Getting comfortable with the uncomfortable

The top trends powering the future of the healthcare supply chain

Table of Contents:

Introduction

As health systems grow larger and more complex, so too do their supply chains. This complexity—along with key events like the pandemic and climate disruption—has underscored an urgency to adapt and build resilience against these evolving landscapes.

While these challenges have been unprecedented, they have also spurred innovative technologies and strategies to overcome them in addition to opportunities for growth and resilience.

Rather than remain stagnant and exposed to future disruptions, the industry must now

"get comfortable with the uncomfortable."

Doing so can help ensure stability in the wake of the pandemic and prepare for the challenges and opportunities ahead.

In the following white paper, we look into what the future may entail by exploring four of the top trends powering the future of the healthcare supply chain. These include:

Digital transformation	**Cybersecurity**
Sustainability	**Resilience**

Digital transformation in the healthcare supply chain

Data and digital transformation are dominating today's conversations on the healthcare supply chain, and for good reason. Again and again, digital transformation has proven its worth in driving visibility and efficiency in supply chain operations.

Today's digital transformation landscape

In a recent article by our partners at LLR Partners, author Michael Pantilione aptly put that digital transformation is "going from 'crawl' to 'walk' in the [healthcare] supply chain."

Historically, digital transformation in the healthcare industry has been slow. In the wake of COVID-19 disruptions, inflation, and labor challenges, healthcare organizations are now recognizing the importance of a strong digital foundation.

A 2023 survey from GHX found that 45 percent of hospitals and health systems have now transitioned to cloud technologies to manage their supply chains. Many more plan to go digital in the coming years. An estimated 70 percent of all hospitals and health systems are expected to implement cloud-based supply chain technologies by 2026.

Cloud-based enterprise resource planning (ERP) systems are now the industry's gold standard, but digitalization can't end there. For digital transformation to reach "run," data integration will be critical. We discuss this point in more detail in the next section.

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of all hospitals and health systems are expected to implement cloud-based supply chain technologies by 2026.

Benefits of digital transformation and data for decision making

According to [research](#) from MIT, digital transformation can reduce supply chain costs by upwards of 50 percent, and healthcare is no exception. In addition to reduced costs, digitalization can also boost revenues by as much as 20 percent.

Digital tools can create a multitude of supply chain efficiencies. These include automation of procurement and payment processes to save time and reduce costs. Automation can also free clinicians from manual tasks, redirecting their attention to patient care.

As mentioned above, data, and particularly the intelligent use of data, is the next step in the healthcare supply chain's digital transformation. It isn't enough to simply maintain records digitally. Instead, healthcare organizations must collect and organize data with scalability and [interoperability](#) in mind.

In other words, data collection must be standardized to maximize the use of digital tools as health organizations grow. Once more, it's important to ensure that all these digital systems can securely exchange and utilize data, known as interoperability.

Digital transformation and data analytics with VPL

Our analytics platform aggregates data from health systems' freight management programs with two big benefits, real-time visibility and actionable insights.
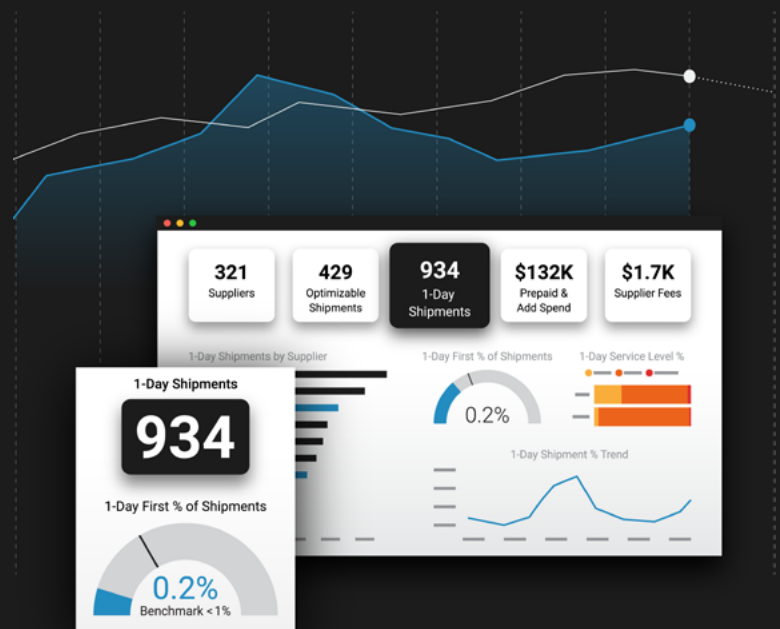
First, by consolidating data, we unlock real-time visibility into shipments coming into the health system. This allows our customers to proactively plan their receiving docks and monitor and address delays before they impact care delivery.

