\*Disclaimer: All transcripts are provided as a resource and are not guaranteed complete accuracy

So hi everybody I'm Peter Schwartz I am the director of the Center for Bioethics and

of the bioethics and subject advocacy program of the Indiana CTSI this

is a next version of our treats series treats translational research ethics applied topics a we offer these

monthly talk by bioethics faculty from

the CTSI and I'm very pleased to get the chance to introduce Dr.

Andrew Brightman who has been our stalwarts Purdue in fact of the various campuses I think we've always had our strongest presence at the school of medicine but I was a Purdue is our second choice

residency I think you've got the fragments work and if you are watching this in the future or now from the

Purdue campus please remember about impressment is you can contacting me for your bioethics questions including any

questions you have on the ethics of research involving wearable technologies and absolutely essential topics in

today's world of research more and more including nationally known projects

there should be all of those projects mounted wearables and we are very interested in the ethics and as you it's

absolutely one of us who knows as best as we mentioned his titles as associate professor of engineering practice as

well as assistant head for academic affairs correct at the Welding school of biomedical engineering and recently

became the leader of the tl-one pre-doctoral programs of the Indiana CTSI I

guess also at Purdue not upon system-wide but system-wide yes I messed

up no that's right the different campuses oversee the different aspects of training that's then so Andrew taking on

that role and she'll do wonderfully add reflecting the excellent and wonderful

yes I will put a caveat in here as Peter

pointed out I think this is happening of wearable technologies really important

and I'll show you a few slides support them but it's moving quickly the field

is moving quickly to develop wearable technologies are moving quickly the integration in research and so thus

ethical questions are arising so today I'm just going to touch on a few maybe

highlights I think there's some more issues in deeper dives that could be considered but as a way to get

researchers quickly up to speed I hope this will be helpful I think one of the key things to

keep in mind is first update people are

becoming much more accustomed to wearing devices that monitor things right I'm

just going to say I'm yeah my and I got mine not because my partner has one and

was commenting at how useful it was to track sleep time and it's always a

challenge for me again depending on time and getting enough sleep and after I saw the recent CTS nighttime sleep issues

related to Alzheimer's I hope you know I'm like okay I'm going to modern fitness lookey and make sure I'm getting so you

know and it's an issue that will come up also as we talk about this this idea that how we are as people as subjects

potentially influence devices and how that might play into the

kinds of potential even confounding issues in our yeah is there's lots of

people wearing these using these more they're becoming more affordable could you view their consumer varieties and

we'll talk a little bit about both medical devices and consumer of Fitness

wearables but the other piece here is that medical devices are becoming

approved by FDA that are wearable first blood pressure monitor connected to

digital health services approved this year FDA um the other thing I would put on is

wearable technology not just like the Fitbit there's technology such as you can see in that lower right it's a

waterproof microfluidic device collect sweat and does biomarker analysis as

well as temperature regulation for athletes under water I mean it can be used in some really unusual settings

where we're not using and collecting data I think that's important for researchers to think we might be able to

get things information we couldn't get before there's another one that's interesting um again an FDA approved system it's

been and then being used for a couple years that I was not so familiar with

this is a partnering of a pharmaceutical a drug that has a sensor built into the

pill so the wearable is the patch that monitors when that sensor has been

adjusted so the monitors that he'll come taking compliance this one specifically

it's coming in just ingestible event marker that tells when my patients taken

a pill this is particularly for some mental health issues it's a perennial

but as a way to monitor in situations at home moderate monitoring of the

patient's clinical both for treatment for clinical studies there's also more

sort of integrated systems this is a wearable device now cleared for at-home use which

integrates a number of vital signs that can be monitored in a number of situations where you want not just

activity but you want my blood pressure you want an EKG you aren't heart raging

my temperature all kinds of different things can be integrated into systems

that one is also one of the first days called AI enabled meaning that's got an

artificial intelligence algorithm in there that's not just collecting data from that the system doesn't just

collect data from multiple sensors but it's integrating it into some decision-making paradigms that could

