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>> ARIA: Hello my name is Aria and welcome to the latest presentation innovation and integration of telehealth and to population health.

Today's webinar is provided to give timely information and support to develop severe telehealth programs and they are presented on the third Thursday of each month.

Just provide some background on the consortium located throughout the country there are 12 telehealth resource centers and two national.

One on policy and one on technology.

Each service a focal point for advancing the effective use of telehealth and supporting access to telehealth services in rural and underserved communities.

If you tips before we get started, your audio has been muted.

Please use the Q&A function of the zoom platform to ask questions.

Questions will be answered at the end of the presentation.

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Today's webinar is being recorded and you will be able to access today's and past webinars on the NCTRC resource page.

>> REID: I'm Reid Plimpton, we cover all of New England and New York at the Northeast

Telehealth Resource Center.

Always happy to meet new folks and connect you to the other TRC's as well.

I'm honored and overjoyed to be joined by my friend and colleague Dr. Hasselberg to we had the distinct pleasure of hosting at our annual conference this past fall.

We've been in touch with him since.

Dr. Hasselberg is an associate professor of psychology and clinical science at the University of Rochester New York.

He's the first chief digital health officer at your medicine is a codirector of the your health lab.

Health systems digital health incubator.

He was recently named the 20 CCHP top 15 digital health list by rock health directness his work to help improve health equity in technology and innovation during the COVID-19 pandemic.

Board certified as a psychiatric mental health nurse practitioner, Dr. Hasselberg pleaded his PhD in health practice research at the you are a postdoctoral certificate at the Johnson school of management at Cornell University.

With that, I think we'll head over to you Michael.

Take it away.

>> MICHAEL: Thank you Reed for that great introduction.

I'm really excited to be with everyone.

I'm going to share my screen here and pull up my slide deck.

Today I will talk about telehealth, but also talk about the bagels bigger spectrum of digital health.

At the University of Rochester how we are pushing forward digital health strategy as we are also moving into more value-based care as a health system.

Where we feel it all fits in?

I have no financial relationships or disclosures to make for this presentation.

I'm going to begin this presentation, in an industry outside of healthcare.

I'm going to talk about these two gentlemen up on the screen here.

These two gentlemen totally disrupted the retail industry.

These are two math majors from the University of Michigan.

They developed one of the first expert computing systems.

Please see on the screen here is Tom and Lewis borders.

In the early 1970s Tom and Lewis tested their expert computing systems in the book industry and stood up a bookstore in Ann Arbor Michigan.

Other bookstores, the Barnes & Noble's of the world could not compete with this bookstore in Ann Arbor Michigan.

The reason why is because they developed a computer system that could in real time track inventory.

They could figure out what consumers were buying in the bookstore so they could quickly get those books back on shelves.

They had a bigger selection, bigger bookstores than anyone else.

They leverage computers to do that.

Throughout the 70s and into the 80s and into the early 90s borders rapidly grew.

He grew throughout Michigan down into Pennsylvania and into New York State.

It was actually in the 1990s that borders lost their edge in regards to innovation.

Around the 1990s, during the 1990s a lot of things were happening in the world.

It was essentially the Internet boom.

The.com push during that time.

Borders decided to stick with what was working for them which was having these huge brick-and-mortar bookstores that were larger than what anybody else had.

They decided to actually partner with the Kmart Corporation.

If anybody remembers Kmart in the early 90s, Kmart was the leader in regards to brick-and-mortar retail.

They had a bigger footprint than anybody.

Kmart had already acquired Warden books.

Made a lot of sense for borders to partner with Kmart.

Within a few years the Kmart Corporation spun out.

Borders grew to over 700 bookstores across multiple countries in the world.

On July 18 2011 the Borders group announced their plans to liquidate.

Essentially they went bankrupt.

What happened to borders?

This man here killed Borders bookstore.

I suspect everyone recognizes this person, this is Jeff Bezo's.

Let me tell you how Jeff Bezo's disrupted borders and disrupted the book industry.

Jeff Bezo's looked at the value chain for retail differently than borders or Kmart was looking at the value chain.

Let's look at the value chain for books.

We look at this value chain at the end are authors and readers.

It's basic, what you want to do is connect authors to readers.

In the middle, where publishers, distributors and bookstores.

Jeff Bezo's said instead of focusing on the middle of the value chain which borders was focusing on in terms of growing their brick-and-mortar presence, growing their bookstores, growing their distribution channels Jeff Bezo decided I'm going to focus on the ends of the value chain and disrupt the center.

