Breaking Down Data Silos: How Health Information Exchange is Unlocking AI's Potential in Healthcare Transcript

(Transcripts are generated by AI and may contain errors)

Introduction and AI workflow overview

Good morning everyone and welcome to Good morning everyone and welcome to Signals and Symptoms podcast. Uh today Signals and Symptoms podcast. Uh today I'm very excited. Uh my friend Sarah I'm very excited. Uh my friend Sarah Huck is here. She works for Fizer, leads Huck is here. She works for Fizer, leads health informatics and very interested health informatics and very interested in policy and governance. And we're in policy and governance. And we're going to talk to her about AI and how going to talk to her about AI and how larger companies, especially pharma larger companies, especially pharma companies, are utilizing and integrating companies, are utilizing and integrating in their workflow. She will introduce in their workflow. She will introduce herself much better than I can but I herself much better than I can but I just want to quickly go with some of the just want to quickly go with some of the weekly updates that we go through. U weekly updates that we go through. U this is a interesting article Harvey you this is a interesting article Harvey you would be interested to see that the would be interested to see that the Telas is actually going to come at Telas is actually going to come at 17,000 tokens per second.

17,000 tokens per second. Insane. So we were talking about Grock Insane.

Explainable AI in cancer research

So we were talking about Grock and Sus and we were talking about last and Sus and we were talking about last time Edward Ed me and you were talking time Edward Ed me and you were talking about demonetization and democratization about demonetization and democratization of intelligence and this is not going to of intelligence and this is not going to be demonetization it's going to bring be demonetization it's going to bring bottom prices [laughter] and we're going bottom prices [laughter] and we're going to make intelligence basically you know to make intelligence basically you know one GPU away um we have been looking at one GPU away um we have been looking at me and Harvey have been discussing about me and Harvey have been discussing about open claw and personal AI agents etc and open claw and personal AI agents etc and the file system is the new database and the file system is the new database and again Um I don't like to show off some again Um I don't like to show off some of this stuff but let me just show you of this stuff but let me just show you that I have been using cloud code with that I have been using cloud code with uh obsidian to actually do massive uh obsidian to actually do massive amount of productivity and it is getting amount of productivity and it is getting become honestly a little insane that become honestly a little insane that that 40 of my human employees are unable that 40 of my human employees are unable to keep up because now I have 20 AI to keep up because now I have 20 AI employees. So again things is massively employees. So again things is massively changing the way that we do functions as changing the way that we do functions as well. Um this is again uh explainable well. Um this is again uh explainable which is very important. Again Sara is which is very important. Again Sara is going to talk about it. By the way just going to talk about it. By the way just as a side note my actual sister name is as a side note my actual sister name is Sara too. So she is she's also uh my Sara too. So she is she's also uh my sister from another mother. So cancer sister from another mother. So cancer integrated radiology clinical picture integrated radiology clinical picture direct visualization. Uh this is a very direct visualization. Uh this is a very important read especially if you want to important read especially if you want to look at explainable AI especially in the look at explainable AI especially in the multimodal format. Very well written. I multimodal format. Very well written. I would love to you should add this too would love to you should add this too many beds tackling the waste epidemic in many beds tackling the waste epidemic in digital medicine. You have talked about digital medicine. You have talked about Edward uh you know how insane it is and Edward uh you know how insane it is and we have given you example that billions we have given you example that billions of dollars are being lost and they this of dollars are being lost and they this article basically encapsulates it. Uh article basically encapsulates it. Uh Harvey I'm going to send it to you and Harvey I'm going to send it to you and you need to add that in your governance you need to add that in your governance uh pitch deck cancer LLM a large model uh pitch deck cancer LLM a large model in cancer domain. So this is SRA I in

cancer domain. So this is SRA I wanted to bring this up for you for your wanted to bring this up for you for your attention that they actually have a data attention that they actually have a data availability too and the idea behind it availability too and the idea behind it is that it's only 22 they use 2.7 is that it's only 22 they use 2.7 clinical nodes and 500 pathologies clinical nodes and 500 pathologies across 17 types and we demonstrate across 17 types and we demonstrate cancer can potentially provide an cancer can potentially provide an effective and robust solution to effective and robust solution to advanced clinical research and advanced clinical research and practicing cancer domain. We actually practicing cancer domain.

Machine learning, research, and AI productivity

We actually actually were looking into this uh but actually were looking into this uh but we are more concentrating on the imaging we are more concentrating on the imaging side and LLM is going to be insane in side and LLM is going to be insane in terms of when you can pull this terms of when you can pull this together.

together. together. So dynamic prediction of time of event So dynamic prediction of time of event outcomes and this is really what uh outcomes and this is really what uh those who are interested in actually the those who are interested in actually the nitty-gritty of it time of time to event nitty-gritty of it time of time to event prediction is very important. So for prediction is very important. So for example, if a patient is here with risk example, if a patient is here with risk factors and then there's a stroke when factors and then there's a stroke when you are able to create machine learning you are able to create machine learning and statistical procedures in an and statistical procedures in an ensemble format, this is amazing way to ensemble format, this is amazing way to actually go ahead and do this. Again, actually go ahead and do this. Again, it's a little more technical, but I just it's a little more technical, but I just wanted to let you know that we are using wanted to let you know that we are using this technique which is by the way this technique which is by the way machine learning. This is not LLM or AI machine learning. This is not LLM or AI or generative AI. This is old school or generative AI. This is old school machine learning. We still use it by the machine learning. We still use it by the way a lot. So by the way all your way a lot. So by the way all your recommendations on YouTube and Instagram recommendations on YouTube and Instagram are coming from machine learning not are coming from machine learning not generative AI. Uh this is again Sam 3D generative AI. Uh this is again Sam 3D body uh fantastic uh application of this body uh fantastic uh application of this uh learn learned a lot from this article uh learn learned a lot from this article towards steering and monitoring AI towards steering and monitoring AI models. Again coming back to Sara she's models. Again coming back to Sara she's going to talk about this more than I can going to talk about this more than I can actually intelligently with of course actually intelligently with of course Harvey being on the helm of it. So Harvey being on the helm of it.

Sarah Hucku2019s background and healthcare AI role

So building a poworker artificial building a poworker artificial intelligence this is an must readad like intelligence this is an must readad like if you go through this if you don't go if you go through this if you don't go through this it is wrong this literally through this it is wrong this literally tells you building a proorker and that's tells you building a proorker and that's what I mean u oh man what I mean u oh man okay uh so by the way this is going to okay uh so by the way this is going to be the Harvey uh uh structure let me be the Harvey uh uh structure let me find that proworker uh you know stuff find that proworker uh you know stuff but in short the gist of the article is but in short the gist of the article is that you have two options now that you have two options now augmentation augmentation augmentation or obsidence.

or obsidence. So either you become a proworker with So either you become a proworker with artificial intelligence or you basically artificial intelligence or you basically are going into obsance. must read very are going into obsance. must read very important for anyone who's thinking of important for anyone who's thinking of and all the kids by the way that if and all the kids by the way that if you're starting a new career [laughter] you're starting a new career [laughter] those there were three two skills that those there were three two skills that we used to check check in SATs right one we used to check check in SATs right one was English the other one was math was English the other one was math English was language the math was English was language the math was reasoning and now we have to third reasoning and now we have to third tooling which is basically using AI I tooling which is basically using AI I think SATs need to include that as part think SATs need to include that as part and parcel of uh their system I don't and parcel of uh their system I don't know what you guys think about it again know

what you guys think about it again dozing errors this is so important when dozing errors this is so important when Sara is designing clinical trials, how Sara is designing clinical trials, how do we dose it properly? Again, uh super do we dose it properly? Again, uh super research be able to do what we call research be able to do what we call both. Um again, technical difficulties both. Um again, technical difficulties with my mouse. We have always been doing with my mouse. We have always been doing what we call deep research or we want to what we call deep research or we want to do wide research. The other ways to do do wide research. The other ways to do it is what we call super research with it is what we call super research with both deep and wide research. And this is both deep and wide research. And this is basically changing the game uh of how we basically changing the game uh of how we are doing research in general. Now I'm are doing research in general. Now I'm going to uh you know let Sarah introduce going to uh you know let Sarah introduce herself. It is her call if she's going herself. It is her call if she's going to talk about the AI revolution in drug to talk about the AI revolution in drug discovery or she want to talk about discovery or she want to talk about AIdriven drug evolution from molecular AIdriven drug evolution from molecular design to personalized care or she wants design to personalized care or she wants to talk about the convergence of to talk about the convergence of ecosystem basically how to put drug ecosystem basically how to put drug development in real world essentially development in real world essentially using guidance and everything especially using guidance and everything especially when we consider that FDA is now using when we consider that FDA is now using real world evidence. So I'm going to real world evidence. So I'm going to stop again. Thank you so much Sarah for stop again. Thank you so much Sarah for joining. Uh if you can introduce joining. Uh if you can introduce yourself to the to the audience so that yourself to the to the audience so that I'm not mucking up some things.

I'm not mucking up some things. >> Well, thank you for having me. It's a >> Well, thank you for having me. It's a pleasure to be here. Um as you said, my pleasure to be here. Um as you said, my name is Syra Hawk and I am a health name is Syra Hawk and I am a health informaticist by training. Um I will go informaticist by training. Um I will go through a little bit of my background through a little bit of my background just so um people can understand because just so um people can understand because I think that your background and how I think that your background and how you're trained and the experiences that you're trained and the experiences that one has influences how they view one has influences how they view problems which is true um really for any problems which is true um really for any solution but particularly with AI solution but particularly with AI because a lot of things rely on because a lot of things rely on parameters data selection etc. So um parameters data selection etc. So um I'll start with my journey a little bit.

