Heart Watch: The Power Of Wearables To Prevent Palpitations And Atrial Fibrillation Transcript

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Introduction to Wearables and BioTressity

Well. Hello everybody. Welcome back to the reverse heart disease naturally Summit this is cardiologist, Joel Kahn and happy to have you back a great episode.

Be sure to watch this and share this one. And I'm gonna introduce you now to a world expert on a topic that really could transform your health. That's the topic of wearables, wearables is not a word we use 10 years ago but wearables are things that you can put on your body that help you monitor many things including your heart status and if you really want to know how you're doing, you've got to get up to date a wearable. So let me introduce you to awaken Al Sadiq.

He's a PhD So dr Al Sadiq welcome. Thank you. Thank you for having me. Dr khan I'm talking to you from suburban Detroit and you're in suburban san Francisco in Redwood city.

And you are ceo of an amazing company called bio Tress Itty. And I'm just gonna set the stage if it's okay with you. Read a little bit about bio tress Itty but we're gonna talk people who are listening don't need to worry too much about that. We're going to ask you to remember an even easier word called bio heart but not yet. So bio tress Itty is a modern medical technology company focused on delivering innovative remote biometric monitoring solutions to the medical and consumer market and those listening.

You're the consumer market diagnostic and post diagnostic solutions for chronic conditions and lifestyle improvement. So basically it's a technology company in the medical sector, looking at measuring various parameters of health and obviously looking to focus as you say, on preventive health care. And so many people listening to this summit are interested in prevention. An ounce of prevention is worth a pound of care.

So I told you I had to ask you, I'm from Detroit, why are you not an automotive engineer? What was it about health care that had you take your PhD and your engineering background and apply it to improving our health. That's such a great thing.

But why did you do that? No great question. So you know, I think it's kind of like it was with all engineering stories, it was a bit of a twisted road. Um but my interest really started when I was in grad school, I was doing some work on sensor networks, working with Cisco, working with the D. O. D. And really looking at remote monitoring of environments right in in a secure way collecting data and basically being able to make real time decisions. And so one of the applications that you know sparked my interest that I got really deep into was the idea of monitoring people's stress levels. Right?

So when you're doing decision making obviously, so I think you know, you know in a Nasa command center, you know how how is the stress level there something's going wrong? Is this person really should, should they really be making that decision or not? And so the idea was how do we track and how do we look at optimum performance of an individual, bring that data back and then be able to do real time decision making and combine both individual monitoring along with environmental monitoring. So that was kind of you know what got my interest and I kind of love that did the big cloud computing thing.

From Sensor Networks to Healthcare Innovation

And then I saw this uh I went to investment banking for a while and when I was looking at that I saw a lot of these technologies coming out in consumer, this idea of transformation healthcare. And I saw that there's a big gap in really looking at the clinical quality of wearables and looking at like how does that relate to improvement. You know obviously we're talking about prevention here and your focus as a cardiologist and looking at what you've been

really talking about, which is how do we really improve our our our core lifestyle so that we can actually focus on better health, better outcomes and and uh lifestyle.

So that's that's what directed me towards the healthcare market seeing that gap and and that research that I originally did during I often quote an automotive engineer guru, Edward deming, which you can't measure. You can't change and we're getting better in my field of cardiology and measuring things precisely.

But you're talking about exactly that. I mean a whole lot of people are listening to this and they want optimal health and we don't want guesswork, We want metrics, we want measurements, we want precision, we want to see trends and you're the guy that can take your engineering background and actually measure stuff.

So maybe before we get deep in the weeds there could be a person or two that just is not familiar with the term wearables and you know maybe you just want to break that down a little bit before we go any further. Yeah, absolutely.

So you know wearables really key came from this idea of quantified self. So the idea was what is the future of of individual health care and actually lifestyle.

It really started from a lifestyle angle and so it started originally with activity trackers write something very simple. How am I gonna walk around, how many steps am I gonna do this whole caloric concept And then what we realize well that is only a drop in the bucket in terms of really managing individual health because health care in and of itself is really around disease management and really around prevention because you don't want to actually develop the disease and in order to do that and activity trackers not enough. Right. You have to layer that on with additional information. So the concept of wearables came in and saying, okay, what else can we collect from non invasive sensors.

