Applying Complex Systems Science To Brain Health: A New Model For Understanding Dementia? Transcript

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Introduction to Daniel Berger

Welcome to the reverse Alzheimer's Summit. I'm your host, doctor Heather Sanderson, and I'm so excited to introduce you to Daniel Berger, a dear friend of mine, a mentor, and one of the people who has most influenced my career and my path.

That took me to reversing Alzheimer's with my patients and the residents at Verona. Daniel is a founding member of the Consultants Project, aimed at improving public sense making and dialog.

The through line of his many interests has to do with ways of improving the health and development of individuals and society, with a virtuous relationship between the two as a goal towards these ends.

He's had particular interest in the topics of catastrophic and existential risk, civilization and institutional decay and collapse, as well as progress, collective action problems, social organization theories, and the relevant domains in philosophy and science.

Motivated by the belief that advancing collective intelligence and capacity is foundational to the integrity of any civilization and necessary to address their unique risks we currently face, given the intersection of globalization and exponential technology.

He has spoken publicly on many of these topics, hoping to popularize and deepen important conversations and engage more people in working towards their solutions, and many of these can be found in the Consultants project.

Daniel, thank you so much for joining us. I'm happy to be here with you, Heather. So we met at 6 or 7, maybe even eight years ago now because you introduced me to a patient who you were working with as sort of a coach and a manager, a case manager, so to speak, on his very complex symptoms that no doctor could really figure out.

And you met me in an integrative office where I had really just started working as a new doctor. And I think what you found in me was that I was curious and excited and young and malleable, that you could use someone who you could influence to, to, and turn on to these big ideas that feel a bit overwhelming, but where we really can have an impact.

And I have been so inspired by the way you grapple with these really big problems, things like Alzheimer's disease, and find manageable solutions. And it gives me so much hope about some of these big issues that we're facing as a society these days.

One of the big pieces of information that you relayed to me.

Complex Systems and Personalized Medicine

Well, there well, there's lots one of the most important things was this concept of complex system science and how just because something is complicated and complex doesn't mean that we can't get really great outcomes, and that we can apply that to the human body in a very systematic and organized way.

And that led to you and I developing this framework or this model of medicine, where we apply that science to, to getting people healthier and optimized.

I'd love to dive into it with you. So can you can you start to describe this framework in this model? Sure. But I want to start with what I actually, appreciated in you that had me want to collaborate.

I, I wouldn't say I was anything like a case manager for this friend. That was just a friend. And it was a time in my life where I was putting a good bit of just my own private study in the thinking about health and medicine and disease and aging.

Because it's obviously relevant to everybody. And most, as my bio that seems to make no sense for of course, like this would indicate, most of my, interest has been with other complex systems like, economies and ecologies and cultures and governments and kind of, global things. But how a society self organizes, how it breaks down, how it's healthy and how a body does is not that different.

Complex system just means lots of interacting parts, where it's a little bit hard to model and you end up getting things like self-organization and emergence and stuff like that.

So I was working with people who were friends, who had health issues that, didn't seem to be addressable in the current systems, and trying to think through how do we make sense of why the body self-organize is pretty well when we're young, and why the same genome starts to self-organize less well with age and stress and etc., and why some people seem to kind of age earlier than others based on various things. And, why there's a distribution of people who get better with particular diseases and people who don't and like what spontaneous remission actually is.

And, you know, just thinking through those things and what you were one of quite a few doctors who I was interacting with during that time. But what you had that was pretty unique was the intersection of being very interested in novel ways of thinking, while also being very conservative to make sure that before you were implementing something with a human person that you had, you could actually see people who had been clinically working with those ideas and getting good results.

So you were neither the slow adopter that wouldn't do something until it had been, you know, fully FDA approved. But you also weren't the cowboy who was like running the experiments on people.

And I thought it was a really right, intuitive synthesis. And you just cared about your patients so much that you spend all of your free time thinking about their cases and worrying about them, and which is exactly the right psychology for a doctor who really wants to care about people.

And I could see you were willing to put in the time to think about each case, really, in a in a unique novel way, not just here's the disease diagnosis and this is how we treat it.

And so in terms of someone to be able to practice and think through, each person in n equals one unique case situation, and to be able to find things that were reasonable to apply, but that also might be able to offer results outside of what was currently available.

You were perfect partner and have been since. Well, thank you. It's been really an honor to get to work with you and a privilege to watch many people improve their health when, you know, they were told, maybe otherwise, by another doctor was at a point where, sorry, I can't help you.

Or there's your test. Look, fine. There's nothing wrong. It's in that story. Come through my office over and over again, applying the model that we built together to those patients and really developing a confidence over time that we would get results over and over again, very predictably, on on challenging complex cases.

And that, brought me to studying with Doctor Bredesen. You turned me on to him initially. And his his model of Alzheimer's and how to approach Alzheimer's is basically a complex system science adaptation to that particular disease process.

And I really had the interest, the curiosity around it and the desire to help, these patients because no one else really is doing it or was at that point, thank God there are quite a few more doctors who trained with Doctor Bateson are starting to understand these ideas.

But you and I talked through this early on, and I think it can be applied not only to Alzheimer's but to many, many other complex chronic diseases. And so I want to dive into that framework and sort of this, a finite number of things that can disrupt the complex system and the definition of balance, and how imbalance is really what ultimately causes disease.

Yeah. One of the things that I found very interesting that I was looking at with any chronic, complex disease, people who had M. S. or even just severe chronic fatigue or things that didn't have, clear causal pathway ideology that we knew how to define and, clear treatment.

There were doctors who were doing strange things in different parts of the world that were having success better than the background of spontaneous remission.

And one of them would be a Lyme doctor. And like, not everybody would get better, but more than people who were getting no treatment or just traditional treatment, and one would be a doctor and one would be working with endocrine balance, and one would be working with methylation and various things.

