

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

Recorded September 2019. [Listen to it here.](#)

- ANNOUNCER: 00:04 [music] Welcome to this Kessler Foundation podcast. The foundation is a global leader in rehabilitation research that seeks to improve cognition, mobility, and long-term outcomes, including employment, for people with neurological disabilities caused by diseases and injuries of the brain and spinal cord. In this episode, we are talking with Dr. Trevor Dyson-Hudson. He is the director of the Center for Spinal Cord Injury Research and the Center for Outcomes and Assessment Research at Kessler Foundation. He spoke with Rob Gerth, the foundation's communications director.
- ROB GERTH: 00:40 I need to start right here, which is you started all this for me. So when I first got here - I don't know if you remember this or not - I visited you in your office, and we talked about a particular study that you're working on having to do with shoulders and knees. It's really two different studies. And you talked to me for like an hour and a half [laughter], and it was great. And I was like, "Ah, I should've recorded this. This is a show." So since then, I've interviewed a bunch of folks and have finally gotten back to you. So now we can finally have our show that we were planning to have. So here's where I want to start then. So you're an M.D. here in a world of mostly PhD's at the Kessler Foundation. How does that change your perspective, being an M.D.?
- TREVOR DYSON-HUDSON: 01:24 Oh, I think my training is from the clinical perspective. So I'm looking at the individual and the medical conditions, or whatever conditions, that they're facing and how research may impact that, whether these are ways to treat a medical complication associated with the condition. So prior to my injury, I was interested in research. I was an M.D., but I wanted to be an M.D. who also did research because I saw the importance of doing research. My grandfather was a researcher. My parents were researchers.
- GERTH: 02:14 Oh, really? What kind of researchers were they?
- DYSON-HUDSON: 02:16 Well, my grandfather used to be director of Cold Spring Harbor Molecular Biology Lab back, oh, during World War II. In fact, he was one of the pioneers in penicillin production, so kind of the earliest stages of molecular biology, so to speak, and even the concept of resilience. So antibiotics were just kind of coming into their own at that point. But there's one thing about producing it in small quantities in a lab and another thing producing it in mass quantities to be supplied to newly-injured soldiers who are fighting in World War II. And so that was one of his areas of research, but then during the course of that time also is the concept of bacteria becoming resilient to these things. So he was director during kind of the transition when Cold Spring Harbor Laboratory was not Cold Spring Harbor Laboratory. It had a separate name. And I really should know the history of this. I've read it so many times, and my mom's drilled it into me. So he was a molecular biologist. My mom started in that area but then, actually when she met my father in England, transitioned to cultural anthropology. But she approached it from a biological anthropology point of view, bringing in the biology of anthropology. And so they were researchers, so I kind of grew up in that type of household, university academia, but at the same time, doing field research. They did their field research in East Africa.

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

- GERTH: 04:17 Did you go? Did they take you?
- DYSON-HUDSON: 04:18 Yeah.
- GERTH: 04:19 Wow.
- DYSON-HUDSON: 04:20 My brother and sister, who are older than me, grew up in the Sudan, and then parts of Uganda. And then when I was born, we were in the States. And then luckily for me, my teenage years, I got to spend some time, went to school, in Kenya--
- GERTH: 04:40 Wow.
- DYSON-HUDSON: 04:41 --which is actually where I learned how to play rugby. And I loved rugby. I played in high school. I played for a club, and I played for the under-21 national team. So I really loved the sport, and when I came back, it inspired/drove me to want to play rugby in college, too. And it was something that I continued to play in medical school, and that's how I had my spinal cord injury.
- GERTH: 05:11 Right. For people that don't know you, you are a spinal cord [crosstalk].
- DYSON-HUDSON: 05:13 Yeah. Back in 1992, I sustained a spinal cord injury playing rugby. I tackled somebody the wrong way, broke my neck. And it was cervical level, so C6, C7, complete, for those who know what that means, meaning I have no sensation or motor function below the level of my injury. And that, of course, drastically changed my life, so.
- GERTH: 05:46 Yeah. And we'll get into that a little bit if you don't mind, but let me go back to your parents there for a second. So when you started out, how did you get on the path to be a doctor [crosstalk]--?
- DYSON-HUDSON: 05:59 Well, it was interesting because actually, I wanted to do marine biology. So I went to UC Santa Barbara. I think I was midway through my sophomore year there. I was kind of just not feeling all that focused. And I had no interest in going to medical school really, even though I was taking the same classes as premed, so just kind of like, "I'm not one of them [laughter]." And so I was kind of feeling lost, and I wasn't quite feeling like I wanted to-- this concept of going to school and going and getting more degrees and all that.
- DYSON-HUDSON: 06:44 And so I did an Intro to Clinical Medicine class, which part of it was teaching you how to do taping for the athletic teams and things like that. And so I really enjoyed that, and so I was working in the medical clinic doing taping for the teams and started to become interested in the sports medicine idea of things, so became interested in maybe going to PT school. And so I thought that was really interesting, and then my dad was like, "Well, what about medical school?" And I'm like, "I'm not smart enough to go to medical school [laughter]." And he said, "Oh, you never know unless you try." And so I was like, "Yeah." So then I took the MCATs, and I did very well. I mean, because my grades in college weren't that great. They really weren't. I mean, I did well enough, but - yeah - I wasn't 4.0, anywhere near that. But I did well in the MCATs. So then I started thinking about it. So after I graduated from college, I took the MCATs to see how I would compare to other people applying, and then I decided to take a couple years off to work and apply to medical school. And so I think that was

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

one of the best things I ever did because it allowed me to step away from going to school, do some work, just kind of relax, finally have a little money, for what it was.

GERTH: 08:34 What kind of work did you do?

DYSON-HUDSON: 08:35 And that was the great thing. That really helped me, I think a lot, get into medical school. I was in Upstate. So I moved back to Upstate New York, which is where I'm from. So I worked in a molecular biology lab with Dr. Ray Wu. I just answered an ad in The Cornell Times. I originally had intended to take a year off while I applied for medical school. And he really wanted a research assistant who would take two years off because he found that it takes six months to really train somebody, and he doesn't then want them leaving after six months. So I said, "You know what? That fits in with my plans," because I really had no plans. And it actually took a lot of pressure off me because in only taking a year off, I would have to be applying for medical schools right away.

GERTH: 09:40 Yeah. [Right away?].

