

# Lessons learned from COVID-19: Best practices for building a more resilient healthcare supply chain

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**Abstract** The COVID-19 pandemic has posed unprecedented challenges to the US healthcare industry from a clinical, operational and financial perspective. Surges in suspected and confirmed COVID-19 cases have depleted supplies, most notably personal protective equipment; overwhelmed health system and hospital order/inventory management processes and systems, particularly those that are manual, paper based; and essentially wiped out revenues, with US hospitals losing an estimated US\$1m per day in cancelled or delayed elective procedures (American Hospital Association. (June 2020) 'Hospitals and health systems continue to face unprecedented financial challenges due to COVID-19', available at: <https://www.aha.org/system/files/media/file/2020/06/aha-covid19-financial-impact-report.pdf>). In this paper, we present insights from US healthcare supply chain leaders on how COVID-19 has impacted their operations and what steps they have taken to support clinicians and maintain patient care delivery. We include recent research on the impact of COVID-19 on the supply chain and commentary from industry organisations and thought leaders on important findings. On the basis of these industry insights and our own work to support both provider and supplier organisations in delivering critical supplies during the COVID-19 pandemic, we conclude with best practices for strengthening the supply chain moving forward.

Readers will gain knowledge around the following:

- How COVID-19 has impacted health systems and hospitals clinically, operationally and financially, including commentary and examples from US healthcare supply chain leaders on their experiences during the pandemic
- Why traditional methodologies, systems and processes for procuring products and managing inventory have failed under the sudden and sharp increase in supply demands
- The impact of the pandemic on the global supply chain, including the risks of procuring products from non-traditional suppliers to meet clinical supply needs

- The many ways health systems and hospitals have been financially impacted by the pandemic, including increased supply acquisition costs coupled with lower revenues and delayed cash collection
- Best practice supply chain advance preparation strategies aimed at strengthening supply chain resiliency and mitigating the negative impact of future disruptions to supply availability and delivery

**KEYWORDS:** COVID-19, healthcare supply chain, healthcare finance, supply chain analytics, data management, supply chain automation

## THE IMPACT OF COVID-19 ON THE US HEALTHCARE SUPPLY CHAIN

The COVID-19 pandemic has revealed significant vulnerabilities and issues throughout the healthcare supply chain. The most noticeable consequence has been the widespread shortage of personal protective equipment (PPE) recommended by U.S. Centers for Disease Control and Prevention (CDC) to safeguard healthcare staff and patients.<sup>1</sup>

Without enough supply inventory, front-line healthcare workers have been challenged to provide patient care with only the supplies they have on hand. According to a National Nurses United survey of more than 21,200 nurses, 87 per cent of hospital nurses reported reusing at least one type of single-use PPE (eg, a decontaminated single-use item), such as an N95 respirator or a face shield, which can increase virus exposure to staff and patients.<sup>2</sup>

According to research conducted by the UC Berkeley Labor Center, more than 50,000 healthcare and other essential workers in California have likely tested positive for COVID-19 (as of August 2020), with at least 20,860 worker and associated household cases potentially avoidable with proper PPE use.<sup>3</sup>

As a result of such critical supply shortages, hospital leadership and supply chain executives have taken a step back to holistically examine their supply chain operations from end to end, from the reliability of companies that manufacture critical supplies (and their raw materials

suppliers), to the effectiveness and efficiency of ordering processes, to the management of product inventory within hospitals and other care sites.

‘The COVID-19 crisis has shined light on how critical the supply chain is to our health systems,’ said EY U.S.–West Health Sciences and Wellness Leader Carole Faig.

Those health systems that invest in their supply chain organization, their supply chain leaders and risk management among the supply chain will prevail. This crisis is a reminder to health care organizations that supply chain should have a seat at the executive table when it comes to effective operations helping the organization to think collaboratively and creatively.<sup>4</sup>

## Old ways cannot support the new reality

Health systems and hospitals have found that traditional ways of procuring products and managing inventory that were acceptable in a non-crisis situation have failed during the current pandemic, such as just-in-time (JIT) inventory models and a reliance on a limited number of suppliers/single-source supplier contracts. If a hospital does not have enough products in its inventory or its supplier does not have the products the hospital needs or is experiencing supply chain issues of its own, the hospital has nowhere else to easily turn to for products.