And so what I was interested in is why are they getting results at all? And then also why are they not getting more complete results? Those were like both equally interesting questions.

And so my, my kind of default hypothesis was that maybe Mis is not one thing. Maybe Alzheimer's is not one thing. Maybe it is a dysregulation of a self-regulating system, a complex self-regulating system.

And that system can dis regulate in different ways. And if it just regulates in a way where a similar set of tissues and biomarkers are affected, we call it the same disease.

So we call it mass if there's a similar set of symptoms or whatever. But even like within Alzheimer's, we'll see. There are people who have we diagnosed with Alzheimer's who have beta amyloid plaque and sum it up.

And there are people who have beta amyloid that we don't diagnosed with Alzheimer's, and some have ApoE E4 mutations and some don't. And so it's not even like there is a clear diagnostic.

So that kind of diagnostic marker is helpful for insurance purposes. But it's not that helpful to really understand what is going on and how to prevent it or reverse it.

And so it made sense to me that if we're dealing with a very complex system, that it's self-regulation could break down in multiple different ways that could lead to similar kinds of pathologies, similar kinds of expressions of symptoms or clusters of biomarkers.

And so it was an interesting question to see. Are the doctors who are working on Lyme getting some results? Because sometimes Lyme is one of the major factors and the ones who are working on mole are getting some results, because sometimes that's one of the factors.

And that if we were to study all the things that seem to be getting some results. So this is kind of looking at positive deviance on the side of success.

Health, Resilience, and Subclinical Imbalance

Case study success. Let's take everything that got some success and take that as a hypothesis that that is one thing that might sometimes be involved in that disease.

Let's also just look at the research literature that is looking for correlation and causation and see what are all the things that show up as being sometimes statistically involved.

So do we see that in, autopsies of brains and nervous systems of Alzheimer's patients that we see Borrelia more often than we do in background? People.

So we would see a correlation that is curious to be is that a partial causation? Right. So things like that. And then we start to say, okay, well all those things that if when you treat them they get better, more than spontaneous remission and all the things that in the literature seem to be at least statistically correlated more than you would expect for background rates.

So let's take all of those as possible contributors to this type of pathology, and we'll create a phase space of all the things that we know that might contribute and then say, well, what if we did diagnostics across all those things?

And we might expect that we see different things for different people, that ten different people with Ms. have ten different sets of things, but that the question would be if we treated specifically the things that we saw going on, might we be able to help them with a higher success rate than just the one working online, or just a one month mold or whatever it is?

And as it turns out, is that ends up being pretty successful. And so the question became, how do we start to identify the phase space of all the things that might be part of the causal factor?

We're thinking about multifactorial causation and show that the complex chronic disease doesn't have one cause. It might have 3 or 410 causes. They might not have all happened at the same time.

Someone might have had a car accident that created a micro TBI 30 years ago that started to create stress in in the nervous system and make their system just slightly more sympathetic and less parasympathetic.

That started to down regulate their immune function so that then ten years later, when they traveled to Guatemala and got food poisoning, they had an ongoing microbial issue in their gut.

And then they got some clinical dental infection. Right. Like that. There's and in another case, it was mold in their house and a very stressful divorce.

And, you know, more genetic predispositions and something else. So we're not just looking at one factor, but possibly quite a few factors. They might be delayed in time all the way up to, like, decades, delayed in time.

And not just that it's multifactorial, but different factors in different people. So also factor in different kind of genetic predispositions that they're coming in with.

So how do we kind of put all that together to be able to not treat M. S. or Alzheimer's or rheumatoid arthritis as if it's one thing, but to be able to actually treat what that person actually has going on and they're presenting with in a more personalized way, and that was kind of like the big the beginning of starting to then say, how do we model all of the different areas and things that are worth looking at?

And it's such an moment for so many people to go from being attached to the diagnosis, to what we name the problem or the symptom scape, to going back and saying, well, maybe the better question to ask is what's standing in the way of the complex system adapting and optimizing and responding to the environment and being able to complete its functions on a day to day basis for many, many decades.

Right. And then maybe not only what's standing in the way, but then on top of that, what can we do to enhance its ability to continue to adapt and be resilient to changes, whether it's seasons or aging or having children or working and contributing?

Whatever the stressors that come up in that person's life, that they actually even have resilience and can optimize their experience of the world. Yeah.

So this concept of resilience, if we're going to define health, obviously health as the absence of disease, symptomology is is a very antiquated definition.

I think everybody knows that because we all know stories of people who had a headache went into the doctor and,

and found out they had a brain tumor that was advanced.

They only had a few weeks left to live, and that thing had been growing for months or years. Asymptomatically. By the time we actually get symptoms of a autoimmune disease, we might have had autoimmune markers.

And before that, inflammatory markers for many, many years asymptomatically and also something that wouldn't even show up on normal blood labs. So, a system can be in suboptimal regulation that is starting to move into pathophysiology, for a while before their symptoms or the the most common disease markers we would look for.

So we say, okay, well how do we define health. Health as health is about the robustness of the body's ability to maintain homeostasis or better term. Our friend Andrew Hill coined was Romeo Dynamics.

And or at least that's where I heard it. And then our other friend June Yoon talked about not home geodynamics, but home geodynamics capacity. It's not, is it?

Staying in range? It's how quickly does it come back to range? And how robustly does it come back when a stressor moves? It out. So home, you know, dynamic capacity or the resilience of the system to be able to stay within healthy ranges as the system is stressed is really the definer of health, right.

Which would be can someone be exposed to more viral particles of the flu and not get it? Can they be exposed to more ranges in temperature and still be able to regulate their body?

Can they be exposed to more environmental toxin and be able to cleanse their body of it if they have a stronger liver, kidney, etc., that it will be able to?

