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Responding to extreme weather events, financial crises, national and local disruptions and the COVID-19 pandemic, many hospitals and health systems face chronic stresses that continually challenge their performance and ability to adapt, further straining their operating models and existing systems. These events have put pressure on organizations to reevaluate their strategic business-planning processes and consider making fundamental changes to remain sustainable in the future. This virtual executive dialogue convened executives across the country to explore how health care systems are adapting and transforming in an era of unprecedented challenges and rapid change in technology, care delivery and patient engagement. ●

KEY FINDINGS

- 1 Leaders have set strategic plans and performance measures, but achieving performance metrics and long-term goals is being **disrupted by repeated surges of the pandemic**, causing delays in care and procedures.
- 2 Health systems are **partnering with companies and other providers to leverage technology** for innovative solutions to workforce shortages and rethinking care models.
- 3 **Command centers with dashboards and artificial intelligence (AI)** improve efficiencies and visibility into resources matching patients to availability and the level of care the patient needs within the system. Additionally, these dashboards provide executives with key performance indicators (KPIs) specific to their areas of responsibility.
- 4 All elements of the care continuum, including skilled nursing facilities and home health agencies, have been **disrupted during the pandemic**. To address inpatient discharge delays and increased length of stays, organizations quickly deployed hospital at home programs, leveraging and modifying electronic health record (EHR) capabilities.
- 5 **Data governance** goes beyond transacting and moving data; it's alignment on what unique measures mean and educating people who are not data scientists on how to use the data for decision-making.
- 6 Going to common platforms forces organizations to **address data standards**. Data standardization provides the ability to automate steps in care models, innovate around provider workflows and create seamless interoperability among systems.
- 7 Leaders see the value of harnessing **predictive modeling** as a tool to predict worsening patient conditions to direct new care models to the highest-risk patients.

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MODERATOR (*Suzanna Hoppszallern, American Hospital Association*): **Many of you are reevaluating your strategies and business-planning processes, and thinking about making fundamental changes. How is your hospital or health system measuring and managing operational performance and improvement? How has that changed over the last 12 months? What are your biggest concerns?**

HSIENG SU (*Allina Health*): All our business units have performance metrics that go through a monthly operating review. There are varying degrees of maturity across the organization in our operation excellence and continuous improvement journey. Over the past 12 months, we are so stretched with COVID-19 response that this may not be top of mind with the staffing issues and increased volume. Jonathan, do you want to add to that?

JONATHAN SHOEMAKER (*Allina Health*): As Dr. Su mentioned, we set performance metrics around five pillars: safety and quality, experience, people growth and financials. We have metrics and strategy execution around growth and volumes related to business units monitored monthly at the system level. Every one of those facets is being impacted by delays in care and staffing. We're in a polarity of getting through the day while trying to manage to a long-term plan. That is the challenge.

BEN CARTER (*Trinity Health*): All our business segments have performance measures. We have four pillars — people, performance, portfolio and purpose — and each business segment aligns under those pillars. We're staying true to measuring our performance. Some measures are based on our historical operating performance and some are geared to the future because we're looking at virtual health and technology use, which we know will move the organization forward.

The current situation is a tremendous disruption. Our indicators are being impacted by COVID-19. We're in our fourth surge. Right now, we have

about 1,200 COVID-19 inpatients, 4,700 nurse vacancies and 15,000 overall vacancies — about a 15% vacancy rate. We're experiencing supply chain disruptions as well, including shortages in some critical supply areas and drugs, particularly testing drugs.

We have an eye on today, an eye on tomorrow, but we are seriously disrupted and beginning to pause some things to focus on the crisis of the current situation. We never would have imagined in March 2020, when our first COVID-19 patient came to one of our facilities, that we would be in a fourth surge almost two years later.

LEE MILLIGAN (*Asante*): I feel as though I'm in a self-help group right now. We are attempting to meet our acute care needs along with population health. On the acute care front, we're launching two regional referral cancer centers and we're in the process of building an addition to our flagship hospital, which will add 350,000 square feet. We are overrun by patients and we don't have the staff or the space. In our flagship hospital, there are 44 beds in the emergency department (ED). Every single bed, except for two, are holding patients who are ready to go upstairs. We're rotating patients through the two trauma rooms that are open. We are in the process of opening up our lobby to add space for patients. The other challenge is that the payment model associated with COVID-19 is so low compared with the normal revenue streams around procedural medicine.