So I want to be very specific here. The idea and the and the topic of wearables in the industry is what can we do that's external to our body collecting data from sensors and these sensors can pick up different information. So you know, it could be something as simple as how many steps I'm taking to something as complex as what is my pa statistics. Bring this into the cloud, summarize that and bring that into something that is actionable and consumable for an individual to basically manage their lifestyle or in the best case if they've been diagnosed with the with the condition, manage their condition.

And so that is the concept and as the, the realm of wearables. And now that has of course gone into multiple sector. So you have wearables that are around, you know, infant monitoring wearables that around activity monitoring wearables around heart monitoring diabetes and so on.

And so that was great. So you're right. I kind of forgot. We started with like a clip on our belt that would tell us when I was head of an employee wellness department 13 years ago our employees getting 22,000 steps a day. And those things were tooth, $3 little plastic devices but they had a accelerometer that allowed you to measure that.

And a lot of people will remember wearing those to basically. Now our smartphone is a wearable in that. It often tracks many health parameters and that is always increasing. I was just going to show a little bit.

I've got a ring on my right hand because I got a wedding band on my left, but that's a wearable that tracks sleep and breathing parameters and it's a very popular one. People know about, I brought with me, I have from online in china a blood pressure watch which is a wearable except I have to say this is so needed and I hope actually by electricity can come up with a wearable blood pressure monitor. But this breaks and breaks and breaks over and over so I can't really endorse anyone yet. I will sometimes be seen with a wearable that is an earplug in my left ear. That is something to do with stress.

And there's another wearable on my wrist. I don't wear all these all the time all the Apollo neuro that also manages stress. But we're our hearts summit and stress is clearly in the main bullseye of prevention and stress wearables and reminders to breathe and remind us to deep breathe their key. But with bio tress, Itty and a subdivision you call bio heart. And I certainly want to uh focus and talk because many people will be fascinated. I'll give you an

example.

I have a very high end patient businessman. I talked to them today on my way home about a clinical question and he he's totally up to date on his smartphone.

He uses every parameter and all. But he was experiencing a bit of a palpitation during exercise. Well you may have a smartphone but you're not going to carry it and look at it during exercise.

What Wearables Are and How They Work

Usually um you may have certain devices where you put your finger on a device and it tells you even runs an electrocardiogram but you're not going to run the treadmill and do that.

And I told him about this, I told him about a device called bio heart. Well this happens to be the device you engineered and that you produce and that's commercially available and it's a strap. I didn't want to take my shirt off for this summit interview but I understand you have your bio hard on but it's a very comfortable strap you wear. And there's of course an app and an application on your phone. And you can actually have your phone show you your electrocardiogram in real time. You know this is for me as a cardiologist.

Actually my research project long ago was on the history of electro cardiogram fee. And the first electrocardiogram now is about 120 maybe 100 and 30 years ago.

And if those pioneers in europe and the United States and actually in ann arbor michigan could see that you have developed doug you know this real time electrocardiogram very cost favorable device that all you got to do is look at your phone and watch your electrocardiogram and then maybe send a strip to a test center or to your physician or your health practitioner. So tell us about bio heart maybe even if it's possible you have your smartphone with you show us your own E.

K. G. As it goes by. I would but I can't because I'm holding it it's not on my chest. But I mean what are the capabilities and how are you expanding that into you know Biocare and disease management? What are people listening how they gonna benefit from having this core heart wearable called bio heart.

That is clearly unique on the market. No. Excellent question. So I'll kind of break that down and really talk about the inspiration behind it. So we are cardiac uh you know we cut our teeth and cardiac diagnostics.

So you know diagnosing cardiac patients for arrhythmias with the smart monitor which is prescribed that doctors prescribe to a patient collect that data.

You know from 48 hours all the way up to you know 30 days to three weeks. And so the question is you know the at the core of it, why are cardiologists collecting this data? Right?

Because patients are primarily intermittent and asymptomatic. Which means it's very very hard to find what is going on with somebody's heart. Like the individual that you mentioned who had palpitations.

That's a fantastic example of somebody who's symptomatic. But there's a lot less patients that are symptomatic as compared to asymptomatic. And so In the world of cardiac you always need long term monitors.

