## Introduction to diabetic foot ulcers

Hello. Welcome to another episode of reversing your Type 2 diabetes 2.0. And this is your co-host, Dr. Will Hsu. Today, we wanted to go to talk about a topic that's relevant and really relevant to our listeners, and that is about diabetic foot ulcers.

This is a critical question that I'm going to show you a few data points here before I introduce our host to our our guest today. Number one is that diabetic foot ulcers are the number one cause of lower extremity amputations.

That's number one. That's astounding number 2 people who have had diabetes for complications. They fear amputation more than they fear death. And, you know, and I'm sure some of our listeners can can identify with that and insert the most.

And fortunately, data is that the rate of amputations going up in this country, despite we have so many different drugs available to us. So today, I have the pleasure of introducing the audience or to our listeners, to one of my friends, Dr. Jon Bloom, who is a founder of a company called Podimetrics really a pioneer in this space of preventing split ulcers and amputations.

Jon, Welcome to the show. Thrilled to be here. Will excited to to be a part of the program.

## Jon Bloom's path from clinician to founder

Yeah. This is really a summit where there's going to be thousands of tens of thousands of listeners with Type 2 diabetes. And they they're pioneers. They want to know how they can do what they can do to help themselves.

Yes. They go to the doctors. They take the they use all kinds of standards of care. But they want to know more. They want to empower themselves. So tell us a little bit about your journey, because in some way, I kind of I kind of take after you.

I think we were both clinicians for decades. And then we we we came into industry, tried to help patients through a different means. So tell us a little bit about your journey, Jon.

Well, that's probably an eight hour and very, unentertaining part. The quick summary of it was originally I was just a musician and not a particularly great, but I was just thrilled to be part of the music scene and I would say what that meant was I was competing time between actually trying to get my undergrad degree in and at my lowest point there is some realizing that I'm ignoring very important parts of my life.

I took this, I came across I was trying to do a I came across seven Habits of highly Effective people. Talk a lot about building your mission statement and just thinking about what I really wanted in life.

I recognized that service and caring for others was was a huge piece that was in there that I hadn't really like. Anytime I got to spend time volunteering at all this meaning, but I really wasn't spending time there.

And so medicine seemed like a very exciting way to be so connected with a patient, a community, a family, and to try to have impact and was is also something really, really.

I also needed a kick in the in the pants to kind of get going so. So tell us what instrument did you play? Drums. The noise out of the possible and punk drums which means I was really no one likes it when you practice in the neighborhood.

No one. I was that pretty good friend there. But it was fun to do. And I kept it up, by the way, up and up and through

until about, you know, business school.

But I don't play much anymore, admittedly. So, yeah, I went to the University of Pittsburgh and got to help and be a part of building their tech infrastructure there.

As a student, I was starting to realize that I really like technology and uses of technology to make things better. And then came out to Boston to Mass General, which was this amazing place where all these clinician clinicians were trying to change the world through not just giving good care, but really trying to push the boundaries on, you know, through research or, you know, there's a ton of these types of centers.

But I was just so caught up in that ecosystem, you know, and by the time I graduated, this is now my anesthesiology residency. One of my attendings was the chief medical officer of it in and he hired me.

He goes, I'm like, this is a technical fellowship and technology development. Just just give me a year. You go right back into practice. And I went out to be his global medical director and that fascinating.

## Why diabetic foot ulcers are a major problem

That was the big introduction. I still practiced, but that introduction led me to think about not just caring for one patient at a time, but are there ways that we really can help communities and populations.

That really painted a picture, a very kind of a human story of how put a metrics so that how you learn from clinician to a founder of a technology company.

But let's get back to kind of the focus of the conversation here, right? So so out of all the technologies out there, right, for people with diabetes, why like focusing on diabetics.

Is two different ways you could do it. I'll I'll answer it this way. I remember sitting at a Covidien and we used to be like, Here's a cool laser. What can we do with it? Here's a cool mirror.

We can put this mirror anywhere. What can we do with it? As opposed to saying, what are the really big unmet problems and how do we solve this thing? Because often it's not sexy, fancy lasers that solve the big problems.