And this is where we can see that kids recover way faster than older people recover from the same thing. Their system has more resilience to it. So there's something about aging that even if someone doesn't have a disease, there's less homey or dynamic capacity in the system, right?

It can handle a less amount of stressor and still be able to come back without symptomology. So aging, we wouldn't say it's disease. We would say it's an increase the susceptibility to disease of all kinds, because the system just has less resilience.

We can say that disease is not just about the decrease of the resilience of the system. It's the system actually having been not resilient and moved outside of the dynamics that a healthy person is in now, it's an ultra calm geodynamics or pathophysiology, which we'll call a disease state.

So the disease state means that some stressors were more than the body's capacity to respond to. And now there's an altered function of the physiology.

So there's a a generalized in a specific way. We can deal with that. The generalized way is how do we support the body's resilience capacities that are in general that are across the scope of everything.

And so most of the like basics of health recommendation, like exercise increases your, you know, if you're exercising, where you're increasing your mitochondrial density, your mitochondrial quality, you're increasing your, oxygen transport and your vasodilation, that's going to decrease your likelihood and susceptibility to disease of all kinds.

Right. The same with sleeping enough, the same with stress reduction, the same with good diet and basic nutrition. So it's how do we support health, which is how do we support the resilience of the system writ large in general.

And then how do we identify the specific unique stressors that took this this system out of home geodynamics into altered home geodynamics or disease state?

And how do we reverse this specifically. So we use diagnostics for the second part, and we use general lifestyle

work for the first part. The imbalance I love you for your definition of balance.

And then also imbalance. Right. That too much, too little in the wrong place. And at the or at the wrong time is part of what leads to a disease process.

So very simply, we can think of diabetes right, as too much sugar for too long. And of course scurvy is going to be too little vitamin C. And these are kind of big examples that are very obvious, but there's going to be a great ation in between a spectrum, in between where you can have too little B12 or choline or magnesium or something else that is going to show up as a as a small symptom at first, but can later lead to a bigger disease process, the kind of where our interests intersect here.

But you this sort of imbalance you can apply to financial systems, education systems, government systems, if you have too much, too little in the wrong place or at the wrong time, you're going to create imbalance.

And if we can focus on those things that really are essential to maintaining balance and whether it's communication, which is in in the bodies, in the, example of the body, in the complex system that is the human body, this communication system is going to be the nervous system or the endocrine system with the hormones.

Right. Where are we getting those signals to tell our neurons to make more neurotransmitters or to connect create a synapse. And those things need to be in balance.

If they aren't that leads to disease. Yeah. So the topic you bring up right now is something that I would say naturopathic medicine or molecular medicine.

Functional medicine have started to popularize and pioneer, but it's just so critical we should underscore it. Here is the idea of a, a subclinical imbalance.

And what we mean by this is. We know the level of vitamin C deficiency required to cause scurvy. Scurvy, meaning the formal disease definition that the person is now acutely dying of vitamin C deficiency.

And it's actually pretty hard in the modern environment to get scurvy. You eat an orange a couple times a year and you'll be fine, right? So you've got scurvy down here, but then we can say, what is the optimal vitamin C level for maximum health?

And it's pretty reasonable that there's a pretty big difference between I'm acutely dying a vitamin disease, vitamin C deficiency, acutely dying, not chronically right.

Not like it has just decreased general health. Maybe asymptomatically that will have effects on lifespan, but I'm now acutely dying of it. There's a pretty big range between that disease diagnosis and where optimum is.

And if I'm anywhere within there, I'm suboptimal, but not yet a definable disease. So if I'm only looking at rickets and beriberi and scurvy as signs of deficiency, then I'll come up with the RDA that we have and say that nobody has nutrient deficiencies.

And it's just nonsense. They don't have acute dying of nutrient deficiencies, but they might be very, very far from optimal. And that might make a pretty big difference to how likely they are to get a autoimmune disease or cancer or a neurodegenerative disease, or a psychiatric disease, or just low grade energy, or live less long and they're more areas where that starting to be recognized, like metabolic syndrome.

You don't quite have diabetes yet. But you have a subclinical excess of glucose in the blood. And maybe, your baseline levels of insulin have raised because of insulin resistance.

And so what we'd say is that an another classic example is let's say we're talking about lead poisoning. Well, there's a, there's a level that is basically as a result of political lobbying, legal lobbying of what do we consider the level of lead poisoning to now get an insurance diagnosis where someone is going to have to pay workman's comp

or someone can be sued for negligence, right.

Like we get into law of criminal law, whatever lobbies are involved to say, why did we set the parts per million here as opposed to here? And we can see that the parts per million of what was considered toxicity for mercury got raised many times in the US, because we kept creating industry that exposed people to more levels, and so long as it didn't cause immediate acute symptoms of poisoning, then we could say, okay, well, it's not toxicity.

So the idea is that there's a level of deficiency that takes you into instant disease, but there's a level that doesn't take you into instant disease.

It might take you into no signs of symptoms, but to suboptimal resilience, which means increased likelihood for any number of diseases down the road. But it's very hard to ever prove that because that's going to be one of many factors that ends up affecting the nature of the disease you get.

So you have very delayed causation, which means very hard to prove causation. Right. And so the same with toxicity.

Environmental Toxins and Systemic Causes of Disease

There might be a toxicity where you say, okay, here's the level of mercury or lead that is in acute poisoning, meaning you have symptoms, your hair is falling out, you're puking from the poisoning.

What is the optimal level of lead or mercury exposure of those kinds in the body? Well, it's not right. So how much higher is someone's exposure level?

If they're operating in industry or around certain kind of chemicals then is ideal. Well, it might be very far from what we would call acute poisoning, but it still might be a subclinical toxicity.

And then the same is also true with infections. And infections are kind of even more surprising because with infections, there has been this general kind of view in infectious disease that an infection means a pathogen enters the body and you have immediate acute symptomology.