‘We are preparing for the next one,’ said Mayo Clinic President and CEO Gianrico Farrugia, M.D. ‘That requires us to have a

much more robust supply chain with many different pathways to ensure we have the right supplies.<sup>5</sup>

### ***Global supply chain challenges***

In an effort to cut costs and boost production capabilities, medical device manufacturers have increasingly relied on non-US raw materials suppliers and manufacturing sites. More than 200 of the Fortune Global 500 firms have a presence in Wuhan, China, where the COVID-19 outbreak originated.<sup>6</sup> The pandemic has revealed how many manufacturers lack visibility into their global supplier base and are therefore unprepared to take action in the event of a local or regional supply disruption.

In a survey of manufacturers immediately following the COVID-19 outbreak in late January/early February 2020, 70 per cent said they were manually trying to identify which of their suppliers had a site in the specific locked-down regions of China.<sup>7</sup>

This has placed the companies, and the healthcare provider organisations that use their products, at the mercy of global conditions.

### ***Non-traditional suppliers***

Health systems and hospitals unable to secure PPE and other critical products from their traditional supplier base have had no choice but to turn to 'non-traditional' suppliers. Pressured to quickly procure the products they need, healthcare organisations have found some of these companies to be fraudulent and unreliable, delivering sub-par products often at inflated prices and, in many cases, unable to fulfil orders on time or at all.

During the COVID-19 crisis, the Global Trade Investigations Division at the Department of Homeland Security (DHS) has opened more than 570 criminal investigations worldwide and, while working alongside Customs and Border Protection, has seized more than 900 shipments of

mislabelled, fraudulent, unauthorised or prohibited COVID-19 test kits, treatment kits, homeopathic remedies, purported antiviral products and PPE.<sup>8</sup>

For example, Yale New Haven Health discovered that most of its PPE vendors were not dealing directly with Chinese factories, but rather third-party distributors or 'grey market' brokers, which refers to supply channels that are unofficial, unauthorised or unintended by the original manufacturer. After also discovering that many of its vendors had sent false test results, Yale sent some of its respirators to a third-party testing lab, which found them only 85 per cent efficient.<sup>9,10</sup>

Another challenge is that vendor access has been limited during the pandemic. Health systems and hospitals rely on suppliers and their representatives to supply products and train clinical staff members, but, at the same time, they must mitigate the risks of potential virus exposure. In turn, suppliers too must take steps to prevent their representatives from either contracting COVID-19 while in a facility or passing along the virus to healthcare staff and patients if they are unknowingly infected. This applies to both trusted, established suppliers and new companies that healthcare organisations are relying on to secure products in high demand during the pandemic.

### ***Manual order management processes***

The COVID-19 pandemic has exposed significant stumbling blocks in health system and hospitals' order management processes. Those organisations still relying on manual, paper-based ordering with suppliers via e-mail, fax or postal mail have been overwhelmed by the massive amount of supply procurement required in a short time to care for the influx of COVID-19 patients. They cannot quickly and effectively scale up operations to handle demand without significant labour involved.

When creating purchase orders (POs) and submitting to suppliers manually, providers lack visibility into the status of those orders, including the inability to confirm receipt of an order for critical supplies, whether those supplies are available or on back order, when they will ship/arrive, etc. In a manual environment, providers also lack access to data and the ability to perform advanced analytics to forecast demand and adjust their procurement accordingly.

Hospitals that have shelter-in-place orders or other restrictions for non-essential workers have struggled to maintain supply chain operations when department staff members are asked to work remotely. Those with manual, paper-based processes risk significant roadblocks because their supply chain personnel cannot process orders and invoices outside of the office. Healthcare organisations that have failed to update their supply chain capabilities over the years are now feeling the pain and pressure of having fallen behind. Faig said:

It will be imperative that the supply chain function has better demand planning, forecasting and visualization tools that help increase transparency and manage resiliency, shortages or whatever the next crisis entails. 'Adaptability and resiliency during the recovery and re-emergence periods will predict long-term winners in the market.'<sup>11</sup>

### **COVID-19 financial fallout**

Compounding these issues has been the financial fallout of COVID-19. Cash collections have slowed as hospitals have been forced to cancel or delay lucrative elective procedures. As a result, hospitals do not have enough cash on hand to cover short-term commitments, let alone long-term obligations.

