

Chris Hutchins: Thank you Brooke. Thank you to my colleagues at Health Catalyst. It's been a challenging year, but the partnership that you guys have demonstrated for us has been valuable. So thank you for that. Today I am happy to walk you through some of the things that we've been through in the last several months here in New York.

And I'm hopeful that in some way that each of you will find some value in this to help you as you're continuing to navigate the pandemic. Fortunately we're all starting to see some resurgence in unprecedented time for sure. So, what we'll cover is taking four things here. I'll give a little background. I won't go too far on that. So I really want to get to the crux of the content.

We'll share some keys to success. We'll talk about what was like providing data analytics support through the height of the pandemic. There's a lot of ongoing things that we can share as well. And then some key learnings and recommendations on really how to support your organization. As you're saying that the resurgence of COVID 19 organization.

So key learning objectives, we'll talk about strategies to navigate, how to use data marts to drive some self-service analytics. We'll get into some strategies to drive transformation, some understanding about why you need to design a flexible model for cohort definition. I think that'll make sense. Fortunately things have gotten easier at this point on that.

And then we'll talk about how we align some key resources to enable our rapid response. So first by way background if you don't know, Northwell was based in New York and the largest company employer in the State of New York with over 72,000 employees. At this point in time we're about 850 or so patient consulting outpatient facilities on 23 hospitals and a number of different affiliations.

We're geographically spread out across Long Island and metropolitan New York. We do have some other affiliations in upstate New York, Connecticut, New Jersey. There're people empowered this two different organizations that we partner with now. This is changing rapidly every day, but at this point we still treated more patients in the Northwell health system than any other organization in the country.

Not something that is a typical marketing point that somebody might wanna make. This is just to say the tremendous impact that was here. It took heroic efforts from the frontline people to be administrative in any executive staff of the whole entire organization to get through this. And many of us were doing roles that we were learning about for the very first time, just to make sure that we're keeping things moving.

The peak, we were creating an additional 200 beds a day, meaning that we're creating 200 more beds above our normal capacity. At the beginning of this the governor did bring health systems together and challenged all of us to at least double our capacity to be prepared to manage the surge of the COVID-19 cases as they came through the door.

So let's talk a little bit about some of the key strategies that helped us to do this. One of the things that was really important and it was done prior to my arrival in the organization was co-locating clinical and IT staff together, to really focus on developing meaningful analytics about, bringing good insight out of the data that we have from a clinical perspective, but more importantly, the perspective of we're here to do healthcare.

And so having the clinical perspective on virtually everything that we do is really important to make sure that we're thinking about the patient, the patient experience and what we do, how it contributes to improvement in those areas. We talked about the number of different aspects during the early stages in the pandemic, that we couldn't have actually accomplished without having that partnership so tightly integrated.

So we'll get to some of the specifics about that, but I think it's important to leverage organizational structure and technology to facilitate coordination. And never has that and more clear than we've been in the situation that we found ourselves in here during the pandemic. And working with executive leaders to identify organizational priorities.

These are some good practices you should just generally speaking interpreting, implementing and managing their pricing analytics. But the last two points really were a key for us over the last several years to have a published to be well-prepared for something like this, as much as you can be prepared. None of us had any idea what we were dealing with in coming out of the gate.

So the learning curve was obviously very steep, but having an established data warehouse and having some capabilities where we can enable business units to advance their own capabilities without having that bottleneck, waiting for the enterprise team to be able to focus on their particular need, all the different verticals within the organization have to make progress, they also have the day-to-day responsibility.

So we wanted to try to focus on making things easier for them to do what they need to do to be successful. And so this is a bit relatively simple, but the vision was to have a single view of patients on one platform. And one of the things that we did early on a number of years ago, one of the clinicians that works in my area had the idea of taking the registry concept across the whole enterprise

to a whole other level, meaning that we have a registry of patients that are in any of our facilities at any given time.

So the minute someone walks through the door and treated and is hospitalized, we start calculating every measure that matters. And it's in a registry that it's accessible and it really drives operations in our operation centers, that really gives visibility for hospital operations as well. And that became hugely valuable, important, and important as we got into the height of the crisis, and had to start addressing things like load balancing between our hospitals.

The other items here, I think, these are standard things that probably all of us are dealing with on some level or not. Another, the data mart concept, I think was a really important thing. And this is something that many didn't know, I'm sure of it, how catalyst is exceptional about. They really think about the purpose the data structures are being deployed for, and making sure that what we're delivering in those data structures is really fit for purpose.