In 1997 Amazon.com went live.

The first e-commerce online bookstore.

Not long after that, Amazon started their self-publishing service line.

Quickly after that they launched the E reader, the Kindle.

The first E reader.

At this point there was no reason ever again for a reader to ever step foot into a bookstore.

Where Amazon has been super successful and continues to grow into multiple verticals goes well beyond this value chain.

This right here is Amazon's actual secret sauce.

This is there printed Amazon recognition algorithm.

It's that simple, the formula you see here on the screen.

Let me break this formula down for you.

Essentially, this formula uses machine learning.

What Amazon did and were really smart, they stuck up their five star review rating system on the products they sold.

That allowed them to start essentially profiling their consumers.

Collect new data on their consumers and understand how an individual consumer may look like groups of other consumers and understand which products those other consumers were purchasing.

Then they took that formula to another level.

They focused in on the individual consumer and look back to the consumer had a buying history.

What did the consumer by two years ago?

What did they buy six months ago?

What did they buy two months ago?

What did they buy a week ago?

They were able to start looking at those buying patterns.

What is the output of that formula?

It is essentially this.

When you go on to Amazon you have your own personalized shopping experience at the click of a button in your own hands were Amazon in more cases than not knows what you consumer wants to buy even before you know you want to buy it.

They put those choices up in front of you with good confidence that you are going to likely click on one of those choices and purchase it.

What does this have to do with healthcare?

That same company that disrupted retail space has aggressively moved into the healthcare space.

They have been in the news, even up to last month when they announced a partnership with Tele Doc.

They will be providing telemedicine right to patient's homes, right off of the Alexa device sitting in patient's homes.

Amazon is coming to disrupt our industry.

Let's apply this to where we are in healthcare as we are trying to move to population health.

When you think of the value chain and healthcare, at the ends of this value chain at its basic are clinicians and patients.

Healthcare at its simplest is really how do we best and most efficiently connect our clinicians to our patients?

In the middle of this value chain we have insurance companies, health systems and employers.

Essentially at the University of Rochester we are all in the middle of the value chain.

We are our own health system, we are own insurer to own employees and we are also the largest employer in our region.

However, most health systems like University of Rochester are doing exactly what Borders was doing.

We are investing in the middle of the value chain.

Essentially we are trying to grow our brick-and-mortar presence, we are trying to acquire more hospital so we can collect more patient lives.

We are playing a game with the insurance companies.

This medical loss ratio.

We know insurance companies are trying to get as much premium dollars as they can from employers and they want to pay out as little as possible.

As a health system, the way we make money is by filling out as much as we can.

Especially high cost billing things like surgeries and keeping RED cranking out patients and keeping your hospital and hundred 10 percent capacity.

Knowing the insurance companies probably going to deny a lot of our claim.

Our focus is really not at the ends of the value chain.

We are heavily focused on the middle of the value chain.

Unfortunately, telehealth and digital health really does not fit well in the current landscape of deeper service and we seen that struggle for years.

The COVID pandemic has ignited telehealth.

I think a health system like most health systems across the country essentially went from maybe two percent of all of our ambulatory visits being done by telehealth to 90 percent of all of our ambulatory visits in a two week period of time.

We need to take it further.

We need to be thinking more like Jeff Bezo's was thinking and less like what Tom and Louis borders and Kmart thinking.

Need to focus in on the ends of the value chain and how we need to do that is by following what happened in retail.

We need to disrupt the middle of the value chain.

How we are doing that in Rochester is we launched the digital transformation strategy for entire health system.

Where telehealth is a piece of that larger strategy.

How do we go from here as usual to being a digital first health system?

Quickly following up with that, following exactly what we saw over Amazon is we are investing in town into data.

We are going to talk a little bit further about how we are investing into data and how we are utilizing that data to essentially transform her whole system to be well prepared for population or value-based care.

Let's start with our digital first strategy at the University of Rochester.

It is pretty simple.

We broken up into three buckets.

The first bucket of our strategy which we are just about finishing up right now is focused on our front door.

Which we are calling a digital front door.

It's this concept of how do we seamlessly onboard patients into our health system using their own technologies?

The mobile devices, tablets and computers?

How do we make that convenient and seamless?

We are very narrowly focused in Rochester in a primary care service lines and urgent care service lines as they are traditionally the physical front door of our health system.

They were primed for disruption as we were behind the eight ball in regards to digital care in the service lines.