DYSON-HUDSON: 09:41 So it really helped to take pressure off me. I relaxed. I bought a dog [laughter]. I just did all these things that you could do when you have more of a normal working life. And so I worked for two years with him, and that was a fantastic experience. He was actually one of the first people to sequence DNA, but one of the most humble people I had met. He was from China and did a lot of collaborating with Taiwan, and actually was very instrumental in setting up their molecular biology program. But he had a large lab. So it was mostly graduate students and post-docs and visiting scientists. So there was about 20 people in his lab. And so I was kind of the lab coordinator, so I was the scut monkey. I did all the work, but it was great because he had a lot of grants. I was the one responsible for ordering supplies, for doing all those things. And he would come and say, "I have this mountain of money, and we need to spend it by this time. Go and buy stuff for the lab [laughter]." So it was nice. We always had plenty of stuff and the latest equipment because, because of his reputation, companies were reaching out to him to try new technology.

DYSON-HUDSON: 11:19 So one of the earliest ones, which was interesting, was this concept - it had just been published in Science Magazine - of polymerase chain reaction, this way of taking small amounts of DNA and replicating it so you have more, so PCR. And initially, it had been done in a lab, and this company had developed a machine that would do it faster. So we got it, and he wanted us to try it out. But if you think about it now, with all the crime stories and all this of where they find DNA samples, PCR analysis is a way that we take small amounts of DNA and amplify it to be able to identify potential criminals or these other things. So it's really become mainstay in a lot of things we do.

GERTH: 12:14 Wow.

DYSON-HUDSON: 12:15 But it was learning all these techniques. The thing that was nice was he was working with rice, so molecular biology, transforming, making rice resistant to diseases, things now that are actually quite controversial, but at the time seemed-- you want them to be disease resistant. You want them--

GERTH: 12:45 Like genetically modified food. Is that really kind of what you--?

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

- DYSON-HUDSON: 12:46 Yeah. It's basically - yeah - genetically modified food, which at its basis is a great idea because rice is lacking certain vitamins, or resistance to certain fungus or other things. And so if you can create these types of rices that grow in conditions, then you can address hunger in certain areas, or address malnutrition because they're lacking certain vital nutrients, by transforming this, by genetically modifying it.
- GERTH: 13:21 So you were part of that. You were at the beginning of this.
- DYSON-HUDSON: 13:23 I was beginning at the whole GMO thing.
- GERTH: 13:26 Yeah. Wow.
- DYSON-HUDSON: 13:26 And in fact, many of the graduate students-- I mean, the place to go work was Monsanto, which is now a lot in the news for negative reasons, but I think it all started with the idea of improving our crops.
- GERTH: 13:42 And how did all this get you to med school [then?]?
- DYSON-HUDSON: 13:44 Well, I mean, my clear interest was medical school, and this was just giving me kind of a lab background and an intro to molecular biology. All these techniques would apply to medical school. So I think the fact that I did well on my MCATs and he wrote me a very good letter of recommendation--
- GERTH: 14:08 Not a bad letter to have from--
- DYSON-HUDSON: 14:09 Not a bad letter. And also, I think medical schools were very interested in students who were interested in research because it was just when genetics, molecular biology was really starting to take off, I mean, some of the early debates of HIV and AIDS, during that time, a science article point/counter point. "HIV causes AIDS/HIV doesn't cause AIDS." Now we do know that HIV is the virus that causes AIDS. But it was just kind of this early stage of learning all this. And so I became very interested in medical school. I did volunteer work at the local hospitals in the emergency room, and this was a job that gave me practical skills that could then be applied if I wanted to do molecular research on the human level while I'm in medical school, so.
- GERTH: 15:20 Wow. So you ended up at Albert Einstein in the Bronx.
- DYSON-HUDSON: 15:23 Yeah. And that's one of the things that I really liked about Albert Einstein. So it had a very strong research background. I mean, it was a strong research program there. I had contemplated whether I would want to do an M.D. PhD or some M.D. kind of combination thing eventually or later on. But really at my truest heart, I guess, growing up as a kid, I always wanted to be Hawkeye Pierce [laughter]. So I love trauma, and I loved emergency room stuff. So one of the reasons why I really liked Einstein was that it was in the Bronx. It was a Level 1 trauma center, had a very active emergency room. I'm from Upstate New York, so I grew up in a town of about 1,200 people. The Bronx was just this crazy place for me. And what I liked about Einstein was, if you've ever been there, it's over by Orchard Beach, and there's a lot of green and parks in the Bronx. And so on paper, you look at the Bronx, and it's got a bad reputation. Especially growing up during the '70s and going out to Long Island to see family, you drive across the South Bronx, and you'd see these burned-down neighborhoods. So it had a negative connotation. But when you actually go there,

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

there's all these green parks in certain areas. And since I had my dog, I went there-- actually, when I went for my interview, I went there, and I saw people riding horses--

GERTH: 17:15

Wow.

DYSON-HUDSON: 17:16

--because on Pelham Parkway, there's a green splotch with a horse path. There's a huge park out towards Orchard Beach that has stables. So it was like, "Wow." Here's a place that's almost like the country in the Bronx where I can look at trauma and ER kind of things.

GERTH: 17:45

Yeah. Stuff you love. So you got injured in your third year there. When you were injured, was it a help or a hindrance to have all this medical knowledge?

DYSON-HUDSON: 17:57

Well, yeah. No. I think - yeah - at times, it was a help. At times, it was a hindrance because I'd be going through my mind all of the things that I could be having. But, I mean, it helped me understand it. I think people sometimes assumed I knew more than I did and so wouldn't necessarily explain things. But I think it helped me in many ways because I was a member of the club, so to speak. I was part of the tribe.

GERTH: 18:31

Because you were a doctor in training.

DYSON-HUDSON: 18:31

Well, I was a medical student, but people are like, "Oh. Wow. There but for the grace of God go I. Here's a person who--" and it's not some exclusionary thing. It's more of just common interests. We speak the same language. I often will use that term part of the same tribe because if you're in a wheelchair, you're kind of part of a tribe, a group, a brotherhood, or a sisterhood. I mean, not that we all have the same experiences, but there are some shared experiences. And so those similarities can bridge gaps, I guess.

GERTH: 19:15

And how do you think now? These many years later, did it-- well, so when you first dealt with your injury, did that change your trajectory as far as what you thought you wanted to do?