To better understand how the pandemic has impacted — and continues to impact — health system and hospitals' financial

outcomes, the American Hospital Association (AHA) conducted a survey of member hospitals. The following are some of the important findings:

- US health systems and hospitals are losing an estimated US\$1m per day, with barely enough capital to cover short-term cash commitments, let alone long-term commitments
- They have experienced an estimated US\$202.6bn in total financial losses between March 2020 and June 2020
- They are expected to suffer an additional, estimated US\$120.5bn in losses from July 2020 through December 2020
- The total projected losses will be at least US\$323.1bn in 2020<sup>12</sup>

### **THE NEED FOR SUPPLY CHAIN RESILIENCY**

Healthcare supply chain leaders agree that now is the time to address these issues in order to build a more resilient supply chain that will support healthcare providers and their patients during future periods of crisis, such as infectious disease outbreaks, natural disasters and any other event that could lead to supply shortages or disruptions.

Executives from more than 200 provider and supplier organisations took part in an online survey conducted during the Association for Healthcare Resource & Materials Management (AHRMM) webinar, *'Re-engineering the Healthcare Supply Chain'*, held on 12 June 2020. The survey revealed that healthcare stakeholders are making healthcare supply chain resiliency and optimal demand forecasting top priorities to overcome the wide range of challenges presented by COVID-19.

Hal Mueller, Chief Supply Chain Officer at The Ohio State University Wexner Medical Center said:

Hospitals will need to take a more holistic, strategic approach to supply chain management that closely tracks inventory and forms stronger relationships with manufacturers and distributors, whether those vendors are nearby or offshore.<sup>13</sup>

Gary Rakes, Vice President — Chief Supply Chain Officer of Aspirus — has experienced the challenges of COVID-19 first-hand. Rakes describes the pandemic's impact on how the supply chain function is viewed within Aspirus, a Wausau, Wisconsin-based health system with locations throughout Wisconsin and Michigan's Upper Peninsula:

'I feel this pandemic has highlighted the importance of the supply chain team as an extremely significant and strategic part of our health system,' We are now more than ever looked upon as key players in the delivery of healthcare. Without our tremendous efforts in insourcing, acquiring and delivering products we would not have been able to respond to the needs of our communities in combating this horrible pandemic.<sup>14</sup>

### **BEST PRACTICE SUPPLY CHAIN ADVANCE PREPARATION STRATEGIES**

On the basis of GHX's work to support both healthcare provider and supplier organisations in delivering critical supplies during the COVID-19 pandemic, we have developed the following best practices for supply chain advance preparation. They are aimed at strengthening supply chain resiliency and mitigating the negative impact of future pandemics, natural disasters or other unexpected disruptions to supply availability and delivery.

#### **Help ensure adequate supplies of critical PPE and medications**

The COVID-19 pandemic brought to the fore many of the limitations and challenges

of today's healthcare supply chain, chief among them being the inability to source PPE during COVID-19. According to the AHRMM *'Re-engineering the Healthcare Supply Chain'* webinar survey.<sup>15</sup> Rakes said:

'Allocations were woefully inadequate and unable to support normal demand much less the significantly increased need for key products,' said Rakes. We were fortunate enough to have a limited stockpile of pandemic supplies that carried us through the initial wave, but we need to rely on global supply chain sources to replenish our pipeline.<sup>16</sup>

Health systems and hospitals that have relied on a limited number of trusted medical supply companies offering a select group of PPE and other essential products found, with the onset of the pandemic, that they did not know where to turn to when these traditional supply channels slowed or ran dry. The medical suppliers themselves also struggled with current limitations, with many lacking visibility into their own supply chains, including alternative raw component suppliers or contract manufacturers.

To prepare for emerging waves of the current COVID-19 pandemic, and for future supply chain disruptions, healthcare organisations must now research and compile comprehensive lists of credible and reliable suppliers, as well as clinical and functional equivalents of supplies currently used in their facilities. They must also examine their existing contracting and sourcing methodologies to determine whether they can support supply demand during crisis situations.

#### ***Identify trusted suppliers***

With so many non-traditional suppliers flooding the marketplace with PPE and other supplies critical to the COVID-19 pandemic, health systems and hospitals must take the approach of 'buyer beware'. This means balancing the need for products



with the danger of procuring those that are ineffective or unsafe for staff and patients, coupled with the risk for price gouging and other dishonest business practices.

According to Rakes, because Aspirus' traditional manufacturers and distributors were unable to provide products ranging from exam gloves to face shields to N95 respirators, they turned to finding brokers who had manufacturing ties with China to source urgently needed products.

Rakes said:

We were wiring funds up front, experiencing significant shipping delays due to the high air traffic volume coming out of China, having customs holding products and paying much more for products than we would have even done in normal circumstances.<sup>17</sup>

Health systems were taking significant risks in working with these vendors, but we really had no choice as we needed their services and their products to meet this pandemic head on.