After a digital front door we are really going to move on and focus on engagement.

Now that we have on boarded these patients into our health system using digital technologies, how to be keep them engaged in her whole system but engaged in health promotion in general

using technology?

You know this is going to require multiple digital modalities.

I will talk a little bit further on how we conceptualize what this virtual care platform will look like and how we are moving forward in setting this up in Rochester.

Again, the important piece to all of this is data.

We are doing and access engagement parts of our strategy is we are collecting new types of data on a patient that years past we have not had in our patients before.

We are in parallel to the digital transformation strategy.

Women enterprise data warehouse.

I will talk to her and what that is in a moment.

That's where we are going to really transform the health system in our community and moved to population health.

The end of our strategies are defined value or smart health.

This is where you really start to use patient's own data.

You can apply things like machine learning and artificial intelligence to develop personalized care and stratify patients and move them through their care journey based off of their own data so they can get the highest quality outcomes most efficiently and hopefully at the lowest cost.

Essentially matching the right patient to the right provider at the right time and in the right place.

Let's talk about the digital front door and how we have conceptualized it.

Before I jump into this, I want to say we had a strong foundation.

At U of R we have been doing telemedicine for quite a long time.

We've been leaders in telemedicine and pediatrics and psychiatry and neurology well before the COVID pandemic which allowed us -when the pandemic essentially hit to turn the lights on for entire health system.

Once things started to settle down we needed to think broader than just telemedicine alone.

We needed to think of other ways to make that access into a health system and more convenient and equitable for more patients.

First thing we did was actually stood up a chat box.

We did this for several different reasons.

First, we learned during the pandemic that are patients really loved chat box.

We used chat box to essentially screen for COVID symptoms.

We used chat box to help with vaccine scheduling.

We partnered with a very promising start up company out of the West Coast and had a really eloquent natural language chat box that we stood up on her external website.

This chat box served as a virtual patient care assistant.

It can do several things.

It can answer frequently asked questions.

How do I pay my bill?

How do I find provider?

How do I schedule an appointment?

The really cool thing, the keeping of this chat bot was help patients sign up for our patient portal.

Full disclosure, we are epic health system.

We really wanted my chart which is the patient portal for epic to be that technology interface for most things within our health system.

Our my chart penetration is not the greatest when we started this initiative.

I think we were at about 30 percent my chart presents penetration.

This chat bot gets art my chart up to 686 percent of our patients.

The other thing this chat but did was allow us to start cleaning our own data.

When one to think about moving to the next part of our digital front door online scheduling the couldn't do it officially.

Our data on our providers was a complete mess.

We did not know where to begin.

We leverage this chat bot to better understand how were patients searching for our providers.

Which turns will be using to seek out a provider for back pain?

I can tell you right off the bat chat but got it wrong quite a bit matching the right provider that may have had available appointments.

We met with this company on a daily basis to look at their data to see where patients were searching for and then we leverage start informatics teams across her institution to clean up our data on the back end which allowed us to efficiently open up online scheduling across our system.

Both allowing or active, current patients within our system to schedule follow-up appointments through my chart portal for their providers.

We also launched open scheduling so patients who were new to our system could find primary care providers who had available appointments and schedule essentially from the Google search engine into our provider schedules.

From there, we moved to focusing in on each check in.

This is the ability to allow our patients to fully check into their appointments on their own device prior to arriving to the appointment or logging into a telehealth appointment.

All the insurance information, demographics and all the regulatory questionnaires that we needed collected or put up onto RE check in platform on my chart.

Patients who were not on my chart stuff up kiosks in our very busy primary care practice with low my chart penetration so patients could have the airport like extremes we can check in on the kiosk, put the information and at the end of that check and they signed up for my chart.

Essentially, we are trying to put the kiosks out of business by moving everyone into mobile check-in.

We then pivoted back to telemedicine.

As we have all seen during the pandemic, there has been a big move into retail health.

This really on demand telemedicine experience where providers with urgent care needs who want to see a provider right now in the moment, we didn't really have a good way of doing that.

Unfortunately at the time, the epic integrated telemedicine platform didn't have the functionality to allow us to do on demand telemedicine seamlessly.

We had an external vendor to partner with in terms of software platform.

We are very smart around how and who we select as a vendor.

It had nothing to do with who had the best telemedicine platform.

Or who had the best you why you ask or was best in class.

It was actually whose platform was most integrated into epic?

Essentially, we found a platform that was spun out of the health system in the country that is epic's second largest customer.

