



EXECUTIVE INSIGHTS

RESILIENCY + RECOVERY



RESILIENT STRATEGIES FOR THE HOSPITAL SUPPLY CHAIN

Using data-driven insights to mitigate disruptions

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The COVID-19 pandemic exposed the weaknesses of the health care supply chain and highlighted its complexities. In the early days of the pandemic, most health systems planned to have ample critical drugs and procured supplies from nontraditional suppliers to last for months. Now health systems are looking at their medical spend, proactively managing the supply chain, identifying revenue recovery opportunities, leveraging scale with suppliers and applying new ways of forecasting supply. ●

KEY FINDINGS

- 1 Collaboration and communication among all stakeholders** — hospitals and health systems, vendors, suppliers, distributors, GPOs and community resources — helped to address immediate shortages during the pandemic and forge new relationships for a more resilient supply chain while optimizing the delivery of care.
- 2 With stockpiles of supplies and added warehousing, hospitals and health systems are trying to find the right balance between just-in-time and just-in-case inventory management.** Centralized warehousing and systems are part of the resiliency model. Many hospitals have 90-120 days' worth of inventory on hand and paying attention to expiration dates is labor-intensive for warehouse crews.
- 3 Supply chain dashboards, disruption-risk mapping and resiliency programs** are some of the tools implemented during the immediate crisis. Organizations also looked to the future by predicting, identifying and preventing product outages before disruption. Key to these efforts is working with clinicians to find clinically equivalent substitutes and alternative sources for critical supplies.
- 4 Statistical forecasting models** based on historical data and caseloads can predict the expected patient population or cases by specialty at each location. Additional parameters by shortages, product type and suppliers provide needed visibility to hedge risk across suppliers and create backup plans.
- 5 Investments in digital patient engagement and data analytics** are accelerating revenue recovery. Organizations are proactively reaching out to the health care consumers who postponed elective surgeries and other procedures to bring them back into the system through targeted campaigns.

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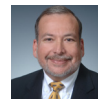
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MODERATOR (*Suzanna Hoppszallern, American Hospital Association*): **What is your organization doing to recover from COVID-19-related revenue losses and prepare for future supply chain disruptions?**

TONY DENTON, J.D., MHA (*University of Michigan Health*): We created an emergency economic relief team to document any economic impacts of the pandemic, with submission of requests for provider relief funds to offset our revenue losses attributed to downsizing the organization and taking care of the influx of patients with COVID-19. Our ramp-down took about two and a half months. Then we ramped up again and recovered a number of those losses through operations and federal relief dollars during the fiscal year ending this past June.

In response to disruptions in the supply chain, particularly personal protective equipment (PPE), we created many alternatives, many of which I call Plan B's. We had a community supply drive and, surprisingly, many people had supplies that were still usable. We filled up thousands of square feet and hundreds of pallets so that we could stabilize while trying to get back on track with the traditional sources of supply procurement. At the same time, we created new supply chain dashboards and forecasts with the intention of having a 90-day supply of inventory for all critical supply chain needs to prepare for any future disruption given the length of the pandemic.

ANGELA LALAS (*Loma Linda University Health*): To recover from revenue losses posed by the pandemic, our health system has focused on digital transformation, revenue and cost optimization, and re-engaging with patients by explaining that hospitals are safe places to receive their care again and that we have alternatives through digital health to give medical care. We are also educating and encouraging patients and employees on COVID vaccination.

In terms of supply chain disruption, our leadership team had the foresight, as early as January 2020,

to direct our supply chain team to shore up six months' worth of inventory. Because of this, we've had minimal disruption in the protective supplies that our physicians and employees need to feel safe in the hospitals.

We're also on a just-in-time inventory but, given the outbreak of the pandemic in China and Asia in December 2019, we stocked up on our inventory in January, worked with our GPO and added other vendors. We continue to work with our GPO and our state hospital associations on local sourcing options so we don't have to rely as much on our international sources for supplies.

MODERATOR: In evaluating your organization's supply chain processes during the pandemic and other recent disasters, what lessons did you learn?

AMANDA CHAWLA (*Stanford Medicine*): Just prior to the pandemic, when the surgical gown disruption impacted many hospitals, we initiated an activity that we call disruption-risk mapping. We looked at the various avenues in which the supply chain can be disrupted from the magnitude of risk, the ability to anticipate the types of disruptions. Upon completing the risk mapping activity, we needed to ensure that the correct response and measures were put in place to the appropriate levels. This led to the launch of a Supply Resiliency Program.