But we all know now that you can have an infection that is, say, viral, say, HPV. That increases your probability for cancer years or decades down the road that is asymptomatic the entire time.

So is that that would we would call a chronic infection that is statistically affecting the likelihood for certain types of disease. The same with, say, chronic subclinical H pylori, increasing the likelihood for stomach cancer.

And so as time goes on, diseases we didn't think were correlated, we start to find correlations with some of those things. But there's a lot of those that we have not found in medicine as a whole yet.

But people at the cutting edge who are paying attention are starting to find these things. So subclinical infections, subclinical deficiencies and subclinical toxicities are all really key aspects of what take people out of optimal resilience, increase their likelihood for disease of various kinds are going to be multifactorial because they might have many different subclinical deficiencies and toxicity simultaneously.

None of those would normally ever be assessed or treated in a traditional alcoholic framework. And yet, if I'm looking at why did this person come down with chronic fatigue syndrome or autoimmune disease or cognitive decline?

These are probably where the answers live. You mentioned how industry influences so much of how we might interpret certain labs, and how an RDA is or, you know, the cutoffs and thresholds where we consider it a disease process or significant.

There is quite a few ways in which society is structured that makes us sick, keeps us sick, and really prevents us

from getting the help we need at times.

And this is another place where you inspire me, because it can get very overwhelming and I think can feel paralyzing. To many people who are stuck in this trap, however, there are solutions.

I've seen it with my own eyes. I see it every day in my clinical practice and at Miramar and and we can work together to, to solve these problems. But I also want to call them out so that people feel, you know, that they're not alone.

You and I have worked together with patients who are trying to get life insurance, and because they've been proactive, they've seen a chiropractor, they've seen a therapist, you know, they've they've gotten medications to prevent disease or to help to optimize their, their physiological function.

Now they're being you know, they're not they're they're not getting disability insurance or they're struggling to get full life insurance. And this really I watch this, I've told patients in my office, you know, let's wait on the testing. Go ahead.

You have a new child, get your life insurance and then come back. And we'll do all of this because your other doctor is telling you you're fine. You have symptoms, so we need to treat them.

We need to figure out what's going on. But we've got to kind of go through this whole process that really is not designed to support healthy human beings.

And so I just I want to I want to let people know that they're not alone in that, that, you know, cheap food is not healthy for us, but it's what simple, easy to grab and inexpensive and healthy food.

It takes a little bit more effort. It takes a little bit more money, takes a little bit more of that, that, you know, you have to stick with it. It takes a little more motivation, but it's so worth it.

And there are a handful of things, including applying this model to complex disease when you're not getting answers that really if you put in that effort, extra effort, there are solutions.

I mean, this is kind of the, The classic libertarian socialist dialog of to what degree are we just self-determined and can pull ourselves up by our bootstrap?

And to what degree are we, influenced by the larger social systems and environment we're in? And it's obviously both and it's a reciprocal relationship between both.

So I think everybody thinks that it's pretty clear that if you're born into an area, into a society where all of your water has malaria or guinea worm, and then you're likely to have different kinds of diseases and health issues as a result of where you're born.

Or led. I mean, if there's lead in the pipes and you're born there, when the point of lead in your blood starts to influence your IQ, so your potential at what schools you get into, what jobs you can get, your earning potential the rest of your life is influenced by that early LED exposure, which is happening right here in the US today.

So I started with the malaria case because it's obvious and because it seems more foreign to us. We actually kind of really see it. And the lead case is less obvious.

And because, you know, we don't necessarily have as big a reference for it, but that it's the same thing. So let's say we take a more extreme example and look at Flint, Michigan.

We're like, okay, we can see that there's a thing there that is affecting the public health of everyone who lives there. So then we start to say, well, all right, well, if.

As soon as, commercial agriculture, better living through chemistry started where we started using DDT and then malathion parasite on and now glyphosate whatever on almost all of the crops, is this going to have an effect on the human health of the people who live in that system at scale?

You know, of course it is. And as soon as we start having a food system where the majority of the food that people need is processed and the processed food doesn't have anything similar in terms of its macronutrient micronutrient profile, is that going to start affecting health at scale? Of course.

And it's important for people to understand that. If I run a corporation in the US as a director of the corporation, I actually have a legal responsibility, a fiduciary responsibility to the shareholders, to maximize the profit of that company.

It's something I sign in law that I'm breaking the law if I don't do it. So if I'm the CEO or director of a major corporation, say, a Nestlé or Hostess or Mars or whatever it is, right?

As a food company, I have to work to maximize its profit legally, to be responsible to the shareholders money. Who's in it now to maximize the profit?

I need to maximize the total number of customers buying the thing multiplied by the total lifetime value of the customer, lifetime value of the customers, how many things they purchase, how often there is nothing that maximizes the lifetime value of a customer more than addiction.

And particularly the younger the addiction can start, the better. So now you start to look at the proliferation of, soda and fast food and, you know, that type of thing.

And you're like, well, this humans have an evolutionary weakness because we grew up in and then we evolved in an environment where famine was a real thing.

And so it was very hard to get enough fat or enough salt or enough sugar in the evolutionary environment. Oftentimes it was always easy to get enough cellulose, right.

There was like green plant stuff pretty often. But hunting is much harder. And and wild meat has lower body fat percentage. And so we got we evolved the dopamine response to things that have salt, fat and sugar because that's where we would survive and have be able to survive famine better.

Well, now, post industrialization, we created a world where we don't have a deficiency of salt and sugar. We have excess of them. And so then we get the but our genetics haven't changed.

Where we still get a hit, we get a dopaminergic hit. And so if you notice all fast food is a combination of those three things, just different combinations of salt, fat, sugar with different types of palatability that are kind of split test optimized for addictive maximization.

And we would hope that if there's multibillion dollar organizations in the healthy society, that they have the vested interest of the well-being of the people in mind, this is obviously not the case.