They built their own platform essentially within epic and spun it out and it's all kind of seamless within epic hyperspace.

We stood up both the visits and on-demand telehealth for urgent issues.

It goes back to that portal and that chat bot and reset up and express online pay.

We went from receiving our payments which we normally average about 40 percent, were not to 70 percent of patients who use the electronic patient portal are paying their co-pays that we have now made easy and convenient for them.

Getting prepared to the next part of a strategy that engagement part of a strategy we know that this is going to be multimodal in terms of technologies we will need.

We are a moderate sized hole system for those who are not familiar with University of Rochester Medical Center.

We are located in upstate New York and a $4 billion health system.

Approximately 11 hospitals.

We are the largest health system outside of New York City.

We cover most of Western New York.

With that being said, our IT department still has very limited resources.

The one thing we were concerned about was how are we going to integrate all of these different digital modalities into our electronic health record?

That would eat up a lot of our resources.

To solve that solution we have actually partnered with another vendor who again spun out of the second largest epic customer health system in the country that essentially solved that problem for us.

This vendor essentially serves as a power strip.

The way this works, RISD team or IT team only has to do want integration into that power strip.

Then the vendor takes care of all integrations for all the other digital modalities that we want to prescribe right out of epic to our patients.

When is modalities are prescribed to our patients, the data collected from them was right back through the power strip and is integrated into flow sheets right into epic.

So providers can see it over time.

The things we are thinking about in regards to engagement, digital care pathways and being able to prescribe those out, digital patient education, mobile apps and apps for chronic disease

management, mobile apps for health promotion that can be prescribed right out of our record to her patients.

Things like rideshare.

I will go into a minute, and my whole system we serve a very broad geographic region where we go from the inner city of Rochester 20 miles out into very rural areas of New York State.

Transportation is a significant issue with our patient population.

The ability to offer other means of transportation that we can prescribed to her patients is going to be a game changer for us.

Of course, the ability to prescribe remote patient monitoring out of our electronic health record and make sure that data flows nicely back into the electronic health record and wraps into those digital care pathways.

Let's move to what I think is the more transformative part.

It's exactly what was most transformative for Amazon.

It's truly the data.

How do you make the data work for you and health system?

I have to laugh.

Right now, machine learning and AI is almost a cliché in healthcare.

I feel like there is anyway I company that pops up every day trying to move into the healthcare space.

As the faculty in our data science program at the University, I'll tell you why AI in healthcare hasn't been as successful as we want it.

I will tell you a little bit about how you of our we are trying to fix that problem.

We will be better prepared to do machine learning within our health systems.

Let's look at the patient for example.

When we think about the data that we currently have on the patient, for the most part it's all located in an electronic health record.

In the electronic health record we have things like did the patient arrived to the appointment?

When did they arrive?

What are their allergies?

Maybe imaging, vital signs, past medical history, medication list.

There's a lot of garbage in the electronic health record.

There's a lot of things that don't need to be in there.

A lot of things that are in non-discrete fields, subjective fields with the narrative notes that are hard to access.

Essentially there is a lot of variability in the electronic health record which makes doing machine learning in the HR very difficult to do.

At its basic, the way machine learning works is it looks for patterns in data.

It looks for outliers in the data to train itself to better pick up those patterns or outliers.

When you have so much variability and noise in your data machine is going to find things that it thinks are important but in all likelihood are not important.

To make this even further complex and the problem, things like this patients experience with healthcare is not in the HR.

Social determinants of health, we are doing better at trying to get that data into the HR but quick typically it's not stored there.

That's another data silo in the health system.

Our claims data is in its own silo.

Quality data is in its own silo.

Resource management, supply chain data, pharmacy data, market analysis data, you heard it.

All in the same cilos which makes really understanding that patient and who they are from a data perspective really difficult to do you don't have all that data in one place.

We've made a huge investment of breaking down those silos and aggregating all data into a single data warehouse.

It's taken a lot of resources and effort to do that.

It allowed us to get standardized terms for the data fields like length of stay.

Length of stay the way we define length of stay is clinicians different than the way our financial people define length of stay.

And are quality people to define length of stay.

Coming up with standardized ways of defining all of our data has also been a huge thing.

A lot of emigration aggregation, a lot of data.

We get a better understanding of who our patients are so we can develop our own Amazon recommendation algorithm to individualize or personalize the care for the patient.

We all want to become a smart health system.

We are all talking about that.

Delivering personalized care using data.

There's a lot of promise there.

Let's talk a little about that promise.