I'll start with my journey a little bit. After undergrad, I went to Michigan. I After undergrad, I went to Michigan. I did my masters in um health services did my masters in um health services administration at the school of public administration at the school of public health in the department of health health in the department of health management and policy. And so really management and policy. And so really from the beginning of my career I've had from the beginning of my career I've had a focus on policy and its application in a focus on policy and its application in real world. After that I worked in real world. After that I worked in management consulting for a few years management consulting for a few years when I went around the country when I went around the country implementing different types of implementing different types of implementations implementations implementations uh for information systems and that in uh for information systems and that in that was before we had a whole host of that was before we had a whole host of big EHRs. So we did things like design big EHRs. So we did things like design and develop custom billing systems which and develop custom billing systems which doesn't really happen now or you know in doesn't really happen now or you know in implementing metacch widescale or things implementing metacch widescale or things like that which was like that which was >> so you are the reason that I hate >> so you are the reason that I hate medical environment right [laughter] medical environment right [laughter] now. Well, you know what's funny is um I now. Well, you know what's funny is um I feel like at the end a lot there's so feel like at the end a lot there's so many compromises that are made that many compromises that are made that everyone is mildly dissatisfied.

everyone is mildly dissatisfied. So um that probably is true for a lot of So um that probably is true for a lot of things in life uh not just health things in life uh not just health information systems but um you know information systems but um you know there's a whole host of considerations there's a whole host of considerations and I think you don't truly appreciate and I think you don't truly appreciate it until you're leading something like it until you're leading something like that because there's considerations that because there's considerations across all the stakeholders.

Um there's across all the stakeholders. Um there's certainly regulatory payment, all the certainly regulatory payment, all the kinds of things that all have to be kinds of things that all have to be considered. Um after that, I went to um considered. Um after that, I went to um an academic medical center and I was the an academic medical center and I was the compliance officer for um the IDN, the compliance officer for um the IDN, the first one actually. And um I really first one actually. And um I really enjoyed building the compliance office.

enjoyed building the compliance office. It was really fun to start something new It was really fun to start something new and develop the systems and processes, and develop the systems and processes, but um that's not where my heart is. I but um that's not where my heart is. I actually didn't enjoy being the actually didn't enjoy being the compliance officer as much as building compliance officer as much as building the office. I think you have to have a the office. I think you have to have a particular uh mindset and compliance is particular uh mindset and compliance is so important and you need to have it in so important and you need to have it in all aspects but to be the compliance all aspects but to be the compliance officer um takes a particular uh mindset officer um takes a particular uh mindset I think. So then after that I did my PhD I think. So then after that I did my PhD at Syracuse in information science and at Syracuse in information science and technology which um and I focused on technology which um and I focused on health informatics given my background.

health informatics given my background. I went to RTI which is a research I went to RTI which is a research institute after that and I started as a institute after that and I started as a health IT research scientist and when I health IT research scientist and when I left 11 years later I led the data left 11 years later I led the data interoperability and clinical interoperability and clinical informatics program. I then moved to informatics program. I then moved to Fizer and I've been there almost five Fizer and I've been there almost five years as a clinical informaticist and years as a clinical informaticist and now I lead the advanced medical now I lead the advanced medical solutions team which involves both solutions team which involves both clinical informatics and practical clinical informatics and practical research. And so throughout all of these research. And so throughout all of these experiences, they are different in a lot experiences, they are different in a lot of ways working in a hospital as an of ways working in a hospital as an administrator, management consulting, administrator, management consulting, different types of research and now.

different types of research and now. However, at the thread and at the core However, at the thread and at the core is using technology to improve outcomes.

is using technology to improve outcomes. So regardless of the setting, regardless So regardless of the setting, regardless of the different way, that's been the of the different way, that's been the common thread throughout my career. And common thread throughout my career. And so I wanted to talk through my journey so I wanted to talk through my journey because a lot of people listening might because a lot of people listening might be coming from different types of be coming from different types of backgrounds and not really see how their backgrounds and not really see how their own educational background or employment own educational background or employment experiences can lead to different types experiences can lead to different types of careers. So um I thought it was of careers.

Career advice and innovation mindset

So um I thought it was important to share that for people who important to share that for people who >> No, love it. I mean it's interesting the >> No, love it. I mean it's interesting the background of this various uh journey is background of this various uh journey is always um clearly we always talk about always um clearly we always talk about Ed actually talks about it more than I Ed actually talks about it more than I do because and uh we have two physicians do because and uh we have two physicians and he brings in this board sort of and he brings in this board sort of situation that you know when you are situation that you know when you are looking at innovation it's about looking at innovation it's about cross-pollination of skills cross-pollination of skills >> so you need to be uh somewhere between >> so you need to be uh somewhere between you know talking about with one domain you know talking about with one domain expertise to technical or whatever that expertise to technical or whatever that case may be and the idea is that case may be and the idea is that innovation happens when you have this innovation happens when you have this interesting sort of journey especially interesting sort of journey especially when you're looking at due diligence for when you're looking at due diligence for even startups. So uh what is your

even startups. So uh what is your current role at Fizer and how are you current role at Fizer and how are you sort of uh looking at healthcare AI in sort of uh looking at healthcare AI in general?

general? general? >> Yeah, that's a good question. So I work >> Yeah, that's a good question. So I work in uh US medical affairs. So that means in uh US medical affairs. So that means uh that's the department that I work in uh that's the department that I work in in general and I lead a group called in general and I lead a group called advanced medical solutions which is advanced medical solutions which is comprised of clinical informatics and comprised of clinical informatics and applied research. In terms of the applied research. In terms of the applied research we're really looking at applied research we're really looking at solving real world problems in um solving real world problems in um identification of patients management identification of patients management according to guidelines and quality according to guidelines and quality improvement initiatives. And so those improvement initiatives. And so those may or may not um involve informatics.

may or may not um involve informatics. However, informatics is everywhere. So, However, informatics is everywhere. So, usually there's some component even if usually there's some component even if it's not um the primary focus of the it's not um the primary focus of the study. I also have a group of clinical study. I also have a group of clinical informaticists who are trained and we informaticists who are trained and we work across um the spectrum really um work across um the spectrum really um looking at things like um EHRs looking at things like um EHRs to help identify patients for clinical to help identify patients for clinical trials, EHR innovation once uh people trials, EHR innovation once uh people are in the system, real world data and are in the system, real world data and evidence and different analytical evidence and different analytical techniques and then evaluation and techniques and then evaluation and continuous improvement. So there's continuous improvement. So there's really a whole host of team things that really a whole host of team things that the team does. Now, one thing that I the team does. Now, one thing that I would like to kind of point out is that would like to kind of point out is that AI is um I guess the latest in a in a AI is um I guess the latest in a in a series of technical innovations.

series of technical innovations. Throughout my career, I have observed um Throughout my career, I have observed um I guess like a little hype cycle of I guess like a little hype cycle of different aspects. Um there was a hype different aspects. Um there was a hype cycle for teleaalth. There was a hype cycle for teleaalth. There was a hype cycle uh back when the EHR first came cycle uh back when the EHR first came out and became um I guess more out and became um I guess more widespread. And so with all of these widespread. And so with all of these things, the technologies are different.

things, the technologies are different. AI is different than um you know like a AI is different than um you know like a you know coding like a mainframe which you know coding like a mainframe which is different than you know all these is different than you know all these things are they do have some differences things are they do have some differences but the underpinnings are the same. The but the underpinnings are the same. The underpinnings of u what needs to happen underpinnings of u what needs to happen to make something successful beyond the to make something successful beyond the pilot is is pretty much the same. And pilot is is pretty much the same. And that's actually something that I really that's actually something that I really enjoy is taking something that we're enjoy is taking something that we're studying as perhaps um a pilot study or studying as perhaps um a pilot study or an init feasibility study, research, an init feasibility study, research, that kind of thing, and then how do we that kind of thing, and then how do we take it long broader? How do we scale?

take it long broader? How do we scale? That's something that I really care a That's something that I really care a lot about because I feel like we spend lot about because I feel like we spend so much time and it's really fun to so much time and it's really fun to bring innovations out and to and to bring innovations out and to and to think about them and think about how think about them and think about how they work and start them. But then what they work and start them. But then what can we take that will impact people more can we take that will impact people more broadly? And so what can we take from an broadly? And so what can we take from an innovative pilot study at one innovative pilot study at one institution institution institution and learn from that that we can scale and learn from that that we can scale more broadly. And so that's something more broadly. And so that's something that I really like to focus on. And now that I really like to focus on. And now the focus is AI. My whole team is the focus is AI. My whole team is working on it. I'm working on it. Um but working on it. I'm working on it. Um but um I think I just want us all to really um I think I just want us all to really kind of take a step back and think about kind of take a step back

and think about okay well what now what what can we okay well what now what what can we actually do that's practical and I like actually do that's practical and I like the innovation obviously as you can tell the innovation obviously as you can tell from my my career. And I also really from my my career. And I also really enjoy thinking about what do we do to enjoy thinking about what do we do to take those things and bring innovation take those things and bring innovation to more people. And so it might not be to more people. And so it might not be that everyone gets bleeding edge right that everyone gets bleeding edge right away, but by taking things uh broader, away, but by taking things uh broader, even one step at a time, we can move even one step at a time, we can move towards better patient outcomes, which towards better patient outcomes, which is really at the end of the day why is really at the end of the day why we're all doing this.

we're all doing this. >> Go ahead, Harvey. Uh floor is yours or >> Go ahead, Harvey. Uh floor is yours or any questions? any questions? >> No, no. So many things I want to say. Uh >> No, no. So many things I want to say. Uh number one, thanks for coming. Uh it was number one, thanks for coming. Uh it was a pleasure meeting you over the summer a pleasure meeting you over the summer last year and uh immediately when I met last year and uh immediately when I met you, we were talking I I could see you you, we were talking I I could see you weren't just superficial. You were weren't just superficial. You were looking at where can we go with this?

looking at where can we go with this? How can we help humanity? Um so I How can we help humanity?