And in our case, as we were thinking about big problems, I mean, it leads a little bit like how we all came together. But diabetic foot was it was just interesting.

And I would spend whole days in the operating room doing nothing but amps. Amputations was just crazy that you'd see this yellow bear belt almost forgive the hyperbolic language is recognizing I'm being a little extreme, but almost like this, you know, endless schedule of patients losing limb for something that we if we just knew about it earlier, this was so unnecessary, a such high morbidity, mortality, you know, attached to it as that.

And I could tell other stories like what I saw in medical school. They kept wanting me to do this. But when the idea came up, could we start a company on this big problem?

It just seemed again, really hard. It seemed like it's a problem. It shouldn't exist anymore. Seems like it's a problem of silliness that could we figure out what it would take to solve that?

That was the hook. So I ended up dropping in full time to do it. This is such an important aspect. limb loss, foot ulcers, such a common problem, But it's highly preventable by certainly, you know, control of glucose drive, Type 2 diabetes remission can all help in that area.

But there's also the important task of early detection. A lot of people don't know they're at risk for for diabetics. Those are so. But tell us a little bit about your technology, Jon What we really is really so I by the way, I take this space like any clinician would as we think about it.

I went to the literature, started searching, looking well, had it, and I had a big monitoring background, both because of anesthesiology and then of course at Canadian, I was the medical doctor for there in that monitoring division.

So I think like, is there is there something you just knew about it early? Could we either encourage the good of it or or move away from the bad of it?

You remember occurring and I came in and I'm coming across some old literature. I've got it back in the 1960s that was noticing that that wounds cause wounds are that is the primary antecedent of an amputation and the wound starts off as as tissue breakdown.

And that temperature was this way that people were saying, okay well that's the inflammation. Skin is starting to break down. The body responds by bringing more blood flow to that region.

## How temperature monitoring detects early risk

We see a localized foot fever. I started finding more of these papers that the major problem had been and why it wasn't used really anywhere is that was extremely difficult to actually use it because of this usability gap is spite.

Three randomized controlled trials showing like it was like a 72% elimination of diabetic foot ulcers. It was nowhere. And so we that was the big riddle that that got us to dive into it.

So our listeners would be very interested to, to hear a little bit about kind of the past physiology, but also like how the technology can detect early foot ulcer.

Right? So you mentioned temperature. Can you just walk us through a little bit what is temperature has to do with diabetic foot ulcer? Well, it's that it's that that first phase of tissue breakdown, the inflammatory I'll call it the inflammatory phase, but it's when when when you're recruiting blood flow to the region of injury.

Now, from our research and I'll tell you about what it is, because I realized I didn't actually answer your question shown is at that inflammatory period on average precedes that our first notice of the wound by a little over five weeks, 37 days on average, that's the big jump and time to do something about it before the wound is going to present.

That's on average. So sometimes it's you only get it a couple of days. Sometimes it might have just already happened. You're actually just catching it very, very early or sometimes you might catch it, you know, a couple of months before it would otherwise occur.

But the way we do that, those we create a met. It goes into the patient's home. We ask them to step on it ideally once a day. And in capturing that thermal data across the entire foot, it allows us to essentially build this thermal model of their feet.

And we're looking for signs of early tissue breakdown, the inflammatory signal. And when we see it, we actually have a team of nurses that works with their provider to make sure that they're running all the necessary preventative protocols to prevent that from occurring.

So it's more than just detecting a fire, a heightened risk, but you actually have an interval pension where you have a protocol, you have a whole solution to to actually intervene so that the fluid also does not occur.

Is that right? That's exactly right. One of my my attendings actually the one who proposed me in committee, and it always tells me he's like, Jon, a monitor without an intervention is useless.

Has to be otherwise. Like, you're just you're just denoting here's a bad event. It has to be tied with a validated intervention of any value at all. And he nailed it.

And and that was the critical part. Don't just monitor for signs very cleanly and, you know, data driven ways to

address those those those signals. So they actually result in outcomes.