They have the vested interest of extracting capital from those people, which happens through, in this case, optimizing for addiction. And we can go through and look at that one.

It has to do with the more that a company can externalize its cost to the commons as environmental pollution, the more profit it makes. Rather than spend the money it takes to actually process that waste.

But then that equals public health issues for everybody. And so we have a world where. Nutrient deficiency, and toxicity. It's not just the glyphosate that is put on the food.

It's the fact that the paint in these buildings has volatile organic compounds that are all from petrol derived

chemicals, that we have no evolutionary relationship in our genetics with.

And these volatile organic compounds are mostly either carcinogens, endocrine disruptors or neurotoxins. And the two big witness in the way we manufacture everything because it's an externalized cost.

Nobody has to pay for it. Nobody's accountable for. And so this is like, all right, well, I have a hard time taking responsibility for all those aspects of the world that I'm a part of.

Right. And so part of the answer has to be systemic change. Right. How do we actually change the nature of, food manufacturing and agriculture to have the well-being of the people in mind rather than not in the maintenance of the soil, the microbiome, and the nutrients of the soil, and how the food is processed, and not having addiction maximization associated with the profit structure, and then materials manufacturing and how we make homes and the nature of industries not having a financial incentive to externalize the cost to the commons.

So not the whole. So the whole solution is not simply what an individual can do, right? A lot of it has to be systemic. And if we dealt with that systemically, just like in our societies today, Western societies, malaria is not really a thing, even though it's totally a killer in some places.

Can we change the environment in a way that obsolete whole classes of disease? Of course we can. Now, in modern society, do we have whole new classes of disease like chronic fatigue and things that are starting to become very ubiquitous, that are totally uncommon in other, less developed environments? Yes.

That's because of different environmental factors. So of course, right now most of the people on your call probably aren't working on how they're empowered to do systems change for materials manufacturing, but it's important to know that's a part of the picture of what has to shift.

What you're trying to do with them now is within the context of the world we're in. How do we at least understand those factors? So, you know, they might be affecting you so you can take responsibility for it.

And if you're going to repaint your house, use non VOC paint. Maybe you run an air filter inside. Maybe you test for mold before you move into an area.

Maybe you pay attention to whether the food is organic and if you have a water filter in those various things. So are there things that we can do, you know, just thinking about, what do we have the power to do right now while we wait for systemic change?

And one of the things is to be well informed. And part of that is getting a complete assessment. And the next five days of the summit are going to be deep dives into the different assessments we can do.

And so when we talk about imbalance and complex chronic disease, in particular Alzheimer's, there's essentially five things that can cause disease or imbalance.

And they're toxins nutrients infections structure and stress. And so when I work with a patient we break it down. And we want to get information about each and every one of those pieces.

And so we'll be I'll be interviewing, you know, 39 other people this week and talking about each of those pieces. But, Daniel, you and I work to come up with that model to, to make this very complex, sort of overwhelming.

Placebo, Stress, and the Role of the Nervous System

Process of categorizing what are the things that are going to inform our treatment and also inform the etiology? How did this happen? Where do the imbalances start?

Yeah, and I would say that is a very good clinical model to work with. That is kind of the applied side of some theoretical models that have a different number of categories in them.

Where it's not I'm saying this to simply say it's not, an arbitrary taxonomy. It is, useful applied taxonomy resulting from some very non arbitrary taxonomies of how do we understand how a complex system self-organize is how the self-organization breaks down, and can we create, models for looking at those factors that are necessary and hopefully sufficient, something like complete models and so with your mentioning stress, I think one of the things that I was fascinated by earliest regarding human health was placebo trials.

And there are some placebos where people feel better, but they don't actually get better. The underlying, pathophysiology doesn't change just their own sensorial process does.

So endogenous opiates or whatever. But there are some situations where the placebo actually makes people get better from at a statistically higher rate from some underlying physiologic things going on.

Meaning we can see changes in objective biomarkers. And this really fascinated me because I'm like genetically, the body has an imperative to survive.

That's its maximum imperative, right? Survive and reproduce. But survive is fundamental to that. There is nothing in the chemistry of that sugar pill that should have empowered the body to heal better.

Why is it if it's healing better after giving the sugar pill with the belief that means it was not healing to its maximum capacity before, what is that like?

Why would the body's genetic imperative to survive not be self optimizing? And there's a whole deep discussion of what's actually happening in placebo that's very interesting.

But kind of the main thing that was the first interesting insight there for me was that placebo is not equally effective across all audiences, and placebo is not the only thing that is effective of that kind. So, when someone has a placebo and it works.

They feel it works proportional to them believing in it. Which is why we've seen that larger pills and more colored pills. And if the injection is actually more painful, all those things actually increase the likelihood of the placebo because the people are believing a real thing is happening.

If they believe they're going to get better, there is a hopefulness that increases that hopefulness replaces some of the worry. That's their worry is the projection of a negative future.

Worry moves the person into a more sympathetic nervous system state. As they feel hopeful, they go into a more parasympathetic nervous system state. While the parasympathetic system is key for regulating the immune system, the digestive system, the detox detox systems all the way down to genetic transcription.

And so it's not that the person wasn't healing at maximum before, it's that they were healing at maximum with the fact, while being in a sympathetic state, which is dealing with the toxin of those kinds of stressful thought processes that are keeping this body from going into the kinds of neurologic states that are necessary for its own reparative systems to be optimized.

But then we got to see that you look at studies like Norman Cousins, where people just started laughing a lot, watching comedy, and their cancer got better, and they weren't believing they were going to get better, but they were feeling better.

So we get to see how the belief they were going to get better was actually just one way to get to the feeling better, which was the more parasympathetic state.

And then we see spontaneous remission stories where someone had cancer or whatever, they fell in love and got better. And we're like, oh, there's a there's a similar thing happening here, which is the body can heal a lot better when it is less sympathetic, more parasympathetic overall.