Right? So you're talking about you know holter monitors, real time cardiac monitors that are used 23 hours a day seven days a week for up to period of time the prescribed period. But insurance will only pay for a maximum of 30 days. So then you diagnose the patient and then what does the patient have? They they have a medication they have a procedure but they're basically left to their own vices unless they've got to really engage cardiologist like yourself who is really focusing on prevention.

So they're basically left to their own vices. They are told you know exercise do you know do the right things and then every six months or so they're back into the office to look at what the what the update is and what the data is

and they'll get a new E.

C. G. And so what we found was diabetics have a blue comet. Er but the number one killer in the world there's nothing there's that device that you can put on your phone and collect 30 seconds of your E. C. G. And in most cases like you said you're on a treadmill how are you gonna stop the treadmill pull the device out, collect the 30 seconds and is a symptom even going to be there or what about what you're sleeping? It's three o'clock in the morning.

Now you wake up you wake up with some chest pain. Are you gonna go fumble around for that device and collect 30 seconds and send it to your doctor. So what we did was we took all of our diagnostic technology and implemented a consumer nonprescription based product for long term data collection on your heart. And that's what the by heart is.

Right? It is the first of its kind. You can record months, you can record a year of your data and what it's really doing and and this will go right into what you're talking about and where we see the product going in the future of it is that as you collect trends when you're coming back to your physician you can have a summary of your data over months. Um You can set triggers on the on the bio heart saying that okay if my heart rate is above this, I want to automatically create a diary.

What's unique about the product is if you're wearing it's recording, you don't have to push anything, you don't have to take a recording. It's automatically recording all the time, as long you're wearing it and it's charged, it's automatically recording. So what you can do then is you can go back into time. But so let's say you're running you're wearing the by heart and you're like oh I think I felt something in the middle of my workout where you can go back to that data in the middle of your workout and look if there was a peak or a trough and then take a snapshot of that and share it um you can automatically share it with your doctor but where we really see is that it's really gonna move into prevention right?

And helping patients with the number one problem that they're having which is they don't have feedback right? They come to their physician the physician says hey you need to exercise you need to do this but until they see it right and like you said about being if you can't measure it right? Yeah. So patients need to be able to an to be able to measure the improvement right?

Because the doctors are always saying exercise.

BioHeart: Continuous ECG Monitoring

But if you exercise and you see that your resting heart rate is improving at nighttime is lower. That means that you're doing better. And so that is what we envision with the bio heart. And what we're doing with the product is adding more and more analytics to it more and more triggers to it so that we can help guide individuals in their care program. Um It's going to get fully integrated with our disease management program which you already mentioned which is the bio care.

It's an entire holistic program. Again first of its kind there's been no program that has been developed for chronic disease management focused on cardiac.

So everybody has disease management but it's very generic. So we've created a cardiac focused disease management program and bio heart is the core of that because it allows you to collect so much data long term over over a patient and you know, things like what I'm doing right now. I'm chatting with you and you mentioned you can see my E C G three, keep that right there. That is so powerful.

So that's you're wearing a strap under your shirt, the bio heart strap that I showed, that's your app live. And if you weren't looking at it and you, let's say you were in a power meeting and you're negotiating and you felt a little flutter or you felt the flop or you felt the skip or you felt the pain when the meeting's over, you can go back and look at the last 30 minutes and that's exactly right.

So one of the one of the things that were to do and you know, I'll show you, I'll show you guys another screen. So here's an example of me going back in history and I'm like, oh what's that going on over there? So I can go and click one of these dots and I can go back and I can actually see that East G. And I say, oh well that looks funny. And I can immediately right now create a pdf and send it to dr khan if he's willing to look at it.

Well that's good. So for for individuals that that, you know, and you can go and we can see so much, you know, they have hours and hours and months and months of data.

And what we've done really here is to create a tool for individuals to match because with diabetics, how do they manage their their eating right? They take prick, They check their blood. If the blood is high then or blood is low, they make their the glucose is high or low, they make decisions.