So so you just heard because initially I remember we we initially met I don't know how many years ago, but at MIT hackathon, I if my memory serves me right, where we were all competing to be right sort of what our brightest idea would be and see that can be commercialized.

I mean, I'm so glad to see that it's not only a diagnostic tool, but it's actually a solutions, right? You're presenting a solutions from early detection all the way to to prevention intervention, right.

And driving health outcomes. So without giving your secret sauce away, you know, we would love to I think our listeners would love to know was you know your at risk for diabetic foot ulcer.

What are the some of the things that they can do right to to to help prevent worsening or even reversing that information. There's a lot there's a lot that's there.

Certainly you need a doc you need a provider to be looking at your feet and actually take your shoes and socks off and get eyes on that foot. Which provider, let's get get could get kind of specific to that.

Well, is I think about access. You know, often it's your family practice provider right. It's it's whoever you have access to Hopefully they understand this responsibility and are getting eyes on their feet.

## Prevention, daily foot care, and provider support

However, for those who have access, a field of podiatry is just it is such a critical one in terms of partnering with this patient. And if they see changes, they know drop of a hat, how to take care of this, whether it's just medically, surgically, whatever's best for that patient.

So I found our best relationships are with whoever owns primary care. PCP is and this specialty and ability to get patients to the to the specialist. But I would say as we look into places like, you know, parts of Mississippi, we look parts in the south, access is a big challenge.

And we have to make sure that our systems work anywhere, not just in those that have good infrastructure. So so identifying the right physician, have the physician examined the fee, may be a family doctor, a specialized physician like podiatrist.

So that's one component, right? So what other things can somebody living with Type 2 diabetes do to help during this period? So, yeah, a good provider supports daily inspections of your own feet.

Absolutely critical. So many things contribute to a potential wound that could be ultimately result in your loss of limb and independence and potentially much worse.

And I ideally be mindful too. All these things are so critical. So it's many of the same, you know, educational education, so critical, understand the critical role of smoking and how it affects blood supply to your vessels, understanding all that it takes to have good glycemic control, all that it takes to understand, you know, the importance of the food that you get access to and the right way to do this.

You know, So there's still so, so critical. And then it'll be other things, too. There are systems like ours that can as I just think about our broader space, not just put a metrics that actually can keep an eye on you in addition to everything you're already doing to try to give you this extra Now data driven lens and that now we can tell you when to take extreme, you know, now, now like for example, in a period be extra vigilant like this is their moment of risk.

We can get you to this moment of risk. We can get you back to caring about all the other things that many of these patients have to really care for and a given.

So let's talk about data, because the data to to to our listeners and to to me as a as a physician really, really

matters. Right? So how are you collecting the data?

Is the data through your device? Is it captured through Wi-Fi or is it cellular or very specific? I was such a good question because in many ways it speaks to how we can try to eliminate gaps in access.

Yeah, in the beginning I think that big pressure because this guy was just starting to like launch into the stratosphere, everyone just figured you just have an app and it was right.

But a lot of our patients, you know, it had some, I'll say, tech literacy gaps that real understand how to use that as an interface and and have you know to really exchange what needs to happen I think was a major point of failure for for populations that we had to be universally caring for why if I was another one and I think of my poor dad, I use him as an example a lot when they come home.

Often he still has his VCR and it's often still blinking midnight like Dad, I just fix this the last time what's going on is like, I will either a power failure or who knows, he changed the cord.

But you know, for him to get organized to fix it, it was a failure point. So he's thinking things about Wi-Fi. They have to pair or Bluetooth yet again yet the pair and there's a possible failure there.

I want every single day to know that their signal all this is say I should have gone through all these other modalities cellular that never has to be touched by that patient.

It just it always works in broadcasts for us. Just gave us mission wise and ability to be in some of these regions where they did not have the same some of the same familiarity or comfort with with various tech modalities.

We just wanted it to be effortless, take it out of the box and it's. Yeah, right. So, so we call that the passive capturing of data is really, really important, right?