Well, there's a lot of psychological things that are keeping people in low grade sympathetic overtone that are affecting the system's regulatory capacities as a whole.

And so if we're not looking for that, if we're not paying attention to that, we're just we're just missing whole categories of what's going on. And in the same way, let's say that we're trying to help someone heal, and we aren't trying to figure out if their house has mold in it.

And maybe we see signs of inflammation in their body, and maybe we see signs of bio toxin, maybe whatever. And we're trying to deal with it, but we aren't looking at the environment they're in. Well, they're just never going to get better.

Let's say that we're not looking at do they live in a household with weird, codependent relational dynamics associated with food, where everybody in their household is obese and nobody exercises, and they actually don't have the willpower to change their behavioral pattern inside of that relational environment.

So if you don't actually change their relationships, their relationships are a primary cause of their illness, right? So the physical environment can be the social environment can be, their own internal stressors can be psychological stressors, including ones that they aren't even aware of meeting unresolved trauma from the past.

That is just created, chronic hypervigilance, right? And heaps of different categories of physiologic things like the fit, subclinical nutrient deficiency, subclinical excess of toxicity or pathogenicity.

So if we really want to be comprehensive in assessing what's going on for someone, gotta look at all of that, right? We have to look at all the different categories of what might be some clinically imbalance in their physiology and in their psychology, and then their social environment and in their physical environment.

And that's kind of like a minimum taxonomy to start to make sense of these things. And, in order to do that, the doctor has to spend a real chunk of time the patient.

And this is the tricky part, is that we don't have enough doctors who have the training to do that, and we just don't have enough doctors, period. Or a financial system where most people could pay for a doctor's time to be able to do that and have it make any sense.

But like, you just you can't run labs and all that, right? Like I can't run a quick lab on what the social environment that is, embedding someone in behavioral patterns or in stress patterns is like.

That takes time. Asking a lot of questions. You know, I find and I know you do, that by far, the number one most important diagnostic tool in the world is a comprehensive medical history.

And that takes in a very educated health care practitioner spending a lot of time. And you know, what exposures did you get and what injuries and what surgeries.

And when did your symptoms start. And trying to really piece that whole thing together and then running the labs and then contrasting the labs to that story and to their current symptom, a logic presentation and what makes it better and what makes it worse and seeing does this story make sense before we start treating.

And another component of that is doing the right things, but in the right order as well. So if we jump straight to treating Lyme disease or treating an infection when we haven't supported the immune system by getting rid of toxins and reducing stressors or balancing stressors, we haven't supported nutrients, then it's going to be really challenging, if not next to impossible, to get actual disease resolution.

To actually get rid of those microbes, to get rid of those bugs. If we don't have the system working with our antimicrobial agents, whether they're pharmaceutical or supplemental or whatever it is.

And so if we're jumping straight to our favorite diagnostic, like favorite diagnostic tool or favorite diagnosis as a

provider, again, like you mentioned, we're just missing this entire problem scape, right.

And that being as comprehensive as possible, we're doing a clinical trial on reversing Alzheimer's currently in my practice and what we see over and over is that the more comprehensive we can be, the faster the easier we get real results.

So putting all of it together is so essential. And yet, unfortunately, although it's common sense, it is not yet common practice. Order of operations is important.

And you know, like let's say the system, let's say there's a number of different factors going on. Maybe there's a couple heavy metals that are elevated, maybe there's just a handful of volatile organic compounds and environmental toxins that are elevated.

Maybe there's a handful of infections or some deficiencies.

Clinical Sequencing and Comprehensive Assessment

There's some structural issues. We don't have to treat every single one to the person to get better. Sometimes you just start to burden the system, and as you burden the system, the regulatory apparatus can handle the rest of the burden better.

Right. And so oftentimes you look at the whole thing and you start to say, what are the things that make most sense to address first? And as you address those you start to see increase.

The other things start to get better before you even treat them right. If I if I like, I might be looking at eight of those things that all have to go through the same detox pathways.

I start to address some of them, and those detox pathways become unburdened. They can deal with other ones better. Absolutely. And this is a great argument for prevention, right.

If we can address these things earlier, then the system has more resilience and we get much more resolution a lot quicker. And so when we stop the focus being so much on the diagnosis and the symptoms and more on the resilience of the system, and that becomes our metric, then we get at the outcomes are just so much better.

And it's hard to prove prevention. Right, because you don't have a disease that you're reversing. But my, my greatest hope is that our contribution to this space is that if we can show we can reverse Alzheimer's, we can convince more people that they can prevent it.

I believe strongly that Alzheimer's is optional. And if we can intervene when people are in their 30s and 40s, we can make that a rare disease. Yeah. The thing I was going to say there about sequences.

There are general rules of thumb of sequence, but their only general principles are never absolute. And so one has to be careful to not try to get too formulaic about it.

If you're looking at the GI system, you can say as a general trend, things that are upstream of the GI system will affect things that are downstream more because there's kind of a flow to it.

So if you have an infection in your mouth, maybe it's more likely that it'll create an infection in your stomach. If your stomach's not working well, you're going to have undigested stuff going into the small intestine.

So in general, the idea that you treat the front of this, the one directional flow channel before treating the end, that's a generally good principle, but it's not always true.

Sometimes you have to treat something in the appendix before anything else because it's really timely. Sometimes, there is something that is acute enough in another part of the system that d burdening it, d burdens the whole

system.

And similarly, like it generally makes sense to treat the mucosal immune system before trying to treat the blood, because otherwise you just if the mucosal immune system is imbalanced, you have leaky tight junctions.

You'll just keep getting stuff dumping into the blood. But sometimes there's something in the blood that is actually down regulating the immune sites ability to produce secretary immunoglobulins in the mucosal system.