So some of the keys to success really identifying organizational priorities were for data access and building the subject for these marts to enable broad inquisition. The access provisioning processes is really an important one. The challenge that we had early on is, there was an evolving definition for COVID. If you recall back in the early stages of it, we didn't even have a way to test for it.

So being able to really keep a close eye on the definition of the disease and being able to adapt the concept of registry to really support COVID specific content, and the cases that we were seeing. So we included in that early on person's under investigation or suspected COVID as well as COVID positive. The challenge for that is because it was evolving, we needed to really take a close look at the access to the data structures to ensure that we're getting consistent answers to the questions across the organization.

Additionally, limiting the burden of access provisioning to our self-service model, but some that we really took on. So we did the deploy and enterprise platform, and when folks are meaning to do data visualizations, they have a place to go. It's already been vetted from information security standpoint, which has never been so critical as it has become the last few months.

Just a few weeks ago. One of the hospitals in this area was hit with a Ransomware attack. And I think that took their systems down for well over a week. That's the stuff that makes it really valuable to the organization. If you can implement an enterprise platform will allow them to do self-service as opposed to each group finding your own way and building on independent platforms that haven't been through the process or even more challenging having to go through the process because we haven't adjusted the enterprise.

Then the other piece is just designing enterprise data marts and enabling folks to do the things that they need to do. What that ultimately does for me in my group is it relieves a lot of the pressure, meaning that we work with our business partners to define the data sets that they need to run the business. Then we allow them access to do that. They can do a lot of ad hoc activities.

They can build their own dashboards with the ease of deployed things for a production standpoint to a large group, then we can engage with them to make that happen. Just a couple of examples of these are probably very familiar concepts for everyone, but these are just examples of the data structures that we deploy to enable that self service center.

Now that I just mentioned, so the ED service line is an interesting one where there's two different models that we use there. One is for real-time monitoring of what's happening across the 23 hospitals and a couple of freestanding ERs, and then there's retrospective, which allows you to do monitoring and things of that nature in that environment, as well as the real-time environment are both very, very highly utilized in the business.

Yeah. Just to show, take it to the next step. We talked about building for broad capabilities for inquisition, we built a backbone that supports our corporate pharmacy, for example, and within that, you can look at trends, you can do comparisons benchmarking and all of those things. When we started to really try to focus in on the Opioid Crisis, we could just put another lens on the same data structure without having to redevelop anything, except for just the dashboard and the interactivity that was required.

And you can see an example of what we did with that. The beauty of it is the data was already well curated and organized in a way they made it very, very easy to grade these views that did support the program that was stood up to start really working on improving our prescribing activities relative to Opioids.

Similarly, again, I mentioned the patient registry. This particular view is built on top of that patient registry. So as I mentioned, we start calculating all of the developing quality measures. Whether it's based on heaters, state or federal programs, or even our contracted arrangements with specific payers.

Every time a new patient walks in the door, we start calculating for all of those programs. And we did it in such a way where it wasn't really relevant to if they were part of one of those programs or not, but if they became part of it, the data's already there.

This is just, lastly, another example of what I mentioned for emergency services, where we got retrospective, so you can see trends, but then you have near real time. And when I say near real time, this is probably within three to five minutes

at the worst. And in terms of performance again, it's built on a much smaller index than our entire patient registry, because it's really focused on just the ERs.

And so that gives you the background. I want to get into some of the specifics around what we did early with our support of the organization for the COVID response. And we'll get into some of the things that we've done because of what we learned from the early days.

So one of the things that we do here, I think is as a result of a lot of experience with a crisis as they, our leadership team has identified a number of different scenarios that would be very, very disruptive to our ability to deliver quality character to the population that we serve.

Pandemic was one of them. Fortunately there was a lot of frameworks that was already in place that just needed to be activated, when we started to see the outbreak here in New York. There's other things like Hurricane Sandy, that in recent memory, that also played into our levels of preparation.

And even since the outbreak in the spring, even at the height of it, as soon as things started to settle down, we started to revisit what went well, what didn't go well, and then look at what are the likely scenarios we'd be dealing with. If we need to anticipate a resurgence for things such as a Hurricane and power failures.

Then oddly enough in the month of September, we experienced that while we were seeing some level of resurgence, but fortunately it was not nearly to the levels that we experienced in the spring, but those are the types of things that organizations plan for. So some of the key strategies really around, how do you coordinate and collaborate with the different parts of the organization? What time do you communicate what's going on?