DYSON-HUDSON: 19:29

So I guess going back to a couple of things, so even having some medical knowledge, I knew nothing about spinal cord injury. So it certainly did not prepare me for having an injury. I had had rotation in rehabilitation prior to my injury and had had patients with spinal cord injury. So as a medical student, you follow certain patients, and I remember making note of things that they were able to achieve, like transferring from their bed into a wheelchair and back, and whether they could do that independently or not. But the significance of that never occurred to me. And then I'm lying there completely paralyzed in bed, and at first, I couldn't even move my arms. I couldn't even scratch my nose. I make this joke-- and you can cut this out, but you know who your friends are when they'll pick your nose for you [laughter]. You think about the simple things that you cannot do with your hands, and it's like you're sitting there and you can't breathe-- or even scratching your nose. And it's trying to do these simple things, and I couldn't do it.

DYSON-HUDSON: 20:49

But I knew nothing about spinal cord injury, and I suddenly felt so alone and so unprepared and very scared and overwhelmed. So even though I had this medical background, nothing prepares you for a spinal cord injury. And I think you could count

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

the number of diagnoses on your hand that you don't want to hear - "You have cancer," or, "You're paralyzed," or, "Your loved one's paralyzed" - because they have such negative kind of gloom-and-doom connotations to them. So suddenly to be in that and just so overwhelmed-- so yeah. So it certainly changed my trajectory because I had gone from interested in orthopedics-- so given my sports background and that interest, orthopedics was a big interest. Trauma was a potential because I'm kind of an immediate-gratification person.

GERTH: 22:11

The excitement of that. Yeah.

DYSON-HUDSON: 22:12

Yeah. Like somebody comes in bleeding, and you fix it versus-- I appreciated psychiatry so much, and I did well in that rotation. But to feel like when somebody comes in and sees me and I can't fix them by the time they leave [laughter] was just kind of overwhelming. I mean, I'm kind of short sighted. Somebody who is having panic attacks, and I can't-- so for selfish reasons, whatever, I just wanted to be able to fix them like that. And so trauma and orthopedics just drew me, surgical-type things. So I wanted to do something surgical-- or pediatrics. I liked working with kids a lot.

GERTH: 23:02

So when did you decide?

DYSON-HUDSON: 23:03

So what happened was I had my injury. There was my limitations with my arms. And so the medical school, Einstein, was there all along the way. They were like, "Whatever we need to do, our goal is to help you graduate and potentially find a career that you can do." So initially, it was the specialties that required less arm function, like nuclear medicine, radiology, those kinds of things, I mean, potentially, psychiatry. I would joke that I could not do radiology. You cannot put me in a dark room and I will not fall asleep [laughter]. I could never do radiology. That was a torturous rotation for me.

DYSON-HUDSON: 23:59

So I was in the hospital for a number of weeks for my acute stay because they were having trouble stabilizing my spine, reducing it. So I eventually had the surgery to stabilize my spine, and then I was medically stable. I transferred to Mount Sinai to do my rehabilitation. And it was there that I met Dr. Kris Ragnarsson and Dr. Adam Stein. Dr. Kris Ragnarsson is one of these giants in the field of spinal cord injury rehabilitation. He has since retired. And then Dr. Stein was kind of a new doctor on his team, so had been with Dr. Ragnarsson for a year. So Dr. Stein was kind of my doctor, and then Dr. Ragnarsson was there every morning, checking in on me to see how I do, but so very invested in me and my case. And Dr. Ragnarsson was the one who spoke to me and said, "Well, have you ever thought about rehabilitation?" And at that point, I had never thought about it. And then he's the one who introduced me to the model systems. He was like, "Have you heard of the spinal cord injury model systems?" I'm, "I've never heard of this." And he gave me one of the first books, which was a compendium of all these articles written on the model systems.

GERTH: 25:45

And the model systems, just for people that don't know, is--

DYSON-HUDSON: 25:49

So spinal cord injury model systems, it's a model system of spinal cord injury care. And the idea is that they provide a continuum of care from time of injury to long-term follow-up. So it's a team approach to caring for an individual with spinal cord injury. And the idea evolved. It seems kind of obvious now, but back in the early days,

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

somebody would have a spinal cord injury. They would get treated surgically. They may then sit on the surgical floor for weeks, months, whatever, and not necessarily getting rehabilitation. They get pressure injuries. They have all kinds of medical complications. They finally get transferred to rehabilitation, and they have all these problems. And they've lost a lot of muscle and all these other things. And then people might be discharged in the community, and there's no organized follow-up.

DYSON-HUDSON: 26:55

And so the concept of a model system is if we can coordinate with EMS, emergency medical services, who pick up people with spinal cord injury, make sure they get delivered to a Level 1 trauma center because the Level 1 trauma center will have around-the-clock neurosurgery or orthopedic surgery on hand so that we can either stabilize or operate on these people as soon as possible. There are trained professionals who are familiar with these cases, who know how to handle them. These individuals get stabilized as soon as possible so that they can start rehabilitating as soon as possible and then transfer to a specialized center that knows rehabilitation for people with spinal cord injury, the equipment needs, with the goal of getting them back out in the community, functioning, integrated into the community. And then that rehabilitation center can function as a resource for those individuals because for right now, there is no cure for spinal cord injury. So there is this need for a continuum of care and long-term follow-up. People will have whatever associated problems they have and will need to come back for new wheelchairs or just medical follow-up. And people within the field of rehabilitation may know spinal cord injury better than other professionals would, so.

GERTH: 28:29

Sure. And so that introduction to the model system--

DYSON-HUDSON: 28:33

Really opened my eyes. So the model system is much more to me than just a data-collection thing. To me, the model system of care, it opened my eyes to that I wasn't alone. In fact, it was kind of one of those aha moments for me - I looked at these names; I looked at these articles, these centers that focused on care of people with spinal cord injury - that there are these individuals who were dedicated to caring for people like me.

GERTH: 29:08

And you're talking about centers across the country.

DYSON-HUDSON: 29:10

Centers across the country. So there are currently, I think, 14 spinal cord injury model systems across the country. And it's varied. Sometimes there're 16. Most recently, there's been 14. But these are specialized centers of excellence that care for people with spinal cord injury. And within these are individuals who collaborate, so there's communication. There's dedicated individuals who are working with me and my family to get me back out in the community, back to medical school, to follow up with me, to see what my needs were because, I mean, you spend your whole life learning how to be able-bodied, right? I mean, you don't suddenly become consciously aware that you're able-bodied. You've learned over time, right? You walk. You learn how to pee. You learn how to poop. You learn all these things - right? - and managing, having the ability to have control over them. And you do that over time, and you grow into that.