We built this [solution](#) for buyers and clinicians to easily search and track their products as well. This creates an ecosystem that keeps everyone involved and informed with email and text notifications.

Second, our technology leverages data analytics to help healthcare organizations mitigate risks and control costs within their supply chains. With insight into lead times by supplier and location, as well as carrier performance metrics, our customers ship more efficiently relative to industry benchmarks.

In addition to the frontline improvements of digitalization, a strong digital core allows healthcare organizations to readily adapt to and integrate more advanced technologies. This includes AI and ML tools, which are rapidly advancing to provide more powerful insights into supply chain operations.

By centralizing vast amounts of organizational data, cloud-based ERPs are primed to pair with data analytics tools. VPL partners with health systems' ERPs to establish secure file sharing and seamless exchanges.

The big picture on digital transformation

With health systems facing monumental pressure to improve operating margins, patient outcomes, and clinician satisfaction, digital transformation is the key. Supply chain leaders must build each step in the process upon a strong digital foundation.

Cloud-based ERP systems and data analytics tools are laying the digital groundwork today for more advanced AI and ML systems to make intelligent use of data in the coming years.

Healthcare supply chain sustainability

Sustainability in the healthcare supply chain is not just in the interests of the planet. Reducing the environmental impact of healthcare's supply chain can also improve operational efficiency, provider satisfaction and patient health, and health systems' bottom lines.

Supply chain activities account for

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The need for sustainable supply chains

Supply chain activities account for 71 percent of emissions in the healthcare industry. This includes every step from the production, transport, and disposal of
all products and services used by healthcare consumers.

To put it another way, if the global healthcare industry were a country, it would have the fifth largest climate footprint on the planet. This is the equivalent of 4.4 percent of the world's entire emissions output.

All these emissions are adding up to several key challenges for the industry. Although pandemic-related disruptions have reigned in news headlines, climate-related disruptions are becoming more common as well, and with longstanding impacts.

Freezes, floods, hurricanes, wildfires, and other types of severe weather induced by climate change are already creating shipping disruptions, production delays, and other obstacles for the global supply chain. Healthcare is no exception.

To name one example, just last year a tornado struck and [destroyed](#) a Pfizer facility in North Carolina. The production facility is responsible for producing 25 percent of sterile injectable medicines used in US hospitals.

While this event fortunately did not trigger widespread disruption, it resulted in costly and time-consuming disruption to Pfizer's internal operations. The company lost over 40,000 pallets of finished medicines and packaging [supplies.](#) In addition, Pfizer continued to pay its 3,200 employees of the facility during months of repairs.

In the wake of severe weather disruptions, sustainability is no longer just a "should" for supply chain leaders. New regulations and organizational sustainability initiatives such as ESG scores make sustainability an imperative as well.

For example, a 2023 McKinsey [survey](#) found that 85 percent of chief investment officers consider ESG factors in their investment decisions. The same survey also found that investors are willing to pay a premium for demonstrating a strong correlation between ESG initiatives and financial performance.

The above factors have garnered the attention and concern of healthcare supply chain leaders across the industry. In a recent webinar hosted by VPL,

> **77% of supply chain leaders indicated that sustainability is now a key focus for their business in 2024.**

Fortunately, supply chain sustainability does not have to remain theory or speculation. There are several research-based strategies that supply chain leaders can implement to reduce their environmental output and build resilience in the wake of extreme weather events.

Ways to improve supply chain sustainability

Addressing sustainability within the healthcare supply chain requires a fundamental shift in supply chain management strategies. This includes implementing more sustainable sourcing efforts, building resiliency against extreme weather disruptions, and improving operational efficiency wherever possible.

First, there are several methods to sourcing healthcare products more sustainably. One of the most well-documented and high impact of these strategies is sourcing alternatives to inhaled anesthetics.

According to the Patient Safety Network, inhaled anesthetics account for up to 5 percent of a healthcare facility's carbon emissions. By simply switching to a less carbon-intensive inhaled anesthetic—of which there are several that are just as safe and effective—healthcare organizations can significantly and instantly reduce their carbon footprint.

Prioritizing local and regional suppliers can help supply chain leaders source more sustainably as well. Investing in locally procured supplies and services is not only less carbon-intensive, but it also boosts supply chain resilience. There's much less chance of disruption to your supply chain when your supplier is down the street versus across the world.

