then intervene with a sugar pill, so to speak, the placebo, so that the p- patient actually thinks that they're getting the drug and therefore the psych- the psychological aspect, which has really interesting biology, uh, in fact, is controlled for, and you're gonna test only the effect of the chemical, of the intervention, of what it is that you want to generate the evidence for We call this evidence-based medicine, and it's worked beautifully because you don't actually do it once.

We do many trials when we want to [00:07:00] ultimately bring a new drug into the world. Um, because the cost in human lives, in human hope, in human morbidity, and financial burden for our system that basically sustains drugs, uh, for patients is really high if we make a mistake. And so, uh, you know, Tom mentioned the population and, and the different individual factors.

If you take a sample of 50 people, maybe you... We call it the winner's curse, uh, so to speak, if your result is positive, but by chance you chose very odd 50 individuals in society that are actually not representative of your population. And so you need to do that again, and it... Winner's curse or loser's curse.

Like, maybe you actually chose a really bad representative of the disease that you're, you're presenting. So there, there are ways to sort of randomize this and make sure that the people that you're [00:08:00] testing your drug in or intervention is a good representative of the population. That's one aspect. The other thing that I wanna allude to, because this is something that we're doing for the XPRIZE, and I think is really the exciting frontier of the future for clinical trials, is to use the methodology.

It's solid. That's just math and statistics, but to bring in precision tools. So instead of waiting for a clinical presentation or clinical outcome to change, you know, in, in the case of cancer, however you're measuring that, in the case of neurodegenerative diseases, cognitive impairment, behavioral impairment, dementia ultimately, which if you start early, you either have to wait super long and no one does a trial over more than a few years, or you're really targeting the end stage of the disease, which should you really- Mm

if you want to be game-changing and impactful? And so in the interim, I think science has [00:09:00] advanced and given us incredible tools that I think are truly game-changing. Those are the biomarkers. So as a, as a large category, it could be molecular measures that are tightly related to the disease process. It could be imaging.

If you want to really expand it, it could also be s- what we call sort of intermediate phenotypes that you can measure through wearables, movement, sleep, your glucose, um, measurements in your blood. And all of these, we think, are giving us more sensitive readouts. So one, you can use them to create a more homogeneous, a more, um, um, simplified sample set where there are not a million different variables that you have to control for.

Two, you can get quick go, no-gos. So instead of doing a trial, an expensive trial for years, and then get to your negative outcome, you can test the impact of your [00:10:00] intervention on these biomarkers and change direction.

**Shruti Naik:** Mm.

**Fanny Elahi:** And I think that's going to be incredibly powerful across medicine, but especially for things like aging, where what is the clinical outcome that you're actually going to target?

**Shruti Naik:** Yeah.

# Measuring Success in Aging

**Shruti Naik:** So y- I mean, I was wondering this. You know, we're- we've been speaking about this trial for many, many episodes, and, you know, I'm wondering how long the trial is gonna last to ever be able to say this is gonna help with this person's aging. Y- you know, Tami, you mentioned you do cancer trials. There, the outcome is super clear.

**Tom Marron:** Mm-hmm.

**Shruti Naik:** Your tumor's getting smaller. You're getting healthier. What are... And you mentioned this measurements, right? So what are the measurements that you're gonna be doing in the XPRIZE trial, and, and how did you come upon those measurements? Like, how did you decide these are the right measurements to do?

**Tom Marron:** Well, we're still really figuring out what the right measurements to do are because the, the goal of the XPRIZE is to improve health span. So it's not to make people live [00:11:00] longer per se, it's to make people live more healthy years so that we're not, you know, falling apart when we're 60 and then staying alive for another 30 years.

Um, there's no perfect quantification of health span. This is a very novel concept. But our theory, our hypothesis, based on all of the data that we have amongst our, you know, neurology colleagues, cardiovascular colleagues, our colleagues that study, you know, musculoskeletal, you know, strength, and then the immunologists that study cancer, you know, heart disease, metabolic syndrome, all these sorts of things, basically every disease we can think of.

Um, everybody is in agreement that inflammation and what we call inflammaging, which is inflammation of aging, is really at the heart of these. Um, is it the be-all and end-all? We don't know yet, but that's our hypothesis. So what we're doing is we're doing an intervention for one year of exercise, uh, spermidine, which is a supplement that we are, are showing in our laboratories is very good at combating aging, um, and then one other intervention that is an anti-inflammatory.