AI implementation, governance, and regulation

Um so I applaud you for your efforts. Uh for me, applaud you for your efforts. Uh for me, I've taken the torch of saying, you know I've taken the torch of saying, you know what, uh I'm going to do some TED talks what, uh I'm going to do some TED talks on the same thing because if we don't on the same thing because if we don't know what we don't know, how do we know know what we don't know, how do we know what to fix, right? And if we don't know what to fix, right? And if we don't know these tools exist, then how do we these tools exist, then how do we implement them? And so my goal has implement them? And so my goal has always been sharing. So, love that always been sharing. So, love that you're on the PAT podcast. I really want you're on the PAT podcast. I really want to see what you have to say on the drug to see what you have to say on the drug development side because uh obviously development side because uh obviously I'm I'm into that because I really think I'm I'm into that because I really think that's the next frontier for us to get that's the next frontier for us to get to uh personalized medicine using AI and to uh personalized medicine using AI and these discoveries and lowering the cost.

these discoveries and lowering the cost. Uh so that was just my comments just in Uh so that was just my comments just in general. general. general. >> Yeah, this this is a super fascinating >> Yeah, this this is a super fascinating discussion. I've written down several uh discussion. I've written down several uh questions for you that I think might questions for you that I think might resonate with with the audience and you resonate with with the audience and you you sort of touched on the edges of some you sort of touched on the edges of some of these but h how you know this is your of these but h how you know this is your profession and so you have a little bit profession and so you have a little bit extra pressure on you know how how do extra pressure on you know how how do you keep up like how I keep up one way you keep up like how I keep up one way is just participating in this podcast is just participating in this podcast learning from people like you and then learning from people like you and then what goes through is like his first five what goes through is like his first five minutes every time I'm I'm like taking minutes every time I'm I'm like taking copious notes like gosh there's so much copious notes like gosh there's so much going on and I try to keep up as well going on and I try to keep up as well and I know it's a struggle for everyone.

and I know it's a struggle for everyone. So, I'm just curious if you have any So, I'm just curious if you have any personal like hacks or or things that personal like hacks or or things that you do or does it just come natural you do or does it just come natural because you're in it.

because you're in it. >> Oh, I don't know if anything comes >> Oh, I don't know if anything comes naturally to anyone in terms of naturally to anyone in terms of [laughter] all this kind of thing. So, [laughter] all this kind of thing. So, even when people have natural ability or even when people have natural ability or talent, you need to have the work to talent, you need to have the work to back it up. [laughter] back it up. [laughter] >> Yeah.

>> Yeah. >> Yeah. >> Um but in terms of how I keep up, I >> Um but in terms of how I keep up, I agree. I mean, the pace has just been um agree. I mean, the pace has just been um astronomical. I think in tech the pace astronomical. I think in tech the pace is always fast but over the last five is always fast but over the last five years I have observed that uh the pace years I have observed that uh the pace of innovation the types of innovation of innovation the types of innovation the stakeholders involved that is all the stakeholders involved that is all really um accelerated um I am a fellow really um accelerated um I am a fellow of the American medical informatics of the American medical informatics association and I've been a member since association and I've been a member since I was a doctoral student so um 20ish I was a doctoral student so um 20ish years [laughter] years [laughter] um and uh and I will say that um I use um and uh and I will say that um I use them a lot to keep up because uh there's them a lot to keep up because uh there's a whole host of things like conferences.

a whole host of things like conferences. I'm on the industry um council. We get I'm on the industry um council. We get newsletters every day. So, there's newsletters every day. So, there's things like that to help keep up with things like that to help keep up with the forefront of what's happening in the the forefront of what's happening in the search. I've also been um pretty search. I've also been um pretty involved in policy and so I subscribe to involved in policy and so I subscribe to a number of governmental type a number of governmental type newsletters to keep track of what's newsletters to keep track of what's happening on the regulatory side which happening on the regulatory side which is a little bit different because the is a little bit different because the pace of technical innovation pace of technical innovation outpaces the pace of regulations outpaces the pace of regulations policies policies policies um organizational governance etc which um organizational governance etc which is to be expected but at the same time is to be expected but at the same time it's important to keep up with both arms it's important to keep up with both arms because because because uh they all they all are interconnected uh they all they all are interconnected so it's important to catch up there and so it's important to catch up there and then of course there's a whole host of then of course there's a whole host of technical things to keep up with one technical things to keep up with one reason that AI is even possible is reason that AI is even possible is because of technological advancements so because of technological advancements so it's possible to analyze more data it's it's possible to analyze more data it's possible to integrate across more data possible to integrate across more data sources the computing power exists that sources the computing power exists that didn't exist before I mean if you think didn't exist before I mean if you think about it we have computing power in our about it we have computing power in our pocket that in the 60s would maybe take pocket that in the 60s would maybe take up a whole entire room you and be so you up a whole entire room you and be so you know all these things um had to be in know all these things um had to be in place and so it's important to keep place and so it's important to keep track on all different types of fronts track on all different types of fronts and yes it's a lot but um if we don't and yes it's a lot but um if we don't keep up then you'll get left behind and keep up then you'll get left behind and so I really encourage people to keep up so I really encourage people to keep up with what's happening but also um in with what's happening but also um in different arenas so technical the different arenas so technical the environment in terms of policy and then environment in terms of policy and then health in particular because without health in particular because without looking at all three of those then um looking at all three of those then um it's really easy to miss something it's really easy to miss something important.

important. important. >> Yeah. Yeah. And one other question along >> Yeah. Yeah. And one other question along these lines, Jana, I know we're you want these lines, Jana, I know we're you want to get into AI and drug discovery or to get into AI and drug discovery or those other cool charts, those other cool charts, but just one other question because I but just one other question because I know that our audience has the same know that our audience has the same question. So, question. So, >> talk about a little bit about career >> talk about a little bit about career advice. So, advice. So, >> people look up to you. You know, you're >> people look up to you. You know, you're well accomplished person, professional, well accomplished person, professional, and they want to be like you. They want and they want to be like you. They want to be in your role. Of course, they want to be in your role. Of course, they want my my little side comment is they they my my little side comment is they they want it to happen in one year as opposed want it to happen in one year as opposed to, you know, working the the ladders to, you know, working the the ladders that you work. But all that said, if that you work. But all that said, if you're a fairly new grad, maybe you're you're a fairly new grad, maybe you're just five years into your career, what just five years into your career, what what is maybe one or two words of advice what is maybe one or two words of advice that you would give someone who aspires that you would give someone who aspires to be, you know, in a role such as to be, you know, in a role such as yours?

yours? yours? Yeah, it's a good question because I Yeah, it's a good question because I think that career development and even think that career development and even the way the career landscape now is is the way the career landscape now is is very different than it was when I first very different than it was when I first started my career. And I think that's started my career. And I think that's important to note. The environment is important to note. The environment is different. The context is different.

different. The context is different. However, um just like the underpinnings However, um just like the underpinnings of technological um implementation are of technological um implementation are the same, so too are are a few um the same, so too are are a few um underpinnings for careers and thinking underpinnings for careers and thinking about it. Um, one thing I'll say that about it. Um, one thing I'll say that I'll start with is to be open to all I'll start with is to be open to all different types of opportunities. When I different types of opportunities. When I first did my masters, I wasn't really first did my masters, I wasn't really um, thinking about technology that much.

um, thinking about technology that much. I liked technology. Um, you know, I I liked technology. Um, you know, I thought it was interesting. I did some thought it was interesting. I did some things with it, but it really wasn't on things with it, but it really wasn't on my radar. I was really thinking about my radar. I was really thinking about myself as more of a policy person. But myself as more of a policy person. But um you know as I came in and did my um you know as I came in and did my coursework and then as I uh did coursework and then as I uh did management consulting where I started management consulting where I started the strategy practice actually I uh the strategy practice actually I uh really enjoyed it because I came to see really enjoyed it because I came to see that technology systems processes and that technology systems processes and strategy are really all linked together strategy are really all linked together and um I actually came to enjoy aspects and um I actually came to enjoy aspects that I didn't even know existed. So, one that I didn't even know existed. So, one thing I'll say is to really be open to thing I'll say is to really be open to different experiences.

different experiences.

Bias, representation, and data quality in healthcare AI

And that might mean um experiences such And that might mean um experiences such as you're asked to take on a new project as you're asked to take on a new project or you're asked to um maybe you think or you're asked to um maybe you think about this job you might be applying for about this job you might be applying for or things like that. really to be or things like that. really to be open-minded and not to Another thing I open-minded and not to Another thing I would say is I've observed um a lot of would say is I've observed um a lot of people who ask me questions will often people who ask me questions will often cut themselves off before they apply for cut themselves off before they apply for something or before they put themselves something or before they put themselves into consideration.

into consideration. >> And I always think, you know, you don't >> And I always think, you know, you don't have to put cut yourself out. what let have to put cut yourself out. what let them do it if they're gonna cut you out, them do it if they're gonna cut you out, you know, or um you know, put put your you know, or um you know, put put your put your head in the ring and think put your head in the ring and think because because because >> everyone has a whole host of different >> everyone has a whole host of different experiences when you're at work, you experiences when you're at work, you know, once you get a role. I've observed know, once you get a role. I've observed that as well where sometimes people will that as well where sometimes people will say, "Oh, well, you know, it's always say, "Oh, well, you know, it's always been done that way or we're not going to been done that way or we're not going to get approval for that." And it's like, get approval for that." And it's like, well, why? You know, I think it's well, why? You know, I think it's important for us to really think about important for us to really think about what are things that we have to do for a what are things that we have to do for a variety of reasons that could be variety of reasons that could be regulatory um you know for payment regulatory um you know for payment whatever the case might be. There are whatever the case might be. There are certain things that are non-negotiable certain things that are non-negotiable right but then um there's a lot of area right but then um there's a lot of area in which you can do things and can make in which you can do things and can make innovation innovation innovation >> and I say this all the time if you do >> and I say this all the time if you do what you always did then you're going to what you always did then you're going to get what you always got and then you're get what

you always got and then you're not and the world isn't the same so we not and the world isn't the same so we need to move. So, I say that all the need to move. So, I say that all the time. And then the last thing I'll say time. And then the last thing I'll say is if you're going to do something, is if you're going to do something, commit. I say this all the time, too. If commit. I say this all the time, too. If you're going to ring the bell, ring it.

you're going to ring the bell, ring it. Don't just like half-heartedly ring it. Don't just like half-heartedly ring it. Don't, you know, [laughter] don't, you Don't, you know, [laughter] don't, you know, kind of go half in. That's right.

know, kind of go half in. That's right. That's right. If you're going to go in, That's right. If you're going to go in, go in and go in full force. Put your go in and go in full force. Put your best effort in best effort in >> and go in. Don't go in half-heartedly >> and go in. Don't go in half-heartedly because that will influence what comes because that will influence what comes out. It might not be that everything is out. It might not be that everything is successful. The very tenants of successful. The very tenants of innovation mean that they won't all be innovation mean that they won't all be successful.

successful. successful. >> Yeah. >> Yeah. >> Yeah. >> That otherwise you're not being that >> That otherwise you're not being that innovative. If it all is su if it's 100% innovative. If it all is su if it's 100% successful, if everything goes 100% successful, if everything goes 100% according to plan, you haven't pushed according to plan, you haven't pushed the envelope enough.

the envelope enough. >> Yeah. >> Yeah. >> Yeah. >> So, we need to be comfortable with that. >> So, we need to be comfortable with that. And then also to think about what can we And then also to think about what can we learn from things that didn't go as learn from things that didn't go as planned and what can we learn from planned and what can we learn from things that um even during the process things that um even during the process if you know if there's a hurdle or a if you know if there's a hurdle or a roadblock to me that's an opportunity roadblock to me that's an opportunity and it's a mindset shift I didn't think and it's a mindset shift I didn't think like that in my 20s in my 20s I wasn't like that in my 20s in my 20s I wasn't like yes I'm going to embrace failure like yes I'm going to embrace failure but um as you get older and as more but um as you get older and as more seasoned in your career have more seasoned in your career have more experiences it's really important to experiences it's really important to think through what what are acceptable think through what what are acceptable risks tolerances and then what can we risks tolerances and then what can we learn from those. So those are the learn from those. So those are the things that I think are really important things that I think are really important for people to consider as they think for people to consider as they think about their own career development.

about their own career development. >> Yeah. Thank thank you so much. It was >> Yeah. Thank thank you so much. It was like a commencement speech. like a commencement speech.