And so this is the first tool that we've created for long term uh patient information. And it's what we've seen is that for individuals that have bought or have had conditions, it's actually making it change because they're able to see changes in what they're doing. And I think that is the most powerful thing and that's what wearables really are about, right, is how do we collect something that's clinically relevant to give feedback to an individual so that they actually listen to their doctor, right. I think it's brilliant and I don't know if anybody's ever used this term, but a lot of the audience will have heard of C.

G. M. Continuous glucose monitors. You mentioned it a little device you might wear on the back your arm for two weeks and you can look at your phone every 15 minutes and get a estimated tissue glucose and find out how you're doing and how your food is affecting you. But this is a C.

H. R. M. I don't know if anybody using that continuous heart rate monitor and it's a vital sign. Certainly as important as blood trigger blood glucose. Um you know, ample data.

I can think of so many examples. The one I gave you of the phone call to a patient who's experiencing a flip flop a race. A skip a pause. Nighttime I roll over on my left side. I feel my heartbeat.

Is that normal or not? Now you got data you can share with your health care team or maybe you have the surface Education to look at on your own. But how about just the importance of heart rate as a vital sign.

You know, as you mentioned, I saw your heart rates in the 60s. That's a more positive and helpful vital sign than somebody who's resting heart rate is 90 continuously over time. If your resting heart rate is 90, there's questions to be asked about your health status, your thyroid status and the rest.

How about people that start medication, beta blockers, calcium blockers, medications, diuretics that can lower heart rate, raise heart rate and now you have a parameter. My mother just an example turning 90 called me, her heart rates often. 48 but that's the 15 seconds.

She's checking her blood pressure. That's not as you said, a 12 hour, 24 hour, let alone a week snapshot. So I think we're gonna have to loan My bio heart. She's quite a tech savvy, 90 year old mom and let her get a little bigger picture on her heart rate.

So many implications. And I just want to say before we leave the diabetic comment because you brought up diabetes management, you know, a diabetic of which are obviously millions in the United States.

And the numbers growing sadly and fantastic. A diabetic with a high resting heart rate is a high risk diabetic. It's a sign of a neuropathy of the heart and it's very hard to measure. And it's largely ignored by clinicians.

But if you have a device like the bio heart where you can actually get some real time and kind of longer term hours, days, weeks, even months of data, you know that the patient that needs real intense diabetic therapy and cardiovascular evaluation for risk management. If a diabetic has a resting heart rate of 90 or 95 it should be down there like yours in the sixties or fifties and you know, it drops at night. It's no problem if your heart rates in the forties at night. If you're asymptomatic.

But now we have this great tool. So what do you mentioned, you know, constantly innovating, what can you see anything that you'd add on to the bio heart or the bio heart to what would be the next Moonshot?

Because you've clearly created Moonshot one, which is I can tell you haven't used your device. I mean, I hook patients up for 48 hour monitors. And it cost 2 to $300. You have a device that's less than that.

But you can use it basically for perpetuity until it falls apart. I mean literally years. So it's a tremendous value. But what's Moonshot number two for by electricity or bio heart.

No, it's a great question. So what we're looking at with bio heart too. And even actually the existing when we're constantly making changes is we're really going to be moving into optimizing heart rate ranges based on activities, right? So we look at sleep and you mentioned, you know, resting heart rate while you're sleeping can be different than resting heart rate while you're sitting or walking or what your baseline is.

Um how your how you're running. And also what people don't realize is the transition, right? How does your heart rate spike or increase when you go from, you know, sitting on the couch too, you know, doing your exercise. And so that looking at those transitions.

So what we're really diving deep into is looking at, okay, let's break up your day into activities. You know, sleeping being one of them. Let's look at what your ranges are within sleeping. Let's bring in some analysis and link that to what is defi mind as healthy with from clinical research perspectives.

And then set flags. Because the flag that is, you know, during the day may be very different than a flag at night because just the way your body uh the status of your body and the same thing is a flag while you're running.

And and uh performing exercise should be very different than a flag of while you're sitting and working. And so what we're trying to do is we're trying to push and and looking at performance optimization in the context of healthcare.

Right. So what is optimum sleep and where is sleeping optimized in terms of heart rates? Where is respiration optimized?

Using Heart Data for Prevention and Disease Management

And how do we link all of this to the heart? And so that's kind of the next evolution of the bio heart product. Um and then we're also looking at, you know, how do we integrate this with diagnostics?