CRAIG MILLER (*Jacobs*): We're also seeing more use of dashboards, which provides visibility on how their systems, departments, etc., are functioning and performing. Some hospitals and health systems are overlaying AI to their dashboards while analyzing live data feeds to predict future scenarios and prescribe options for how to mitigate undesirable situations.

SCOTT NYGAARD (*Lee Health*): We've had several

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waves. We've talked a lot about the impact on cost and vacancies and additional things people have mentioned, but there's a big culture impact in our organizations as people don't gather, don't see each other, don't talk and don't network.

I don't think our scorecard and metrics have changed much. The difficulty in achieving some of our performance metrics is because there are so many distractions. We're all struggling with the day-to-day operations to drive our strategic agendas. We're here to serve the community and its health care needs in an environment that's changing rapidly around us.

CRAIG WALLS (Natividad Medical Center): In our region, there's a total of four hospitals — a district hospital, a private hospital and a critical access hospital, in addition to us. Pre-pandemic, there were areas of competition. During the pandemic, we found ways to cooperate that we would not have been able to do prior to the pandemic. For example, we've avoided getting into a bidding war for traveling nurses. We've cooperated on monoclonal antibodies and on outreach to the forensic population in our county.

Psychiatry is our bleeding edge right now. We have a population in Monterey County of about half a million, and we have 19 beds in the locked unit. There's only one locked unit in the county. Our ED is full of patients who are boarding. We've had to open a large conference room and use it as a Mental Health Unit overflow.

It's hard to find psychiatrists. Few psychiatrists are interested in doing liaison consulting on inpatients and trauma patients. I worry about the long-term effects on our community with this shortage of care

and resources, especially for adolescents. We're seeing tremendous numbers of heartbreaking stories of adolescent behavioral health patients. We're thinking about recruiting graduate medical education residents and psychology interns.

MODERATOR: Are you changing what you're measuring, what your dashboards and your scorecard look like in response to these resource shortages and concerns about disruptions or not being able to provide the care that you would like?

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— Craig Miller —
Jacobs

SEAN O'GRADY (NorthShore-Edward-Elmhurst Health): Our board has decided that we're not changing our dashboard or priorities. They remain critical to advancing the health of our communities, but we are seeing a degradation in performance with the nursing vacancy rate, as well as the proliferation of new graduate nurses who are doing their best in a challenging environment. We're seeing levels of hospital-acquired conditions associated with COVID-19, but rather than drop our goal, we're just rethinking our care models. Specifically, we are doubling down on purposeful hourly rounding and considering how we may use advanced practice nurses and new care models to drive better hospital performance.

MODERATOR: How are you using data and AI for operational and clinical process improvements?

MILLIGAN: Some of the biggest challenges of a health system that is navigating this new world are trying to figure out how many patients are going to have their care managed by your system, how many are going out from your system and when that is going to happen. Most systems have a clunky, manual process. Frequently, each

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individual hospital would make decisions on who gets admitted to their hospital from other outlying places. Recently, we're looking to implement a unified command center that will allow us to have a holistic view of the entire system and a single point of contact to decide what level of care a patient needs within the system.

On top of that, we're going to layer in technology with predictive analytics to give us a handle on who's going to be discharged today and when, who will be admitted today and when, and allow us to free up space. The AI associated with this is getting better. We're maximizing our workflows first and will look to layer in the technology.

MODERATOR: In what areas are data availability and interoperability a problem right now, where you have to solve challenges on the fly?

NYGAARD: We're struggling with the brokenness in our communities. The skilled nursing facilities and home health agencies have as many labor problems and challenges as we do. Our length of stay is up a day. The revenue is not on pace with the case mix index. Labor expenses are spiraling out of control. Everything's moving in the wrong direction. I think this year is going to be even more challenging.

CARTER: We have a command center at the system office so we can share information across the whole system. We've been working on establishing common platforms, but we don't have them fully installed. We've been implementing Epic during all of this. We use PeopleSoft and Workday on the supply chain, finance and human resource sides. Common platforms will put us in a better place. We've been doing that while all this is going on, which has created a challenge.