potentially feedback information to a clinician or whoever's monitoring this

with some indications about how those different markers relate to each other

which might indicate the health status it might indicate mood status it might indicate other things so I want to just

do some clarification about some of the

terminology because it gets a little murky we're moving quickly in this field

so the idea of digital health is really this larger system in which you have

everything from electronic medical records through sensor technologies that

integrate and within that there are medical devices and there are even

systems in which these consumer-based devices for health and fitness and

activity can be integrated but the goal ultimately is to monitor the patient

real-time and to provide that information to a clinician or in this

case a clinical investigator in some useful way and most often I want to

point out that there's typically some sort of integration system and collaboration platform they're calling

it's usually through a mobile phone but it could also be a few other systems that telemedicine

adoptable device or remote sensing devices it sends the information data back to some central

data monitoring place and this is going to become important in our discussion of ethics what do we do with that data how

do we handle it where does it go who has control over it right another just fact

that there are this is to me over 300,000 health apps currently out there

could be access I my guess was 3000 I

was not buy a fiber and about 350 now

consumer wearable devices of varying abilities and diagnostic competency as

well but within that this overall digital health these systems the devices

fit into a system which links electronic medical records across the top here you

can see there's issues of machine learning and AI algorithms that handle the data to help either interpret it in

some way or do linkage with other sorts

of data sources it may not be coming from a sensor but it is coming from some

other entry of digital data there's integration with social media and communication platforms apps which both

provide data collection and also feedback systems and then of course

there are the sensors some of which are wearable some of which are not and the newer devices are what we're talking about are these wearable monitoring

personal individual devices that

can be mobile and wearable and used in different situations provide a more

unique pattern which we can collect data on a patient and Jurnee our subject in clinical research

where they are outside of the clinic what they're doing and perhaps get deeper insights into research

questions so some of those consumer health wearables I was interested about

this wondered what are those three hundred-plus wearables all doing and so

it's a wide range I put these up here just to sort of show that they can be worn in different places headbands body

patches camera clips smartwatches are

certainly a prominent component and then also since clothes sensors embedded in

clothing so hospital gowns athletic wear undergarments socks lots of things that

are just part of our normal wearable clothing that are now being embedded with monitoring sensors and linked

together so and in that you can see a wide range from everything from activity monitors altimeters camera so digital

cameras for recording environment monitoring physiological states locating

people and where they're traveling which could have implications for you know

sort of community-based health or studies it brings to mind that issue of the Monon Trail analysis of community

health within certain regions and where are people in those regions and how long

are they there it also raises some other issues that we can talk about monitoring people attention to

vulnerable populations there in places that they don't want to be monitored microphones for recorded speech or other

noises is that both during sleep early

as we say different sorts of physiological but also pressure based

monitors you know so monitoring how much sure patience may be putting on one foot versus another for what they're sitting

diabetic patients understanding those so

some of the terminology as I said I my understanding as this breaks down and if

you see it differently please help me understand but digital health is really about the larger complex digital systems

and platforms that support medical care so a wider range of umbrella mobile health devices or M health are not all

completely wearable but they are medical ices approved medical devices that bring

treatment and sometimes diagnostic diagnosis directly to the patient outside of the clinical setting in many

cases the wearable medical technologies are subsets of that mobile health and

those where wearables are again two categories the approved medical devices

for sensing and communicating that with the clinician and then typically

unregulated consumer Health and Fitness wearables those are becoming more

complex but there are differences in between those two categories and then

and finally part of this system is the mobile health or mobile medical applications own smartphone systems the

computer based applications that take that data and do things with the FDA for

a number of years was not regulating any of those and that has shifted in fact

the guidance just was recently released week ago yeah how these should be

regulated in there's three categories in there these definitely regulated medical

device mobile apps because they're either used as an accessory to a

regulated medical device or they transform a whole into a regulated then there's a category

of definitely not the medical device and not going to be regulated and then they have a third category which is more