So if a doctor really wants to say, hey, I want to actually look at the details of an individual's CCG, just like they would do a Holter analysis. You know, how much information do we need? What level and quality do we need that in?

And can we bring that data output it and turn it into a clinical diagnostic report so that, you know right now, what's the workflow and patient puts on the bio heart?

They feel something, they share it with you. They come to you, you'll make either clinical decision or you might say I need more information. So I'm going to prescribe a Holter monitor or or the diagnostic monitor that costs a couple 100 bucks and now they're gone and they're on that monitor.

So is there a way to shortcut that. And so what we really see in bio heart too is that it will be a combination of a lifestyle and a diagnostic in one.

Yeah, that's excellent. And in case there are any clinicians listening to this summit and this presentation, they should check out a by electricity dot com Biocare because there actually is a reimbursement pathway that won't pertain to the consumer listening but may pertain to the clinician where they can use bio heart for continuous health monitoring and have appropriate diagnostic codes.

So be sure to check that out. It's very provocative clinical application. What would you add on? Can you ever foresee a oxygen sensor on the back of the heart strap or I don't think we're going to get blood pressure off of this.

But um can you do hr the heart rate variability algorithms off of the data? Is that already available? I should know. But great question. So heart rate variability is going to be out there in the next release and yes, oxygen saturation we're adding in um to the next gen device. So that's already, I'm already testing with with an oxygen. You're also looking at, how do we integrate with, you know, other devices? So blood pressure uh low blood pressure watches are not around there are blood pressure cuffs. Some of these patients, like you said, cardiac patients have hypertension if they're buying a blood pressure cuff. Can we integrate and pull that data and yank it in. So we're looking at all that to create a more and more holistic picture of the individual and so whatever we can pack into the device we we will. And I think one of the people people always ask me and I'm sure it comes up with you as well. You know why not an Apple watch?

Why not a device? And what uh why the heart has been so difficult to monitor And why you need a chest is you actually have to go across the heart and watches in these other devices because you're sitting on one wrist you can actually collect data across the heart without closing the circuit.

Which means you need you need the second hand or your second hand to touch the watch to essentially go across your heart which is a manual process. So if you wanted to record E. C. G. For 20 four hours or even for one hour on your watch you'd have to hold your watch with the opposite hand for an hour.

And so the form factor of a chest strap is super critical in order to get long term heart to heart data. So now we're trying to figure out okay what else can we collect from there? Um You know posture analysis because sometimes posture actually tells you along with heart rate that somebody is if your pa declining it means you're actually becoming more unhealthy.

And if your heart rate is actually also decline of like increasing in terms of resting the correlation is there that you should probably start engaging more in physical activity.

So those are some of the different parameters that we're trying to bring all together and the heart being the center point. But also the verifying point of saying yes, this if there's an alert over here on the on on on this item the change in the in your heart rate variability or your heart rate is verifying that that is a problem.

All right. And I just want to reiterate one thing and you're absolutely right knowing the history of monitoring and electrocardiograms. Everybody knows you get a strap when you get the doctor's office, on your ankles, on your wrists and a number across the chest.

You know the Apple watch. It's a fascinating breakthrough but it's just sitting on your wrist you have on the the back of the bio heart. I believe there are four. You know, you can almost see them their electrodes. So you actually are creating these little triangles of electrical access. And that's why you actually monitoring how many leads as we call them in cardiology when you showed us your phone?

33. So, you know when you want to know I mean these critical questions doctor, my heart was racing and I have to say was it atrial fib relation which causes a stroke risk? Was it sinus tachycardia because you're stressed out having dreams or drink too much. You know, was it a premature beat? Because maybe your magnesium potassium low you want high quality electrocardiograms having these four electrodes on the back of the bio heart is, you know, quantum increase in accuracy and it's very comfortable to wear maybe in the last few minutes. You just give us a spectrum.

I mean you have no competition really in your field of continuous, comfortable wearable cost, affordable, you know, electrocardiogram monitoring for all these reasons. We talked about the bio heart, but just the whole spectrum. I mean what wearables uh and you can include even glucose ones if you want. Do you think are meaningful and uh maybe even enviable from your engineering and business standpoint?