I will start with the company in my backyard.

It started in Bennington New York.

One of the Lord world leaders in data science, IBM, they had more data science expertise probably than anyone else in the world.

They launched a couple of experts computing systems.

The first deep blue, pizza world's chest player.

A lot of promise.

Your next version, Watson went on Jeopardy.

Beat some of the best Jeopardy champions ever.

After Watson won on Jeopardy IBM said we are going to go after healthcare.

He made some pretty ambitious goals.

Goals like we are going to use machine learning to essentially match the right cancer therapeutics with the right patient in cancer care.

And hopefully make cancer diagnosis faster and maybe even one day cure cancer.

What IBM then did was invested heavily in healthcare.

They spent over $4 billion purchasing healthcare data sets.

Some of the biggest healthcare data sets in the country.

They spent $4 billion buying the HR data, claims data and have access to government publication databases.

What is happened within the last year?

Watson health just sold pennies on the dollar to a private equity firm.

Essentially IBM is closing up shop on their big ambitions of using Watson which won at jeopardy to essentially transform healthcare.

Why did Watson fail?

It gets back to the data that we have in healthcare does not set up nicely for machine learning.

Again, too much noise and variability.

It sends the computer down the wrong direction.

How are we trying to prove that at the University of Rochester?

One of the things we knew at the University of Rochester is we didn't really know our patients.

We didn't really know them from their own perspective.

Many of their labs, diagnoses, we need their meds.

Neither imaging.

We didn't really know the patient from their own voice.

A lot of folks don't know about us at Rochester, that we are the home of the biopsychosocial model.

We decided we need to start profiling our patients.

We made a decision about seven years ago at this point.

Where do we start?

Let's start with the biopsychosocial domain.

What can we understand about heart patients are feeling from a physical functioning lens?

And from a social lens?

We leverage an initiative that was happening at NIH called promise.

Essentially what NHH was doing was investing billions and millions of dollars into taking these complex multi-item psychometric scales that we all have in healthcare.

Some of them are 30, 50 items long and how do we apply things like item response theory and computer adaptive testing?

My patient only has to answer maybe one or two questions within that scale and I will have enough data to really understand who that patient is compared to the general population norm.

They have spent a lot of money and investing a lot of research into moving a lot of psychometric scales into the computer adaptive tests.

We leverage that.

He essentially put these computer adaptive tests onto iPads.

If you came into the University of Rochester, it did not matter what you were coming in for.

It could have been a toenail injury.

This is well before pre-pandemic.

He got handed an iPad at time of registration.

We asked you about your emotional levels.

We asked you about your pain interference in physical functioning and asked you about your social functioning.

We then integrated that system right into epic hyperspace.

The providers could see over time and every time these patients hit our health system how they were doing on these broad domains within epic hyperspace.

What this is really allowed us to do is it's created a huge foundation of systematically collected data on our patients from their own voice, from their own lands in these broad domains.

We now have the largest patient reported outcome data set in the entire country.

That is the data set that we use as a foundation for all of our machine learning work.

Depending on what question we are going to ask we will pull in other data points from our enterprise data warehouse.

From our PHR, claims data, supply chain data based on the question we are trying to ask.

More times than not we are going to have that PR oh data set as our foundation.

It is allowed us to do some really great things.

One of the first value-based or population health reimbursement models at our health system that we got involved with were joint bundles.

Before we got involved with a joint bundle, those of you not familiar with joint bundles to essentially get a capitated rate for a patient.

For the time they have an acute joint injury until the time they recover.

Faster you can get into recovery, the money used and saved in a bundle is yours as a system.

It's again trying to encourage you to provide the right efficient care to your patient after the injury.

First thing we are asked to do is to look at our data to determine what is the highest cost of the joint bundle if we were to get involved with this today?

Surprise to many it was getting put in to a skilled nursing facility for rehab after surgery.

Her leadership and said okay, can you predict presurgery who is going to get put into a nursing home?

We leverage that PR oh data set and pulled in other data points from our model.

We were able to develop a model with 90 percent accuracy that was going to predict presurgery who would go into a nursing home with that surgery was to be cut today.

He then built within our PHR essentially a risk calculator for our search engines to see him.

If you were to cut today this is the likelihood the patient we go to a nursing home.

Our surgeons can play with modifiable risk factors within the PHR essentially do simulations, things like social supports.

What if I got behavioral health supports around this patient?

What if they lost weight and could see what that would do to the model?