And the goal is to really, you know, decrease this [00:12:00] inflammation that we see with aging. But, uh, we're gonna... You know, when we finish the trial, we're not gonna be able to go out there and conclusively say, "We have fixed aging. We have totally cured, you know, the whole concept." We will say, you know, "This intervention had this impact on inflammation," and prospectively

we'll follow these patients over the coming years to really see, you know, what is the lasting impact.

But our goal is to really get lots of data. Uh, like Dr. Elahi said, you know, we're using all these very, you know, precise tools in our laboratory to take blood from patients at serial time points so that we can say, "All right, what's happening? What is changing on a day-to-day basis?" And then we'll use that information to not only, you know, refine our understanding of what aging is and how we can quantify it and how we can improve, you know, the, the healthy aging, um, but also to iterate and basically create the next trial and the next trial 'cause we don't wanna, you know, do an intervention, you know, today in 2026 and wait until 2046 to say if it worked or not.

Mm. Uh, 'cause eventually, you know, I have to retire. And so we, we need to basically, you know, ask a question now, [00:13:00] and over the next few years we'll get a lot of data. And then, you know, come 2028, 2029, we'll ask our next question. We'll say, "Okay, we had some good impacts, but maybe we could build upon that." And based on the data coming out of our laboratories, we already have a few candidates of other supplements that we might wanna try.

So our goal is to do this in an iterative fashion. And eventually, you know, these are small randomized studies, but eventually, you know, ideally, we would do a very large study. If we have a perfect cocktail that we say, "You know what? We think that this is the real game changer," then we'd wanna do a big study of, let's say, 10,000 people where 5,000 get, you know, the, the intervention and 5,000 don't, and we really prove to ourselves and the whole world, "Hey, this intervention's actually helpful, and it's not hurtful most importantly."

**Fanny Elahi:** So I think one of the key aspects actually, which is both exciting and it's, uh, really cut out the work for us, is how do you actually gauge success in anti-aging clinical trials? As you pointed out, if you have a tumor, you look at the size. In the field of neurodegenerative diseases, we have [00:14:00] outcomes, whether you think they're good or too not sensitive enough is a, is a totally other debate.

But we do have markers of disease state that you can then follow and, and gauge your intervention. Aging being this sort, sort of slowly unfolding process, which is very heterogeneous or mixed in its nature, it's quite tricky. So I think there's a lot of trailblazing here. One, we are coming up with the methods to assess how to test, you know, from a clinical perspective, from a design perspective, anti-aging interventions, how to combine them-

**Shruti Naik:** Mm.

**Fanny Elahi:** and still be able to get the evidence for what combination sort of works, um, how long- Mm. ... you need to intervene on, how many people. There are so many questions about the design. But then I think at the heart of it, we will be building tools, we hope, that it, it-- even if we weren't to extend, uh, health [00:15:00] span by the number of years that we would, uh, hypothesize, that we would at least have really sturdy tools to test the next one and the next one.

And, and I think our hope is to actually have multiple interventions ongoing for anti-aging treatments. Uh, we have a real sense of urgency because, um, I work on brain, Tom works on tumors, and a- as he said, this is-- there's endocrinologists, you know, all specialties are basically dealing with the ramifications of the aging body-

**Shruti Naik:** Mm

**Fanny Elahi:** one way or another. So if we can actually go to the root cause of age-associated diseases and slow down the pathological aspects of aging, we could have massive impact on the burden of disease at large. So we wanna run many trials.

# Safety in Clinical Trials

**Shruti Naik:** So, you know, it sounds extremely innovative, and folks, if you wanna know more about the trial, please scan the QR code or click the link in [00:16:00] the description below.

It sounds super innovative, right? And as a scientist, I am so excited because you're pushing the frontiers of medicine. But if I'm sitting at home and I am watching this podcast, um, I'm gonna put my mom... my, myself in my mom's shoes. She always texts me like, "Oh, do you think this makes sense? Do you think this is the right thing to do?"

Right? It also sounds a little bit scary. So what... You know, how do you guys think about designing these trials so safety is the number one priority? And like what should folks who are sitting at home wondering, you know, "Should I be joining this trial? Should I not?" What should-- how should they be thinking about this?

**Tom Marron:** So, y- you know, we are giving these medicines that haven't necessarily been studied in huge populations before as part of the trial, but we're keeping a very close eye on people. So first of all, whenever we do a clinical trial, we're always weighing the risks and benefits. So in my clinic with cancer patients, they are, you know, the, the [00:17:00] benefits oftentimes way outweigh the risk, 'cause the risk is really that the cancer grows and kills someone.

So we, we are more flexible, and we're more willing to try drugs that might be more toxic. Here, we're talking about a trial in healthy people, trying to make them more healthy. Mm. And so our bar is much higher, and we really have to only choose drugs that we believe are safe. However, everybody responds differently to every medicine.