In any given month, at any given time, there are disruptions in the supply chain from product recalls, manufacturer back orders, delays in transport, stock-outs, etc. The average number of disruptions in a given month can range from four to 500 that Supply Chain handles, less than a few percent becoming visible. To manage the volumes, we must invest heavily in technology, analytics, and insights. At Stanford, we have invested with technology partners on the visibility of market disruptions, better understanding our demand to shortages, to how we partner with our clinicians on clinically equivalent substitutes.

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Using the 80/20 rule of the medical supplies we purchase, how do we know what is truly critical? How do we think about resiliency and response in preparing, preventing, predicting and responding, and identifying products before they're disrupted to ensure a clinical alternative?

We're working toward ensuring we do not go from a just-in-time model to a just-in-case model. This is a risk for many hospitals as many organizations have opened warehouses (including Stanford) when we have our low unit-of-measure distributor. We must operate a 'just right' supply chain in which we have flexibility, reliability, and response built in. It is no longer an option to invest in technology and analytics within supply chain; data and robust analytics are the backbone in effective demand and forecasting.

MOTZ FEINBERG (*Cedars-Sinai*): During the pandemic, what really changed is the strategic direction of how we manage inventory across our network. We were transitioning from a self-distribution model to a just-in-time program with a go live of February 2020. Part of the overall transition strategy was to close one of the main warehouses in our region, which had some cost savings, but we chose to keep it open. This certainly had an impact on the business case, but it created capacity to manage critical supplies differently across the network and created a support structure for various contingencies. It became part of our resiliency model to keep the warehouse, partially for day-to-day operations, and more significantly for network support of critical supplies.

Because we received a lot of donated products, we regifted about eight truckloads that were not suitable for medical use, including PPE, to other organizations that could use them. Then, we repurposed a lot of space in the warehouse.

We also consolidated other warehouses into the main warehouse, and reaped cost savings and leveraged the capacity. That's going to become part of the anchor of our network for a lot of our supply resiliency work.

CHERYL SADRO (*University of Texas Medical Branch*): We reorganized our supply chain team about two years ago. With the pandemic, we refined our processes further and, with our contacts throughout the United States and internationally, we were able to secure PPE when it wasn't easy to do.

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— Amanda Chawla —
Stanford Medicine

We also have a warehouse and were in the process of closing it. We won't use it for daily operations, but because we live on an island and are subject to hurricanes, we'll keep the warehouse for resiliency.

From a staffing perspective, we're having to become creative, because we, like so many, are dealing with human resources issues affecting other sectors. Meanwhile, we're also in the middle of setting up new processes, new IT infrastructure and new inventory management.

JULIE QUIRIN (*Saint Luke's Health System*): We've learned that everybody tends to take it for granted that they're going to have the supplies they need every day to do their jobs. This pandemic shone a bright light on the supply chain, helping us see just how important it is. Our team has established good relationships not only within the GPO/aggregation group process, but also beyond into the vendors and transportation mechanisms. Those relationships served us well because those choke points were huge during the pandemic. Not having to rely solely on third parties has served us well and will continue to going forward.

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RON CHRISTENSON (*Morris County Hospital*): We're a rural, 21-bed critical access hospital. I have been part of a COVID-19 committee in the past year and a half that has been studying our revenue streams and supply expense results. We have one person in materials, so we don't have the luxury of having a large staff.

Being in a rural area, there's no such thing as next-day air or overnight delivery; you must deal with delivery schedules. I've been noticing inventory creep all along, simply because department managers are leery of being out of stock. As the CFO, if I see my inventory climbing, it means that cash is tied up in the inventory versus being available for other operating expenses. We're doing the best we can with our distributors and GPOs, but a small community hospital doesn't have as many options as a big health system.

BRIAN MURRAY (*NorthShore University HealthSystem*): The major lesson we've learned is always having a worst-case scenario plan for our PPE of at least 90 days in a local warehouse. We historically utilize a just-in-time inventory methodology, but we transitioned key items to be bulk self-distribution early in the pandemic, and tried to get as far ahead of the market as we could.

We added on a local warehouse for our own use because we didn't have a footprint within our existing campuses early in the pandemic. The key burden we're facing is just having overvalued inventory. Much of our inventory of PPE, cleaning supplies and a few other things are 10 times the cost of what we paid for them.