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

- DYSON-HUDSON: 30:25 And spinal cord injuries just happens in a matter of seconds, and you have to relearn everything. And how do you that? And so to have these individuals that are kind of there to help you along that path, and then also with that comes other people who've had spinal cord injury who can then act as a resource. That was a huge thing for me, too, meeting people with my-level injury because I could see what they were doing, because I couldn't imagine like how I could drive. So eventually, I started getting more arm function back. I was able to finally get up in a manual wheelchair. And in my brain, I was like, "If I get in a manual chair, I'm going to be doing marathons." And the first time I got in a manual chair, I couldn't even push it because--
- GERTH: 31:27 You couldn't push yourself.
- DYSON-HUDSON: 31:28 --it was just too hard. And I think - yeah - I even rolled into a wall and fell over because my balance was challenged. And I just sat there stuck, and I couldn't call for help because my voice wasn't strong enough.
- GERTH: 31:42 Oh, geez.
- DYSON-HUDSON: 31:42 And so over time, just working at it. But seeing individuals with levels of injury similar to me and them saying, "Just keep working at it," or watching them, how they do it, because that's how we learn sometimes. I mean, if you're really bright, you can figure it out on your own. I'm not so bright [laughter]. I have to watch other people or watch it on YouTube. But that really helped me transferring into a car, knowing there were these options, so. And I think that all came through being associated with a model system because there are these resources. And so the model systems are more than just collecting longitudinal data on outcomes of people with spinal cord injury and doing different research projects. They are a resource for people to provide the latest on research and addressing medical complications.
- GERTH: 32:49 So you went on and got your M.D. then.
- DYSON-HUDSON: 32:51 Yes. So I took a year off, did rehabilitation, went back to medical school. So I'd finished my third year of medical school. Actually, the timing of my injury was pretty good. I couldn't have probably timed it better. So I had that clinical experience of rotating through all my clinical rotations, which the way Einstein at the time organized their medical school was the third year-- so first two years were class based, with some intro to clinical medicine. Third year was all clinical rotations, so surgery, internal medicine, pediatrics, ob-gyn, rehab, all of these different things. And then fourth year was your elective year when you would start to do one-month or two-month or multiple-month rotations to see what you might want to specialize in, what you might want to do your residency in, or to take time off to do some research or do these different things. And so that was a year where I could explore nuclear medicine. I could explore radiology further, rehabilitation, and decide what is it I want to do my residency in. So I decided I wanted to do my residency in rehabilitation, and so I applied to different programs. So I looked at all the model centers across the country. And that's actually how I found out about Kessler--
- GERTH: 34:43 [crosstalk].

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

- DYSON-HUDSON: 34:43 --because I had never heard about Kessler.
- GERTH: 34:45 That was my next question. How did you end up here?
- DYSON-HUDSON: 34:46 Yeah. No. It's kind of the same way like in the Bronx. I was like, "The Bronx? Ugh [laughter]." I was like, "New Jersey? Oh, what's in New Jersey [laughter]?" So I said, "Well, they've got a model system here, so let me check it out." So I interviewed here, and that's when I met Dr. DeLisa, who is the chair of the department of Physical Medicine and Rehabilitation, [John Bok?], who is the vice chair, Dr. Kirshblum, and then Scott Nadler, who is a sports medicine fellow, and had interviews with them. And it was just the most amazing experience. One, Dr. DeLisa because he was such a giant and leader in the field of physical medicine and rehabilitation. Dr. [Bok?], who is this just amazing clinician, and we talked about everything but medicine, wine and music, and then Scott Nadler, Dr. Nadler, was just very much patient [oriented?], and then Dr. Kirshblum. And that was an amazing experience.
- DYSON-HUDSON: 36:03 And so I went to all the different programs across the country, and the thing I liked a lot about the Kessler program was Dr. DeLisa was very interested in research because he felt that research helped justify the clinical interventions that we provide, or the flip side actually is that - yeah - we need to justify why we do what we do. And so he was really a leader. All residents had to do a research project, which was kind of a novel concept at the time. And so to me, it was like, "I can do a residency. I can do research. I can do both." And so Kessler was one of my top choices. So luckily for me, I matched into the program, meaning they match their candidates, the candidates match them, and then they see how the numbers align. So I matched into Kessler, the, at the time, University of Medicine Dentistry of New Jersey, Department of PM&R program.
- DYSON-HUDSON: 37:21 But what you need to do before you do your residency is a one-year medical internship, just to give you general medical experience. So I decided to stay at Einstein and did my medical internship in a mix of pediatrics, internal medicine, and neurology. And that probably wasn't the best strategic move just because a lot of where I rotated through was an inner-city hospital, and there just aren't necessarily the same level of resources and support. And also in my mind, I was trying not to be disabled. So I was pushing myself way too hard and not taking good care of myself. I have a hard time asking people for help, and so I was trying to do things myself. And so I was pushing myself too hard. And so by the end of my internship, I had a bad pressure injury, a pressure sore, so I couldn't start my residency right away. And so Dr. Kirshblum was like, "That's fine," because at the time, he was the director of the residency program here with Dr. DeLisa. He's like, "That's fine. We'll just hold that spot, and then in a year, you'll start up your residency."
- GERTH: 38:56 Wow. That's great.
- DYSON-HUDSON: 38:57 So I was at Einstein, and at one point, he was like, "Well, during this time, this interim, maybe you can come to Kessler and do research," before I start my residency. So I teamed up with somebody who was, at the time, the director of complementary and alternative medicine. His name was Dr. Sam Shiflett. And they had a big NIH grant to look at complementary and alternative medicine in stroke and neurological disorders.

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

And so I was like, "Oh, a spinal cord injury, that's a neurological disorder." I was still kind of interested in sports medicine concept. I was starting to become interested in shoulder pain, overuse injuries in people with spinal cord injury. And so I was like, "How about an acupuncture study for shoulder injuries and spinal cord injury?" and he's like, "That would work." So he helped me put together an application to NIH for a fellowship for people with disabilities and from disparate backgrounds, a disparities fellowship, which helped to pay my salary, helped to actually cover a research assistant because of my disability. And so I started here, started doing research.

GERTH: 40:41

What year was that?

DYSON-HUDSON: 40:42

That was in 1997.

GERTH: 40:45

How do you think your spinal cord injury affects your perspective now? How does it--?

DYSON-HUDSON: 40:52

Yeah. No. I mean, I don't want to feel like I speak for everybody with a spinal cord injury.

GERTH: 41:01

No. Of course not. [Everybody's?] different.

DYSON-HUDSON: 41:03

Everybody's completely different. But having the injury definitely gives me an experience. I mean, aside from the paralysis that I experienced at the time of my injury, I immediately felt neuropathic pain. And that was almost, in some ways, more disconcerting to me than the paralysis because the paralysis was, "Oh, okay. That's because of my spinal cord injury. But what is this burning pain, and why won't it go away?" all of the strange feelings I had.