And also we're giving people exercise routines, and that's also something that has to be done under close supervision. And, and supervision is really the key to a clinical trial. So as opposed to your mom sitting on the couch and going on Amazon and just ordering the drugs we're talking about and doing it herself willy-nilly, you know, as part of the clinical trial, you come in, you're evaluated by, you know, physician, physician assistant, nurses, um, we do blood tests, we check in, make sure you're not having any side effects, and we're, we're sort of tracking your progress over time so that if something doesn't look right, you know, we can quickly intervene.

Or if, you know, you're having a bad response to a drug, we can quickly stop that drug. And so that's another reason why it's so important to do things within the context of a clinical trial [00:18:00] as opposed to everyone just going on Amazon and, you know, popping whatever pills- Like spermidine?

**Shruti Naik:** Exactly. Like spermidine sales are going up

**Tom Marron:** right now.

You can, you can buy whatever you want and you can take it, but if you're not studying and if you're not doing it- Yeah ... under close supervision, it could be dangerous. 'Cause also, you know, spermidine, I'm taking spermidine based on the stuff that we saw in the lab. It, it looked very convincing. Um, but you know, spermidine maybe will interact with somebody's blood pressure meds.

Yeah. If you're, you know, a 60-year-old and on five different heart meds, we don't know what spermidine's gonna do interacting with your Digoxin or what other, you know, pills you're taking. And so it's, it's always good to do things

under the supervision of a doctor. Even if patients, you know, m- don't live in New York and they don't wanna be part of our trial, if they have an interest in certain supplements, they should always first bring those to their doctor and ask their doctor if there's any data around them and if there's any concern that they might interact with other medicines they're taking.

'Cause there are, you know, lots of very dangerous drug-drug interactions. Similarly, you know, I think exercise is always the right answer, but it's always good to do that, you know, in, in consultation with your doctor and maybe, you know, talking to a physical [00:19:00] therapist or somebody who really knows what they're doing, 'cause it's easy to hurt yourself in the gym.

I hurt myself in the gym all the time. Um, and so you should really be, you know, making sure you're, you're learning from people who actually know what they're doing.

# The Supplement Problem

**Fanny Elahi:** I think one of the aspects that's, uh, I'm gonna come back to, uh, what Tom said in the beginning, that these supplements are not FDA regulated.

And one aspect is we don't even know if they're gonna work or not, but we also don't know what's in them.

**Shruti Naik:** Mm.

**Fanny Elahi:** And, and so e- one is that we're not doing any new compounds in humans, so this is not the very first time that the human body has seen any of these, right? Mm. So there's ample safety data. The innovation is really their combination, and not just drugging aging, but also intervening with exercise.

So it's a combination of lifestyle and, uh, chemicals. But also, we know exactly what dose each chemical is being given. And my worry about supplements, [00:20:00] one is it's bad for the budget, and is it actually healthy? We don't know. We don't have the evidence because we do need to do these trials. But two, is what I'm buying actually what I'm buying?

Yeah. I sort of wanna just, like, send it to a mass spec company and see whether the chemical is actually there and in what dosage. So that's another huge problem, and I think something that may- may- maybe as a society we do need

to take care of because there are a ton of supplements being directly advertised to consumer- consumers.

**Shruti Naik:** I mean, this, this really brings us to, like, how important the FDA is. Yeah. 'Cause they really seem to be the folks who are, you know, making sure that what we get is safe. And I'm just shocked that supplements aren't part of that because they're, it's like, what? Multi-billion dollar business. They're everywhere.

You know, I... All the vitamin shops that I see, all the... So this is actually quite surprising, and I, I actually didn't know this, that- Yeah ... when you see something online, it can be anything. It can just be a sugar pill. [00:21:00] So, and you talked about this a little bit before. You said sometimes you can have a placebo effect, and that folks can just manifest through mechanisms that we don't know outcomes.

So if I was playing devil's advocate, couldn't I just manifest health by thinking about it?

**Fanny Elahi:** Yeah, if we could in a reproducible way recapitulate that in you every single time you need it in order to counter the disease process, absolutely. I mean, I think the state of mind has a really powerful effect. We know, you know, from, from well, well, uh, done studies that if you're a caregiver for someone who's sick, it can actually have an impact on your own health because it's, it's a very hard thing, especially for neurodegenerative diseases.

Um, so how we feel, stress, um, and many other states of mind have a real impact [00:22:00] on the physiology of the body. And, you know, you're an immunologist, and so I think maybe a lot of that is actually mediated through the immune system in ways that we're only beginning to understand because we finally have the tools to look at human beings as opposed to creating a model system, a mouse, a rat, or, or other to, to ask those questions.