ambiguous they have a term for it but it's basically categorized devices they

wanted to put that out there for both I think yes

no there so the sensor in the pillow is not directly considered but I'm pretty

sure that sensor and that patch is considered part of the medical device

directly relate to treatment an interesting question I hadn't thought

about because within the device within the FDA approval realm they have

pharmaceuticals or the drugs and the devices and then they have the biologics

and then they have the combinations so I actually don't know where that one Falls because it's a drug and a device it's a

combination but it's not directly mind it's only and by this new guidance if

it's not regulated not currently it's not medical it's just

and if it was a app that could detect what even a fib mm-hmm using your Fitbit

it probably become rated now there are there are apps when iPhone cardia has

one for monitoring and it communicates with clinical people but it comes with a

separate technology that you can mount to your phone or monitoring the app just

that is that particular version they use

yes the app itself is not what the device is using with the Kaiser I think the app would be considered

because it's using that data and communicating yeah I don't know how the

biosuit bio information in their suits were specific whether it's considered a

medical device or not it's interesting I know they're definitely a lot of physiological much going on

probably much of this technology early

work and it's been yeah but they're also

mentioning Fitbit there are also similar devices that a Fitbit this barely study

watch is an FDA cleared device or specifically for medical research so

it's people that recognize it may be clinical researchers to a lot a higher

level of accuracy or control over their

Hardy potentially so I don't know what the third-party regular regulations will

be on this but this was developed by barely a subsidy of alphabet which

Google was developed probably for the Google how

so their research and they have a large national scale study going on as well

forgot the name of it it's likely all of us but it's something like they want to

get the million ten million patients wearing these devices and collect all

that data so it's very similar but you know that's a version a medical device

version this one actually records so um

interesting in clinical trials.gov I came across this study how wearable

technology was coming into clinical trials and in January they did a search 200 clinical trials with wearable

devices aware of the technologies so I just I just did another quick search recently that's gone up since then

but more interesting to me was I found over trials it's they didn't say

necessarily something said wearable but the 400 child for intent I think that

said Fitbit so they actually were four hundred trials were using the Fitbit currently and that's just one of these

commercial I was just curious how much how prevalent would be a study watch

versus a Fitbit and one is one that's currently enrolling is it it's

actually a randomized clinical trial on comparing the standard care after cancer

surgery which is asking the patients I think weekly basis to complete a

questionnaire I think they get emailed this questionnaire about life activities

and they're trying to determine how quickly patients are recovering from major surgery cancer tumor removal

surgery a number of cases brain surgery and bariatric team versus them wearing a

Fitbit monitor that the data from the 50

is fed back to the clinician and they're looking at a couple of parameters you

how active they are when they're sleeping and they're then they've set up a paradigm monitoring protocol to say a

rating scale if the person seems to have recovered back to normal level of activity but they can do that on a daily

basis and it has alerts in there to say every day if there's anything that's

different if it's not an increasing that's decreasing in the clinician well the researchers will get an alert so

they're doing an outcome study to see if that changes earlier intervention final

outcome was time to recovery to see if that makes interesting opportunities so

um how else can these wearable technologies help in research so I'm

going to point out why they might be becoming so prevalent first of all you

can in many cases more easily and accurately monitor detailed longitudinal

data right you can get as I just explained instead of just weekly reports

daily reports you might get hourly reports on how a patient is doing

something know the accuracy is an issue that we have to talk about or think

about and the ease with what does that mean for who eats for who the patient or

the but we also have the opportunity to collect data in a much wider range of

non-sleeping showering swimming traveling in the loop somewhere as long

as I think they have some phone surface to communicate that data back but even if it's intermittent phone service you

can still be collecting the devices collecting data continuously it's charged but they do require connectivity

that online communication services but that does provide ease of you know it's

a little easier maybe than standard telecommunication or email communications or certainly less visits

directly to the clinic phone conversation also the connectivity to other systems

we talk about cameras microphones to collect different kinds of data and the

data management and analysis so these particular machines learning artificial intelligence algorithms that might

manage to that or combine it to give decision-making so the pendulum manages

of the consumer where well in some cases they're used because less expensive in

the medical devices they may be easier to get maybe the subjects already have them and so you're not interfering with

their life or complicating their life in a sense and they'll use a different kind of medical device I did a test couple

years ago a chest harness monitor and I

found it both comfortable and very effective didn't work on lots of conditions and then so using a wearable

was way more it felt like I was getting much more information and it was it is

intrusive so you get better patients' compliance sometimes because the

consumer devices are designed to be more user-friendly they look nicer willing to

participate and you get built-in and continues user feedback and support

which is often part of what gets people to buy them they want some feedback they want the good job when you get your