[clears throat] So good. [laughter] It [clears throat] So good. [laughter] It was great. I mean that is a great was great. I mean that is a great compliment. That that was uh so good and compliment. That that was uh so good and spot on. So thank you Janate. I'm sorry spot on. So thank you Janate. I'm sorry I took it a little bit.

I took it a little bit. >> No no no. Don't worry about it. >> No no no. Don't worry about it. [laughter] So two things that So first [laughter] So two things that So first let Harvey add some of his experience.

let Harvey add some of his experience. >> Yeah. I got to jump in. Um, I'm sorry >> Yeah. I got to jump in. Um, I'm sorry again, Jana, for not jumping into the again, Jana, for not jumping into the next part. I got to unpack this because next part. I got to unpack this because I really want to say a couple of things I really want to say a couple of things that people didn't realize that she just that people didn't realize that she just said said said >> in the age of AI, and I'm going to bring >> in the age of AI, and I'm going to bring this to AI.

this to AI. >> We're all scared that we're losing our >> We're all scared that we're losing our job, our jobs, and oh my gosh, AI is job, our jobs, and oh my gosh, AI is going to replace me. But listen going to replace me. But listen carefully to what she said. She put carefully to what she said. She put herself out there and she hired people herself out there and she hired people and she wanted to be the people that was and she wanted to be the people that was in common. Because if you think about it in common. Because if you think about it to again to her point, if

we're trying to again to her point, if we're trying to do the same thing and we hire the to do the same thing and we hire the same people that think like us, we're same people that think like us, we're going to get the same answers that we going to get the same answers that we were going to give out. But if we get were going to give out. But if we get someone different, i.e. your someone different, i.e. your personality, your clinical gestalt, what personality, your clinical gestalt, what makes you you, your personality, that makes you you, your personality, that secret sauce of you, secret sauce of you, >> plus now we throw in the modern AI, and >> plus now we throw in the modern AI, and you put it together, you're going to get you put it together, you're going to get some crazy good output.

some crazy good output. >> And so I really want everybody out there >> And so I really want everybody out there to really uh reflect on that those to really uh reflect on that those statements because it is true. Um, and statements because it is true. Um, and one other thing, when I used to run one other thing, when I used to run hospital systems hospital systems >> for marketing, for other silos, I would >> for marketing, for other silos, I would hire people that did not have experience hire people that did not have experience in those industries because I knew they in those industries because I knew they had that secret sauce of their had that secret sauce of their personality and I they could combine and personality and I they could combine and I can teach them X, Y, and Z. But it was I can teach them X, Y, and Z. But it was that combination that made them so that combination that made them so unique. And then the last thing I want unique. And then the last thing I want to say is it's looking at it with to say is it's looking at it with children's eyes. If you could see children's eyes. If you could see something and you're naive to it, for something and you're naive to it, for example, I'm working for a space example, I'm working for a space company. I'm coming in working with company. I'm coming in working with scientists, but I'm looking at with scientists, but I'm looking at with different eyes. I'm able to come up with different eyes. I'm able to come up with different solutions for the company that different solutions for the company that they wouldn't see.

they wouldn't see. Is Is Is >> that right? >> that right? >> That's so true. And one other thing I >> That's so true. And one other thing I wanted to amplify from what you just wanted to amplify from what you just said is um the way that you're trained said is um the way that you're trained um people's educational background, um people's educational background, their um perhaps work experiences their um perhaps work experiences influences how they think and how they influences how they think and how they view problems. And so um going back to view problems. And so um going back to the team composition, it's really the team composition, it's really important to have people with different important to have people with different types of experiences. For that reason, types of experiences. For that reason, I'm an informatist. My PhD is I'm an informatist. My PhD is information science and technology. I information science and technology. I see things as information problems. I see things as information problems. I have a physician informaticist on my have a physician informaticist on my team. Pharmacy informatics team. Pharmacy informatics informaticist. They view things informaticist. They view things differently because of their training.

differently because of their training. Their tolerances are different. The Their tolerances are different. The things that they pick up are different.

things that they pick up are different. If I hired a bunch of informatists like If I hired a bunch of informatists like me, we would all look at the same me, we would all look at the same aspects of a problem. But one piece of aspects of a problem. But one piece of that is also being comfortable with that is also being comfortable with having discussions where we don't all having discussions where we don't all agree on what the core problem is. But agree on what the core problem is. But that's because of um our experiences and that's because of um our experiences and background. And it's important to shape background. And it's important to shape that and really embrace it so that you that and really embrace it so that you have a better solution and that you have have a better solution and that you have better answers to the things that you're better answers to the things that you're trying to address.

trying to address. >> Very well said. reminder it's very hard >> Very well said. reminder it's very hard for females to jump on top and then for females to jump on top and then secondly it is harder for you know uh secondly it is harder for you know uh people of color so amazing work I just people of color so amazing work I just want to make sure that people understand want to make sure that people understand that it is coming from someone who has that it is coming from someone who has lived the issue um I I have so much to lived the issue um I I have so much to say about it but I want to ask you a few say about it but I want to ask you a few things so this is going to be a rapid things so this is going to be a rapid fire now we understand so the whole fire now we understand so the whole

point of this podcast is signals so point of this podcast is signals so remove the noise which is high and remove the noise which is high and concentrate on the signal which is concentrate on the signal which is actually this and we talk about this actually this and we talk about this that overcoming the you know the AI that overcoming the you know the AI based uh discovery of drugs is going to based uh discovery of drugs is going to actually decrease from 1 to 10 10 being actually decrease from 1 to 10 10 being definitely in the next three years and definitely in the next three years and one being total how would you one being total how would you rate that this is actually going to rate that this is actually going to happen because I'm I'm just going to be happen because I'm I'm just going to be honest is there really a drug out there honest is there really a drug out there by AI I mean I know one of them but what by AI I mean I know one of them but what I'm saying is that what do you feel in I'm saying is that what do you feel in the industry from 1 to 10. Do you think the industry from 1 to 10. Do you think this is or [laughter] this is or [laughter] >> you know um I don't think that things >> you know um I don't think that things are so uh black and white in that sense are so uh black and white in that sense because there's aspects that are because there's aspects that are happening right now and you know will AI happening right now and you know will AI will there be a 100% AI developed drug will there be a 100% AI developed drug without people involved? That doesn't without people involved? That doesn't seem likely. Will AI be used to seem likely. Will AI be used to influence various aspects? Yeah, that's influence various aspects? Yeah, that's happening as we speak um somewhere happening as we speak um somewhere probably right now. Um and so I think probably right now. Um and so I think what we could really think about and I what we could really think about and I one thing that I really am excited about one thing that I really am excited about is how can we use AI to um really make is how can we use AI to um really make things more relevant for particular things more relevant for particular populations and subpopuls.

populations and subpopuls. Um, traditionally there's been um Um, traditionally there's been um someone someone someone um like a one kind of patient profile um like a one kind of patient profile that's common for many clinical trials that's common for many clinical trials and the further you deviate from that in and the further you deviate from that in terms of race, age, sex, um you know terms of race, age, sex, um you know other types of coorbidities other types of coorbidities then the less likely it is that results then the less likely it is that results from trials will be relevant for you.

from trials will be relevant for you. Now with AI there is the potential to Now with AI there is the potential to analyze more types of data to delve into analyze more types of data to delve into subpopuls that perhaps aren't available subpopuls that perhaps aren't available in structured data and to really delve in structured data and to really delve into how do different types of disease into how do different types of disease progression um certainly medications and progression um certainly medications and coorbidities impact different types of coorbidities impact different types of subopuls subopuls subopuls and now um from at the health system and now um from at the health system level more people are capturing data level more people are capturing data around different types of subops. So around different types of subops. So when you marry that together, we lead to when you marry that together, we lead to um what Harvey was talking about um what Harvey was talking about earlier, which is moving us more towards earlier, which is moving us more towards precision medicine. And so I don't know precision medicine. And so I don't know that we're at the point of precision that we're at the point of precision medicine for Syra Hawk, but perhaps medicine for Syra Hawk, but perhaps we're getting closer to the point for we're getting closer to the point for precision medicine of Syra Hawk of a precision medicine of Syra Hawk of a certain age, of a certain um ethnic certain age, of a certain um ethnic background with, you know, these kinds background with, you know, these kinds of health um considerations. And so of health um considerations. And so that's what I'm really excited about that's what I'm really excited about because with the increased computing because with the increased computing power and also the increased velocity, power and also the increased velocity, veracity, and amount of data, we really veracity, and amount of data, we really have more things that we're able to do have more things that we're able to do with the computing power that we have.

with the computing power that we have.