And these, this-- I don't, I'm, uh, I'm, I don't know animals well enough, but I think there are some aspects that are kind of complex and would really need to be studied in human beings by taking their blood, by analyzing it, and by understanding the, the causal relationship of these, uh, states of mind. So there's placebo and nocebo.

**Shruti Naik:** What is nocebo?

**Fanny Elahi:** Nocebo- Tell me more ... nocebo is basically when you think that's gonna hurt you, and it actually does.

**Shruti Naik:** Oh, wow.

**Fanny Elahi:** And so, um, for, for all those reasons, we, we need to basically be able to, um- Clear out the [00:23:00] noise- Mm-hmm ... so to speak, in order to get definitive answers. Now, it doesn't mean that if, if the drug worked for me to this extent, it's gonna work for Tom or for you to the same extent, right?

So what we are trying to do is to say, "This combination could be helpful." But ultimately, why we need to test a lot more than what we're gonna do in this just one trial, and why we need to build a pipeline, is that we will probably need to personalize interventions. Mm. We would need to take the person characteristics into account, and that's the, the next frontier.

First is de-noise the literature. S- tell, tell everyone that we actually can use the methods for which we tested cancer drugs and neurodegenerative disease drugs, and really, uh, toxic, you know- Mm ... so, so to speak, drugs. But the same exact methodology can be applied to the condition of aging. And you're not [00:24:00] alone.

You don't need to start experimenting on yourself because the scientific world won't do that. We really want to do that, and we want to do that in a rigorous fashion. And next, I think we want to personalize it so that people don't need to, again, do it on themselves, because everyone realizes that we're very different.

Mm. So can we have measurements that allow me to say, "I probably won't respond to that given these personal characteristics, these I would say quantitative personal characteristics

**Tom Marron:** I think it's also important to realize that the, the way in which we're measuring all these characteristics about inflammation and, and also a variety of, uh, you know, cognitive proteins associated with cognitive decline and, and exercise, these are all sort of technological platforms that have never been used in this situation.

We really have just developed these, and we've been working to optimize them here at Sinai over the last five years, and we're using them [00:25:00] aggressively in clinical trials for cancer drugs, for, uh, uh, Alzheimer's drugs, for IBD drugs. But now we're gonna take those, those platforms, these technologies where we can, you know, take just a drop of somebody's blood and

get this amazing, really multidimensional picture of how inflamed their body is, and then track that over time to see if our intervention changes that.

So people might say, you know, like, "Well, why haven't you been studying this?" You know, "Why haven't you been studying aspirin or metformin for the last 20 years?" We have. We just haven't had the technologies that we have in 2026. And so now we're really saying, "Well, let's repurpose these." We're already using them very successfully to better understand how the therapies I'm giving my patients with cancer, uh, respond and what their bodies are actually doing biologically, and now we're gonna put that into normal people and say, "All right.

What are these medicines that everyone's popping willy-nilly off of Amazon? What are they actually doing in people?" And so that we can be more intelligent and more informed when me as a doctor, when somebody comes and says, you know, "Should I take spermidine or should I take, you know, St. John's wort or this?"

I can actually have real [00:26:00] data to support my impression, as opposed to me saying, "Well, my mom takes it, so, you know- Yeah, yeah ... it's probably fine."

**Shruti Naik:** Yeah.

**Fanny Elahi:** Yeah.

# Precision Medicine and Biotypes

**Fanny Elahi:** And I wanna highlight o- one method that we'll be using, and I think is increasingly being used in clinical trials, is intra-individual change. So we do need to repeat that experiment in as many people as we can because one given person is not representing the whole population, but we're not gonna be comparing group means or only group means, saying like, "The, this group got the drug and this group didn't."

We're actually gonna look at the trajectory of that individual, and that's gonna give us greater confidence in that we're actually right, and that-

**Shruti Naik:** So t- I wanna break this down a little bit more. Mm. Why is that individual tracking so important, in addition to, like, looking at how the groups respond?

**Fanny Elahi:** You could, it, it's really fascinating because you could actually have someone who responds zero.

**Shruti Naik:** Hmm.

**Fanny Elahi:** And someone who responds, I'm just gonna really simplify, uh, uh, the, the problem, zero and, and let's say like 10 people respond zero and 10 people [00:27:00] respond 100%. Well, the average could actually cancel each other out. You could even end

**Shruti Naik:** up- Oh, 'cause it would just be 50. Yeah. So it would look like everyone's responding half- Absolutely.

Oh, I get

**Fanny Elahi:** it. And so if you anticipated that you need to have like 60% or 70% effect on the disease pro- then, then you're gonna- Yeah ... not reach. But then really the answer is in choosing those 10 who respond at 100. So that's where these biomarker strategies and, and the fact that we're not just looking at brain, we're looking at muscle, we're looking at the immune system, um, is going to give us the best chance to detect signal and to, I think ultimately we're all very interested in understanding biotypes.