In its *Transitioning from Crisis to Phase One Recover, Supply Chain Operations Guide*, AHRMM recommends that healthcare organisations develop a process for analysing risk and determining when additional supplier diversification is needed.<sup>18</sup> In an effort to identify reliable alternative medical product suppliers, healthcare organisations have been spending significant time and staff resources vetting companies. This includes identifying and prioritising suppliers with manufacturing operations within the United States.

Approximately 59 per cent of AHRMM members participating in a recent webinar said more prioritisation of products produced in the United States would help to alleviate PPE shortages, bidding wars and other healthcare supply chain challenges in the future.<sup>19</sup>

The Mount Sinai Health System is New York City's largest academic medical system, encompassing eight hospitals, a leading medical school and a vast network of

ambulatory practices throughout the greater New York region. The health system's Corporate Director of Supply Chain, Franco Sagliocca, comments on supplier challenges that have emerged during the current pandemic and potential ways to address them.

'I think it really is about having a better understanding of factors/indicators not normally looked at that hint to manufacturing and distribution issues,' said Sagliocca. 'I also think we need to take a hard look at bringing more production back into the U.S.'

Now is the time to put into place an effective and efficient process for vetting potential suppliers so that when the next crisis hits, a health system or hospital can quickly secure what it needs. Healthcare organisations should look for suppliers with not only credible and reliable products but also automated processes and communications platforms for more efficient order placement and management.

Because there was no centralised body conducting supplier vetting prior to the pandemic, the AHA and AHRMM have partnered with GHX to help solve this challenge. Leveraging an existing solution that has been in use for 15 years to credential new vendors, the process includes information such as sanction searches, validating tax IDs, reviewing financial snapshots and business licences/certifications.<sup>20</sup>

The National Governors Association (NGA) is now seeking to consolidate the work done by not only GHX and AHRMM, but also other organisations that have been vetting suppliers and/or critical supplies. By hosting the collective results on a single website, those seeking PPE and other supplies will have a one-stop shop where they can search for both products and vendors. Healthcare delivery organisations will also be able to see which vendors and/

or products have passed multiple screenings and/or been reviewed by their peers, expanding the value of the various sourcing initiatives.

As Jack Koczela, Director of Supply Chain Services at Froedtert Health, explains, the supplier review process should engage both the healthcare organisation's supply chain professionals and clinical stakeholders. The Froedtert & the Medical College of Wisconsin regional health network includes five hospitals, nearly 2,000 physicians and more than 40 health centres and clinics, drawing patients from throughout the Midwest and the nation. Koczela said:

'We need to have a better understanding of how much PPE we need and of the trustworthiness of suppliers,' said Koczela. We have become very good friends with our colleagues in Infection Prevention and Occupational Health. They have been the voice of reason when it comes to PPE practices and have helped us evaluate any new products that have come from non-traditional suppliers. We engaged with a number of non-traditional suppliers, but only built strong, long-term relationships with a few. This helped us create a long-term supply chain rather than just a spot buy.<sup>21</sup>

### ***Build a list of standardised substitutions***

Equally important is researching and compiling a list of clinical and functional equivalents of supplies. Because supplies impact a hospital's cost, quality and outcomes (CQO) as defined by AHRMM,<sup>22</sup> supply chain and clinical teams must work together to identify substitute products that will deliver the highest quality care at the lowest cost and with positive financial returns for the organisation.

There are industry resources available with trusted data on suppliers and their products that can help with identifying clinical and functionally equivalent solutions from both supply chain and clinical perspectives: from data on supply chain performance to product clinical effectiveness data. Healthcare

organisations can also rely on testing information from the National Institute for Occupational Safety and Health's (NIOSH's) National Personal Protective Technology Laboratory. NIOSH is responsible for the conformity assessment of FDA requirements for N95 masks in healthcare settings to ensure they meet specific standards in areas such as fluid penetration, flammability and biocompatibility (eg cytotoxicity, sensitisation, irritation).<sup>23</sup>

Supply chain and clinical stakeholders can collectively review third-party testing data to make the right decisions for their organisations and patients. Health systems and hospitals must also document the use of newly sourced supplies for reimbursement.

'Where products were scarce we had to source functionally and clinically acceptable substitutes,' said Sagliocca. 'We worked with clinicians in our organization and already on our team to make those decisions. In addition, we sometimes sought outside expertise to test certain products once received.'