Synthetic data, digital twins, and personalized medicine

So that's one thing that um I don't know So that's one thing that um I don't know if I would take me to a 10. It's hard if I would take me to a 10. It's hard for me to get there, but it's definitely for me to get there, but it's definitely going to get me further along than going to get me further along than perhaps I was when this first started perhaps I was

when this first started coming on scene.

coming on scene. So uh that's one of the basically the So uh that's one of the basically the holy grail and I don't know who's going holy grail and I don't know who's going to get there first.

to get there first. >> Uh the wet lab is basically what's >> Uh the wet lab is basically what's happening at I don't know um fizer who's happening at I don't know um fizer who's has just published that they're going to has just published that they're going to do does drug direct discovery from just do does drug direct discovery from just to 30 days save 16,000 research hours.

to 30 days save 16,000 research hours. Janentech is saying that it's actually Janentech is saying that it's actually going to degrade a molecule by 25% going to degrade a molecule by 25% faster and then of course me and you faster and then of course me and you know other stuff like in Cleveland know other stuff like in Cleveland Clinic we can deploy it. So the core the Clinic we can deploy it. So the core the core holy grail is that the wet lab core holy grail is that the wet lab which is inside fizer or any other which is inside fizer or any other company we don't know inside sarah huck company we don't know inside sarah huck lab I don't know where she and then the lab I don't know where she and then the dry lab is essentially me or a community dry lab is essentially me or a community of similar me so in your opinion we are of similar me so in your opinion we are getting closer from what we used to say getting closer from what we used to say like okay statent for everyone to a like okay statent for everyone to a specific statin for this particular specific statin for this particular population and then eventually you're population and then eventually you're going to say that janed needs to build going to say that janed needs to build this particular statin period and we are this particular statin period and we are probably going to customize it for him.

probably going to customize it for him. So in in this exactly what we want to So in in this exactly what we want to say is that the wet lab we're coming say is that the wet lab we're coming close to the dry lab as soon as close to the dry lab as soon as possible. Now here's the pro here's the possible. Now here's the pro here's the issue where I mean we can talk about so issue where I mean we can talk about so much of it and that's where you know uh much of it and that's where you know uh these guys always uh push me let me find these guys always uh push me let me find it uh FDA regulation and how and it has it uh FDA regulation and how and it has actually improved by the way uh I can't actually improved by the way uh I can't find that slide that I made uh recently find that slide that I made uh recently but what do you think that from a global but what do you think that from a global regulatory alignment on AI where are we regulatory alignment on AI where are we at and what do you think how would you at and what do you think how would you govern govern govern let's say a bioimilar or for me or a let's say a bioimilar or for me or a statin for me and you know I mean Harvey statin for me and you know I mean Harvey is is a health horse so he doesn't need is is a health horse so he doesn't need any man [laughter] any man [laughter] so Ed actually already had a widowmaker so Ed actually already had a widowmaker and now he's actually taking care of it and now he's actually taking care of it I wish I was but anyways long story I wish I was but anyways long story short short short where where how do you actually like where where how do you actually like deploy it I'm just going I have made deploy it I'm just going I have made many products I've been selling many products I've been selling fantastic beautiful fantastic beautiful >> but believe it or not now I feel like >> but believe it or not now I feel like making a product was the easier part making a product was the easier part than implementing [laughter] it.

than implementing [laughter] it. >> That's right. >> That's right. >> And then and then the and then the >> And then and then the and then the regulation part was the hardest. So when regulation part was the hardest. So when you see this future, how do you see it?

you see this future, how do you see it? Again, I understand it's going to you Again, I understand it's going to you know take so many things and Europe is know take so many things and Europe is going to have some and so is going to going to have some and so is going to have some but FDA is going to have have some but FDA is going to have different but what what do you think is different but what what do you think is how how people are thinking that how it how how people are thinking that how it is going to look in the future?

is going to look in the future? >> Sorry for the long question. [laughter] >> Sorry for the long question. [laughter] >> It's a great question. And so a couple >> It's a great question. And so a couple things, one thing I was thinking about things, one thing I was thinking about as you um asked your question is so um as you um asked your

question is so um yes there could be a specific statin yes there could be a specific statin design that is for you for instance, but design that is for you for instance, but perhaps you have a different LDL target perhaps you have a different LDL target than Harvey or Ed or me. Perhaps the than Harvey or Ed or me. Perhaps the target that we're even aiming for is target that we're even aiming for is different based on our particular health different based on our particular health and our particular background, our and our particular background, our particular demographics. So even before particular demographics. So even before we get to the medication, we have to we get to the medication, we have to think about well what are the goals for think about well what are the goals for us and why typically there's or even lab us and why typically there's or even lab reference values. There's one set of lab reference values. There's one set of lab reference values typically but why is reference values typically but why is there one set of lab reference values?

there one set of lab reference values? Why do Ed and I have the same set of lab Why do Ed and I have the same set of lab reference values that doesn't really reference values that doesn't really make sense for certain for certain make sense for certain for certain things, right? And so then right now things, right? And so then right now we're relying on providers to keep up we're relying on providers to keep up with their knowledge of what's happening with their knowledge of what's happening in the literature to understand um in the literature to understand um perhaps to look at well you know what is perhaps to look at well you know what is this patient cohort for this particular this patient cohort for this particular person you know that kind of thing and person you know that kind of thing and that's not really and use that to that's not really and use that to interpret results and then use that to interpret results and then use that to inform their prescription or whatever inform their prescription or whatever the maybe their care decisions I should the maybe their care decisions I should say because it may or may not be say because it may or may not be medication. Just to give you a real medication. Just to give you a real world example, uh the CBC count and the world example, uh the CBC count and the normal values were set somewhere normal values were set somewhere sometime in 1970s.

sometime in 1970s. >> Yeah. >> Yeah. >> Yeah. >> And at that point in time in US, it was >> And at that point in time in US, it was generally, you know, uh you know, generally, you know, uh you know, Scandinavian population descent. And Scandinavian population descent. And then my mom always calls me beta. I then my mom always calls me beta. I actually have a low I'm anemic. I said, actually have a low I'm anemic. I said, "No, you're not. You're 5 foot coming "No, you're not. You're 5 foot coming from a darker skin. Is you're not from a darker skin. Is you're not anemic. you just this is normal for you.

anemic. you just this is normal for you. So it's insane. You're so right that we So it's insane. You're so right that we don't have normalized values per don't have normalized values per population. So sorry about that. Go population. So sorry about that. Go ahead. I ahead. I >> I'm sorry. I'm going to jump in one more >> I'm sorry. I'm going to jump in one more time. I [laughter] time. I [laughter] I love what you're saying because it's I love what you're saying because it's like oh my gosh. Okay. So like oh my gosh. Okay. So I'm I'm work I've been working on my own I'm I'm work I've been working on my own digital twin and for this reason what digital twin and for this reason what you just said is one of the things I'm you just said is one of the things I'm using it for.

using it for. >> I'll be open. I have uh I I have a >> I'll be open.

Closing thoughts and future directions

I have uh I I have a genetic disorderish that can increase my genetic disorderish that can increase my homoyine levels and so my normal range homoyine levels and so my normal range is not normal for the population. my is not normal for the population. my normal range is lower and as a result I normal range is lower and as a result I need to make sure I take certain V B need to make sure I take certain V B vitamins and so as my digital twin is vitamins and so as my digital twin is examining who Harvey Castro is looking examining who Harvey Castro is looking at my genetics it's looking at my at my genetics it's looking at my wearables it's looking at my habits it's wearables it's looking at my habits it's putting all that together and in this putting all that together and in this example it's doing exactly that saying example it's doing exactly that saying hey Harvey uh your labs actually we just hey Harvey uh your labs actually we just got them back it looks normal but for got them back it looks normal but for you it's actually over here you it's actually over here >> and so I just wanted to highlight that >> and so I just wanted to highlight that not for the product that I'm developing not for the product that I'm developing but more for this problem that

we're but more for this problem that we're looking at it's a bell curve and we looking at it's a bell curve and we don't fit in a bell curve.

don't fit in a bell curve. >> That's right. Yeah. And actually um >> That's right. Yeah. And actually um going along those same lines, there's going along those same lines, there's actually an NIH funded cohort looking at actually an NIH funded cohort looking at cardiovascular disease in the South cardiovascular disease in the South Asian population and identification of Asian population and identification of the South Asian population is not the South Asian population is not typically available in structured data typically available in structured data and they had to make a whole separate and they had to make a whole separate cohort. However, cardiovascular disease cohort. However, cardiovascular disease and diabetes are disproportionately high and diabetes are disproportionately high in those populations. So coming along to in those populations. So coming along to that same exact example, perhaps the that same exact example, perhaps the recommendations would be different and recommendations would be different and the targets are different for those the targets are different for those populations. There are certain populations. There are certain anatomical things that are different.

anatomical things that are different. There are certain um There are certain um >> um genetic predispositions etc. So then >> um genetic predispositions etc. So then kind of going back to um you know auntie kind of going back to um you know auntie Kalia saying that hey I'm anemic and Kalia saying that hey I'm anemic and Jana's like no you're not. Um this isn't Jana's like no you're not. Um this isn't for you. But you know how many people for you. But you know how many people know that? How many people have a know that? How many people have a physician son or son-in-law or daughter physician son or son-in-law or daughter that they can call and ask those that they can call and ask those questions? And um an unintended questions? And um an unintended consequence of the 21st century cures consequence of the 21st century cures act was that um you know people have act was that um you know people have access to their results right away access to their results right away through patient portals which for some through patient portals which for some people is great. Uh I'm for me it's people is great. Uh I'm for me it's great. I don't want to wait. I don't great. I don't want to wait. I don't want them filter. I want to read it and want them filter. I want to read it and then I'll figure it out. I'll go and pub then I'll figure it out. I'll go and pub if I need to. I will look things up. But if I need to. I will look things up. But is that great for everyone? And you is that great for everyone? And you know, is that great for someone who gets know, is that great for someone who gets a result that might appear abnormal on a a result that might appear abnormal on a Friday afternoon Friday afternoon because it comes real time, but then because it comes real time, but then it's actually not abnormal for them and it's actually not abnormal for them and then they have to wait till like Monday then they have to wait till like Monday or Tuesday to find to have to find out or Tuesday to find to have to find out that, oh no, actually it looks abnormal that, oh no, actually it looks abnormal because of the reference values, but for because of the reference values, but for you you you it's fine because of X, Y, and Z. You it's fine because of X, Y, and Z. You know, they need that kind of know, they need that kind of interpretation. So like everything interpretation. So like everything there's positives and negatives. I'm not there's positives and negatives. I'm not casting aspersions. The intent was was casting aspersions. The intent was was great. You know, the intent was good, great. You know, the intent was good, but then you know there's things that but then you know there's things that happen. Um and so and going back to that happen. Um and so and going back to that that that funded study, um a lot of that that funded study, um a lot of people don't know about it for a variety people don't know about it for a variety of reasons because it's more in the of reasons because it's more in the research realm. And that's one reason research realm. And that's one reason I'm so passionate about about taking I'm so passionate about about taking things from pilot to practice because things from pilot to practice because what's the point of having that cohort what's the point of having that cohort and f that's just one example, but in and f that's just one example, but in general, what's the point of doing all general, what's the point of doing all that that that >> if we're not going to scale it? And um >> if we're not going to scale it? And um going back to something Jade said going back to something Jade said earlier, I completely agree that earlier, I completely agree that implementing is the hardest part. The implementing is the hardest part. The the tech and development and all that's the tech and development and all that's the easy part. And I'm not saying it's the easy part. And I'm not saying it's easy because you know obviously it's easy because you know obviously it's not. But that's the part that you can do not. But that's the part that you can do more quickly when you have to get in more quickly when you have to get in organizational stakeholders. You have to organizational stakeholders. You have to worry about clinical administrative and worry about clinical administrative and technical workflows and the people who technical workflows and the people who are responsible for them. Governance are responsible for them. Governance both at the organization and at the both at the organization and at the policy level. That's where

it gets hard.