Whenever you have the, the patient themselves having to connect to, to download an app to, to somehow link the app to, to the wife's side.

## Data collection, cellular connectivity, and ease of use

Now that they're you're creating these technology gaps and this care gap. So so let me confirm it is this has a cellular capability on the med so so the patient just step on it doesn't have to do anything.

The data goes to the back end and to the cloud. Right. Is that is that what it is. Yeah. You like but in front of the sink and just while you're washing your hands that day.

Done got your scan and then you go on with the rest of your life that I recognize this patient often has a lot that they have to care for. Just, you know, often they're worrying about things like safe home access and nutrition.

And we think about just the social determinants. You know, the last thing I want to do is give them a bunch of stuff to have to do and if I can just make it so passive, then I can be potentially a part of their just everyday life and we can be a real partner to them.

And then it comes out to, to the real question is, Wow, this sounds really good, right? And the people who have a foot ulcer often are repeaters, right?

Meaning that they're at risk for continual like in the future when development. And so is the same people that that that tended to to have to face this problem.

So the questions of payment really comes at right so great technology you know one of our listeners maybe some of our listeners may be saying, that's me, that's me there of how do they I mean, is this service the solution reimbursed?

Is it do they have to pay out of pocket? How do they look for something like what you're offering? I'm trying think in the best way to answer me, how do we come to the model that I'm about to describe?

Well, in the beginning, when we came to market and when well, I were just kind of teasing around, like, how could we make this thing work? And by the way, I so appreciate your time as we were trying to figure this thing out, the real struggle that we started to recognize is this classic phrase of, you know, prevention, you know, doesn't pay in the typical fee for service system, which is really there on the treatment side and four things that we do.

So if you have a company that then eliminates things that we do in the way that that structure is set up, it's not necessarily it's most viable environment to get out.

We have to make sure that our providers are able to do things, the things that they need to do. And it here is a something that doesn't necessarily add to that and potentially, you know, it has some competing pieces and it's not the fault of anyone is just preventing utilization.

It had to find a home. And what I would say is that with as the Affordable Care Act really came into its being to say, okay, well, actually there's other ways we can pay for care and actually do things like accountable care to do things with risk based and value based care.

Suddenly now prevention is is actually a way that docs can keep the lights on in the way the system is built on. It is a way to now really align outcomes, and that's been such an exciting change.

Now I wish in today that we could just offer it up and have it to be anyone, but we have to work with the payers to get it covered one payer at a time.

But we have the, the, the, the right impact on those payers to be highly financially advantageous. Right. This is a this patient population is as much as 90 billion we spend on every single year our patient as much as $40,000 per patient per year.

And it's all most of is unnecessary like we are showing about a third of the total cost of care reduction just by putting a mat in the home and offering this extra nursing around our providers that results in about $12,000 savings per patient per year.

These per the clinical trials that we have. And that way it works out really because now with value based care prevention is can be a business model. And that was the big change in the beginning.

It was just how did we find our place in the health care system?

## Reimbursement, value-based care, and coverage

But as value based care really started to become more mainstream, suddenly our services were where needed and I'm so thankful that we just kept banging our head against the wall to build it so that once we found easy ways to get it into into homes, we were there for, for that for the system.

So I know it's a it's a process of getting people to fund this effort. This is really good solution. So where are you right now? Who what what what commercial player payers does Medicare pay for this or can you just give us a little bit of where you are?

I know that there probably some proprietary information there, but to as much as you're comfortable with. Right. So because our our our our listeners may be calling their insurance carrier and say, hey, can you fund this, Can you cover this for for me?

Right. So I think it's important to know when a technology is available. Our listeners are advocates for themselves that they're they want to do something for themselves.

So it things really started to get interesting around the time of the pandemic for some related reasons. Just of course, now we had to be super virtual and how we were reaching patients, we weren't having the same access to them and that that really changed virtual care, remote monitoring.

That was a that was a big lift, you know, at that spot. You know, we had a small, tiny team and we built it up quite considerably. We're now operating, I think, in every state except for one.