Uh and you know, ones either you personally wear try have used. Yeah, no, absolutely. So I have been, I mean I'm

always playing around with these things. So I I've I've been playing around with the same ring that you are using and I think that that is um a fantastic, very interesting device. Um I think a lot of people are very enamored with it.

Future Features and Clinical Applications

Um I think where they need to push the envelope is that, you know, you're a clinician, I'm an engineer that is quite a student with clinical data. So like I can interpret and analyze that.

But a lot of other individuals, the it's got all of this data, but it's not intuitive and and and for individuals to really understand or how to optimize. I think a big part of that is because they're a consumer company and I think that bringing you know sleep apnea and COPD these are these are major issues. We need to bring it closer to the clinical outcomes. So what I think is very exciting is the fact that a product like that is out there. But then pushing it to the next uh level would be to really bring in the clinical efficacy. And there is a company called night owl which has done some really good stuff on uh Pat which is another alternative to doing sleep diagnostic studies at home.

Yeah but they write I used for sleep studies. So nine I will build one that's like a finger based P 80 device. The issue that I find which you know, I love that technology would love to have that or access to it or develop it and they're using it for diagnostics but they're not bringing it into the consumer world for consumers to consume. Right?

So and I really think that the exciting areas are kind of like that middle ground where you can get the clinical data clinical value but then also bring it into the consumer.

And the best most recent technology that has done is actually C. G. M. Um blood pressure is another area that you know is very clinical but they've made it in a way that individuals can consume it on a regular basis and and make decision making and I think that doing that for COPD sleep apnea and also kidney disease. That's another area that I'm very excited about.

I'm looking at, you know, we know dialysis is moving back into the home, but how do we measure the other levels, right? Like increasing potassium levels in uh, kidney patients is a big problem. Many kidney uh, patients who have CKD have cardiac issues. So how do you combine potassium levels plus the water attention. So that means that you need to look at impedance monitoring or wait and then align that with heart potassium and have kind of this four pronged approach. So, you know, I'm very much investigating the types of sensors that are clinical that can be applied in a consumer way in the sleep and COPD space. I just recommend for the those that are listening that they do check out bio heart by electricity.

But there is a website bio heart dot com, correct. Right. For the device itself by electricity, the parent company. And I'd really encourage if we have any athletes because you can mount, you could mount your phone on your bike either whether it's in your gym or whether you're out on the road. If you have any concerns, you actually be able don't take your eyes off the road but be watching your electrocardiogram real time. And if you were or an athlete or exercise or having a concern about your heart rate or skip feeling, you'd be able to watch it.

But even if you don't watch it, you'll have this recording to go back when you're done with your exercise, review it. And again, I want to emphasize patients, send me these recordings, these PDFs. Um, you know, look at two o'clock, I was doing a walk, run, walk, run out, work out and I felt a little flutter. Do you see anything?

And it's really a breakthrough that patients are so involved and engaged. So it's a great, great opportunity. So again, tell us where the consumer, that's as you know, this sounds excellent and I want to bring one into my wearable menu at home. They go to a website to get the bio heart, they can go to www dot bio heart dot com. And if you want to learn more about our company and if there's clinicians out there, all of our products are insurance reimbursable and you can learn about them at by atrocity dot com. Excellent. Excellent.

Well, I appreciate you taking the time. We've learned a lot. I can say from personal experience, it's absolutely through comfortable to, I want to see how comfortable it is to wear it. I love you don't have to shave your chest hair.

Guys, I mean there's a lot of monitors you wear where you do have to, so this is something you can wear, you

know, while workouts during the day where tonight and look back, it's kind of really, really practical wearable for optimal heart health and natural heart health and really optimizing and you know, maybe you've engaged in a lifestyle program and you're working out and you're meditating and you're trying to eat better and maybe lose some weight.

And you want a parameter to measure well, measuring your resting heart rate. Like this is an absolutely solid scientific way to do that. So, thank you so much. Dr Al Sadiq.

And we look forward to seeing, you know, all these great breakthroughs. You're talking about oxygen sensors, heart rate variability, new iterations and integrating it into the office so that doctors have better tools.

We definitely need better tools in the office. Thank you so much. Thank you, doctor. All right. We'll share this with everybody. They'll benefit from it.