So one of the things that we did is we establish a meeting cadence with core analytics, business intelligence, data science teams, to ensure that there's a common understanding of the evolving needs, measures and definitions. This is extremely important as I'm sure all of you know at this point there's a number of requirements, both from state and federal governments that are still evolving today.

And the number of data points we have to communicate and how they're defined, that evolves. And on a good day, we might find ourselves having two or three days advanced notice. But that's about as good as it gets, unfortunately. So having a really well thought out communication strategy is important to make sure that people are getting what they need.

And then there are some things they're sure defining them from a clinical perspective. They're a big sense for us, but that's not how the government agencies are looking for it to be reported. So this communication mechanism is a critical piece. And then really increasing coordination across your business units that are doing analytics is a really important aspect of what it takes to support this, because the organization when it begins to see the overload that we experienced.

There's got to be a really well thought out approach to making sure that we're able to measure all the things that need to be measured. And while everyone wants to be helpful in this kind of a situation, if we don't coordinate it, we're all going to try to solve the same problems at the same time, we're not going to cover the range of things that the organization needs us to meet to be monitoring.

So that coordination is a really important step. And then that coordination between all levels of staff all the way through the organization, and there's probably roles that you wouldn't think about. But early on, we had to spend a tremendous amount of time working with our research division, because we realized that the statistical significance of the cases that were coming through here were really, really, really high.

And probably at that point in time, the best source of data to provide a research, anywhere not only in this country, but potentially in the world, because at that point, we were getting very sparse information out of China, and some of the other countries that were impacted. When Italy was being hit, it was really a matter of about 14 days before it really started to show up in the big numbers here in New York.

So, we had to really account for all the different perspectives and the needs of folks to really make sure that we're learning as much as we can. And we're able to get it out to our colleagues across the country that were trying to fight the same fight and even internationally, as much as we could share to inform other organizations what we're experiencing and what's being effective, and what's not.

We already touched on this a little bit, but we had to identify and dedicate a team to really understand and drive the definition of what was COVID at the time. We didn't have that ICD 10 code. We didn't have a way to test, even if we knew the code. So it was really important to get this stood up, which we did early on. This thing started probably about, I'd say, 10 days or so before we started to see cases here in New York, we had conversations internally within the analytics team on how we're going to approach this.

And we started to plan a separate data structure that would essentially be our COVID registry. And again the definitions were changing as we learned more about that. So we really had to focus on making sure that we're organized in such a way that there's no gaps and the information had to be disseminated to a lot of folks; the CMOs, the CMIOs from the different facilities in the health system, our executive team, quality officer, the folks that were dealing with regulatory reporting, everybody had a need for some set of this data or a subset.

So it's really important that we organize in such a way that we standardize, we document it and as things change, we were updating that and sharing that broadly through the organization. Identifying key indications and conditions, we found early on that there's just looking for presenting symptoms, when people were arriving in urgent care centers or EDs that there are a lot of flu like symptoms, pulmonary disease, things of that made sure there were markers to call us that there's probably something going on that may or may not be related to COVID, but we needed to test that as best as we could.

But we learned, if it were to seem like it was COVID, we took the precautions, we put patients in isolation and we monitored it and we treated it like it was COVID. We tried to make sure that we were not enabling it to spread. We were certainly at the point where we were just trying to get our hands around what we were dealing with.

And then the last point here is relative to the registry. So we needed three different perspectives, as it turned out, to support the health system. So inpatient would be getting back to do the concept of the registry that I mentioned, where it's done in real time, when patients come through the door. This was just an additional subset that essentially we just created flags on that same registry that we're evolving as we figured this out.

Similarly, we were doing that in the ambulatory space, trying to make sure that we knew that where our patients were coming in from because we were working closely with the state agencies to determine were there significant activity and how do we reach people educating them on we were trying to deal with, again, we didn't shut everything down right away in the early stages of this thing, but it very quickly became a massive shutdown everywhere.

But early on, we were just trying to coordinate activities around the geographic locations, where we were seeing the most positivity. Then I already mentioned the research, which was important. They actually needed to see everything across the continuum care and in a number of years of history on the patients that we are monitoring for so that they can understand what impacts that preexisting conditions might've had on patients that ended up being COVID positive, et cetera.