GERTH: 41:35

And people don't realize that there's other complications with spinal cord injury.

DYSON-HUDSON: 41:38

Absolutely.

GERTH: 41:38

Just list some of those for me just so--

DYSON-HUDSON: 41:40

Sure. So spinal cord injury can affect bowel function, bladder function. You can have neuropathic pain. It affects the ability to control one's blood pressure, so people can have very low blood pressure. They can often have extremes in high blood pressure in response to pain, a condition called autonomic dysreflexia, where the body is feeling the pain so is having a fight-or-flight response, but the brain can't counteract that. The brain may know better, but it can't tell the body to stop because the spinal cord injury prevents signals from the brain to get down to the level of where the signals are coming in from the pain. So there's overuse injuries. There're so many different medical complications. And for some individuals, these complications affect their lives more than the paralysis itself because paralysis affects their mobility, and if you give that person a wheelchair that fits them, they can become very independent. But if they're having problems with bowel or bladder function, if they're having bowel accidents or bladder accidents or urinary tract infections, these are things that keep them at home, that can send them back to the hospital.

DYSON-HUDSON: 43:24

And that's what interested me, was the secondary medical complications because you have this spinal cord injury, and with rehabilitation-- the thing with spinal cord injury is the injury happens, and then you move on with what you have. And you try to

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

regain as much function and become as independent as you can along the way, and you learn so much and you improve so much in many different ways, whether it just be in learning how to do things or some type of recovery. But you can still end up back in the hospital or back at home because of a bladder accident or because you have infections or pressure injuries. For me early on, pressure injuries, what people commonly call pressure sores, pressure ulcers-- they're changing the language all the time. They're now called pressure injuries.

GERTH: 44:24 Which comes from your weight being on a certain part of your body [crosstalk] be able to tell, like--

DYSON-HUDSON: 44:27 Exactly.

GERTH: 44:29 --I'll shift my body weight if I'm getting sore at a spot. And if you're spinal cord injured, you can't feel it, so you don't shift your weight. And eventually, it breaks down your skin.

DYSON-HUDSON: 44:38 Correct. And so what can happen is you've lost the muscle because the area's paralyzed. You can't feel this. So the bone is pressing against the skin, and you get damage. And then eventually, you get this break down, and unfortunately, there are no real easy treatments or cures. The best thing to do is to get the person off of the pressure sore, which means getting them in bed. But what can happen is if you're in bed and you're lying on your side or lying on your back, you are at risk for getting pressure injuries in other locations. So that actually happened to me while I was in medical school. I took off probably another six months while in medical school because during my sub-internship, I developed a really bad pressure injury. I tried to heal it up at home. It only resulted in two other pressure injuries. And that was that point that I went and saw a doctor finally, and the doctor yelled at me for being so stupid [laughter] and said, "You really need surgery. This is not going to heal on its own," and it was actually the best thing I ever did, was to have surgery for the pressure injuries. But, I mean, I was in the hospital for probably a month, and then the recovery after that and finally getting back to medical school after the pressure injury took time.

DYSON-HUDSON: 46:07 But those are the things that set you back in such a big way because you're ready to go on, and the last thing you want to do is end up back in a hospital. Or for a person who's fought so hard to regain function, to lose function later on in life because of overuse-- they start losing their arms. And they start functionally becoming quadriplegic. So if you take an individual with paraplegia and they're using a manual wheelchair and they're doing all these activities - they're racing; they're transferring into their SUV; they're leading a very active lifestyle - and they develop shoulder pain, and now they can't do these things. And--

GERTH: 46:59 Well, I was just going to say, so let's talk about that. Let's talk specifically about that. So I want to talk about your research for a minute. And I think, as I look through the research that you're doing, the research is about trying to help people rehabilitate themselves to become independent. Is that a fair thing to say?

DYSON-HUDSON: 47:14 Absolutely. I mean, that is our goal. It really is. I mean, if you look at the holistic model of how you would apply something to an individual with spinal cord injury, we used to

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

kind of think of the cure as being able to walk again. But really, what the cure is is trying to get that individual back to being as close to what they were before their injury, in whatever capacity that is.

GERTH: 47:52

Well, let's talk about shoulder injury because that's something you're right in the middle of doing. So I want to talk a little bit about your research, and that's one thing I know you're right in the middle of doing. So tell me about that research. Obviously, shoulder injury in everybody is a situation, but particularly in people with manual wheelchairs.

DYSON-HUDSON: 48:09

Correct. For people with paralysis, for many of them, their arms become their legs. They're using their arms to propel their wheelchair, to do transfers from the wheelchair to bed or some other surface and back into it, to their cars, all these things. And so it puts a lot of strain on the shoulders. So this is a problem for this population. And so it's looking at the ways of either preventing this from occurring or treating it when it happens. In an ideal world, you should be approaching both areas. So there's preventing shoulder overuse from happening, and then when people do have pain, treatments.

DYSON-HUDSON: 49:09

And so I initially started with kind of the treatment concept, so acupuncture. So people who had immediate pain-- or actually, chronic pain, so pain that they've had for three to six months and just were finding that typical analgesics weren't helping, things like ibuprofen, Tylenol, steroid shots. So I did a study looking at whether acupuncture could help these individuals, and [I?] found it to be effective for that. I then started to look at more of trying to understand the factors that contribute to it, so the biomechanics, so to speak, of shoulder pain, so wheelchair propulsion, transfers, those things, and understanding how maybe with better technology, by setting people up with the best wheelchair, this may help prevent shoulder overuse. And then again, teaching them how to properly use their wheelchair also, so making sure that they propel their wheelchair properly, that they're minimizing the risk of developing a repetitive strain injury because overuse injuries from wheelchair propulsion, it's really just a repetitive strain injury, like what you might see in a factory worker or something like that. And so it's looking at trying to prevent that. And then for those who have pain that's not going away, then looking at different types of treatment.

GERTH: 50:57

Yeah. And so tell me about the one that you're working on now where you [crosstalk].