10,000 steps or you know though you should get up and move I get a warning area you know our it until you've moved

it up are you alive keep moving and so those are advantages but there's also

questions about how does that influence the actual behavior of the exam how does

that influence what you're trying to study techniques an interesting piece um so I thought I'd throw in a case you

like to have a case sometimes in these talks this is taste it it's published and from

a group called catalyst an in can a good medical center that do some analysis of

ethics cases this one was a very recent one on secondary use of data in studies

about involving wearable technology so this was a clinical study involving

Fitbit in fact with a mobile application so they want to understand that study

was about the impact of activity and diet individuals with depression or

suicide ideation so the goal is to have 100 participants being the study they

would log their mood several times a day so the mobile phone application which is also requiring the Fitbit data is

continuously Majin Edison reminds them several times a day bite

them to record some mood analysis and blog and that's captured

digitally as well they also have the option at that point to blog what

they're eating throughout the day so they can capture diet influences and then the goal is studies examine the

data from the diet the movement levels of activity to see if it

influences suicide ideation and depressive state the application also

gives subjects the ability to log in if they are experiencing particular signs

of depression or suicide ideation so that is going to be recorded and stored in

a cloud server the study team extracts that data regular intervals and so being

synchronized through the Fitbit and the mobile application so the team is also

going to request data export directly from Fitbit the company because all this

active marching it data is available to the company which

using the application they have access to all of that so that's the question is

if the identified could agree that we would say is appropriate for somebody

walks in and says you know I'm going to jump off this bridge so I mean if

somebody monitoring in real time so it's it sounds like in this study they were monitoring it didn't say that they

had set up any alarms for that they just

said they were going to be monitoring it it's regularly like in the other side of

that is if you have patients in a study that go home or obese you don't

know right so it's an opportunity and data and the question are what you do it and what's your responsibility

well this is my cry for help

so here's issues that the researchers

have to contend with they're using this wearable they because the users have you

bought the Fitbit or given it they have to agree to the Fitbit privacy policy that's a third party which that I'll see

includes that that data is available for the Fitbit company to use as a secondary

research so there's some complications

there is it how identifiable is that is it protected it got a RB approval to

do this knowing that there is the

researchers if you were in this design

we have that wait 40 min started to

study Ghana bread and just sort of highlighted which is that if it's the

person up and collected it's your name and that's how do you say it much I've

got it right and that's part of only a Fitbit and what's hilarious about that is if we are upset by that in the

research setting it's kind of like it's funny to be funny haha because you think

oh and research saying no we never fly but of course outside the research day where people just click on that ok box

yes that's just the way it goes so well talking second I think we should

now we put that back into the steak but I want to stop there and talk about the situation before the study even got a

nagging which is that if you sue saving back you know the Fitbit records that

Peter Schwartz has stopped moving for two days you know and like well

nobody's monitoring that I was going to get back and help eat off the floor of his house like its sort of boy they're

getting all this data they're not using it always no protection to you it might seem disturbed you want to just that you

just want to she want to address you understand is that really the case that companies like technology because it's

outside of the medical setting with Eric HIPAA issues outside of the research setting was I happy oversight that

basically personalized data is being collected and stored and potentially

used in a personalized matter without any yeah I think there are certainly so

I'm I don't know that much about it actually it's away not an expert but I know that um the European GDP are yeah

thank you so folks in European Union have been

concerned about that very thing because there aren't outside in the medical room there aren't any really protections so they created this and set up these to