And you actually have to deal with that first. So it's valuable to have as practitioners these general rules of thumb. But really you have to take each case uniquely, and then you have to really pay attention to what is working and what's not.

And you have to not get married to your favorite hypothesis, where then, even if the person isn't getting good results, you just say it needs patients, or you explain the bad symptoms as a healing crisis.

Maybe it's a healing crisis. Maybe you're doing the wrong thing. And so there has to be like very much like Bruce Lee discussed with GQ. No, there's a formless form where you don't get attached to there's one particular form.

It's like, what is the right move next? And that's what real mastery looks like, is I don't know ahead of time what the right move next is. What I'm going to do is look at all the factors.

I'm going to have a model that helps inform all the things I can consider, but then it's the entirety of clinical experience and judgment and discernment that is going to inform that and then really paying attention.

And the thing that I would say is it's like, damn, that's kind of like difficult and hard to automate and expensive right now for people. And that's true.

And there's a lot of things that we think of as incurable that are really only incurable because they're hard. Like it just takes work and it takes a lot of assessment and but I think the fact that we can see people getting better pretty regularly with a lot of these things means it's not incurable.

And the people who are going through that work now are helping to prove. With an enough statistic that these things are curable, that that starts to motivate economies of scale to catch up, right?

To start to motivate changes in medical model and medical research writ large, and better diagnostic methods that can bring the cost of diagnostics down.

It can train more doctors up and change the nature of medical school. So everybody who is taking the time to work on it now, one should feel really lucky that they're at a time where there are any doctors that have better solutions, because ten years ago, that wouldn't have been the case for 20 years ago that wouldn't have been the case.

And it should also feel like they are beyond just helping themselves and their family member, helping to contribute to a change of paradigm that will make this easier and more accessible for a lot of people in the future.

It is an exciting time because I do believe that we are. We are changing the paradigm and when you talk about the cost and expense of this at a societal level, we cannot afford for as many people to have Alzheimer's as are about to.

And not just it's going to, frankly, bankrupt Medicare, but also we're squandering this extremely valuable resource by putting our seniors in assisted living facilities where they're parked in front of TVs and fed cake and cookies and visited by loved ones.

You know, the statistics is is the average is once every six months. It's not even every Sunday. It's every six months. And of course with Covid it's been even worse.

However, you know that is optional. Again, like this. It doesn't. We can do better than that. Society can be better. We can bring these people back into society where they can contribute if they want.

They can continue to work. They can, you know, add value to their families. They can care for young children, they can be engaged, and they can pass on the wisdom and experience that they have accumulated over a lifetime and give that back.

And the fact that, you know, forget the dollars, the fact that right now we're squandering that resource. I think that is more expensive than we can afford, right.

And putting investing a little bit, you know, it ends up being that we're doing this in the clinic. So for someone with diagnosed dementia, it's about $25,000 to take them through this process.

We can put a number on it now and that will get you, usually some reversal. And if if we can do that for at scale, this will save Medicare money. This will save people.

The money they're going to pay to is, you know, a subpar memory care facility. It will save the heartbreak of this very long and awful disease, called Alzheimer's.

And so I am so grateful to you for inspiring me to take on these really challenging problems, things like Alzheimer's and brain degeneration and to find solutions not only for this bed, but for medicine in general.

Now, Alzheimer's is so interesting at a societal level, too, just to just continue with where you were going. Such a high percentage of people that are experiencing some form of cognitive decline that is significant as a part of their aging right now, and increasing to where most young and middle aged people can forecast cognitive decline, dementia and Alzheimer's as, the end of their life.

And I think it's hard not to fall in to nihilism if you actually think about that.

Alzheimer's Prevention, Cost, and Social Impact

When people stop having something to look forward to, they have to go into disconnecting and numbing out. And so then then like the only response to nihilism other than suicide ends up being hedonism, right?

Because there's nothing to look forward to than fucking go for it. Enjoy what you can. And then that ends up being a self-fulfilling prophecy that drives the addiction cycles and the whatever.

The pattern of leading to that happening later. And I really do think it is not, a necessary outcome. And so I think it's important that people can actually look forward to their older years being good and meaningful and not lonely ones and not useless ones.

I think when you look at the evolutionary history of humans, the old people in the kids being in connection was the center of a tribe that was about intergenerational knowledge and wisdom transfer.

And the middle age people were really just supporting that process. And right now, our kids are mostly lonely, farmed out to daycares and schools where you have the least number of middle aged people, necessarily 1 to 30 or whatever it is paid the least amount of money to tend to them without actually really caring in the same way that an invested person would.

And then as soon as the person is no longer a money generator again, we want the least number of middle aged people necessary to tend to them in the cheapest way possible.

And that's just a completely fucking broken civilization values. Broken civilization. It's so interesting how just reconnecting the kids and the old people instantly increases the health of both.

And so much of childhood psychiatric issues are gone. If the kids just actually have someone who cares about them and so much. I mean, Alzheimer's is not just a meaning issue.

There's other things going on, but it's amazing how much of it is affected by meaning and connection, that when someone feels that they have people that need them and something that counts on them, how much more motivation to keep the system capable and upregulated?

There is? So yeah, I mean, I just when you told me you wanted to start focusing on this and prototyping a, a type of clinic that could show a model that could start to get replicated.

It is just such a humongous, important thing to do. And the fact that the model is starting to have the success that it is already so early is amazing.

It's important work and very meaningful. And, you know, I am looking forward to aging as your friend so that we can continue to, to do this work. And I really you my biggest goal is that if if I think if we can influence one family and one family can avoid the catastrophe that is the development of Alzheimer's, that we've been successful.

And if we can do that at scale, then we're really making some progress. And I think that the generations after us can, can avoid this and, and live more full, more meaningful, more connected lives.