MODERATOR: Scott, can you give us an overview of what you're seeing nationally in interacting with clients in the supply chain?

SCOTT MILLER (*McKesson Health Systems*): We've learned a lot and evolved our business by managing working capital, having appropriate inventory available and working with suppliers to meet hospital and health system needs. The themes around the amount of money that can be tied up in purchasing pharmaceuticals and medical supplies ahead have a significant impact operationally; it's not often that you're carrying 90 days' worth of medicines and supplies.

I'd like to get your feedback on how you're working with your suppliers so that proper communication is coming on the demand planning while you're doing your own forecasting and risk-mitigation strategies. I'm curious upstream how you're talking with your wholesaler and suppliers to better prepare for demand with your current patient loads and what you anticipate going forward. How are we responding as an industry to meet the pharmaceutical and medical supply needs?

ALAIN BOIS, R.N. (*Northern Maine Medical Center*): Our strategy was to not only create a dashboard and predict our PPE needs, but also the critical

pharmaceutical agents we would need should we be hit by a surge and how we would react to that. We've had increased conversations over the past 18 months with our wholesalers that we haven't enjoyed in the past. We've learned to collaborate more, even with organizations that previously we regarded as our competitors.

There are only four hospitals in our county. We met regularly through Zoom, sharing challenges and lessons learned. We also shared both pharmaceutical and medical supplies. When it came time to do vaccinations, we approached the state and proposed that the three independent hospitals get

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together because we are not part of a system and were not getting regular weekly supplies of vaccines. The state agreed that we would get a shipment weekly, and that it would be shared among the hospitals based on need. A couple rural health clinics also were part of the arrangement. It's all about collaboration and communication.

TERRY SCOGGIN (*Titus Regional Medical Center*): We had three surges and, as a rural independent hospital, it was tough. Even though we had one of the the highest per capita COVID-19 rates, we had one of the lower mortality rates because we communicated and collaborated with our medical staff from Day 1.

We turned over every stone when it came to PPE. We jumped at opportunities to share and help other people. We had many pickup trucks moving throughout Texas, and people who had planes offered to transport supplies for us. It was really a community effort.

We had direct contracts with some of our local employers, which had started right before the pandemic, including the largest food-processing plant. From a community health perspective, that agreement helped with PPE and other supplies they needed to protect their employees, and they were able to help us as well. Collaboration and communication were the two biggest considerations for us.

We applied what we did in finance to the supply chain, and it worked well. We took the same interest rate models that we used in finance and stress-tested our PPE on different scenarios to understand where our misses were.

Post-surge, we're focusing on how to make some changes in the hospital infrastructure to handle supply chain disruptions better. We did not have enough ventilators. We're spending a lot of time and effort on our respiratory therapy equipment to make sure we cultivate those relationships and are prepared.

MODERATOR: How are you using data and analytics in new ways than in pre-pandemic operations?

ALEX RODRIGUEZ (*St. Elizabeth Healthcare*): We have been on the same strategy for a few years and really got our inventory product levels down low. But the pandemic really changed the game. Many of our metrics were designed to follow contract conversion and sourcing opportunities and costs. We have some back-order metrics, but didn't have metrics for product outages.

SUNIL DADLANI (*Atlantic Health System*): First, we are emphasizing the digital front door. That means that we are trying to create an omnichannel experience and engagement model in which we can proactively reach out to health care consumers who had postponed their elective surgeries and other procedures, so that through targeted campaigns, we can get them back into the system.

Second, we are expanding our efforts, time and investments in data analytics. We have built a state-of-the-art, predictive analytics platform. We are proactively creating a stratification of consumers and identifying the people who need care the most, and then creating targeted campaigns to bring them back into the system. That approach has jump-started the patient population back into the health system.

As far as the supply chain is concerned, we are setting automatic replenishment cycles, where we create certain thresholds and identify the key high-value supplies. This is where suppliers come into play. We want to have a good mechanism of identifying the demand, their supply and the gaps to avoid being out of stock. Nor do we want to be in a position where supplies are either expired or wasted.

We are also trying to use real-time location solutions to pinpoint high-value supplies and find them easily because we have six large state-of-the-art

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hospital systems, with approximately 2,000-plus bed capacity. Largely, we are trying to bring decentralized ordering back into a centralized system.