Looking at how healthcare organisations outside of the United States are managing supply shortages during the pandemic, some have addressed the challenge by leveraging national efforts, while others have taken a more regional approach. In her 12 November 2020 HCSA presentation, *The Global COVID-19 Classroom, Procurement Leaders from Around the World Share Lessons Learned*, Karen Conway, Vice President, Healthcare Value for GHX and Former National Chair for AHRMM, described some of these varied approaches, including:

- **United Kingdom:** A central approach through which the government has contributed significant resources, time and money to help address shortages.
- **The Netherlands:** A central approach through which the government has established a temporary non-profit, public/private partnership that brought together supply chain experts from

the public and commercial sectors. All COVID-19-related supply ordering (eg hospitals, individual physician practices) goes through this programme.

- **Canada:** The federal government has delegated most of the coordination for responding to the pandemic to the provinces (similar to the United States).<sup>24</sup>

### *Leveraging data standards*

As the US healthcare industry has increasingly adopted the use of product data standards, most notably the FDA's unique device identifiers (UDI), it has become easier for healthcare providers to gain visibility into the variety of products available in different categories and identify those alternatives that work for them.

Conway said:

The combination of a standard identifier, such as the UDI device identifier, in association with a classification schema, such as the Global Medical Device Nomenclature, can facilitate building out lists of products and suppliers within specific essential supply categories. It's worth noting the value of standardizing those lists versus having each organization create their own.<sup>25</sup>

### *Adopt blended procurement and inventory management models*

While JIT inventory management strategies can work during 'business as usual' as providers and suppliers work to reduce supply costs and waste, this model has been a major stumbling block during the COVID-19 pandemic. With the widespread and significant increase in demand for PPE and other supplies, JIT vendors could provide only a fraction of what the hospitals needed as the pandemic surged. Rakes said:

'We quickly realized how fragile our national just-in-time supply chain strategy actually was to support a true global pandemic. The industry for years had been pushing low unit of measure/just in time programs and as such our manufacturers and distributors designed their models around that philosophy and unfortunately led them to be ill prepared to support health systems in their greatest time of need..<sup>26</sup>

Another root cause of the supply shortage is the reliance on sole and dual source contracts for high-volume, low average selling price (ASP) PPE items. This approach has backfired during the COVID-19 pandemic when a healthcare organisation's preferred suppliers do not have the products it needs, and it is forced to turn to alternative sources.

Moving forward, providers and suppliers must consider other strategies to manage crisis situations. A hybrid approach to supply procurement and management could help health systems and hospitals transition from JIT to just-in-case when the need arises. Conway said:

'While JIT is not going away, we'll see more balance between JIT and efforts to reduce supply chain risk,' said Conway. A variety of tactics will be pursued, from keeping more safety stock on hand (either as an individual organization or as part of a broader collaborative), mapping supply risk factors upstream to supplier's suppliers, and more demand forecasting.<sup>27</sup>

Rakes said:

We have an obligation not to repeat the sins of the past. Our current system has failed us and we as supply chain leaders need to be much better. I feel that our collective strategies from both suppliers and providers needs to be totally revamped as we look at providing an appropriate mix of just-in-time and just-in-case inventories to meet future demands of this type.<sup>28</sup>



### **Implement effective facility access procedures**

Many healthcare providers have struggled during COVID-19 to manage the evolving dynamics of vendor access. While the ability to control who enters a healthcare facility has always been important, it is critical during the pandemic to protect staff and patients from potential virus exposure.

An analysis of vendor badging data from US hospitals shows how COVID-19 has affected on-site vendor representative visits at health systems across the country. As healthcare providers shut down elective procedures and restricted non-essential personnel access, vendor representative visits declined. There were an average of 10,500 visits per weekday prior to COVID-19 stay-at-home orders in mid-March 2020. Vendor representative visits, however, dipped to an all-time low during the height of the pandemic in April 2020 to 1,750 visits per workday. Currently, vendor representative visits have improved but are still below pre-pandemic levels. In November 2020, there were approximately 7,500–7,700 badging visits per weekday, illustrating a rebound to about three-quarters of the norm.

On the supplier side, companies need to protect their representatives from exposure, while at the same time enabling them to provide on-site product support to clinicians and other stakeholders (eg ventilator training or N95 fit testing). They want to have access to the latest hospital COVID-19 visitor policies to facilitate compliance and avoid complications.

Healthcare organisations should prioritise the alignment of vendor access policies with their infection control guidelines, specifically facility needs and state and local guidelines, to prevent unauthorised individuals from gaining access. There are resources that healthcare organisations can leverage to automate their vendor access and management processes, which can drive greater compliance and efficiency.