They would make better decisions on who to cut and when to cut which essentially allowed us to provide better care and saved us a lot of money in those joint bundles.

Not surprisingly, having social supports for your patience in their homes before surgery was essentially the data points that made the biggest impact reducing skilled nursing facility risks.

Other things that we have done with our data more on the telehealth side is collected all of these PR rotators on all of our patients.

What we have been done is we geocoded every single one of our patients.

We geocoded all of their addresses.

Essentially we created these heat maps.

Heat map you see here is essentially depression or mood, emotional distress symptoms of our patients at the University of Rochester.

We can hone right into the neighborhood level of where our patients live in understand who is depressed and who is not depressed.

And really hone in right to the individual patient.

This allowed us to do some really cool things when it came to telemedicine.

It allowed us to make smarter decisions on where to deploy our telemedicine resources.

The one downfall of telemedicine is it's still provider dependent.

I still only have so many psychiatrists in my health system for care of patients on the other side.

We had to be smart about where we set up our telemedicine suites to meet our patients.

We used our own geocoded data to make the strategic decisions.

What you see here is our Medicaid population which is about 20 percent of who we see at the University of Rochester.

During the pandemic they were our biggest utilizers of telemedicine.

We saw medication patients that engaged across telemedicine.

He gave us a good indication of where Medicaid patients were coming from with telemedicine but with them we were able to geocoded on top of our data things like the social vulnerability index.

The area deprivation index so that we can better understand our patients.

What we actually learned was our Medicaid patients engage more with telephonic telemedicine than video telemedicine.

It didn't really matter if they engaged via telephone or video.

It actually had major impact on their downstream outcomes.

We found that they had much lower no-show rates and cancellation rates.

We also found that they were going to the ED less when they engaged in telemedicine.

And utilized less as lab orders and less follow-up.

We have a pending article in the Journal of medicine catalyst where we will present this data in depth.

It shows you the power of data and allows you to better understand your patience.

Let's take a step further.

Ideally we would love to meet them in their homes.

We found our community was it wasn't that we didn't have good broadband access in our rural areas.

We had good broadband access in these rural counties.

Except our patients, especially our low socioeconomic patients could not afford the Internet in their home.

The only Internet that they relied upon was their data plans on their cell phones those of us that user and data plans on our cell phones when we are streaming video conference fee that kills your data plan.

Our Medicaid patients and low socioeconomic patients engage in telemedicine but did it via telephone and not video.

The thought was, can we set up suites or other place we can bring specialty care into these communities where we have Wi-Fi and could put telemedicine hubs or kiosks in?

What you see here is essentially primary care practices in the University of Rochester's network about 75 percent of our patients live at least 40 percent from the closest primary care practice.

When you go to urgent care actresses around the area it doesn't get much better.

It's about 75 percent of our patients outside of Monroe County who live 5-10 miles away from the closest urgent care practice.

Delivering specialty telemedicine care into these brick-and-mortar practices was a great idea but we never got the value that we hoped we could.

Transportation is a major issue for our patients.

Let me tell you what I think was the most disruptive thing that is happened in healthcare since the pandemic.

The most disruptive thing that has happened was in July 2021.

When Dollar General came out and said that they had hired a chief medical officer at Dollar General and they wanted to become the leading provider of rural healthcare.

Let me show you why that potentially is going to be so disruptive.

We geocoded all the Dollar General's in our primary markets to our patients.

We found that 85 percent of our patients outside of Monroe County live within three miles of a Dollar General.

Think about that.

Opportunities for telemedicine and disruptors in the healthcare space, Dollar General is prime to disrupt population health.

They have not really announced or formalized what their strategy is.

I've had the opportunity to talk with their CMO Albert Wu a couple of times.

They are still figuring it out.

What I being is to keep an eye on Dollar General and where patients are located.

Let's talk briefly here at the end but where I see the future going.

We think about machine learning and where machine learning has been really successful is in computer vision.

The images are pretty consistent in regards to that data.

As our innovation side of our health system we are partnering with some really early startups.

They have some cool and interesting technology.

Including a startup company that essentially can collect vital signs.

All vital signs, blood pressure, pulse oximetry, heart respiration, all just using the camera on the phone.

Essentially just using computer vision.

They have done this in web conferencing platforms and just iOS and android cameras on phones.

That will be a game changer in my opinion for telemedicine.

One of the things that we have difficulty doing especially in primary care delivering telemedicine is collecting those vital signs that we need to report back for regulatory purposes.

Having that functionality could be huge.