And I'm looking forward to that and looking forward to seeing the benefits of this information getting out. And really excited to dive even deeper with our next summit attendees and and interviewees over the next few days.

Daniel, thank you so, so, so much. I love to hear some parting thoughts for our guests and also learn a little bit more about the consultants project and where people can find out about your current work.

There's just a psychological thing I'd like to say. I'm sure this will be said other places around the course, but when we're learning how we might be able to influence things we didn't think we could influence, there's an empowerment that comes with that that's beautiful.

The unhealthy psychological way to hold that is, some kind of blame. Like, if I have Alzheimer's, I did wrong things, or if my family member has Alzheimer's, the doctors didn't treat them properly or we didn't do the right things for them or and but nobody knew these things.

Right. So it's important to say like we're coming to understand stuff we didn't understand. As a result, new capacities are starting to come online, which is awesome.

If your family member died of Alzheimer's and you didn't have access to these capacities and you're like, fuck, why didn't I know about this earlier? Why did medicine get there? Like, that's just sad.

There's not nothing else that really can be said, and there's realistic grief to that. But this is where, like, we are actually evolving in our knowledge as a as a species, as a people where certain kinds of suffering don't have to keep happening.

And we're nowhere close to being able to say anyone with Alzheimer's at any stage. It can be cured. That's not true. We don't know. It's very, very early, but it is promising that more can be done than we thought.

And for people to have as much commitment and as much of an empowered perspective as they can to be part of helping to advance, to utilize the best of the knowledge it's there and and support the people who are doing the research to advance that knowledge is super important.

So tell us more about the consultants project. It's a big jump of topics, but, well, I know that you've inspired people. You've educated, inspired people, and a lot of everyone here who's listening.

I know you've opened their minds in a way that probably hasn't happened before or hasn't in a long time. You are a

thinker like Leonardo da Vinci and and, you know, like so many not not that many, actually like a, a handful of really big thinkers before you take these complex ideas and really can create change out of them, things that I, I imagine will change the world.

And I when I'm sure people are inspired to learn more about your projects and what other places you are applying this idea, these ideas to, and the Can Salience project is the current one.

The Consultants Project and Collective Sensemaking

It's funny how if I'm thinking about it in the context of our current conversation, we can see how in Alzheimer's there's a decrease in the coherency of cognition, and that if we look at the collective body of humanity, or even just the collective body of, say, a nation like the US today, there is a similar kind of decrease in the coherency of its collective understanding of what the nature of reality is and how to move forward.

I like to say that the US has Alzheimer's is kind of an interesting way of thinking about it, because is Covid a hoax? Is it manmade? Was it did it have a zoonotic origin?

Does hydroxychloroquine help? Is the vaccine the right approach? Like we can see that there is fervent disagreement on the most fundamental and consequential base realities climate change, systemic racism, Second Amendment, anything.

Right. We then think people safer or less safe and just right down the line, fervent disagreement on everything. So how did those people self-organize to be able to make coordinated choices together?

The idea of what a democracy is, that we can make sense of the world. We can identify what we all value and make the coherent best choices and areas we in affect each other. Well, we can see that we can't, right?

Like we're as a society, we put all this energy into fighting every four years for who gets in. Whoever gets in spends the time undoing whatever was done in the last four years.

Nobody works on anything that has a longer than four year timeline because it won't get them reelected. So there's no long term planning, and almost all the energy of the system is wasted as heat in just terms of infighting.

Meanwhile, somewhere that doesn't have those coordination challenges, it doesn't have term limits, and two parties competing against each other, like China, can put together a 100 year plan and build high speed rail.

All around the world. In the time that we haven't built a single high speed train, even in our own country. And so we're like, oh, at the level of the collective, there is a decoherence and a breakdown that is affecting the environment, social well-being, everything.

So how do we create health at the level of the societal body? Right. How do we reverse the pathologies there? And you can seek a cancer or an autoimmune disease.

Autoimmune disease is where some of the cells in the body end up turning against other ones because they get confused. They're immune differentiation.

To be able to recognize foreign versus not foreign is off. Right. And cancer similarly is where there is a base kind of genetic change where some of the cells pursuing their own self-interest are doing it in a way that is no longer aligned with the the image of the well-being of a whole.

And what's so interesting is, as the cancer is proliferating, it's also in the process of committing suicide, because as soon as it kills the host, it all of it dies.

So it's pursuing short term interest, which is its own more rapid proliferation at its own long term expense. Those metaphors are actually pretty apt for what's happening to civilization as a whole.

And so how do we similarly do a multifactorial analysis of what it is that's causing that? How and how we reverse those things to create a healthier society?

That's those are the topics where most of my attention is and the consultants project is an attempt to see can we upgrade public sense making, meaning that everybody can make sense of reality better on their own, rather than just adopt whatever their in-group or the authority they are used to deferring to says is true.

And can they come to understand their own values and understand other people's values better? To be able to say, what are all the values that matter? Can we create a proposition that meets all of these values, as opposed to will pursue our values at the expense of yours, and stay stuck in cultural arms races?

So can we improve our collective, individual and collective sense making and meaning making enough that we can improve our choice, making enough that we can actually, coordinate effectively to be able to apply the more powerful technologies we have to rather than ruin the world, actually create a, desirable functional world that that's roughly the topics that we're working on.

So if somebody wants to go check it out, it's in the very, very early stages. Be the stages. But that's that's the gist. Thank you for sharing that. You have inspired me more than anyone else to take on these big, hard, challenging problems and somebody needs to.

So I am so grateful to you for being here, and I am sure you have inspired more people to do the hard work that it takes to create not only healthier individuals, but a healthier society.

Whether that means contributing a little bit more with raising the young ones, or reading a little bit more about the consultants project and potentially even donating.

So Daniel, thank you so, so, so much for your time. You are very busy and I am so grateful to you for your friendship and for being here today to share your insights.

Thank you for having me here. For.