The most common policy implementations include screening for COVID-19 symptoms, travel risks or potential contact with an infected individual, while testing is less often required. Upon a review of 249 COVID-19-related health system vendor policies, only 5 per cent required COVID-19 testing, while 39 per cent have an on-location screening requirement that are often self-reporting, such as temperature, cough, and loss of taste and smell prior to accessing the facility. Among these facilities, 11 per cent require vendors to schedule appointments ahead of a visit.<sup>29</sup>

Provider policies indicating N95 mask requirements for suppliers have been steadily increasing. In July 2020, more than 96 per cent of providers were undecided or did not specify who would provide N95 masks to vendor representatives. As of 30 September 2020, 12 per cent of providers indicated in their policies that they would provide N95 masks, and 9 per cent denoted that N95 masks might be required, up from 7 per cent in July 2020.<sup>30</sup>

Hospitals seem to be quickly moving in a contactless direction. From a social distancing and risk mitigation perspective, credentialling kiosks located within a healthcare facility and mobile applications facilitate on-site vendor representative vetting processes without face-to-face contact with a facility's staff member(s). Another option that has emerged in the face of the pandemic is contactless temperature checkpoints, which allow the providers in charge of the vendor badging process to check the temperature of reps before they enter the facility, aiding in compliance.

Healthcare organisations can also establish virtual vendor training and policy enforcement, as well as online references to screen vendors prior to their arrival at a facility. Building these requirements into vendor contracts can help alleviate the reliance on front-line workers for managing vendors.

To enable safe vendor access to their facilities, healthcare organisations need a way to establish clear policies by department and easily edit these policies amid a changing environment. For example, providers must be clear about what PPE is required, which locations (eg facilities, departments, etc.) require PPE and who will provide it. The need for clarity on policy applies not only to the COVID-19 pandemic, but also to expected events (eg flu season), localised events such as weather and any new issues that arise.

It is important to note that shift in facility access procedures will work only if the health system or hospital communicates policy changes to its vendors. At the time of a pandemic, it is likely that a healthcare organisation's policies will continuously evolve on the basis of the overall state of the crisis and the organisation's own risks and needs. It should have in place a mechanism to quickly change and inform vendors of these changes as they happen to avoid unintended policy violations.

Furthermore, any system and processes put in place to manage vendor facility access and communicate policies and changes during the current COVID-19 pandemic should position the healthcare organisation to successfully manage access during future infectious disease outbreaks and other crisis situations.

### **Maintain essential order management processes**

The operational impact of COVID-19 has amplified the importance and necessity of automation and maximisation of efficiency in all functions, including procurement, accounts payable (AP), accounts receivable (AR) and finance. Automation not only improves efficiency, but also enhances the healthcare organisation's visibility, 'which is critical to identifying potential supply shortages, sourcing essential supplies and getting them to where they're most needed', as stated by Conway.<sup>31</sup>

Healthcare organisations should take steps now to automate and streamline provider/supplier communication, order placement and confirmation processes, and facilitate remote sourcing activities with a reliable, cloud-based e-commerce platform that is accessible anytime, anywhere.

'Technology enablers are coming to the forefront, including cloud-based ERP and advanced analytics,' said GHX President and CEO Bruce Johnson.

With such enablers, automation, digitized supply chain tools and more accurate inventory allocation can drive efficiencies across procurement, inventory management and clinical operations. In addition, it can achieve better integration and interoperability between clinical and ERP systems to synchronize item and vendor tracking and the flow of goods and costs to and from the emergency room.<sup>32</sup>

With greater visibility into supplier transactions, the supply chain team has the information it needs to make informed and timely purchasing decisions for their organisation. Whether a buyer is working on-site in the hospital's supply chain department or remotely at home, he or she has access to the same real-time, detailed information required to keep critical patient care products in the hands of clinicians. Rakes said:

'Data analytics is extremely important and has been critical to our pandemic response,' said Rakes. We developed multiple tools during this pandemic to show inventory transparency in multiple product categories so that our hospitals could see how much stock on hand, days on hand and issues that were occurring on a real-time basis. We need our caregivers to have confidence in our ability to deliver. By providing transparency into our inventory position they were able to feel much more comfortable as they saw what products we had and what we had in route.<sup>33</sup>

### ***End-to-end automation***

An important benefit of an automated, electronic ordering environment that bridges provider and supplier systems is the ability for suppliers to send their provider customers electronic confirmations. In this type of environment, the supply chain team has confidence that its order has been received and is being processed. If hiccups occur, they can be surfaced quicker. Advance ship notices provide additional, critical information on when the supplier has shipped its product and when to expect receipt. If a supplier notifies the supply chain department that a product is backordered, supply chain can then collaborate with the clinical team to identify an alternative supplier or product when necessary.