It will totally in my opinion disrupt the remote monitoring, remote patient monitoring space.

All of those peripherals, Apple watches and fit bits and sectors sensors and smart phone that we have are collecting the same exact data that all those peripherals are collecting.

Keep an eye on that.

Another area we have loved his computer vision.

We are looking to innovate with Kelly sitting.

Particularly in the home setting in hospital.

There's another sector we are working with called Sherry labs that essentially builds a computer vision model where you put cameras up in the patient hospital room for example or the patient home and it keeps it private.

As you saw it turns the patient into a stick figure.

The AI can predict before even a human I can predict when the patient is potentially doing a risky behavior or potentially going to fall out of bed they alert the human to take a look at that camera to potentially prevent that fall.

Traditional services you have one human watching potentially five cameras at a time.

Think of the potential of having an AI watching 200 cameras at a time and flagging which cameras that human needs to look at?

That could really relieve some of our staffing problems in the hospital.

The other area where a lot of innovation is happening in the digital health space and with high potential of the telehealth space is virtual reality.

This is an area that we are doing our own developments as an incubator and partnering with a lot of VR companies including meta which owns oculus.

We have built our own your applications for our patients.

We found a way to hack into the sensors in the VR headset simply click the patients heart rates and respiration rate in real time with just the sensors in the headset alone.

We as a university have some patents around that.

We can provide mindfulness or meditation to our patients in those environments based on the patient's own vital signs.

A good portion of my staff went home with oculus headsets.

About 15 of us are in our oculus headsets and trying to do our innovation work from our homes in the same room interacting with each other.

We have rolled out the R&R clinical service lines in a second here I will show you a success case that we have had in pediatrics.

One of the areas we've had difficulty in pediatrics is some of our children have behavioral health or developmental delays.

Things as simple as getting a COVID vaccine or getting a blood draw is so difficult for them that we have to use general anesthesia and knock these kids out to get that blood draw.

Just not good care for us, not good care for the patients and we want to disrupt and change that.

We built our own VR application specifically for kids.

We put them in this aquarium space where they can use the microphone on the VR headset to blow bubbles of fish.

I will play a video here for you guys shortly can see what it looks like in this impact on one of our patients who allowed us and the mother allowed us to share this video with permission of the impact that this has had on some of her children.

>> Even though he is wiggling around a lot, he is still very interested in what is going all in the video.

>> Mommy!

>> As you can see he is tapping it.

Usually he would be trying to bite and smack everyone else.

Are you done or do you want more?

>> More.

>> Okay, put it back on.

It's very easy for him with his grasping it's hard for him to use anything.

With the cushion it's very textural and easy on his face.

Like I said, he's usually trying to go after whoever's trying to do any sort of procedure on him.

He is more into this than what is going on with his body.

>> That's very interesting.

Thank you.

>> You are welcome.

>> Again, the next spot I think with their will be significant opportunity, especially for telehealth is in the speech recognition space.

We've already seen Amazon care announced a partnership with Tele dock and the ability to essentially ask Alexa, I need to see a doctor and get services delivered right into your home.

Get that from Tele dock providers.

A lot of opportunities here.

When I'm thinking about space that we are trying to innovate in this space.

With that said, I would like to open it up for any questions.

>> Thank you Michael, thanks for a great talk.

I would say we have a few minutes here.

There's a couple questions that got pretty populated throughout.

Folks are welcome to throw your questions into the Q&A box and I will read them out to him.

The first one here was reflecting on the beginning part of your conversation around how important it was to make sure things were fully integrating into your E HR.

Could you talk a little about some of the best strategies and practices that you have found in terms of engaging the vendors, the HR vendor but the platforms and questions you are asking?

>> MICHAEL: That is a great question read.

We have two major DHR vendors epic and concern her.

They are good at what they are, DHR vendors.

Things in innovation, digital health space they are starting to innovate there.

They are starting to move that way but it is not their bread and butter.

They are not quick.

Let's just say that.

The opportunity for integration into those DHR's where a lot of vendors could be quite expensive because you have to work with the E HR to get that integrated into the apple orchard.

A lot of times cost is prohibitive.

Fire interfaces of making it a little bit easier to integrate in.

For us as a health system we look to the leaders in the field.

One of the health systems I look to is Providence health out of Seattle.

I referenced it a few times.

The third largest health system in the country.

They had the second largest epic system in the country.

They were $300 million venture onto the health system.

What they do is develop solutions within epic that fill gaps and they spin out these companies and invested them.