**Shruti Naik:** Okay, now you've put a big word on the table. I, I wanna know about what a biotype is. This sounds like a future word. Yeah. Like a futuristic- Yeah ... you know, you're like in a spaceship and you talk about your biotype.

**Fanny Elahi:** It's basically putting science to what we all intuitively live.

**Shruti Naik:** Okay.

**Fanny Elahi:** We are a very [00:28:00] diverse population of humans on Earth, and we know that we respond differently to the environment, to different medications, to different...

We have different aptitudes and different deficits, weaknesses, and the same goes for our biology. It's not one size fits all. But if you think about how we practi- practice medicine in, in our healthcare systems, it is one size fits all. Hmm. It's one threshold of cholesterol. It's, it's one exercise regimen.

It's eight hours of sleep. It's eat, you know, this diet or that diet, and it's one drug for, for one condition for everyone. And that's partly because our evidence-

based medicine methods have only been able to give us that kind of evidence. So this works or this doesn't work. We've never had the methods or the tools at our disposal in order to say who does it work for most?

Hmm. And how can we actually use those same tools at the start [00:29:00] to pick who should be getting this drug? And I think if we were to do that, we would truly have game-changing treatment options for, for individuals.

# Personalized Treatment Approaches

**Fanny Elahi:** I'll give a very simple example of anti-amyloid treatments for Alzheimer's disease. They got approval, and it's great because we have something and we had nothing.

But if you... Now that they're on the market and people are getting it, some people stabilize, absolutely do, and some don't. And if I as, as someone who gets to prescribe them had a way to select it, I would do a much better job- Hmm ... in my conversations with my patients, even just helping them weigh the risk and the benefit.

But right now I can say you have Alzheimer's disease, which we know it's not one thing, and here is the drug, which- Mm ... is really, uh, rudimentary and unsatisfying for us and for patients.

**Tom Marron:** Yeah, and I think those biomarkers, that's what we're gonna really dive into with this trial, is 'cause the trial's taking everyone, so we're sort of, you know, taking a very wide swath of people from 50 to [00:30:00] 80, and, you know, it's gonna be a very mixed crowd.

But hopefully some patients respond like gangbusters, and we see, you know, the markers of inflammation really plummet in them when they get the intervention, and I'm sure there'll be people where we don't see that. And it's really, you know, looking at that, that, you know, intra-patient and inter-patient difference that'll allow us to identify biomarkers so that one day if a patient comes and sees me and they say, "Should I take spermidine?"

I can say, "Well, let me draw a blood test and see if you're the type that would benefit from this, or maybe your body's already chock-full of spermidine, and it's just a waste of your money." And so we need that more... In order to do personalized medicine, it sounds funny to say, to do personalized medicine, we have to do unpersonalized clinical trials, but that's really what we do.

We're starting, you know, to collect information and, and sort of create these metrics by which we can, A, identify who's gonna benefit, and B, define what benefit even means. You know? And so I can not only draw a blood test to say, "Hey, you should get some spermidine," but I could also draw a blood test, you know, two months later to say, "Oh, you're benefiting from it, and you should continue doing [00:31:00] this, or it's not really helping you."

**Fanny Elahi:** We're doing precision clinical trials.

**Tom Marron:** Precision clinical trials, yes.

**Shruti Naik:** I think that is such an exciting endeavor, and, and I mean, not just the innovation in healthcare, but thinking about how we provide evidence to people, how we make our drugs the most effective. You know, thank you for leading the way.

Thank you for being here, and thank you for your perspectives.

**Fanny Elahi:** Thank you.

**Tom Marron:** Thank you.

# Closing Thoughts

**Shruti Naik:** Here's the bottom line, folks. The XPRIZE Healthspan challenge isn't just testing an intervention. It's building the scientific infrastructure to help medicine measure and improve aging itself, and Mount Sinai is helping lead that effort.

Even modest gains could move medicine from reacting to disease to preserving health and independence across lifespan. That shift is worth pursuing. This has been The Vitals, a special edition on healthspan and longevity. I'm your host, Dr. Shruti Nayak. If you'd like to learn more about the study or find out whether participation may be right for you, scan the QR code on your [00:32:00] screen or click the link in the description below.