Some suppliers choose not to participate in a fully electronic and automated procure-to-pay platform, with some relying on third-party services to convert e-mail or fax documents into electronic data interchange (EDI) transactions for those providers requiring this format. In these cases, provider customers are not guaranteed to receive a confirmation upon order placement, creating room for errors.

The COVID-19 pandemic has shown the critical importance of real-time visibility into product purchasing as supply chain teams struggle to provide clinicians with the PPE they desperately need. To address this issue, an e-commerce solutions provider can offer an added service where it proactively secures confirmations from these non-automated suppliers, converts them to an electronic format and makes them visible to the purchasing healthcare organisations through the online platform. Through this service supply chain teams also have real-time visibility into backorders and stockouts for informed decision making.

### ***A system of intelligence***

This transition from manual, paper-based processes to an automated, electronic system

where data is integrated and shared via the cloud is necessary for the US healthcare industry to establish a 'system of intelligence', through which multiple stakeholders (public and private) can share data related to patient demand, forecasted needs and available resources. With the improved visibility and communication offered by such a system, healthcare providers, suppliers and others (eg federal and state governments) can collaboratively facilitate rapid response to crises.<sup>34</sup>

In a survey of 138 hospital leaders by Sage Growth Partners, which took place in early April 2020 as the US approached the peak of the COVID-19 curve, 49 per cent of those surveyed identified supply chain analytics as an important technology solution that seems more critical now than it did a month prior to the survey.<sup>35</sup>

### ***Alternate care sites***

COVID-19 'hot spots' have emerged in various US geographic regions where cases requiring acute care have threatened to exceed hospital capacity. Many healthcare organisations have in place contingency plans where they can convert a large nearby facility (eg convention centre) into a hospital within a 24-hour period to serve as an alternate acute care space.

For a healthcare organisation with hundreds of suppliers the challenge becomes how to route supplies to this outside facility. The supply chain team must build flexibility into the system, designate receivables areas at this temporary location and notify suppliers of these new 'ship to' locations to ensure clinicians at the site have what they need in terms of products.

An e-commerce solutions provider should work with the supply chain team to configure these locations within the electronic procure-to-pay platform and communicate to suppliers how and where to deliver their products.

Jeff Berman, principal and Healthcare & Life Science Operations Transformation practice leader at Grant Thornton said:

No longer should healthcare organizations try to restore supply chain service to pre-pandemic levels, but rather, they should elevate their capabilities for greater cost-effective and efficient operations to become more resilient and develop a position of strength,

This will allow for faster distribution of equipment and inventory to the front lines, better integration between clinical and supply chain operations, and quicker centralized decision-making and communication across the healthcare ecosystem.<sup>36</sup>

### **Prepare your financial systems for crisis**

Health systems and hospitals, both those that were already suffering financially and those that were financially stable, have been propelled into fiscal chaos as they struggle with the challenges of COVID-19.

As the AHA points out in its July 2020 *The Effect of COVID-19 on Hospital Financial Health* report, healthcare margins have typically been very thin compared with those of other industries.

Even before COVID-19, a number of US hospitals struggled with negative margins—in other words, they were losing money on operations. In fact, the median hospital margin was a very modest 3.5 per cent. This situation has been a serious threat to the future viability of many of America's hospitals.<sup>37</sup>

Their number one source of revenue — surgical procedures — came to a grinding halt as they attempted to reduce virus spread within their facilities by cancelling or delaying elective procedures. Patients are continuing to delay their own overall healthcare, further exacerbating the struggles with revenue capture for providers.

There is widespread uncertainty around the future and whether additional surges in COVID-19 cases will once again impact surgical services. Compounding the issues are the broader economic conditions affecting unemployment levels and, consequently, the number of uninsured.

Rakes notes that while Aspirus has always had a strong financial position, the health system has been losing significant revenue during the pandemic like most other healthcare organisations. Rakes said:

‘As we climb out of this pandemic and move to the new normal, the biggest challenge is to recover financially,’ said Rakes. Our new focus from a supply chain perspective will be on escalating and expediting any and all cost savings initiatives, while also balancing the continued COVID-19 overlay which could be with us for several years.<sup>38</sup>

With slashed revenues, healthcare provider organisations simply do not have enough cash on hand to cover near and long-term expenses. Many hospitals have opened new lines of credit or increased existing lines of credit in an effort to bridge the gap. Most have relationships with multiple banks, each with their own payment options (eg credit card, automated clearing house (ACH)).