try to protect consumers in some way so there are some growing both concerns and

regulations around that I think the

piece that's become more obvious to me is that selling you things like this is

helping you to monitor your sleep or your activity and they get a little money from this but a bigger business

opportunities they have millions of people's data that they can sell to

other people to use and in most cases it's not negative they can't resell it medically because that would change the rules but for

consumer use who's using it how are they using it what are they doing they can make better devices that's what the secondary uses

it is trying to make that's an option in

the case this wasn't a clinical trial done by art

it's their ethics these sorts of

technologies that you can go to this say they put in studies well the researchers

came to that's you should be where us because the research setting now it's

better not to get the personalized data in order to do it some other ways

so this particular sensor is right now set so it can determine when I biking

I'm chopping vegetables at home and it thinks I'm swimming okay but it is

remarkably accurate feel that it would

be important to actually see I mean if this is really a consumer-friendly and I

think one of the questions is how identified are they just getting random information

they actually for making better consumer

products and for marketing other things you if they find out that you're oh you swim a lot well let's market you let's

say like to Amazon and they're going to try I get ads for you need a new pair of

swim goggles or you know here's a pool you go to this resort in here people like Marilee a data collection

place and so he over the idea that data

was the currency he wanted to trade in perhaps to become a data company so I'm

going to keep moving here but these are interesting so some of the ethics research considerations they're just

about research in this particular case that the case this is a potentially

vulnerable population how he does the study personnel vet the potential risk

of these particular so dicks there how are they tracking them are there

emergency alerts for just as you said if somebody's logging in that they have

suicidal thoughts and then what are the safeguards to protect them in the event

of a crisis and what's the responsibility of the study members in that case and whether they were

wearing a wearable or not in this particular study I think those important but some of the considerations because

there are wearable technologies we have begun to touch on first of all are the subjects trained to use the devices

properly in accordance with the study guidelines you know they're going off we're giving this can you really make

the study will group in order to collect data that you think is accurate and

clear how does the manufacturer protect the data and how well is that understood both by

the participants you know if you're thinking about it form consent how do they know how well this is protected how

did the researchers know how well it's protected what rules do we have to actually get honest responses how secure

is this particular device from hacking or the mobile application most of these

are transmitting over unsecure so the

data if you're a patient I mean so dick in a study and somebody's hacking I'm not sure why I said you'd do it but it

could happen and do the subjects have the appropriate security measures already implemented on their devices so

if there are additional security measures making sure that they are

activated important consent does it include language about the potential

secondary used we have to ask those questions factored in and make sure that

the subjects and if they by themselves

and already have it versus did you buy it and given it to them as part of the study are there some differences there

and then what are the other compensating factors that would be needed to use to

minimize the risk of this secondary data use that's out there so those are some

things that I think in any case if you're using some wearable technology that's linked to a mobile phone or

smartphone so here's how the case

resolves publication I can a medical

center that was running this study chose considered two approaches to helping

control the secondary use of the data one was ask Fitbit to be amenable to a

study specific and user privacy agreement so in other words saying this particular set of it's don't go into

your general pool that it is protected in a different way and if you want us to use your Fitbit in

this day this is the agreement that you're making with us that you will have

special protections in place the identification you don't get you don't get put it into your large so that's one

option that could be considered the second was using fictitious names and

pseudonyms and personal information so the study researchers would basically just set up accounts fake accounts make

email give them the mobile phone give them the Fitbit and it's all tied to a

number so even if that data goes into a cloud a news secondary use individual

particularly because they're just subject so some core ethical issues that

I in doing the background thinking about this and research stomach or ethically I

came up with certified that I think are really things that researchers need to think about when using wearables a key

one is privacy for the subject so that includes disk reaching or you know if

you're wearing a Fitbit yeah that's lots of people wearing Fitbit you know in your study but if you're wearing a study watch that people read would recognize

oh you're in a study because I can see that orange watch I'm here and people

are identified in public because they're did some kind of a study and there may be other things for example ingestible

the ingestible event yes exactly the ankle bracelets or the injectable drug

monitoring device if you can't hide where it sits on your base or somewhere people can see the read identification