policy level. That's where it gets hard. That's where the rubber meets the road. That's where the rubber meets the road. So, um, you know, I I feel like I could So, um, you know, I I feel like I could talk about this all day, but I'll pause talk about this all day, but I'll pause and see if there's anything else that we and see if there's anything else that we should talk about.

should talk about. >> No, this is amazing. I do want to say >> No, this is amazing. I do want to say two things. I know there's a lot of two things. I know there's a lot of people learning about AI and healthcare people learning about AI and healthcare and this. So, I just want to unpack and this. So, I just want to unpack something you said just from a basic something you said just from a basic point of view. We all have heard of point of view. We all have heard of biases and this algorithm doesn't biases and this algorithm doesn't represent this population. Well, here's represent this population. Well, here's a great example of what she just said.

a great example of what she just said. If our training data is only looking at If our training data is only looking at certain population, it's going to only certain population, it's going to only benefit those people. It may not apply benefit those people. It may not apply to these other people. And so if we to these other people. And so if we don't have the studies, then the AI is don't have the studies, then the AI is only going to know what it can see. So only going to know what it can see. So having studies like this, having that having studies like this, having that put into the training model to be able put into the training model to be able to push it out to now serve that to push it out to now serve that community is so important. So I want you community is so important. So I want you to keep that in mind when you're looking to keep that in mind when you're looking at products. The second thing that she at products. The second thing that she said that I really want everybody to uh said that I really want everybody to uh unpack is she says something key and as unpack is she says something key and as actually I posted that this morning.

actually I posted that this morning. It's about culture. If we all in this It's about culture. If we all in this table love AI, understand it, use it, table love AI, understand it, use it, but my colleagues are like, "No, Dr.

but my colleagues are like, "No, Dr. Castro, I'm not using that thing. It Castro, I'm not using that thing. It scares me." It's not going to happen. scares me." It's not going to happen.

So, we need to as a culture understand. So, we need to as a culture understand. And my favorite thing I always say is And my favorite thing I always say is look back at two years for everybody at look back at two years for everybody at this table. How did you use AI two years this table. How did you use AI two years ago, three years ago compared to today?

ago, three years ago compared to today? You saw a shift. Why? Because you got You saw a shift. Why? Because you got educated. Second, the culture has educated. Second, the culture has changed. So anyway, Ed, [laughter] changed. So anyway, Ed, [laughter] >> yeah, I was writing the same I was uh in >> yeah, I was writing the same I was uh in the chat, right? Writing the same thing the chat, right? Writing the same thing that you actually as you were typing. U that you actually as you were typing. U it is funny, right? We're all into AI.

it is funny, right? We're all into AI. We all love it. we understand the power We all love it. we understand the power of it and what it can do and you know of it and what it can do and you know save people's lives and all the great save people's lives and all the great things but at the end of the day when it things but at the end of the day when it comes to actually implementing you know comes to actually implementing you know it still comes down to the people and it still comes down to the people and yeah it's all the things you said and yeah it's all the things you said and the other one I added was courageous the other one I added was courageous leadership because I I know so many leadership because I I know so many times like people are just afraid to times like people are just afraid to make a decision and I had to be make a decision and I had to be >> you know I've got some scars you get >> you know I've got some scars you get scars from it too but that's what scars from it too but that's what leadership is you know if you don't have leadership is you know if you don't have scars you probably weren't a very good scars you probably weren't a very good or aren't a very good leader um we got or aren't a very good leader um we got to be the one you know go out there and to be the one you know go out there and make things happen within your make

things happen within your organization.

organization. organization. >> That is a pet peeve of mine actually. >> That is a pet peeve of mine actually. And if my team is watching, they're And if my team is watching, they're probably laughing. Uh because I cannot probably laughing. Uh because I cannot stand when we preserverate over and over stand when we preserverate over and over about the same topics and just kick the about the same topics and just kick the can down the road. Um I would rather can down the road. Um I would rather gather the information we can make a gather the information we can make a decision and then move on and then if we decision and then move on and then if we if it wasn't if there's some if it if it wasn't if there's some if it wasn't the great decision then we learn wasn't the great decision then we learn from it. But um that is everyone has a from it. But um that is everyone has a different um probably other people find different um probably other people find that to be frustrating but for me if that to be frustrating but for me if we're going proverating on the same few we're going proverating on the same few things for a long time I I can't um I things for a long time I I can't um I did want to highlight one thing before did want to highlight one thing before though about the bias and representation though about the bias and representation of data that's something that uh we of data that's something that uh we really need to spend a little bit more really need to spend a little bit more time on as an industry and as thought time on as an industry and as thought leaders researchers as people in this leaders researchers as people in this space so many models models even models space so many models models even models that are implemented and widely used in that are implemented and widely used in clinical practice are developed on local clinical practice are developed on local data sets and what I mean by that is data sets and what I mean by that is they're developed on a data set at one they're developed on a data set at one institution in one region and um the w institution in one region and um the w the amount of times that those models the amount of times that those models are validated on a national data set on are validated on a national data set on a more representative data set and then a more representative data set and then adjusted before going into practice it's adjusted before going into practice it's not as high as you think. Um, if people not as high as you think. Um, if people if you look through what's in pretty if you look through what's in pretty much any EHR vendor, look through what's much any EHR vendor, look through what's in uh what's out there in practice, look in uh what's out there in practice, look through what people are using in through what people are using in wearables, often times they're very wearables, often times they're very local models. And so to go back to our local models. And so to go back to our points before about making sure that we points before about making sure that we address the entire population, which we address the entire population, which we all live here, we should all be all live here, we should all be addressed. We're all getting care. Um, addressed. We're all getting care. Um, then we have to think about the data and then we have to think about the data and we have to think about the providence of we have to think about the providence of the data. We have to think about who's the data. We have to think about who's in and who's out of data sets and why.

in and who's out of data sets and why. And then going back to the policy that I And then going back to the policy that I cared about in the beginning. Well, why cared about in the beginning. Well, why aren't people in data sets? If people aren't people in data sets? If people are not getting their care because they are not getting their care because they don't have access, if people are getting don't have access, if people are getting care in a free clinic and it's not care in a free clinic and it's not documented and then and you or maybe documented and then and you or maybe it's documented in a different way, it's it's documented in a different way, it's not part of the H. I. E. Then all those not part of the H. I. E. Then all those people that's a whole big group of people that's a whole big group of people who are not going to be in data people who are not going to be in data sets which means that they will not be sets which means that they will not be represented for a variety of reasons. I represented for a variety of reasons. I love using real world data because I love using real world data because I love using things that are already there love using things that are already there and there's a whole host of reasons that and there's a whole host of reasons that it's good to use them but every single it's good to use them but every single data set there's no data set in the data set there's no data set in the world that's a perfect data set. There's world that's a perfect data set. There's no such thing as a represent like a no such thing as a represent like a fully representative data set that fully representative data set that doesn't exist but which is okay. I mean doesn't exist but which is okay. I mean that's well it's not really okay because that's well it's not really okay because there should be you know we should there should be you know we should everyone should have access to everyone should have access to healthcare. However, what I mean is that healthcare. However, what I mean is that doesn't mean we don't do an anal doesn't mean we don't do an anal analytics. It doesn't mean we don't use analytics. It doesn't mean we don't use them. But what it does mean is that we them. But what it does mean is that we need to more clearly articulate the need to

more clearly articulate the limitations of each data set and we need limitations of each data set and we need to clearly articulate what we're doing to clearly articulate what we're doing to address it. There are analytic to address it. There are analytic techniques that could be done. We can techniques that could be done. We can change around model parameters. There's change around model parameters. There's a whole host of things that can be done a whole host of things that can be done and I think that those should be part of and I think that those should be part of what we do part and parcel when we're what we do part and parcel when we're thinking about AI and implementing more thinking about AI and implementing more broadly. Um and I know that some strides broadly. Um and I know that some strides have been be been made. There's been have been be been made. There's been some governance strides in the US and some governance strides in the US and Europe some of the things that Jana Europe some of the things that Jana alluded to but th those are still not alluded to but th those are still not widespread I guess best practices or widespread I guess best practices or kind of things that have to happen kind of things that have to happen before implementation. It's kind of like before implementation. It's kind of like testing with a general technical, you testing with a general technical, you know, testing is always what's get get know, testing is always what's get get what gets compressed every time. If an what gets compressed every time. If an implementation goes long, you're like, implementation goes long, you're like, "Oh, we will we'll just shorten the "Oh, we will we'll just shorten the testing. It'll be fine." Well, you're testing. It'll be fine." Well, you're going to you're going to you're going to going to you're going to you're going to test before or after. And I feel like test before or after. And I feel like it's the same kind of thing here. If you it's the same kind of thing here. If you don't follow the best practices before, don't follow the best practices before, it's going to come out somewhere. And it's going to come out somewhere. And so, um, you know, I think that's so, um, you know, I think that's something that I guess I could talk something that I guess I could talk about this all day, too, but that's about this all day, too, but that's something really think we need to pay something really think we need to pay more attention to as an industry and more attention to as an industry and make that part of what do we see almost make that part of what do we see almost like a flowheet or a cover sheet for like a flowheet or a cover sheet for each model, what's in it, what's not in each model, what's in it, what's not in it, who's in it, what testing has be it, who's in it, what testing has be been done, things like that. That way, been done, things like that. That way, people really know what they're looking people really know what they're looking at. Right now, models are in place, at. Right now, models are in place, people are using them, AI is in place, people are using them, AI is in place, you don't know where it comes from. So you don't know where it comes from. So >> s by the way so many things are changing >> s by the way so many things are changing with the agentic AI.