DYSON-HUDSON: 50:59

So yeah. So there's been kind of this evolution in the last, I would say, 10 to 15 years of regenerative medicine and orthobiologics, so to speak, of somehow assisting the body in healing itself. So we had done an early study with platelet-rich plasma, which is when we take blood and isolate blood, spin it down to isolate the platelets - and platelets have growth factors - and you would inject that into a damaged tendon to hopefully help with healing. And this had gained a lot of notoriety in the lay press because back in-- I forget when it was, but Hines Ward had done platelet-rich plasma when he had had an injury when he was playing with the Steelers and they thought he wouldn't be able to play in the Super Bowl. He had this treatment, and he had this incredible recovery. So that cast a big spotlight on platelet-rich plasma. So I'd done a study with that early on with Dr. Gerry Malanga, who is a physiatrist who specializes

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

in sports medicine and pain. And so he was looking at various nonsurgical interventions to address musculoskeletal injuries in athletes and able-bodied people who had these types of injuries, whether it be overuse injuries or arthritis, or other things like that.

DYSON-HUDSON: 52:43 And so we had done the platelet-rich plasma study and had seen good results in some individuals. The next step was to do randomized controlled trials, so a bigger study. And it was at that point that he was starting to explore using micro-fragmented adipose tissue. So he was looking at different types of tissues, so looking at bone marrow, and adipose tissue was another tissue that was an area of interest because it's easy to access.

GERTH: 53:24 Because adipose tissue is fat, right?

DYSON-HUDSON: 53:26 The adipose tissue is fat. Yeah. And people have plenty of it.

GERTH: 53:29 Plenty of that. Yeah.

DYSON-HUDSON: 53:31 Yeah. No. No matter how skinny you are, you can usually find some fat on you. And it's really using cells from your own body. I mean, there are people using stem cells. There's a lot of different research being done in this area. But we were trying to use cells from people's own bodies. And so Dr. Malanga was looking at using adipose tissue because there is the thought that adipose tissue contains growth factors that may help with healing. And so he was looking at a particular technique of isolating, harvesting the fat, processing it, and breaking it down into smaller quantities, particles, clearing a lot of the excess oils and things that may be detrimental, and then injecting that back in, whether it's shoulder or the knee, to address either a tendon injury or arthritis or a meniscal tear, cartilage tears.

GERTH: 54:50 And the idea is it would rebuild itself.

DYSON-HUDSON: 54:53 Well, we're not quite sure what is happening. So at its basis, fat is a cushion. Some of us have more cushion than others. And so it provides a cushioning that in itself may perhaps relieve some of the pain. Does it heal the tendon? That's a tough one because I don't think studies have actually documented-- we may see some promising results in imaging, but actually showing rebuilding is very challenging. But what it may do is have growth factors that support the remaining tissue. And so if you have tired, old, and worn tissue, is there something about the adipose tissue that is somehow providing a nurturing environment so that what you still have will function? And it's very challenging because imaging on an MRI does not necessarily correspond to what people feel or function. And as Dr. Malanga will often say, it's not what we see on MRI. It's how the person feels and how they function.

GERTH: 56:24 And you've had good success with this, right?

DYSON-HUDSON: 56:26 Absolutely. We did a study using micro-fragmented adipose tissue to treat-- well, injecting that into manual wheelchair users with spinal cord injury who had rotator cuff disease, so tendon tears, chronic shoulder pain from rotator cuff disease. And so these individuals had chronic pain. So these were people who had pain for more than six months and had tried other therapies, conventional therapies like physical

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

therapy, steroid injections, medications, and they were still having shoulder pain. And usually in able-bodied people, if they don't respond to conservative treatment, then you start recommending surgery. And so that is what you would possibly do in a person with spinal cord injury, but for a person with spinal cord injury, having shoulder surgery can have a significant impact on their function and quality of life because they're dependent on their upper limbs. And so you have surgery on your arm. You shouldn't use it for however long that may be while you recover. And so that can have a profound impact on that individual. Psychologically, it can throw them into a deep depression because they are now very debilitated because they'd been so-- it's like almost having your spinal cord injury again.

GERTH: 58:16 Yeah. I can imagine. Speaking of things that you mentioned earlier, chronic pain was another thing that you mentioned earlier. And another study that your group is working on has to do with neurofeedback to combat chronic. Tell us a little bit about that.

DYSON-HUDSON: 58:30 So this is a study being led by Jeanne Zanca. We know there is a cognitive, psychological component to pain, right? Pain is very difficult because we often perceive it as a response to some painful stimulus, right? So you get poked and you feel it. But neuropathic pain is very different because the trigger's not obvious, but the brain is perceiving this pain. So how the brain responds to that pain and how the brain can influence that pain, you may be able to take advantage of that and use it, whether through meditation or some type of neurofeedback- or meditation-type therapy, help individuals at least come to terms with their pain, perceive it as just a stimulus. I use the analogy of - and I don't know if this is how people are, but - medical marijuana. People who use medical marijuana, they feel the pain, but they just don't care, right? It's there - it's a stimulus - but it doesn't bother them. And having neuropathic pain myself, I notice there are certainly times when it's more prominent than other times, and is it because I'm more fatigued so my brain is less capable of suppressing the stimulus and responding? So Dr. Jeanne Zanca is leading this study trying to use a real-time fMRI while people practice different methods of reducing their pain.

GERTH: 01:00:54 To find the best method or a good method?

DYSON-HUDSON:
01:00:57 To see if we can find a method, a way for people to reduce their pain, whether through using real-time fMRI or biofeedback, right? We use biofeedback in so many different ways, whether it be a sound or just a visual feedback, or whatever, to tell us we're doing the right thing. So for somebody who's meditating and can look at a real-time MRI and see an area of their brain which shows high activity when they have neuropathic pain and they can lessen the activity in their brain, that could really have a profound impact on that individual, for them trying to come up with ways to control their pain.

GERTH: 01:01:50 I just want to say, and some of that pain could be in a place on your body where you don't feel anything else.

DYSON-HUDSON:
01:01:56 And that's the thing that's really sometimes frustrating for people. I don't feel my toes, right? So my injury is complete, but it feels like my toes are burning. And it may

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

feel like my butt's burning and my legs are burning and my hands. So pretty much from below the level of my injury down, I feel a tingling sensation. And in some areas-

GERTH: 01:02:33

Tingling not in a good way.

DYSON-HUDSON:
01:02:34

Tingling not in a good way. Yeah. Yeah. The way able-bodied people can imagine neuropathic pain is when you fall asleep on your arm and that your arm has that weird kind of tingling feeling. Imagine that nonstop at a much higher level and that it's potentially there night and day. And no matter what you do, it doesn't go away. And why it's happening, you're not quite sure. And you feel it in areas which you can't normally feel. And so there's parts of you that are like, "Am I crazy?" And the answer is no because your brain is trying to make sense of stimuli that it's receiving. I mean, there're so many different theories to why this is happening. But I know certainly, if you think about the person with phantom limb pain, somebody who lost a leg, let's say, and they feel like they have this horrible pain in their feet, it's a type of neuropathic pain. Right after my injury, I would wake up. I was lying in a bed. I couldn't move. And I would tell the nurses, "My feet have flipped up over my head. Can you please lower them back down? I keep having these spasms that put my legs up over my head." And they were like, "Your feet are right there." But in my brain, they had flipped up over my head. And it felt so real and so uncomfortable, and my body felt so twisted from this happening. But they would look at me like I'm crazy [laughter].