issues have to be considered in this when you are using large databases or

putting the data into and so there is some trade-offs with consumer comfort

and less obtrusive versus less control of the data informed consent we

mentioned a few of those both the challenges for understand understanding those terms of privacy and use of

secondary data both by the subjects and the researchers what is happening

to this information how is it protected it how do we get informed consent okay

conflict of interest come here as well this issue of financial arrangements of

privacy agreements with any third party providers no both the medical device so

that barely vice study watches for using clinical trials it's still you know

owned by a private company developed it

obviously not out of just they're going to make some money out of this and they want something happen so thinking about

the conflicts of interests in the security of the data is also I think separate from the privacy of third party

access which seems to have I realize user ignorance leaking data or

communicating not having security

there are also two issues we're not going to go into but this idea of control returns of information one of the things

that's out in the literature right now is within these wearables people are wanting more information about

themselves so they enroll in a clinical study and it's involving the wearable technology and has feedback on it how

much do they get and what can they know and how you protected if you're giving it back to them and it's not that I

think that's deeply novel ethical concern but it just becomes complicated

because there's this digital access and some expectation oh I'm going to stay I'm going to get this deed what Mike outcomes

are I'm going to monitor it along with you and then you're going to tell me what it means and we have some risk issues there they

have some understanding issues and the third and the fifth one is their veracity of the data so how accurate are

these devices or inaccurate especially those not designed for research

increased user error I'm familiar with the technology they put in the wrong place they don't turn on the right way

does it accurately track movement does it actually accurately track certain

activities particularly this issue of people who have different abilities who

movement abilities these are set for normative movement tracking and so if you're doing a study population or

someone ambulatory problems mental health problems you know I can think of

Parkinson's issues or autism where the person's movement patterns are also

altered for varices you may not accurately track what you think

consideration and then the evaluation of

artificial intelligence enables data outputs we have lots of concerns about

that and many of these devices now are using some sort of algorithmic codes

there sometimes in machine learning mode where there it's not really clear how they're

tracking that data but they're learning from it by they collect more and more data and they tend to get more accurate like you don't know exactly what they're

measuring and then the last piece is this influence of are you getting a an

alteration in clinical outcomes because there's some sort of social engagement

digital influence it's actually kind of study so those were the five things that

I point out I mean in some further reading there's a groove victim

UCSD that's been studying particularly

digital health in mobile health issues and trying to understand so this is a

group called recode you can go to their website it's link there in the middle and they've come up with a decision

making framework and a checklist for digital health researchers based on bioethics principles really interesting

they published papers on it and their four primary categories involved similar

issues of privacy access and usability data management the risks and benefits and it breaks out if you go to the web

page there's something very specific questions under I know that's kind of small print but for example under access

and usability is this mobile health

device wearable device is it accessible to diverse populations can it be tailored for specific end-user data

collection how long is the data is it short-term or long-term storage what do

you need there's issues of data management certainly issues around

privacy so this is a this is a research group that's actively trying to

understand the ethics and so another resource that people might use the other

group is exertion mobile health app guidelines in this group is partly

AMA American Medical Association AJ I think they got involved

because a lot of the early wearables were cardiology issues became SS oh I

forget what that is but it's a health information something security group so

the sport main groups got here that I found this about five or six years ago

and they've been working on coming up with set of privacy and security guidelines which were initially sent out

to maybe last year about a year ago for public comment and also clinical

comment and then they finalize them just in August and those are online now and I've just highlighted there's a

document that you can go to but they have six privacy areas and nine security

issues that you can go to just start sort of asking questions

who's the data disclosed to how's it collected retain how long is it stored

one of the business purposes behind the secondary use if it's there and they

also talked about complying with this data protection regulation as well as

clinical practice with wearables the security concerns we've mentioned a lot

of these but how it is the app developer and this is particularly for mobile apps

that they're addressing less about the sensor devices but more about the apps that link to them how do they maintain a