We haven't found a predictive model that's been effective. During the first surge, we used many different models and realized that none of them were accurate. We stopped trying to predict and

are back to reacting to what's happening in each community. Our biggest issue is that the whole process of patient care is disrupted. We can't discharge to nursing homes or discharge to home health. We have people ready for discharge, but we can't move them out of the hospital. In Michigan alone, we were holding 200 inpatients in our EDs, and in Fresno, Calif., we're holding 50 inpatients in an ED that has 50 beds. The ability to efficiently manage patient flow has been disrupted by the fact that all elements of the care continuum have been disrupted. That's our biggest challenge.

SU: It's reassuring that we're not alone in our journey in terms of throughput issues and having difficulties discharging to nursing homes. In terms of data, it's not the volume of data or how real-time the data are. The question is: How are we using the data and how are we engaging our caregivers to use the data in an effective manner? We have a lot of data. How can we leverage those data to make important decisions?

SHOEMAKER: I don't think the problem is data. If we think about getting some breathing room and getting out of crisis, thinking about the use of data, decision-making and nimbleness in some future state will be helpful, but it's not today. We're all tired of predictive analytics that doesn't predict anything well. We're all a little scarred from that right now.

MODERATOR: Craig, do you want to share some insights?

MILLER: One of the top issues that's been near and dear to me for a number of years has been data standardization and how we can achieve interoperability. Working with hospitals and health systems, I often hear about some of the challenges they face due to a lack of standardization, such as: 'This technology platform can't speak to this other system,' or 'We don't know where or when this item is running short or which patient received a now-recalled item or device,' or 'We can't track

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our spend for this patient or procedure because the process/procedure for charge capture is not set up.' We can't look at data across one standardized data set.

I became involved with GS1 Healthcare, which has a data standardization initiative. It's gaining a lot of traction outside the United States, but has been slower to become integrated with hospitals and health systems here. The hospitals in the US that are beginning data standardization initiatives are doing so with pilot programs and gradually expanding from that base.

I'm curious if any of you have had experience with investigating or trying to standardize your data and develop the necessary processes/procedures, either in the past or moving it to the future with some type of pilot program?

SU: It has to do with having clinical teams agree on metrics universally that they all want to see and pulling different specialty software into one data warehouse where everyone can leverage the data instead of having silos of data. We're fairly successful in terms of breaking down those silos; I think the issue we're facing now is using the data wisely and doing it quickly.

SHOEMAKER: We have not found issues around moving and translating data and building out data sets. We have had a data warehouse for 20 years and the same instance of Epic. We move in specialty data sets and we have a master patient index and even interoperability capability. There's an element of data governance that gets into business-capability conversations. For example, what is a unit of measure in labor that allows you to have discrete decisions both clinically and from a business perspective?

There's some last-mile data governance that is the hardest. It's not even about transacting and moving data. It is about alignment on what that unique measure means and how you make decisions on it. It's also partnered with data education. People who understand how to use data and data tools well is a critical part. We have a lot of smart people, but being data scientists is not their day job.

CARTER: As we move to common platforms, data standardization becomes critical. We're in the throes of that going to a common instance of Epic in 22 different states. Going to common platforms is forcing us to address data standards — Kronos and PeopleSoft. We're on that journey. Our data warehouse is relatively mature. We're a member of Truveta to advance clinical care with AI.

O'GRADY: From our perspective, predictive analytics, as it relates to patient volume, has proven to be of limited value in COVID-19 demand projections. Prior to the pandemic, we had created a powerful, predictive analytics tool in Epic that would identify patients with a high risk of death within 24 hours, readmission within 30 days and death within six months. That tool was significant in improving our performance in those areas.

We're now pivoting to create a tool to predict hospital-acquired conditions, so that we can direct new care models to the highest-risk patients. That's where we see the value of harnessing predictive modeling, not on the demand side, but in patients who are likely to have a condition that worsens and how we get ahead of that, particularly with fewer staff.

WALLS: We've had the same experience. We're near Silicon Valley and we engaged with a company that

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— Jonathan Shoemaker —
Allina Health

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provided us with some predictive analytics. It was not terribly helpful in any practical sense, but I still hold out hope for the future of predictive analytics. It's going to change the landscape, but we aren't there yet.

CARTER: I would agree.

MODERATOR: Thank you, Craig. We've also heard that some are looking at predictive analytics for health care-acquired infections. Are there any innovations in data standardization and interoperability that are making a difference in delivering a personalized health care experience or addressing any of these shifts in supply and demand, the supply chain disruptions, or even optimizing physical space for improved outcomes?