If it's a problem for them, it will probably be a problem for me.

I work closely and learn from them.

I fastball the solutions that they are creating.

For us, you might be the best in class vendor and a space if you don't have it seems integration into our electronic health record we are not going to look at him.

>> REID: Sure, I think that's really helpful.

I'm truly here's the wood of the questions we have.

We have two and trying to juggle have asked them.

I think we can ask them simultaneously and then you can answer them as we go.

First one was can you talk a little more about the chapel integration process to looked at and I think you mentioned there's more than one and some differences you may have considered.

The second one was any further elaboration you had on how you thought Dollar General might be thinking to plan to interact with their customers.

Whether you thought it would be point-of-sale or through their app or things like that?

>> MICHAEL: The chat about space or incubator essentially build our own chat box when COVID hit.

I think we got a chapel out before Carnegie Mellon and Facebook did in Stamford got theirs out.

For chat bots were really cool.

We quickly learned that our patients really liked it.

Never, given all the digital transformation that we had to do is health system, for us to continue to build our own AI chat bots was just not sustainable for ours small innovation incubator team.

We were very lucky.

A lot of innovation happens on the West Coast in there in a much capitated market out there.

They are ahead of us on the East Coast.

I was able to look at some of my partners out on the West Coast and we were able to find an early and nimble agile natural language processing chat pot company.

We really like their interface.

Elected to partner with them to take some of that load off of them.

It's been fantastic.

In regards to Dollar General, that's a great question.

Dollar General after making a big announcement that they were hiring a CMO and transform healthcare, it's been really quiet.

There CMO I think is getting his feet on the ground.

They have really come out with the market strategy is going to be.

They have moved on the product side bring more produce into their stores and to be healthier.

They have announced that they are going to bring helpful dental supplies and over-the-counter medications.

There are concerns that could cause other health deserts because Dollar General is so much cheaper than everyone else with their business model.

That will essentially potential he cause other pharmacies like CVS and others do not want to open up shop in towns that Dollar General is in a given they will not be able to compete on the same margins.

I think they have a prime opportunity partnering with health systems in the country, partnering with ACO's in the country and allowing the health systems to deliver telehealth services into their brick-and-mortar retail stores.

In potentially developing risk arrangements with Dollar General in itself to do that.

It's fairly wide open and it will be really interesting to see what they do.

It's similar to the Walmart health model in some ways in terms of potential.

Moment does not go into the towns that Dollar General are in.

Dollar General's business model is specifically opening up brick-and-mortar stores in populations with less than 10,000 people.

You are not going to see Walmart or target moving in those areas.

You talk about health disparities and social determinants of health, they have to brick-and-mortar reach to make it a big difference in some of our most vulnerable patients.

I think that I will be online to see how they do this and hopefully they do it right.

>> REID: I know we are pushing on time, but I've been thinking about this since last time we saw each other in September when you bring up how phones have all this technology we are finally seeing the potential and ability to work with and potentially interact with.

I've been thinking about technology and telehealth initiatives that maybe the landscape is now more permissive for the possibility.

A simplistic example would be QR codes when they first came out.

There was nobody that had the app or things like that.

Now almost all smartphone cameras will instantly recognize that.

If you take that larger are the things that you're spinning in your head that you think technology innovations that were tried in the early 2000 30,000 tons than others better capacity software wise and hardware wise?

>> MICHAEL: Absolutely.

Technology moves so much faster in healthcare.

Cloud computing we see all the big tech companies, AWS, Microsoft, Google cloud.

Cloud computing alone will allow us to do some pretty awesome things.

In healthcare from a data standpoint, it's just getting to that level that most of us to have large health systems, technology and our data is it on on prime service which limits our computer power and our ability to scale.

It's starting to feel that comfort level of.

Especially our PHI off of our pro-men up into the cloud.

Once that tipping point happens the power of cloud computing combined with potentially more data, better data will improve care tremendously in our country.

>> REID: That's awesome, you're appealing to my inner data nerve.

We are at the top of our soul turned over to our colleague aria to close us out.

>> ARIA: Thinks read, just a reminder next webinar will be held on Thursday, May 19 on integrated patient portals and improving the virtual experience.

Registration mission is available on the NCTRC website.

The last we ask that you take a survey that will probably end of the webinar.

Your feedback is very valuable to us.

Thank you again to Dr. Hasselberg for his presentation today in the Northeast telehealth resource Center for hosting the webinar.

Have a great day everybody.