ROCKMAN FERRIGNO, M.D. (*Yale New Haven Health System*): We've been able to open discussions with our physicians and nurses about flexibility in what products we're using. As we build our budget for the next season, we're thinking about what we're ordering, whether it's the 80/20 rule or the depth we need to have within each product category. For example, can we take what we learned in COVID-19 and ask our subspecialty surgeons whether they can do this with three vendors instead of 15? It's led to some clinical consensus. We have enough breadth in our system to deliver a specific clinical experience to our patients.

We overbought in preparing for COVID-19 as others have mentioned, we're donating supplies and we're looking at how much we need for 90 days' worth of supplies.

CHAWLA: The pandemic has highlighted the need to understand better and project demand with clinical practice. This requires reviewing data integrity and business practices, such as when and how frequently inventory is issued to where it is utilized. Pre-pandemic, understanding demand for a category such as PPE was not something we tracked closely. We immediately defined the term usage throughout the pandemic and began tracking; we built categories and subcategories in our data sets, including clinically equivalent products in the dashboard. Hospitals struggle with understanding supply to clinical use and demand because we have operated the logistics, the movement of supplies as if we are 'hunting and gathering.'

At Stanford, we are passionate about removing the hunting and gathering and bringing intelligence, proactive notifications, and warnings when inventory runs low prior to a stock-out or disruption. Over the past few years, we have been deploying point-of-use technology, RFID tagging of individual products and bins of supplies that provide us with advanced intel on low inventory, expirations and retroactive analysis of inventory to use patterns.

Stanford aims to increase automation and technology so that we know there's a double bin stock-out before a clinician experiences it. As an industry, we must address the glaring gaps of the lack of information or warning of potential disruption across the entire supply chain. How do we improve multitier visibility to know whether we will run into a disruption?

Within Stanford, some of the metrics we review and manage are the numbers of stock-outs at the point of care that our clinicians experience. The number of times a clinician calls down to supply chain personnel for additional, new or stock-out inventory incorporating these elements in the right-sizing of parts and inventory levels. As a supply chain, we measure how many shortages we are experiencing and turn-around times. The key has been having strong data integrity controls, standard business

processes and understanding what problem we are trying to solve with the analytics capability we are building and how that supports increased reliability.

ETHAN BLAND (*St. James Parish Hospital*): We are in our electronic health record conversion now. Going forward and using metrics, we're going to focus on utilizing our minimums and maximums to drive reorder points, and to make sure that our safety stocks are high enough to get us through the back

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orders and substitutes that aren't available directly to us just because we are a rural, critical access hospital. It has been important to use all those metrics during the pandemic.

DADLANI: We are using a statistical forecasting model based on the caseload and on our historical data to tell us how many cases by specialty we are expecting in each location. It also drives the workforce model and how many full-time equivalents or consulting resources we need at each location for the patient load.

For the supply chain side, we look at shortages by location, by specialty, by provider, by product type and by supplier so that we know where we need to build Plan B or Plan C. That's how we hedge the risk across multiple suppliers or multiple product lines.

MODERATOR: Scott, would you like to share what trends you're seeing in analytics that will take us into the future?

MILLER: We have made and are continuing to make significant investments in our supply chain analytic tools. That helps us for normal seasonality and normal volatility. But now, with the pandemic, you can't really forecast demand, given how unusual the situation is. We can expect that kind of volatility to happen into the future.

Communication and visibility into the supply chain are critical. We need more information from our

customers on patient loads and expected demand triangulated with what we're learning from our suppliers upstream. Within that, we're able to close the loop and, as a community, better solve normal and unforeseeable volatility and turn that data into actionable information. Communicating it up and down is important.

I'm interested in how we can better support hospitals and health systems with the information we have, to be able to predict and understand your needs in advance. I appreciate what Amanda said about just in case; you can't afford to hold that much inventory, but just in time is maybe a bit too lean.

The communications as to anticipated and current volumes combined with data-driven insights will make all the difference in driving a resilient health care supply chain.

QUIRIN: As we look at the future with new care delivery models, our supply chain needs to have built-in mechanisms for hospital-at-home, hospital-to-home, different types of home care and digital monitoring programs, and population health initiatives. Having these built into the system will add the necessary complexity of the supply chain infrastructure and the variety of analytics we'll need going forward. ●

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