DYSON-HUDSON:
01:04:32

And I think that's how a lot of people feel when they talk to doctors about their pain. It's like this imagined pain that you're feeling. And I think there are so many signals. Your brain is trying to make sense of all this because suddenly, it's not getting input, or it's getting a different kind of input. And it's used to processing things one way, and it's processing it another way now. And is that maladaptive change? Why do people develop neuropathic pain? Why do they feel it in their toes? It's just, as I said, the brain trying to make sense. I will say if I'm in my wheelchair and I tumble out of my wheelchair, I feel suddenly like, "I'm okay. My feet are down there," and I look, and my feet are not down where I thought they are. So I feel like my toes are burning, but if you take my toes and put them behind my head and I had my eyes closed, I'd still feel like they were sitting in my footrest because I don't feel them. But my brain is telling me my toes are down there, but it's only probably because I'm visually looking, and it knows that's where my toes should be. So it's the brain. And for people where it is, "Oh, it's in your mind. It's crazy," and all that, in truth, it is because why can one person tolerate being stabbed or shot and handle that pain in a different way than a different person who has the same type of injury? So it's very much a subjective experience, and the stimulus that you're receiving and how your brain is interpreting that and how you are responding to that all factor into that.

GERTH: 01:06:30

And does aging factor into that now, too, because I assume people with spinal cord injuries are living longer? So what is the complication of that?

DYSON-HUDSON:
01:06:42

We all are affected by aging, right? So able-bodied people are affected by aging. When you have a spinal cord injury, there are some models that show that it sets you off on an accelerated trajectory for aging. So for example, overuse injuries. So able-

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

bodied people develop rotator cuff injuries, arthritis, but usually later in life-- cardiovascular disease. People with spinal cord injury are prone to cardiovascular disease probably at an earlier age just because of the way their body metabolizes fat and other things. The automatic nervous system is disrupted, and how you metabolize things changes. And that can affect your risk for things that might affect older people. So certainly, fractures are a problem in people with spinal cord injury, from bone loss.

GERTH: 01:07:56

Because you're not standing on your bone.

DYSON-HUDSON:
01:07:59

You're not standing. And it's not even just standing. You've got to be actively moving. Simply standing doesn't help. Bone reacts to force, and so if you run, then that will give you stronger bone than if you walked, or weight lifting can increase bone density. But for people with spinal cord injury, they don't have muscles contracting, and so that's why Dr. Gail Forrest is looking at studies where you combine therapies. So you give them electrical stimulation to make the muscles contract against the bone. Even though that individual can't contract the bone, by making what muscle they have contract, you force the bone to remodel itself because bone is dynamic. It grows, so.

GERTH: 01:08:53

You talked about wheelchairs. Have you done studies on wheelchairs or improving wheelchairs?

DYSON-HUDSON:
01:08:59

Well, in the concept, not so much in design. But in the sense of I think the way we approach wheelchair prescription in the sense of--

GERTH: 01:09:11

Just to interrupt, because wheelchairs are prescribed, you don't just go pick one up at Kmart. You go to a doctor, and someone figures out what size, where your butt's going to be, where everything's going to be.

DYSON-HUDSON:
01:09:24

Absolutely.

GERTH: 01:09:25

Okay. I just want to make that clear to people.

DYSON-HUDSON:
01:09:25

Yeah. No. No. This is a device that helps a person get around that's their main source of mobility. And so for somebody who's using a manual wheelchair, you want to give them a custom-fit wheelchair that's adjusted perfectly to their body. You want it made from the lightest possible material because just changes in a few pounds can make a huge difference. And so we know that if a person's in the wrong type of wheelchair, they'll develop shoulder pain, and rather quickly, because pushing the standard wheelchair around all the time subjects the upper body to a lot of load. And that's tough. It's physically demanding.

GERTH: 01:10:22

Yeah. You're pushing around 120 to 200 pounds, depending on how much you weigh.

DYSON-HUDSON:
01:10:24

Yeah. So yeah. I mean, these larger chairs can weigh anywhere from 40, 50 pounds. Ultralight wheelchairs, I mean, they're getting the frames down to 12, 20 pounds. I mean, it's kind of drawing the same kind of ideas from the racing bikes, where people try to get really light. And people may think it's being a little ridiculous, like, "Really? Does half a pound make a big difference?" But speaking from my own personal experience, when I've sat in a wheelchair and pushed my own wheelchair that has a

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

component that's slightly heavier and I switch it out with a lighter component, I notice a difference. It really makes a big difference. So while I've not technically been involved with research, design, certainly education forms a cornerstone of the research we do. And that's where the clinical part comes into the ring when I'm seeing a participant for a study. If I see that they're in the worst possible chair and they're telling me, "I've got this chronic shoulder pain," I'm saying, "This is--"

GERTH: 01:11:46

"This is going to be easy."

DYSON-HUDSON:
01:11:47

Well, look. This is like, "You probably don't need to do my study [laughter]. If we get your chair addressed, your shoulder pain will go away, most likely. Let's do that first because you're pushing around a chair that's too heavy. It doesn't have the right types of wheels. And that's just putting this strain on your upper limbs." Just like a guy I screened who was complaining of-- this was way back with my acupuncture studies. He was complaining of shoulder pain, and I was asking him, "Well, when did it start?" and stuff, and he was like, "Yeah. Well, my car broke down, so I'm wheeling three miles one way to work and back every day [laughter]." And I'm like, "Get your car fixed. That'll help. I mean, if I enroll you in my study and you get your car fixed, you're going to get better. And I'm going to say it's from my study, but it's because your car got fixed." So I think it's so important, and I think these are the simple things that we can do. It's not rocket science. But it's very challenging because a custom-fit wheelchair is expensive. It can run around 5 to 7 thousand dollars.

GERTH: 01:13:17

I imagine socioeconomic strata has something to do with how people recover, right?