non packable security system around the data what do they do if there's a breach

how do they comply with and it's just

another set of privacy security guidelines particularly for mobile health researchers and then here's a few

aren't those that I think are useful for people the NEB occur group has a couple

on their work my dad was the bellman decision-making coolest that just came

out in translational behavioral medicine a very highly cited paper is high

Wycombe right the consumer health wearables very

it talks about how these are becoming part of our clinical research as well as our medical health delivery and that's

it questioning us so if you are researcher

wanting to do something with fireballs why not just do this when I just go to

one of these companies that is already collecting this data from a non medical

device just say find these mobile health

apps they're already cause these all seem

like very hard problems we can you know can you avoid it

well it would be a big issue with informed consent I don't think you get a RB approval to go after your data that

was collected without the users understanding well the study than

my institution you guys you're saying

there's something we want to know like what's the general activity level whyisign

of course it might be you know the

people are if you're going to know the

reason why with these all sound so bad TV sets like this is scary but at the

top someone Conrad not ask you do you miss message in question we meant this to be where our treats talk suspect be

that way need to know if you're going to do research about wearables and you've identified some issues and hopefully

some resources recesses I think we'll put up the link to the recode

but it sounds like if you had a study and you wanted to get people Fitbit's do you think is a skinny law I'm interested

in your in your effective and effective response here at UC education to be freaked day I think politics are like

whatever is approved yeah and that's a

whole separate well I was I think my

initial idea was this is really challenging and then I went in so that

there were over 400 clinical trial well somebody's right so I think there are

ways to do this as we saw in the case study you just have to set it up the right way to avoid a lot of these issues

no basically what I did was try to point out as many pitfalls it could be possible that you should think about but

people are doing these studies in and learning and in the fact that there's a randomized control study that's asking

you know is it better that you can Fitbit or not it's important I think this we're going to go into asking how are

those studies getting approved in you know there's this distinction between studies so as a of course I came across

some lots of space I review different capacities here not here I you know

whoa we're staying you know effect of this medication or this exercise program and if we slap on

a wearable as part of our data collection which you've done a study without that the primary out

sure maybe it is a lot more troublesome

to put safeguards in place but if you can collect some data it really gives

you insight patient's health status hour-by-hour in particular that you

can't collect any other way this is really important in understanding disease progression or healing so we

have these opportunities and megaria Spinnaker's no I just mean I am NOT a

researcher of training Iowa as a clinician and so my thing is if you're

not going to benefit the person then why are we getting so excited about powered by our I mean I get said this with the

impact and the risk to the purse which you're talking about is to be especially

but we it is not without it is not just

yeah

and you're watching this on tape let's see what and you mag the rest of us can

alright that's what's passing about that initial right now is that the survey

does make saying you get subjective data how does it make me feel what are the

attractions of fitness Jack Norris you know exercising they're moving in a

different way Dr. Jafek a committed clinician what matters is how they're

feeling not whether they're actually moving more in fact this objective sense

that it's so objective is actually baked out because as Karen said it might take

off their watch or the burners but run out my Twitter hands running to talk instead of actually moving more and so

so that's a recurring theme in research active mattress movement not always the

right time including I'm thinking about analogy here at the trials of move where

you can't get it funded unless you also show a change in my friends neck feel

say yeah okay I said why do we have tomorrow you don't eat that and say we do need it to get funding yes you go

here's my son attack that's an objective measure and that will get it from the funding agency so he has a deep issue

here about the attraction of wearables yeah and whether it's a fake out or expressing a deep bias medicine or its

objective measures I think it's also but maybe I'm wrong here but my sense is

that again this idea of some people cut the digitizer so we are really

intrigued right now as a culture with putting data on everything that we do is

if it's going to help us understand ourselves better but for whatever reason it's a cultural phenomenon it's

influencing this I want to say one more

thing and then actually appreciating

I think if you want to dig into this more and I'm saying this do any researchers I'm not an expert talk to

somebody who's actually put together with a wearable and find out what it

really took that being played by obese mystics bodies and even questions

they'll come to us people watching this that we can help you don't have to run