Hospitals are often at the mercy of the form of payment a supplier is willing to accept. Some still require paper checks, while others minimise credit card payments to reduce processing fees. Therefore, having a variety of payment options is necessary.

The challenge comes with managing these various payment methods, each of which requires its own workflow. When operating in financial silos, healthcare organisations have no means of gaining a consolidated view of their payments. Lack of visibility leads to lack of control, which could result in late supplier payments and the burden of associated fees.

Furthermore, with individual banks and payment channels, hospitals cannot automate the documentation of payments within their enterprise resource planning (ERP)/ materials management information system (MMIS) platforms. Instead, they must rely on complex and time-consuming manual manoeuvring and 'swivel chairing' to input data into disparate systems.

### ***Aligning cash management, supply chain and clinical efforts***

An acute focus on regaining financial stability and the ability to secure future financing/investment demands a holistic approach to managing cash aligned with clinical and supply chain efforts.

In order to gain greater control over payments and greater visibility into financial data, healthcare organisations must adopt an electronic, automated and unified payment solution platform where they can manage all payment modalities in one place and link them to their overall procure-to-pay processes. In a recent survey, 81 per cent of healthcare chief financial officers (CFO) and senior leaders said, '[T]here was an absolute and immediate need for digital transformations for the long-term survival of their organizations.'<sup>39</sup>

During normal circumstances, supply chain, accounts payable (AP) and financial teams need process efficiency and reliable information on which to base decisions. This need is heightened during a pandemic situation as business disruptions add complexities and costs.

Doug Brown, president of Black Book Research said:

It would seem most CFOs understand what the pandemic has proved is the need to speed up digital transformation initiatives to not only survive but to prosper in the new normal. For CFOs eager to expedite their organization's digital transformation, the standardization and simplification

leaders want in their back-end processes are allowing for less complicated, faster adoption despite the times.<sup>40</sup>

Automation and consolidation of payments not only streamlines workflow but also helps evaluate cost of capital supporting cost reduction with the avoidance of payment delays and potential credit holds. In addition, it increases revenue by helping providers capture early payment incentives from suppliers.

An electronic, automated and consolidated payment channel also supports the remote work environment required during a crisis situation. A hospital's supply chain, AP and finance staff can perform their functions off-site using the same platform and accessing the same data on which to make decisions.

### **FORTIFYING THE SUPPLY CHAIN FOR THE ROAD AHEAD**

Across the United States more than 6,000 acute care hospitals care for approximately 36,353,946 in-patients each year, not accounting for the multitude of patients treated by clinics, physician offices and other sites on an outpatient basis.<sup>41</sup> These organisations constitute one of the most comprehensive healthcare delivery systems in the world, but the COVID-19 virus swiftly overwhelmed it in a matter of months. In the past, most took it for granted that clinicians would always have what they need in terms of supplies to effectively and safely care for patients, but the pandemic revealed the significant flaws in the US healthcare supply chain. Hospitals did not have what they needed when the virus hit, which was a true wake-up call for hospital leaders, government agencies, medical product suppliers, front-line healthcare workers and patients.

Faced with this reality, the US healthcare industry has been taking steps to address current supply shortages, including close collaboration among providers, suppliers,



the US government and other stakeholders to boost production and delivery of critical supplies. While these actions are currently making a difference, it is not enough to sustain the supply chain in the long term.

Supply chain leaders agree that the path forward to a truly resilient supply chain that can meet the needs of today's pandemic and effectively address future crises will require comprehensive, holistic change. It means critically analysing all aspects of supply production and delivery — from the manufacturing locations of raw materials to the processes by which hospitals place products into the hands of clinicians.

Much of this work revolves around fundamental supply chain principles that have been historically lacking in healthcare, such as process automation, system integration, data management/sharing and advanced analytics. It comes down to enhanced visibility throughout the supply chain, for providers and suppliers, so that all parties can better control the production and flow of goods to meet real-time demand.

Supply chain leaders have the opportunity to assess the best practices contained within this paper and evaluate them within the context of their own organisations to determine what is feasible for enacting change in the near- and long term. But significant and lasting change cannot be achieved within a silo. Building a more resilient supply chain requires industry-wide collaboration to drive industry-wide improvements. This includes supply chain professionals engaging in open discussions with their peer organisations, suppliers and system and solutions providers about ways in which they can partner to tackle the tough issues and overcome these shared challenges.

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