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Health organizations can also source more sustainable packaging materials, such as recyclable or biodegradable options, to reduce waste. Optimizing packaging sizes can further help reduce unnecessary waste and maximize space utilization during transportation.

Lastly, thanks to more advanced technologies, healthcare organizations can create both energy and operational efficiencies within their supply chains. Incorporating warehouse energy efficiency measures such as automated LED lighting and temperature controls can help reduce energy consumption and costs.

Enhance supply chain sustainability with VPL

We take a holistic approach to social responsibility that includes environmental, labor, ethics, and sustainable procurement best practices.

One way to ensure that you're partnering sustainably is to choose vendors that follow the environmental, social, and corporate governance (ESG) framework.

At VPL, we align with the ESG framework with our policies on environmental awareness, energy consumption, water conservation, responsible disposal, and air pollution awareness.

Additionally, our software can promote supply chain sustainability by allowing health organizations to proactively monitor shipments and plan inventory space to reduce waste. This improves efficiency with real-time ETA tracking into shipments from supplier to point of care.

This feature ensures that supply chain teams know exactly what products are arriving where and when. Our solution can also send shipment updates to all stakeholders, including clinicians, to avoid duplicate ordering and/or supply stockpiling.

The ability to track incoming shipments also allows receiving docks to plan for high- or low-volume days. This improves operational efficiency and allows for resources to be reallocated to other tasks on low-volume days.

The big picture on sustainability

Sustainability in the healthcare supply chain is the next big challenge the industry must conquer. At the same time, it's the perfect opportunity to fortify and streamline supply chain activities.

While there is much to be done to reduce healthcare's environmental footprint, supply chain leaders can forge the path ahead by implementing evidence-based strategies within their own operations.

Not only does a more sustainable supply chain promote a better environment, but it also boosts efficiency and resiliency. These improvements directly correlate to a stronger health system and overall healthier patient population.

Cybersecurity in the healthcare supply chain

With digital transformation well underway across the healthcare supply chain, cybersecurity has taken a central role alongside it. This is because cyberattacks are only becoming more common as healthcare organizations go digital.

Why focus on cybersecurity in the healthcare supply chain

Healthcare is more digital than ever before. As a result, cyberattacks are now more frequent and often more severe. To illustrate, over 106 million people were affected by healthcare cyberattacks in 2023. This is nearly 2.5x the number of people affected just one year prior in 2022.

Cyberattacks not only threaten patient's data, but often the patient themselves. Cyberattacks can disrupt care and even be a threat to life when they force hospitals to shut down.

For example, a 2021 ransomware attack on Scripps Health impacted care not just within the health system but for adjacent hospitals as well. While the health system underwent a monthslong internal disruption, nearby hospitals saw an increase in patient numbers, ambulance arrivals, waiting room times, and lengths of stay. In fact, the level of disruption in the area was so significant that researchers considered it a regional disaster.

Cybersecurity breaches can also be very costly, particularly in healthcare. The average cost of a healthcare data breach is the highest of any industry at

$10.93 million.

The surge in supply chain cyberattacks

The increased interconnectivity of healthcare technology systems creates vulnerabilities that impact every corner of the industry. The supply chain is no exception to the recent surge in cyberattacks.

In fact, supply chain activities are a particularly valuable targets for cyber criminals. This is because they are at the top of the funnel of the rest of the healthcare industry. Breaches in healthcare supply chain technologies therefore impact all the downstream customers within the supply chain.

According to a cybersecurity survey of industry professionals, two-thirds reported that their organization suffered a supply chain attack in the past two years. 77 percent of this group said that the attack disrupted patient care. The same survey also found the average cost of these attacks was nearly $5 million. $1.3 million of this cost was directly associated with disruptions to supply chain operations.

77% of this group said that the attack **disrupted patient care.**

One of the most severe and costly cybersecurity attacks on the healthcare supply chain involved UnitedHealth Group just months ago. United Healthcare faced a [ransomware] breach and likely paid $22 million in Bitcoin to a hacker group to recover their data.

The effects of this attack, which shut down the largest healthcare payment system in the U.S., rippled throughout the industry. With insurance approvals and reimbursements on indefinite hold, providers and suppliers were paralyzed without the cash to pay or be paid for everything from distributing critical supplies to performing life-saving surgeries.

In the wake of the United cyberattack, healthcare stakeholders are beginning to recognize the urgency of cybersecurity threats. A 2023 [survey] found that nearly two-thirds of executives, including those in healthcare, cited cybersecurity as a top concern. The survey respondents are also giving particular attention to cybersecurity education and literacy.