These are some of the more tactical things that we had to do in order to really make sure that we were focused on the right things. So we decreased model development timelines for the things that were specifically focused on supporting the organization for the pandemic. And we pulled people off at a number of projects and assigned them full-time to work on this thing.

And we designed and deployed our inpatient data mark using that registry, including all the medical history, as I mentioned, on the patients that we were tracking for COVID. We had to do the coordination with the research team very, very quickly. We had to circle the wagons and work with them, to define a model that would support the needs that they have to do broad inquiry.

They were definitely not interested in dashboards and reports. They really needed to be able to query raw data. So that was another separate initiative that we did. Probably this next one was the one that was a little tough, but we found we really had to limited access to the COVID data marts to ensure we were coordinating these effectively.

And we had high availability to critical functions. Another reason for this is, ensure that this is happening already in that setting in some of the other States now, is that there was daily briefings being given by the governor. And the information that was being presented was essentially up to the latest point. And then the night before that we could report those would be that information.

And by the time the governor was live presenting it, we had much more new information. So we really needed to make sure that we were careful about that, that we weren't getting ahead of the public communication that was going on. And when we're seeing those numbers climb, it's clear that currently track from a not only an hourly perspective, but from a daily perspective and it just needed to be as timely and accurate as possible.

And we just couldn't afford to have more than one answer to the same question, which is the risk that you run when you have a lot of access to the data marts and people were legitimately trying to solve and trying to help what they can get different answers. And while the definition was evolving, this was just a really important factor for us to take care of that.

And then I think these are some logical things, but we had to reprioritize the data science team efforts and really get them working on iterating as we were learning on adapting the models that use. They were modifying some predictive algorithms that we'd use for other purposes to really help us understand where we were going, as this is the disease state became more clearly.

And then some of the key visualizations that were necessary were our command center operations. We built some capabilities for our ambulatory

network, something that was really new to me. I really didn't understand anything about psychology testing, not being a clinical person, I guess that's probably shouldn't be a surprise for folks, but just being transparent about that.

PPE distribution was another one. We were not in a place where we had way to track the person by person dissemination of protective equipment. So we worked very, very quickly to create a database structure and a user interface that allowed that tracking by either scanning an employee's badge or their employee ID number, so that we could track not only who's being given PPE, but we're also looking at how effective it was. As we're monitoring the health of our patients, as well as the health of our staff.

So the serology testing early on was really done in an effort to help the staff to understand what their current status was, whether they have antibodies or if they don't. That was also used in a way to coordinate where we were staffed, sending our staff, or we had staff that didn't have the antibodies. We were trying to make sure that we didn't throw them into the hottest spots that we had that had the highest COVID levels.

It was unbelievably complicated. I think at the height we were seeing probably, I think we had about 5,000 plus at the height of the pandemic patients in our facilities that were COVID positive, but we had to really be cautious in terms of how we decanted some of the sites that had other types of cases in numbers. When we started, we already had people in-house.

So we really had to coordinate both the patients as well as our staffing and where they were deployed in order to handle this. The ambulatory network in particular, essentially it shut off almost overnight. And a lot of our physicians and nurses that were working in those centers they were redeployed to support the service that was happening in our hospitals.

I'll give you a couple of examples, and I see the visualizations that we were doing. This was the inpatient perspective. As you can see, you can see how many patients were in isolation on this day, how many were on ventilators. You can see what the co-morbidities were. Maybe you can see how things broke it down to by age and gender.

These are things that we tracked on a daily basis. There's a trending version of this that clearly shows that, I guess we called it a curve back then, but really was a really steep slope. And then a really long drawn out declination over several weeks after we hit the height of the pandemic.

Across the top, you can see these little bottles, which they represented different hospitals in the health system, so that we can actually just click on those in the

dashboard and it just resets the context so that you're looking at the information on the activities in that particular facility.

This was looking at it through a different lens where you're seeing all the activity, including the testing that gets done with our core labs. Another aspect that's happened even since then is, probably around June, we negotiated with the State of New York to get access to all of the testing results on a daily basis without PHI, but with Zip code information so that we can actually track what communities we're seeing the most prevalent spread.

We can actually see where the point of origin was. We'd get some interactive mapping capabilities as well to really track this thing. We saw some interesting things such as when we started to roll out testing on large numbers. We tested students at the university, Hofstra University, and we saw some spikes in the positivity rate from that.