NYGAARD: We're in the early phase of trying to design a more patient-friendly dashboard. We went through a consumer feedback process during which we interviewed 400 consumers in our market and it was eye-opening. People are on a life journey at different points in time and they need different things. How do we identify more of those personas and try to connect more personally with our patients as they go through life?

On the operating side, we're in the early phase of trying to innovate around the workflow of a provider, which might be 15 or 20 minutes. You can't be hunting, gathering, chasing, finding and organizing all the data; they must be readily accessible at the time of the visit.

O'GRADY: There is no lack of data. But from an operational decision-making perspective, we need more real-time data to drive interventions to do things that make a difference. There's a lot of potential, but we've been hearing about that for

a long time. Our clinical leaders are thirsting for tools that would help a clinical nurse manager make a decision about staffing and staffing models in the moment that will make care better and more efficient. It feels as though we're far from that, but I am confident we have the team to figure it out.

MODERATOR: Is anybody using data and analytics for staffing models?

SHOEMAKER: There's a whole operational excellence maturity cycle that many in health care are thinking about — how you think about financial planning, financial management, labor and your cost, particularly as you think about population health. Data are central to that. Regulatory functions have pushed the need to collect data in a way that's done less for improving care and more about figuring out how to get paid, and getting paid is complicated.

From a different perspective, the opportunity with data and analytics might be to have nurses and physicians spend less time clicking away. Natural language processing is probably going to be where we see the most wins for clinicians in the near

term. It's at the cusp of being able to just annotate the entire visit for physicians.

CARTER: We're viewing the current labor shortage as permanent for the foreseeable future. Given a shortage of nurses, clinicians and other staff, we are looking at different operating models using technology. We also believe that our population health management approach, where we're partnering with members to manage their health and keep them out of the hospital, is where a big part of the future is. The key is how we use technology and AI predictively with members to manage their health and avoid hospitalizations altogether.

Blue bar, quote: "The ability to efficiently manage patient flow has been disrupted by the fact that all elements of the care continuum have been disrupted. That's our biggest challenge." — Ben Carter — Trinity Health, blue bar

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MILLER: One of the most common questions I hear is: ‘How can we increase the efficiency of these processes where you can automate the steps in the care model so that the nursing and other staff aren’t necessarily spending time going to mobile computer carts or workstations before being able to bring patients their medications or administer certain treatments?’ It’s already built into their care model, so that pharmacy has a system in place to dispense or prepare the medication and send it to the floor, and ancillary care staff know when they need to visit with a patient.

SU: We have a shortage of respiratory therapists (RTs). A lot of the work has to do with monitoring, going to different patient rooms to monitor oxygen saturation and whether they need an adjustment and oxygen. We are thinking about leveraging remote monitoring for RTs to streamline that work and be even more effective. We have a fairly robust teleintensivist program that we’re leveraging. Recently, we had someone with pneumothorax in an outlying hospital, and our teleintensivists helped walk the local care team through all of that management and saved the patient’s life.

You’re right, Craig, we need to do more. I’m of the mindset not to let a crisis go to waste. This is perfect timing to leverage technology and to push us to more innovation. We don’t know what we don’t know, in terms of AI usage.

NYGAARD: We partnered with an agency that helped us look at all the digital technology and

prioritized the opportunities. There are a lot of niche products that solve a one-off problem. Then you have the challenges of integrating the technology. The other problem we face is culture and change management. We’re dealing with human beings who aren’t used to real-time data and information — an enculturated workforce that is not ready to respond to anything other than a crisis during a labor shortage.

MODERATOR: Good point, Scott. Are there any other examples of automation that you’re trying to implement to help with the staffing shortage?

CARTER: We partnered with AvaSure for remote patient monitoring during the first several surges, so that we would not have so many staff going in and out of rooms. We’re looking to see if we can parlay that into a virtual nursing model as well. Technologically, those are probably the two keys for us.

SHOEMAKER: We did a strong and fast deployment of hospital at home, leveraging a lot of Epic capabilities that we already had and modified. That was a significant event. Then, we deployed roughly 1,200 iPads into the ED and inpatient rooms for staff teams to use with patients for video chats. People didn’t have to enter or exit rooms; it was done originally to reduce the use of personal protective equipment, but now it’s a workflow optimization. It’s interesting to see how things become leveraged in the future state.

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