with the agentic AI. >> So just to let you know the next batch >> So just to let you know the next batch of our de approvals the four we're going of our de approvals the four we're going to go through. Uh to go through. Uh exactly just the status.

exactly just the status. >> Mhm. >> Mhm. >> Mhm. >> Not not testing. Testing is done by >> Not not testing. Testing is done by humans and confirmation but humans and confirmation but automatically just updating the status automatically just updating the status quickly made such a huge difference in quickly made such a huge difference in efficiency because what happens was that efficiency because what happens was that the whole team actually had the vis the the whole team actually had the vis the visibility going back to the data silos visibility going back to the data silos and then this um just to let audiences and then this um just to let audiences know that FDA has actually published the know that FDA has actually published the data of synthetic mamographies of breast data of synthetic mamographies of breast that is actually one of the best data that is actually one of the best data sets on mimography itself. Mhm.

sets on mimography itself. Mhm. >> What we have seen is that that if you >> What we have seen is that that if you have enough data in the sense like have enough data in the sense like millions of images, we're not talking millions of images, we're not talking about small and then you have the right about small and then you have the right way to do what we call synthetic data.

way to do what we call synthetic data. We were able to actually augment our We were able to actually augment our data with all I'm telling you all the data with all I'm telling you all the edge cases. What do you mean by that is edge cases. What do you mean by that is that I can have a 22 year old Nigerian that I can have a 22 year old Nigerian woman with mimography of a stage 4 woman with mimography of a stage 4 cancer done because I have 200 million cancer done because I have 200 million mimographies available with a lot of mimographies available with a

lot of Nigerian and a lot of uh you know etc.

Nigerian and a lot of uh you know etc. So I don't know what your thoughts are So I don't know what your thoughts are on that but u just again uh FDA is now on that but u just again uh FDA is now not officially 100% on paper agreed to not officially 100% on paper agreed to it but you can request you can request it but you can request you can request it hey I cannot find this data it's a it hey I cannot find this data it's a very minute edge case is it okay if I very minute edge case is it okay if I use synthetic data and believe it or not use synthetic data and believe it or not you would be surprised by the answer but you would be surprised by the answer but I I just don't want to give away some of I I just don't want to give away some of my stuff but what I'm saying is that my stuff but what I'm saying is that that what you have the the the and that what you have the the the and Harvey what are your thoughts thoughts Harvey what are your thoughts thoughts on um synthetic data that's the right on um synthetic data that's the right term which people use I don't like that term which people use I don't like that word I use the word augmented data and word I use the word augmented data and the reason I use the word augmented data the reason I use the word augmented data is because it comes from actually the is because it comes from actually the basis um Hari first you go ahead with basis um Hari first you go ahead with your digital twin and everything your digital twin and everything [laughter] and then I'm going to ask Sra [laughter] and then I'm going to ask Sra that uh do you think it's ever going to that uh do you think it's ever going to be implemented in industry be implemented in industry >> wow this is a big controversial area I >> wow this is a big controversial area I I'm biased when I say it I I think I'm biased when I say it I I think synthetic data data doing it correctly synthetic data data doing it correctly and being a data scientist from that and being a data scientist from that perspective I I see a lot of weight to perspective I I see a lot of weight to that and I think it's a good thing that and I think it's a good thing because again my focus is the patient because again my focus is the patient how can I help this patient and if I can how can I help this patient and if I can get over the culture and create a new get over the culture and create a new paradigm way of doing things and helping paradigm way of doing things and helping my patient then I personally feel my patient then I personally feel ethically it's a crime that I'm not ethically it's a crime that I'm not using this technology if I see someone using this technology if I see someone dying because I'm not using it per se dying because I'm not using it per se >> so I'm big on it.

>> so I'm big on it. >> Um >> Um >> Um >> I think um like a lot of things, yeah, I >> I think um like a lot of things, yeah, I think that there there's a lot of think that there there's a lot of promise and I don't think it's really a promise and I don't think it's really a matter of if it's going to be used, but matter of if it's going to be used, but the degree to which these data sources the degree to which these data sources will be used and the degree to which will be used and the degree to which people will use the digital twins h are people will use the digital twins h are they're there now, right? Like they're they're there now, right? Like they're there. There's um I do like your your there. There's um I do like your your idea of augmented data versus synthetic idea of augmented data versus synthetic data. I like that term. I'm going to data. I like that term. I'm going to start using it.

start using it. >> Um, I'll write a paper on it. [laughter] >> Um, I'll write a paper on it. [laughter] >> And >> And >> And I like it though. I like it though.

>> You You should You Harvey, I should >> You You should You Harvey, I should follow your lead and, you know, follow your lead and, you know, trademark everything.

trademark everything. >> It's going to be a race. >> It's going to be a race. >> I'm just messing with you. [laughter] >> I'm just messing with you. [laughter] >> Trademark together. That will be the >> Trademark together. That will be the outcome of today's podcast.

outcome of today's podcast. >> You're you're you're my sister, so you >> You're you're you're my sister, so you But I actually feel like that with a lot But I actually feel like that with a lot of different things that it's not so of different things that it's not so much if much if >> but how, >> but how, >> you know, so you know all and with kind >> you know, so you know all and with kind of with a lot of the things that we've of with a lot of the things that we've been talking about, it's almost, you been talking about, it's almost, you know, how and to what degree. And those know, how and to what degree. And those are the things that we need to really are the things that we need to really kind of consider because I know that kind of consider because I know that saying is overused, the devil is in the saying is overused, the devil is in the details. But especially here, it really details. But especially here, it really is because

um you know, people might is because um you know, people might say, "Well, I don't use AI. I don't like say, "Well, I don't use AI. I don't like it." um they're probably using AI and it." um they're probably using AI and they don't know it. So, you know, they don't know it. So, you know, there's a lot of things like that that there's a lot of things like that that it's important for us to know and then it's important for us to know and then really think about and consider so we really think about and consider so we can make a reasoned decision. And can make a reasoned decision. And sometimes the decision will be not to sometimes the decision will be not to take the recommendation.

take the recommendation. >> Sometimes the decision is just to use it >> Sometimes the decision is just to use it and that's fine. Um and there's some and and that's fine. Um and there's some and it's also important to think about well it's also important to think about well what are the things that you really need what are the things that you really need someone to look at and what are things someone to look at and what are things that we're comfortable just kind of um that we're comfortable just kind of um you know letting training on a good data you know letting training on a good data set and allowing the AI to to move set and allowing the AI to to move forward and I think those are things forward and I think those are things that we really need to unpack and take a that we really need to unpack and take a nuanced approach and that's where going nuanced approach and that's where going to um Jade kind of to your point earlier to um Jade kind of to your point earlier about the implementation part being hard about the implementation part being hard that's what's hard you know it's hard to that's what's hard you know it's hard to kind of balance all the competing kind of balance all the competing priorities ities, stakeholders, priorities ities, stakeholders, considerations, and arrive at decisions considerations, and arrive at decisions and then and then >> finding an appointment with Harvey >> finding an appointment with Harvey because he's in the middle of a war because he's in the middle of a war zone.

zone. zone. >> [laughter] >> [laughter] >> [laughter] >> I mean that's what follows and actually >> I mean that's what follows and actually wherever Harvey goes next I guess that's wherever Harvey goes next I guess that's where we'll see the next conflict where we'll see the next conflict [laughter] is that in implementation I think one of is that in implementation I think one of the biggest you know bottlenecks has the biggest you know bottlenecks has been that okay the contract is even been that okay the contract is even signed but I can't find a goddamn person signed but I can't find a goddamn person to set up a meeting for three to four to set up a meeting for three to four weeks. So, you know what I'm saying is weeks. So, you know what I'm saying is that that that that >> that you're so right that insane amount >> that you're so right that insane amount because you know everything is going to because you know everything is going to um Ed you set up a point in the chat um Ed you set up a point in the chat which by the way I have to space start which by the way I have to space start paying attention to is that there's a paying attention to is that there's a new medical school where all graduates new medical school where all graduates have med degrees and engineering degree.

have med degrees and engineering degree. Can you I I did not know that. Can you I I did not know that. >> Yeah, I'm headed there uh next month. >> Yeah, I'm headed there uh next month. It's It's It's >> Arizona State and I'm meeting >> Arizona State and I'm meeting >> and she's gonna to share uh the whole >> and she's gonna to share uh the whole philosophy. So I I just know the philosophy. So I I just know the headline. It's a friend of mine that's headline. It's a friend of mine that's the CIO there and um I'm going to head the CIO there and um I'm going to head out there and visit do a tour and yeah, out there and visit do a tour and yeah, one of the reasons I wanted to do that one of the reasons I wanted to do that was it's the latest medical school and was it's the latest medical school and in the United States and and I thought in the United States and and I thought that was brilliant and I I want to know that was brilliant and I I want to know the reason and I suspect it's something the reason and I suspect it's something that you said earlier. Um um you said u that you said earlier. Um um you said u about the tooling right we got all the about the tooling right we got all the other stuff already but now the tooling other stuff already but now the tooling and so I think it's to learn how to you and so I think it's to learn how to you know think like an engineer and know think like an engineer and prompting and all that kind prompting and all that kind >> so I'm there to learn I'll report back >> so I'm there to learn I'll report back for sure for sure >> oh I can't wait to hear what you learned >> oh I can't wait to hear what you learned that sounds really cool that sounds really cool >> I would love to and m by the way we >> I would love to and m by the way we should bring the chancellor on to this should bring the chancellor on to this podcast podcast podcast >> yeah you know I did that with the the >> yeah you know I did that with the the other the I guess if ASU the latest other the I guess if ASU the latest medical school. [clears throat] I could medical school. [clears throat] I could be wrong on this because it's not my be wrong on this because it's not my area of expertise, but the one previous area of expertise, but the one previous to that is Belmont, uh, Thomas J.