But when we looked at it, we realized, "Oh my gosh, these patients are not all coming through from one zip code, actually. Their origin was spread out from a whole lot of other areas." And what it told us when we actually looked into it, it really aligned with what we were seeing at the State level only. As we looked at the positivity rates, the geographic locations, where the most dense populations that were having positivity actually was reflected.

And when we really dug into the next level down on the cases that were identified to the university. And I mentioned PPE, this is another example of what we put together here, not earth shattering visualizations, but I just let you see now how we organized it in general, breaking things down by the type of unit that our staff were assigned to. You can see what their job functions were.

What we're showing there, the distribution for prior day, the geographic makeup. You can see what facilities these employees are deployed to. We also had the ability to change the view and see where their patients, excuse me where the employees were actually coming from to report to work.

And I mentioned the serology results. This is another version of a similar report. You'll notice these seem to be generic classifications and they aren't necessarily, so it's based on employee data. And so this was used to really understand what was happening in our employee population to make sure that we're protecting our staff as best we can.

Trying to understand what areas they're coming from. If they happen to be living in a hotspot, coming up with alternative solutions for them to keep them safe. And in any case, so many cases that are involved in renting hotel rooms for family members or for the staff or whatever the case was, then that was necessary to protect them appropriately. This became something that we

started to achieve, also provide to other municipalities, to religious organizations and employers as they requested. These are the things that we put together for them.

Most of them were weren't looking at this level of detail. It was definitely an important thing for the planning of re-entry and restarting of the businesses across the region as we start to understand what the risks really were. Last week, we just highlighted the key learnings and recommendations.

These are items that we've talked about already in the presentation, but dedicating the cross-functional team with the clinical technical resources was really important. Identifying the cohort parameters, always iterate and communicate, can't be stressed enough. The iteration process was a huge focus for us, and it was tremendously important to make sure that we are getting the most accurate information out to the organizations as we possibly could.

The regular meeting cadence, again, that was necessary because there was a lot of questions coming at us from every angle early on. And so we needed to set aside a specific time so we actually did one in the morning and one in the evening, where people call to dial in, there's a video conference and they're able to get the most recent information. They could ask the questions, but in between those meetings, our teams were really heads down, continuing to do the work that was required to support the organization.

Lastly, just make sure that we're driving the coordination of enterprise deliverables. But we really had this staff to step up into that and make sure that we're helping everyone to understand what the swim lanes were, so that work could go on in parallel. And we weren't wasting time and energy to solve the same things, but we're actually covering the largest span of work that we could possibly do relative to supporting the organization throughout the pandemic. And with that I'm going to turn it back to Brooke for some questions.

Brooke MacCourtney: Great. Thanks Chris. Thanks for the great presentation. If you have any questions for Chris, now's a great time to submit them in your control panel and we'll begin our Q and A session in just a moment. We do have one poll question for you before we begin. I'm going to go ahead and launch that.

So while today's webinar is focused on Northwell Health's data-driven response to the pandemic, some of you may want to learn more about Health Catalyst's products and professional services or about Northwell. So if you'd like to learn more, please answer this poll question and I will leave it open for a few minutes as we jump into our Q and A.

Alright. So Chris, our first question is... let's see, they're asking what tools were used to create your visualizations?

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Chris Hutchins: We were using Tableau. That was the tool that we selected for the enterprise to use, just generally for all of our self-service activities.

Brooke MacCourtney: Perfect. Next question. What impact, if any, has COVID had on analytic adoption? Do you think this is a temporary, or is it more of a cultural shift?

Chris Hutchins: I can say for sure that in our case, it really accelerated things. The explosiveness of the demand for data, it was just unprecedented. I've never seen anything like that, to the point where at the height of things, we were trying to figure out what we're measuring in and what was important, what had to be coordinated for the state, what we need to do for our employees.

Answering the demands of the State government as we're partnering with them. It just became a much more visible reality that data was a really critical component to how we navigated in order to be successful. In the weeks and months following the height of the pandemic, once things started to settle down a little bit, we actually made some significant decisions to make investments in our infrastructure and capabilities to do and data and analytics more effectively.

And it really focused on not only recovery, but helping to examine virtually everything about our business model as a healthcare system to identify how do we get better. We felt like we have done a pretty decent job historically as a health system. We've grown rapidly over the last few years, but this highlighted that we've got to find out how we can do better.

I think that's always been the vision and I've heard of our present CEO, Michael Dowling has said on a number of occasions, and it's such a great quote, is "We are here to get better every day." That's the call, we want to do better today than we did yesterday. And so as we started to do recovery, there were a number of different groups that were put together to really figure out how do we restart the ambulatory network? How do we help our patients to get comfortable to come back through the front doors here?