How to prioritize cybersecurity

Digital transformation is a critical next step for growth in the healthcare supply chain. To be successful, however, the healthcare supply chain must pair it with cybersecurity measures to protect patient and organizational data.

While we often envision cyberattacker's methods to be highly technical, the reality is much less complex yet equally sinister. The most common and most successful method that cyber attackers employ is email phishing. Phishing is the fraudulent practice of sending emails under false pretenses in attempts to trick people to reveal sensitive information.

Keeping employees aware and informed of cybersecurity threats like these can help organizations stay vigilant against cyberattack attempts. Defenses can include a range of strategies—including technical, physical, and administrative safeguards—that all synergize to protect against cybersecurity threats.

Phishing defenses are important not just to protect against a breach, but to maintain HIPAA compliance as well. The HIPAA Journal offers detailed best practices to prevent healthcare phishing attacks.

Another one of the most common scenarios in which cyberattacks occur is when healthcare organizations store data across multiple environments. According to IBM's 2023 Cost of Data Breach Report, the highest percent of breaches occurred under circumstances where data was stored in disparate environments.

> **These breaches were also the costliest and required an average of 291 days to detect and contain.**

As such, consolidating your organizational data into a single storage method can significantly reduce the risk of a data breach. This strategy can also help IT teams find and react against data breaches more quickly to lessen the severity of disruption and contain costs.

Cybersecurity with VPL

We're committed to cybersecurity through our system and organization controls (SOC) Type 2 certification. This is an independent audit of our internal cybersecurity and data stewardship policies.

Our internal cybersecurity measures follow ISO 27001 information security standards and include policies on acceptable use, HIPAA compliance, access control, asset management, encryption, backup and restore, operational management, proper data disposal, incident management, supplier security, and secure SDLC.

All VPL employees complete annual security trainings on these policies and cybersecurity best practices.

Additionally, we're partnered with cybersecurity detection and response vendors to provide 24/7 anomaly monitoring across our organization. This partnership helps us mitigate the risk of waiting the 291-day average time to detect and contain a breach.

VPL integration strategy

Secure transfer of patient information is critical. To support our specialty pharmacy customers, VPL offers custom shipping integrations with Epic Willow, PioneerRx, Asembia-1, and ScriptPro to transfer patient information safely and seamlessly. We're always working to add more integrations as well. Integrating with dispensing systems delivers security benefits and operational efficiency for clinicians and their patients.

The big picture on cybersecurity

Given the inevitability of the industry's digital transformation, cybersecurity in the healthcare supply chain is inevitable as well. The urgency for cybersecurity measures is more apparent than ever as cyberattacks against healthcare organizations become more frequent and costlier.

Fortunately, there are several strategies healthcare organizations can employ to shield against cyberattacks. Worthwhile endeavors to safeguard patient data include:

Employee education	Data consolidation
Partnering with trusted technology vendors	
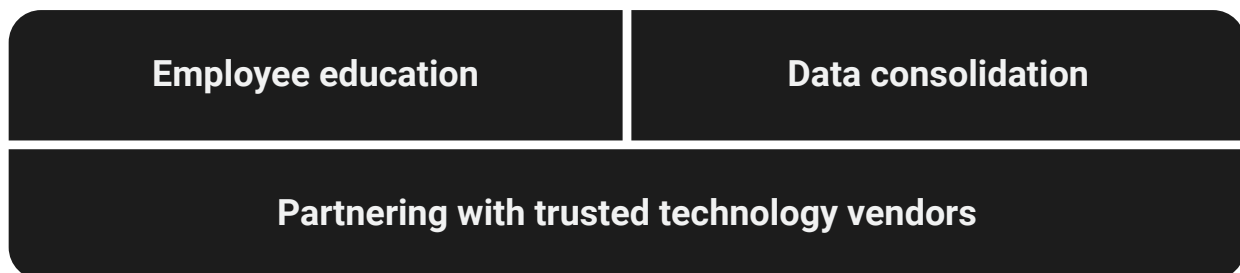
Strategizing for supply chain resilience

Building resilience is more important now than ever. Since the pandemic first shook the foundation of the healthcare supply chain, the impact of disruption is now much too obvious to ignore.

Resilience in the post-COVID era

98 percent of hospital leaders said that the pandemic exposed significant supply chain [vulnerabilities](#) within their hospitals. As a result, most hospitals have reported that their supplies management and procurement processes have already changed in the wake of COVID-19.