I think it's Alaska. And it's been just exciting to see. We've been doubling every single year since 18 and it's been now to get to see our numbers roll in.

It's it's been super rewarding. Probably our the account that you would see the most on if you did some some digging as we do a lot of work with our veterans who you know potentially from Agent Orange exposure as you think about our Vietnam veteran as we think about higher rates of smoking and sometimes even social challenges, my dad's a Vietnam veteran.

You know, I think that that was just the most important. That's where I wanted to start many ways. I was just wanting to care for my dad. And and it was it was an interesting system to really have to figure out how do we work?

Our providers are so busy. This is true in the VA and everywhere outside of it. And we recognized early on, if you give them anything extra to do, you would have you get almost like they just it's overwhelming.

So we were like there. We kind of figured out how to build our system so that it was hopefully so plug and play for our provider, practice and and just be an effortless background companion.

In a way. So I wanted to clarify because some of our listeners are veterans, are they in is this the technology available in the VA system? Yet if you're a veteran and you qualify, you're it's 100% covered, as far as I'm aware.

As far as I mean. That's really good. Okay. And so for the non veterans, where should they be looking for full coverage? There's probably two ways. Ideally, you are in a region that we have helpline coverage and on our website you can ping in and we can try to find if that is the case, in which case super simple.

There is to date that I'm aware no cost of the patient. We didn't want to have any cost to our patient who often has. It can be quite challenging and the various things that they have to care for.

And if not, there are ways to do it. But we would have to go without coverage, in which case we try to find a way to get it into that home as minimal price as possible.

## Where Podimetrics is available and who it serves

Jon What's, if people want to find out more about this, this amazing technology for early detection of diabetic foot or would work and they go what's the website?

Our website https://, so excited never break that out https://podimetrics.com/ P O D I M E T R I C S dot com (podimetrics.com) there you can find out first of all I know I'm a little bit being a physician overzealous on clinical research so you can see all the research we've done to get a sense of it feels like it could be a help but also on on where you can get access more on the system, more on us as a people and as a company so you can get a sense of where people even want to work with and and hopefully can we can find a way to to support you.

Jon, Well, this has been a wonderful conversation and, you know, I often do at the end of the conversation is to ask our guests to to maybe a sentence of encouragement or kind of a last talk right in thinking through your journey and what you're doing and what you were able to take in a concept and build a a whole solution to.

What do you say to to people with Type 2 diabetes that are thinking about sort of ulcers? Maybe it's a concern or maybe for loved ones that they have.

You know, you're your real crew. You're hoping for one moment to be able to give hope to a population that may have lost some of their hope. And here is a patient population that's often very much struggling.

As we look at Hispanic Americans and Native American Americans, This is diabetes does not treat everyone equally, and it's devastating these communities, for example, if you're a black American, your likelihood of suffering an amputation is four times. That is a white American.

That's crazy. If that's the case, we've shown in our in our peer reviewed work, which you could see on the website with Kaiser, who has already has a very strong preventative practice.

## Closing encouragement and hope for patients

On top of that, we were able to eliminate 71% of the amputations that they had in our study reports. Nine out of ten major amputations, the one where you lose your limb.

So the ability to try to give some trust back to the patient that we can help hopefully keep you on your limbs, on your legs to keep your independence.

This is at the root of the reason why many patients fear loss of limb more than and the mortality like we want to give you that life that's there and it takes a village.

Look, we are one piece of it. Our providers are so important, our health plans and the care management that they can provide to give you the tools you need at the moment, you need it together.

We're trying to give this patient our the patients that we care so much about their their future so that they don't have to be so worried about this, this loss of limb hope and potentially life, so thrilled to get a chance to chat about it today.

It's been the most meaningful thing I've ever been able to to be a part of. Now we're over a decade old from when we first started in a hackathon and now to see it and across the nation, it's been it's been really rewarding.

Well CEO and founder. of Podimetrics Dr. Jon Bloom. Jon, thank you so, so much for for just speaking to us about your heart, your passion and the exciting project that you have.

So thank you, Jon, Will, thank you for having us. I appreciate it.