What information can we use to really prioritize outreach to patients that may have had what we called elective surgeries, but were really critical in cancer cases, heart surgeries, things of those nature. Some of those things actually got put on hold as well. So it was important for us to be able to identify our patient populations that were affected by cancellation of elective surgeries and reaching out to them and working through the process of dealing with even getting pre-admission testing done which now had to involve COVID testing.

All of the data that was needed to support that just on the ambulatory network was a big deal. We looked at productivity from our ambulatory network to figure out what sites we should prioritize, making, getting them up and running,

matching that information up to the patient population that was around that particular geographic area.

There's a ton of different groups that are still there up and running today. They have a command center function that's evolved and is now standardizing and automating the flow of data and analytics to each of our sites. But it's been coordinated in a way now we're having common definitions and we're creating common views.

So that it's really easy for the executives at the highest level to see the whole health system view, but then the local executives can also see the views that they need to do to manage their operations. So, two answers to the same question, it really did accelerate analytic adoption. I think we probably did about two years' worth of acceleration over a two-month period, which I've never seen anything like that before.

Then the sustainability of it, I think it is sustainable and now have a term. I hesitate to use it because, probably everyone's going to deal with it on some level, but we now have this concept of COVID time, meaning that it's gotta be done yesterday. And if we need to get on a phone call right now and bring in six executives and technical people to do things on the flier while we all watch on a conference call, those are the things that we have to do.

So there's a lot more being done in a shorter amount of time, and there's a lot less barrier to moving things forward because there's a clear understanding across the organization that these are things that help us to do what we need to do, to take care of the patients that are expecting us to step up.

Brooke MacCourtney: Awesome. Okay. It looks like we got a lot more questions flowing in now, which is great. Okay. Well, jumping to the next one. How did you and Jess analyze video and audio data generated through telemedicine encounters?

Chris Hutchins: That is a great question. I'd have to do some homework on that one. I know that's been managed in different parts of the organization, but I know that we ramped up very, very quickly, as probably most organizations did in getting telehealth up as soon as we possibly could. It was probably not as early on here as it was elsewhere, primarily because of the surgeon or inpatient facilities.

Brooke MacCourtney: Okay. Great. Next question. How has the great work you did from the first surge helped in the current surge of caring for patients?

Chris Hutchins: It's helped us to be a lot more prepared. We have, as of right now, two designated non COVID facilities, meaning that we're going to make sure that we're preserving capacity for all the other types of cases that we need to be

able to support. Because as I mentioned before, people that are having heart issues that need surgery, they don't need it less because of COVID.

So really thinking differently about how we coordinate as a system. So we're not going to have all the same services in every one of our 23 hospitals. We're going to do the necessary things to support things at a regional level and adapt our model to really care for as much of the population in that community as we possibly can, but really make sure that we're protecting people from COVID that haven't already been exposed. So organizing ourselves both from the ambulatory network and from a hospital perspective is helping us to manage that.

Brooke MacCourtney: Perfect. Okay. Next question. Someone says, thank you very impressive. What are your thoughts about the sustainability of the new processes you were able to create, like the clinician slash analyst team?

Chris Hutchins: So that's a great question. So that has been a permanent change. As I mentioned, some of those things were done prior to my arrival, a little over five years ago, but the clinical team within the analytics group has grown pretty significantly over the last several years, actually when we started, there was just one physician and he would introduce himself as the clinical team.

I think he has now a total of eight FTEs. And that's a critical role that will help us to really stay focused on the mission of delivering good patient care, and everything that we're doing in terms of how it's going to sustain, it's actually led to the creation of an organizational governance model. In fact the executive oversight team was just launched earlier this week.

They're going to set high level priorities for the organization. There's also a steering committee, that's going to be starting relatively soon I guess the next few weeks. It's going to be in the intake belt or analytics. It'll begin with an inventory of current demands and things that are in the pipeline for all the various groups within the organization.

And that will also lead to, again, the coordination that a high level of what are the important things that we need to do. And part of the challenge is now, there's so much demand. How do we decide which things we're going to move forward with? And so there's a value proposition that we're going to have to work through. So the decisions will be named, priorities will be set based on the value proposition of what's being proposed.