However, the same survey indicated that 62 percent of hospital leaders believe that there is much more to be done to address vulnerabilities and plan for future resilience. Whether the industry is ready or not, the pandemic has imposed an urgent need for a new approach to supply chain resilience.

Much of this approach can be made easier by modernizing the foundation of the healthcare supply chain with [technology.](#) This includes transitioning paper-based P2P processes, legacy inventory management, and outbound shipping to digital, cloud-based platforms. We discuss more strategies for resilience in the next section.

Evolving resilience strategies

Planning for resilience looks much different in the post-pandemic era than it did before. Thanks to both technological advances and the lessons learned from COVID-19, the strategies for building resilience have evolved.

The first such evolution is the industry's approach to procurement. Before the pandemic, many health systems relied on a "just-in-time" procurement strategy. This strategy aimed to reduce storage needs and therefore costs by delivering supplies just before they were needed.

However, when the pandemic first struck and health systems were quickly overwhelmed by demand, so were their supplies. The just-in-time approach fell apart as health system's inventories were depleted and supply teams were unable to procure supplies as rapidly as they were being used.

This vulnerability directly relates to the impact of broader supply disruptions. Prior to the pandemic, the U.S. healthcare system was reliant on global healthcare manufacturing and sourcing. For example, the U.S. imported over $125 billion pharmaceutical goods in 2019, just before the pandemic struck.

When the pandemic made it very difficult, and in some cases impossible, for global suppliers to reach U.S. health systems, many were left to operate without critical PPE including face masks and isolation gowns. When these supplies were available, they were often significantly inflated in price. Some hospitals were paying as much as $5.20 per mask during the pandemic.

Today, health systems are now beginning to recognize the importance of a diverse supplier network to ensure their access to critical medical equipment and PPE. Many hospitals pivoted towards regional and local manufacturers and suppliers to fulfill supply needs during the pandemic.

Continuing to prioritize local relationships can help health systems stay resilient in the wake of future disruptions. As mentioned in the previous section on sustainability, these partnerships can also be more environmentally sustainable as well.

Build resilience with VPL

Our healthcare supply chain solutions can help you take control of your supply chain to build resilience against future disruptions.

First, our solution can make it easier for you to monitor your suppliers with our multi-carrier inbound shipping.

By combining choice with transparency, our solution allows you to see exactly what you're paying for on every shipment. With better insights into all expenses within your freight program, we can help you hold all your suppliers accountable to pricing agreements, rates, and fees.

Next, our real-time tracking helps bolster your health system's evolving procurement needs. With real-time order status updates and proactive notifications, we can help you plan for contingencies to reduce delayed or cancelled procedures. If a known disruption happens, you can quickly identify all incoming shipments that might be delayed.

We also promote clinical alignment by allowing anyone in your health system to easily search for an order.

Investing in resilience planning efforts presents unique challenges of its own. These features and the many others we offer are designed to make it easy for health systems build resilience post-pandemic. With multi-faceted support all on a single platform, we help you get the most out of your investment.

The big picture on supply chain resilience

Healthcare supply chain resilience will continue to be a priority for health systems for years to come. While we learned many lessons from the pandemic, it will take a concerted effort to put them to good use.

As discussed in previous sections, digital transformation will be a key ingredient in modernizing the healthcare supply chain. Digital tools will also be foundational to the industry's resilience by facilitating new initiatives to strengthen the supply chain.

Conclusion

The work done in 2024 and the coming years will be pivotal for the future success and stability of the healthcare supply chain. Now is the time for the industry to get comfortable with the uncomfortable by acting upon the lessons learned from the pandemic, climate-related events, and other disruptions.

The path ahead must begin with a strong and secure digital foundation. With the right tech tools, sustainability and resiliency strategies can be better planned and therefore more effective. In addition, investments in these areas can help health systems uncover new opportunities for growth while building the critical infrastructure to thrive in the future.

When it comes to implementing industry-defining initiatives, partnership can bolster both your efforts and your outcomes. We're at the forefront of supply chain innovation with our data-centric, technology-driven solutions.

What we offer

Supply chain

Inbound freight management

Outbound shipping and tracking

Real-time supply chain visibility

Analytics and data visualization

Pharmacy

Prescription shipping, tracking, and triage

Compliance-focused data visualization

Last-mile pharmacy logistics

Pharmaceutical distribution software

See how a partnership with VPL can support the future of your organization's supply chain.

Learn more →

Modern **clinical supply chains** for healthier patients.

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