Fris to that is Belmont, uh, Thomas J. Fris Jr. Belmont or School of Medicine or Jr. Belmont or School of Medicine or something in Nashville. And I was there something in Nashville. And I was there a year ago with the dean and and they a year ago with the dean and and they use a ton of AI as well, uh, especially use a ton of AI as well, uh, especially in their simulation lab and other areas.

in their simulation lab and other areas. So, so that yeah, this next generation So, so that yeah, this next generation of clinicians are are much better of clinicians are are much better trained, but I suspect not all medical trained, but I suspect not all medical schools are there yet. These are just schools are there yet. These are just two of the latest, you know, the new two of the latest, you know, the new ones. They had a green field ones. They had a green field opportunity. So pretty interesting.

opportunity. So pretty interesting. >> Um going back to the informatics part, a >> Um going back to the informatics part, a lot of departments of informatics or lot of departments of informatics or many are located in medical schools.

many are located in medical schools. Some are located in schools of public Some are located in schools of public health, some are, you know, they're all health, some are, you know, they're all in different places. And regardless, in different places. And regardless, there probably does need to be a little there probably does need to be a little bit more of a tie-in with education. And bit more of a tie-in with education. And what I've observed is that there, you what I've observed is that there, you know, some places have maybe a lecture know, some places have maybe a lecture or some have a class. I've not seen one or some have a class. I've not seen one that has an entire degree, which is that has an entire degree, which is pretty amazing, but we'll see more of pretty amazing, but we'll see more of it, right? Because it has it has to be it, right? Because it has it has to be there. Um, people are going to be called there. Um, people are going to be called on to be perhaps a physician champion or on to be perhaps a physician champion or to review output and they need to know to review output and they need to know what they're looking at and what the what they're looking at and what the considerations are. I think it's great.

considerations are. I think it's great. I can't wait to hear um what comes of I can't wait to hear um what comes of it. it. it. >> Yeah, it's great. >> Yeah, it's great.

>> The CEO of ASU, he has his own podcast >> The CEO of ASU, he has his own podcast and it's in the back of a and it's in the back of a Oh, I love the Whimo. Yeah, you just Oh, I love the Whimo. Yeah, you just talk. Uh, is very clever. They're very talk. Uh, is very clever. They're very tech, very tech forward.

tech, very tech forward. >> Interesting. You got to share the link >> Interesting. You got to share the link with everybody now. I got to watch an with everybody now. I got to watch an episode. This sounds fun.

episode. This sounds fun. >> Yeah. Awesome. I mean, I love that. Um, >> Yeah. Awesome. I mean, I love that. Um, so Harvey, uh, you are, uh, official so Harvey, uh, you are, uh, official adviser to Ministry of Health of adviser to Ministry of Health of Singapore. And then um here's my thing Singapore. And then um here's my thing that uh I just told you about this you that uh I just told you about this you know this data distribution issue and know this data distribution issue and then how would you advise the health then how would you advise the health ministry that Syrahawk should come and ministry that Syrahawk should come and fix your data problems. [laughter] fix your data problems. [laughter] >> Well I think you're overstating what >> Well I think you're overstating what Sarah Hawk can do.

Sarah Hawk can do. No, but [laughter] No, but [laughter] but what I'm saying is that like but what I'm saying is that like >> but do you understand what I'm trying to >> but do you understand what I'm trying to say that uh they are actually in a say that uh they are actually in a unique position as compared to US unique position as compared to US because US has because US has >> oh yeah >> oh yeah >> privatized data US you know it's insane >> privatized data US you know it's insane I I don't know if they have the CBC you I I don't know if they have the CBC you know from a 6 foot five inches of a you know from a 6 foot five inches of a you know Polish woman as a standard or know Polish woman as a standard or something else. So what I'm asking is something else. So what I'm asking is that that what what what what do you see that that what what what what do you see there there there >> and we have five minutes so I'm gonna >> and we have five minutes so I'm gonna and then you can go ahead. So and then you can go ahead. So >> yeah I I I'll keep it short. Basically >> yeah I I I'll keep it short. Basically

basically they're they're really lucky basically they're they're really lucky and um I got a little FOMO. I'm not and um I got a little FOMO. I'm not going to lie. uh they have a a somewhat going to lie. uh they have a a somewhat uniform population and that helps with uniform population and that helps with the data sets to some degree because a the data sets to some degree because a lot of their studies and to give you a lot of their studies and to give you a real example they have everyone's gen real example they have everyone's gen genetics which for better or worse genetics which for better or worse depending on what side of the spectrum depending on what side of the spectrum but here's what they're doing that is but here's what they're doing that is special they're leveraging their special they're leveraging their uniqueness they're leveraging their uniqueness they're leveraging their genome they're being proactive and what genome they're being proactive and what I talk about as proactive medicine and I talk about as proactive medicine and looking back and saying you know what looking back and saying you know what this particular population will have a this particular population will have a heart attack in their 20s we should take heart attack in their 20s we should take a look at them in their tens and their a look at them in their tens and their teens and maybe start them on different teens and maybe start them on different medications or different programs so medications or different programs so they don't have a heart attack. And in they don't have a heart attack. And in my mind, I'm like, "Wow, you're my mind, I'm like, "Wow, you're leveraging AI. You're leveraging your leveraging AI. You're leveraging your population. You're able to do studies population. You're able to do studies that we can't do in the United States." that we can't do in the United States." And another thing I'll just share real And another thing I'll just share real quick, I was seeing this software they quick, I was seeing this software they have and they're like, "Okay, let's look have and they're like, "Okay, let's look up all the diabetics." And then they did up all the diabetics." And then they did a quick search and for their patients a quick search and for their patients and they were like, "Okay, here are the and they were like, "Okay, here are the worst diabetics for our our population worst diabetics for our our population and we can correlate that these and we can correlate that these individuals live so close to so many individuals live so close to so many fast food restaurants and we think fast food restaurants and we think there's a correlation there because there's a correlation there because their eating habits and their hemoglobin their eating habits and their hemoglobin A1C and I'm like oh my god I am so A1C and I'm like oh my god I am so jealous. I want those tools for my jealous. I want those tools for my So um again coming back to symptoms and So um again coming back to symptoms and uh one because one of the things that we uh one because one of the things that we also talk about is entrepreneurship.

also talk about is entrepreneurship. Sarah if you know any startups feel free Sarah if you know any startups feel free to introduce us. We'll bring that. So to introduce us. We'll bring that. So any other guest you recommend we want to any other guest you recommend we want to bring them to the podcast. By the way bring them to the podcast. By the way before you stop recording make sure that before you stop recording make sure that it uploads. Last question and then we're it uploads. Last question and then we're going to just automatically close out of going to just automatically close out of that. If you had a magic wand and a wish that. If you had a magic wand and a wish list list list >> to actually use personalized medicine in >> to actually use personalized medicine in one year, what would that actionable one year, what would that actionable item be?

item be? >> Wow. I have so many things that I would >> Wow. I have so many things that I would like like like >> just one just [laughter] one >> just one just [laughter] one >> I you know I um one thing about >> I you know I um one thing about courageous leadership is you're not courageous leadership is you're not afraid to ask. So um I want a whole host afraid to ask. So um I want a whole host of things. [laughter] of things. [laughter] Um, one is going back to our data Um, one is going back to our data conversation before. Um, we have data on conversation before. Um, we have data on a whole host of a whole host of conditions. We have data on different conditions. We have data on different types of people, but it's all over the types of people, but it's all over the place. It's not all structured. Um, and place. It's not all structured. Um, and it's not representative as we talked it's not representative as we talked about before. So, I would I mean I know about before. So, I would I mean I know you know it's a magic wand. So with you know it's a magic wand. So with magic, I would love to see an actual magic, I would love to see an actual representative data set that's representative data set that's integrated across uh systems, settings, integrated across uh systems, settings, etc. And I think that that would be etc. And I think that that would be amazing because by fixing that problem, amazing because by fixing that problem, you fix a lot of what happens later with you fix a lot of what happens later with AI because you don't have to think AI because you don't have to think about, well, do I have this history data about, well, do I have this history data because this person was seen, you know, because this person was seen, you know, in three different systems and now I'm in three different systems and now I'm trying to figure out their medication trying to figure out their medication history and now I'm

trying to, you know, history and now I'm trying to, you know, all those kinds of things. Um, but if we all those kinds of things. Um, but if we could fix that, which um I guess in could fix that, which um I guess in Singapore they have, but maybe in the Singapore they have, but maybe in the United States, um that would be amazing United States, um that would be amazing and that would really lead to a whole and that would really lead to a whole host of other things that we could um host of other things that we could um look at in a more um holistic way look at in a more um holistic way because and if we could include things because and if we could include things that are health related but not health that are health related but not health data, for example, um workouts, data, for example, um workouts, wellness, things like that. So those are wellness, things like that. So those are things that very much relate to health things that very much relate to health but aren't actually available in many but aren't actually available in many EHRs for example or people may or may EHRs for example or people may or may not ask about them or you know like pat not ask about them or you know like pat patient generated data. We haven't even patient generated data. We haven't even touched on wearables and all those kinds touched on wearables and all those kinds of things. So when I'm talking of things. So when I'm talking comprehensive I mean comprehensive comprehensive I mean comprehensive that's what I would like to see.

that's what I would like to see. >> Thank you so much for um joining us >> Thank you so much for um joining us Syra. Thanks for my co-host as usual. Syra. Thanks for my co-host as usual.

There's an amazing paper from Google. There's an amazing paper from Google. Everyone wants to do the AI work. Nobody Everyone wants to do the AI work. Nobody wants to do the data work for high wants to do the data work for high impact. High impact which is health and impact. High impact which is health and military data is so much more important military data is so much more important than anything else. Grateful. Thank you.

than anything else. Grateful. Thank you. See you guys next week. See you guys next week. >> Thank you for having me. >> Thank you for having me.