So not every piece of information is going to generate any kind of decision-making or an improvement. So we really have to be judicious about that. And we'll work through things. We have to look at financial impact as well as patient

outcomes. But ultimately it's about the patient. And so we're going to probably see a number of other groups stood up.

My expectation was there'll be some folks who are very focused on hospital operations and emergency operations. There'll be some focused on ambulatory network. There'll be some folks in the finance supply chain, human resources, research, there'll be different groups that will be stood up to really drive the transformation in those specific areas.

But ultimately the coordination will be really set at the top level so that we use our technical resource in particular, really to the top of their license and have them working on the most pressing needs of the organization.

Brooke MacCourtney: Great. Okay. Next question. What elements of the pandemic learnings do you see carrying forward in new normal operations? I guess that's what you just answered, but I don't know if there's anything you want to add.

Chris Hutchins: I think probably the only other aspect of it that I would address, is what's going on right now? This is a normal part of everyday where folks like us are on video conferences and having virtual meetings. I don't think that's going to go away for the foreseeable future in any of that. And I think a lot of organizations are making some different decisions and plans now around what reoccupation looks like.

And is it necessary for all functions? I don't think that we're going to look the same even once we have immunity through the vaccine programs, the cost of doing business for any kind of business is really, really expensive when it comes to real estate. And if we can prove that we can do the things that we've done over the last several months remotely then does it really warrant having the high overhead of having a lot of real estate in our organization?

I know that the cost is dramatically higher than what I've ever seen before, is it because we happen to be in New York? There's a few markets in the country that are extremely high and we're certainly in one of them, but I think that'll be something that will continue to impact us for a long time or will look different in a year from now. I'm certain.

Brooke MacCourtney: Okay. Next question. Health system data is typically controlled for many valid reasons. What framework do you suggest for finding a balance between self-service and protecting organizational data?

Chris Hutchins: Great question. That really gets down to the point of the data structures and the data marts that I mentioned. So understanding where the highest areas of demand are, that is how we've planned, which data marts that we're going to build. Why that's important, is we know people need to have an understanding

of what's happening in their business unit, whether they're doing clinical care or they're doing financial planning, or are they running a practice?

So our Job is to figure out how do we help them to do that in such a way that they're not constantly frustrated, they're always waiting for the IT team or the analytics team to deliver the answers to what they needed yesterday or sometimes up to the minute. So some of the examples that they showed, the Emergency Services is one of them.

We work very, very closely with some of the executive and clinical leadership in the emergency service line to define what needs to be in that data structure. And we continue to iterate with them as they see a need to adapt it. We work with them to make sure that we do that in the models that they're accessing. Similarly, we're doing that with surgery.

We're having some challenges in that space because not all of our hospitals are on the same systems. So we're working closely with them to make sure that we're building a model that can handle the data from the different sources. But the real challenge with all of this is you've gotta be able to take the time to do the hard work of the data curation to make sure that when you turn it over for them to do self-service, that it has the things that it needs to have, and it doesn't have the things that it shouldn't have.

Primarily to make sure that they been able to get the correct answers and they're getting things efficiently. Good example of why that was important is, before the clinical team was really heavily involved in analytics and the analytics team, our technologists were doing the best that they could, but with multiple EMRs, which in our situation is the scenario, the data tables and the fields that are available in them they're not necessarily self-explanatory. And many times you can have different iterations of them.

Discharge diagnosis, for example, in one of the EMRs, there's actually more than one location in the tables that you might find that, which one is the appropriate one. It could be based on a timestamp. But those are things that having the clinical teams working closely with us, we can work through that and get those definitions right.

And very similarly, we've done a lot of work with our corporate pharmacy. We're adjusting things with them on a regular basis, but part of it is thinking, how we organized our analytic teams, both clinical and technical in such a way that we're aligned with some of these service lines, then we're really focused on. I'm sure that we become a much better asset to them.

And that we're understanding their particular part of the business as a real area of focus. Then we're organizing all of our teams now to really have some specific

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focus areas so that we can allow them to go faster and deeper. And we're getting the data that's curated in a way that really helps them in their particular area.

Brooke MacCourtney: Alright. This is related to the EHR that you were just speaking about. Kyle asked, "how did the Northwell EHR perform and integrate with the large amount of data and analytics taking place due to COVID?"

Chris Hutchins: That actually worked very well for us. At least in the enterprise EMRs we have one outpatient one in inpatient. And one of the benefits that my team has, is we also have the database administration function. That's part of my teams. And so the majority of the data assets, databases, and servers for the health system are managed by my team.