DYSON-HUDSON:
01:13:23

Oh, certainly. [inaudible] is looking at healthcare disparities in individuals with spinal cord injury, and so whether people from racially diverse or disparate backgrounds have less proved functional outcomes. And she certainly has seen that, that the functional outcomes in people who are Black or Hispanic may not be on the level of those who are non-Hispanic Whites. And there are so many different factors that can factor into that, but certainly, insurance can play a huge role. Well, and just because you have insurance doesn't mean the insurance company's going to be willing to cover your wheelchair or to cover a titanium chair versus an aluminum chair. And to them, a titanium chair seems like an extravagant purchase. Do you need state-of-the-art materials? But titanium helps dampen vibration. It's lighter than aluminum. It's a couple pounds, but for that individual who's pushing that chair all day and/or lifting that wheelchair into their car every day, that little weight makes a huge difference. So yeah.

GERTH: 01:15:01

What would say is the most exciting thing you're working on right now?

DYSON-HUDSON:
01:15:04

Ooh, boy. Well, there's a couple different areas. So I certainly think the micro-fragmented adipose tissue is a very exciting area, just to see the improvements that we've seen in some of the individuals. Not everybody improves, but there are certainly people who have had pretty remarkable improvements in pain and function, people that I would be skeptical would have improvement. So it ranges from the very active person, where it's kind of like, "You really shouldn't be doing that--" so what can happen is pain can limit people so that they don't do things they shouldn't be doing - right? - I should say. They may not do these crazy workout routines or wheel

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

three miles each way each day because they have shoulder pain. And that's a good thing because they are putting themselves at risk. And I find sometimes when I remove that pain, they go back to some of these behaviors.

GERTH: 01:16:19

The adverse behavior.

DYSON-HUDSON:
01:16:20

Yeah. So we have one gentleman who is just so active. But that's him. That's his quality of life, and that's what he wants to do. And I'm going to suggest maybe he doesn't push it so hard, but that's who he wants to be. So he still is pain free after almost two years, so coming up on two years. And then there was older woman who pushed a manual wheelchair. Her function was quite impaired, and her range of motion was limited and all these things. And one month, two month after the treatment, she still had pain, but she could lift her arm up over her head without it causing pain. So her function was much improved. And then later on, her pain became improved.

DYSON-HUDSON:
01:17:15

So I just think this is another tool in our toolbox. So I'm not saying this is the be-all to end-all for curing rotator cuff disease or regenerating tendons. I mean, we're doing MRIs of the tendon. But imaging is not an exact science, and so we're trying to understand that better, too, because as we were saying earlier, what we see on an MRI doesn't necessarily correlate with how people feel. There are plenty of MRIs that have been done in people without shoulder pain who have MRI tears. So they have a tear on MRI, but they have no shoulder pain. And then there are people who have pretty significant shoulder pain and you do an MRI, and it doesn't look that impressive. So they don't always correlate, and that goes across multiple conditions, so.

GERTH: 01:18:24

What do you think the next innovation's going to be? Where's it going to come from, like in the next 10 years or 20 years?

DYSON-HUDSON:
01:18:28

I think assistive technology is really the key. I mean, I think--

GERTH: 01:18:35

Are we talking like the Google Mini? Is that what we're talking, or--?

DYSON-HUDSON:
01:18:37

Well, I think it's across the board, so whether it be improvements in wheelchairs-- I mean, you take a power wheelchair, for example, and this chair can take somebody who has some of the most severe mobility impairments and give them mobility that they normally wouldn't have, that they can operate independently. They can tilt in space to do a pressure relief to prevent a pressure injury. They can stand up and look at somebody in eye level or assist with their transfer in and out of bed so that it makes it easier on their caregiver or their assistant. But this just gives them mobility, and they're back out in the community, and with the way it can interface with environmental controls within their home. They can't use their arms to operate switches or turn on TVs or operate a computer, but they can use their voice. And they can be just as plugged in and doing work and living a productive life as they were before their injury. And in many ways, it focuses your mind on trying to take advantage of technology.

Kessler Foundation Podcast Transcript: Trevor Dyson-Hudson on Spinal Cord Injury

- DYSON-HUDSON:
01:19:55
- And so part of that lends its way to exoskeletons, and then also neural stimulation. I just think these are all tools in our toolbox. We used to talk about the magic bullet, so is there going to be one thing that we take as a cure? And I think it's a series of things that are going to help people become more and more independent, whether that will be with bowel, bladder, pain, all these different things, because I go back to the one thing of some people may be, "Getting around in the wheelchair, I'm fine with the wheelchair. But the fact that I have bowel accidents or bladder accidents-- if I could do neural stimulation to be able to have better bowel function, that beats walking any day, or my pain." For me, I wish I could get rid of my neuropathic pain because it's there. It affects my work. It affects things on different levels. I have good days, bad days, but if I could eliminate my pain, that would be fantastic. And so it's hard to answer that question because I think there are so many different things that are working together. So, I mean, we talk about regenerative medicine. I hesitate to use the term stem cell because it's such a loaded term, but using the body to either heal or do something to address problems that we run into, technology to help us do things better, environmental controls, and neural stimulation I think are all very exciting.
- GERTH: 01:21:48
- Well, here's an easier question. It's my last question. What keeps you here at the Kessler Foundation?
- DYSON-HUDSON:
01:21:52
- Oh. Well, I mean, for me, it's personal. It's very interesting because I am a person with a spinal cord injury doing spinal cord injury research. And actually, it's very profound when I look at it because I'm a person with spinal cord injury who is actually director of a spinal cord injury model system, or a co-director with Dr. Kirshblum. And so it's kind of overwhelming at times, and so to actually-- one, I mean, the research interests me. But also, my personal experiences I'm able to share with other people with spinal cord injury because I drive. I work. I have a girlfriend. My life has gone on. And so for newly injured people to have that conversation with me, to say, "I feel like my toes are burning. Am I crazy?" It's like, "No. You're not crazy. And I know your doctor may say this imagined pain or whatever, and it's not imagined. Well, it is, but it's your brain telling you this." Well, I heard a really profound quote from a monk, or something like this was in a novel, and it was a monk woke up after having a dream about being a butterfly and then thought, "Or am I a butterfly dreaming about being a monk?" And you think about - what is it? - The Matrix and what is reality. So - yeah - it's all in our head, so.
- GERTH: 01:23:38
- I can't think of a better place to end it [laughter]. Thank you, Trevor. I appreciate it.
- DYSON-HUDSON:
01:23:42
- Oh, sure.
- ANNOUNCER: 01:23:43
- For more information about Kessler Foundation, go to KesslerFoundation.org. Follow us on Facebook, Twitter, and Instagram. Listen to us on Apple Podcasts, Spotify, SoundCloud, or wherever you get your podcasts.