So we do all the monitoring and performance. We already do that 365 days a year. We switch 24/7 support, we have partners overseas that work with us. So we have that handoff that goes on, it's shift change essentially. And the coordination is a very, very important part of it. So just having those eyes always on what's going on in how the platforms are performing, how the data transfers are being done, are they running efficiently? These guys are good at what they do, and that's really their focus constantly tuning things and making sure that the data movement is happening additionally.

Brooke MacCourtney: Perfect. Okay. And then Kyle also asked, "how much of what was said in the webinars attributable to Health Catalyst?"

Chris Hutchins: That's a great question. So there's two ways that I look at this. One of which was prior to coming to Northwell Health, I worked with a team in Boston at Mass General And Partners HealthCare, working with them to implement the health catalyst platform there. This was a number of years ago, but a lot of what I saw relative to how do you deploy things that are fit for service in terms of the data structures? A lot of that, those ideas and thoughts for me came from seeing how Catalyst build their solutions.

And so now at the point we were just getting overwhelmed with the first wave. We were in the close to finishing our contracting to migrate our entire organization to the Health Catalyst platforms. Had to take a pause, but back to my earlier point, relative to the acceleration of adoption and the recognition of the importance of data and analytics we made some decisions very, very quickly and I believe it was probably within 45 days of coming down from the height of the pandemic that we were able to re-engage in and get our agreements in place.

We're currently in the process of migrating, but the idea of organizing and curating your data to enable self-service was logical from that standpoint

because of how I worked with Health Catalyst really like they're partners. It really worked well that you organize the data structures appropriately and they're curated well, you can allow that kind of self-service access.

So while is not what we did in the height of the pandemic, was not on Health Catalyst technologies, it certainly leveraged a lot of the concepts and ideas that I gleaned from my previous exposure to the health catalyst approach.

Brooke MacCourtney: Awesome. Alright. I think we have time for about one more question, and then we'll go ahead and wrap up since we're getting close to the top of the hour. Maybe two more, probably time for two more. Okay. This question says, "are you seeing patient flow for inpatient/outpatient services recover? How has the data capture helping manage that element?"

Chris Hutchins: Yeah, so we've definitely seen things pretty much come back to the levels that they were, a lot of that's come through our communication and the work that our marketing team does to really make sure that our communities know that we're available for them, and we're letting them know what we're doing, the precautions that we're taking, letting them know how we're going to protect them when they come back in the ambulatory space in particular.

One of the things that I know that we're doing is we're using the concept of risk stratification to identify patients we know have a need for ongoing care. And we're picking the opportunity to reach out to them proactively and letting them know that we're open and we're really wanting to make sure that we take care of them, giving them options for a virtual visit, getting them the option to come back to the doctor's office if they want to do that.

But it's really a matter of just making sure that we're looking at the information that's available to us at the patient level so that we can personalize our outreach to them. So we know what we need to know to make sure that we're keeping everybody safe.

Brooke MacCourtney: Okay. Then the last question, this is from Iris. She asked, "What's the main reason that your hospital decided to purchase Health Catalyst products?"

Chris Hutchins: There's probably two different things that are really critical. The technology piece, obviously it's an important one, but for me the primary reason for the partnership is to enable transformation at a level that we've not been able to achieve previously. And if we're going to make data-driven decisions, we really have to have the ability to see the underlying variation and in our data sets and identify where there's opportunity for us to get better.

Some variation may be good and maybe a differentiator in the marketplace, but often times there's a very different result based on the variations that are there,

and the expertise that the help paddles team brings to the table. It really stems from longstanding relationships with multiple clients prior to even Northwell getting involved.

So there's a lot of legacy knowledge that's available to us because of algorithms for built into the DAS platform that we can start to take advantage of just when we start establishing data flow. So having partners to understand the healthcare world in that they weren't a technology company trying to crack the code to do healthcare.

They're healthcare minded experts who have designed and tailored an entire approach and the entire technology stack to effectively support healthcare and taking care of patients. So that was really the big win for us, as we're making the good decision is looking at, is this just technology? Or can this be used to help us to understand where we have our best opportunities to transform?

And then looking ahead, what are the things that we're thinking about that we can contribute to the greater healthcare community, that could be meaningful from that standpoint? So I really just can't say enough about the partnership aspect of having a whole team of experts that are living and breathing the same stuff that we're living and breathing as healthcare providers is a massively important advantage that we can take advantage of.