Pharma Supply Chains: From Fragile to Agile

CDMOs bolster supply networks as offshorers look to risk-proof supplies.

This is the seventh of a nine-part series of articles addressing pharmaceutical outsourcing industry trends.

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Pharma firms today are looking to turbocharge their global supply chains with additional capabilities to make them resilient to potential challenges and ensure secure supplies.

Taking a cue from the pandemic and the continuing geo-political unrest, they look at building supply networks that are agile, adaptable, and capable of responding quickly to disruptions caused by various factors including natural disasters and regulatory changes.

In 2019, when the novel coronavirus broke out in the Chinese city of Wuhan, that led to severe disruption in the pharmaceutical supply chain leaving the global drug making industry in jeopardy.

Even though acute shortages of medicines owing to additional demand for certain products, manufacturing delays, or capacity issues are not new to the industry, Covid-19 lockdowns and the supply chain crisis that ensued created a "perfect storm" scenario.

During the pandemic, as many as 170 cancer clinical trials conducted by the National Institutes of Health of the U.S. were either forced to halt or adversely impacted and almost all the drugs involved were made in India, show reports.

Laying bare the vulnerabilities of the supply chain, the pandemic keeps serving as a reminder that heavy reliance on select market sources for drug products can have serious ramifications.

More than 80% of chemicals used in the manufacture of drugs marketed in Europe are currently sourced from China and India, according to estimates by the European Fine Chemicals Group (EFCG), an umbrella body representing API manufacturers.

Likewise, a large proportion of drugs sold in the U.S. market have ingredients supplied by countries including India and China, either directly or indirectly by incorporation into finished dosages.

Meanwhile, Indian firms account for nearly one-third of generic drugs sold worldwide.

PUTTING UP GUARD RAILS

"It is no surprise that a growing number of innovator companies are looking to have either a backup or supply chain outside China," says Kenneth Drew, vice president at Flamma USA," adding that this is the current and the most obvious trend that is being seen in the pharma industry.

The Bergamo-based Flamma operates a plant in Dalian, China besides manufacturing facilities in Italy and the U.S.

Drew says, while there are numerous quality contract development and manufacturing organizations (CDMOs) within China, they unfortunately do not have an answer if there is a sudden disruption to the supply chain due to unforeseen events such as the recent Russia-Ukraine conflict.

His fully integrated small molecule CDMO, however, is a viable safeguard for this issue. The company has positioned itself to internally backup materials made at the Flamma Honkai (Dalian) site in China. The CDMO is already making many of the same materials in Flamma Italy as well.

This practice of internal backups to Flamma's various sites helps the CDMO ensure a secure supply chain.

Previously, Flamma had 250 m3 of capacity in Italy along with 200 m3 in China. The company slowly built its network to take advantage of the strengths of each site, Drew explains. The purchase of the Bulciago site in 2022 provided Flamma with an additional 650 m3 of capacity.

Today, the family-owned company has five sites and over 800 employees. Apart from Bulciago, the CDMO has facilities in Chignolo and Isso in Italy. The others are the Dalian site in China and a factory in Malvern, PA outside of Philadelphia, U.S.

The CDMO has tested the approach of working simultaneously at Flamma USA along with Flamma Honkai for early-stage drug candidates and found that it significantly decreases the time required to complete the work.

This combined approach, according to Drew, was praised by numerous customers who had experienced challenging issues with suppliers in Asia and the U.S.

He adds that with the concerns about working in China, Flamma can provide the opportunity to move production to Italy if unforeseen circumstances arise.

VISIBILITY COMES TOP

The increasing geopolitical uncertainty that foreshadows potential supply chain risks, gives a compelling reason for pharma companies to bolster their investments to accelerate the ability to track and trace their raw material and component suppliers in real time. The supply chain visibility factor or connectivity has been the agenda of pharma companies for decades, but not as top priority as it is now.

"There is a growing emphasis on achieving end-to-end visibility across the clinical trial material supply chain," says Sanjay Vyas, executive vice president of safety and logistics, and country head of India at Parexel, one of the world's largest contract research organizations (CROs) that provide the full range of phase I to IV clinical development services.

Stakeholders are recognizing the importance of real-time tracking, monitoring, and traceability of products, from manufacturing to distribution and patient delivery. Besides gaining the ability to mitigate risks and respond swiftly to supply chain disruptions, this trend is driven by the need for transparency and regulatory compliance.

Meanwhile, by enabling newer capabilities and quickening processes like tracking, the rapid uptake of cutting-edge technologies is dramatically changing supply network management.

The clinical research material supply chain, Vyas points out, is experiencing a digital transformation with the adoption of advanced technologies such as blockchain, the Internet of Things (IoT), artificial intelligence (AI) and data analytics.

Parexel, which uses virtual and direct-to-patient (DTP) models to enable decentralized clinical trials, leverages advanced technologies to optimize supply chain management. This includes real-time tracking and monitoring of shipments, temperature-controlled packaging with built-in sensors, and electronic data capture systems to record supply chain data.

Parexel has been rated "Top CRO to Work With" in the 2023 WCG CenterWatch Global Site Relationship Benchmark Survey for the second straight time with the highest average rating across all 26 performance attributes out of 34 CROs included in the survey.

AI FOR AGILITY

Several CDMOs offering supply chain solutions have advanced technologies as their unique forte so that customers can make informed decisions about assets and inventory.

PCI Pharma, a global pharma and bio-outsourcing solutions provider, which recently created a digital platform designed to give its pharma customers real-time insight into their clinical and commercial supply chains, is an example of this trend.

Analysts say the widespread adoption of AI will revolutionize supply chain operations.

"Supply chain software providers are integrating AI to varying extents in their solutions, helping to process vast amounts of data and develop better insights," says Ryan Wiggin, industry analyst at ABI Research, a global technology intelligence firm.

Among the more immediate use cases for AI in supply chains are demand forecasting, route planning, price optimization/procurement, inventory management and supplier risk assessment.

Cyber-attacks and trade disputes create the greatest risk of supply-chain disruption in the pharma industry, according to a

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report by McKinsey & Company. That is primarily because of the industry's abundant proprietary knowledge, capital intensity, international data flows, and a moderate level of digitization.

SENSITIVE COLD CHAINS

Working on building more adaptable supply networks, firms are heightening their focus on cold chain management. They find that a robust cold chain suitable for the changing requirements is yet another necessity as advanced therapies derived from biologic materials such as human cells and gene therapies are much more sensitive to temperature changes. So, it becomes crucial to maintain the integrity and stability of these products throughout the supply chain.

End-to-end product tracking and ensuring product integrity for increasingly stringent regulatory conditions is becoming a top priority.

The cold chain currently makes up just over a quarter of the industry, in terms of value, comments Wiggin. This share, however, is widely expected to rise given the developments in novel therapeutic modalities.

TAILORED SOLUTIONS

Increasing complexities of the globalized supply chain present significant challenges particularly when operating across different regions and countries with varying regulations. While updating themselves with evolving regulations, CDMOs and CROs must navigate these terrains coordinating with diverse networks.

According to Vyas, robust supply chain networks, alongside country-specific regulatory knowledge, and local partnerships, are required as pharmaceutical companies are increasingly conducting trials in diverse geographic locations.

The rise of emerging markets as manufacturing and distribution hubs have led to the need for tailored solutions to navigate complex regulatory landscapes and optimize supply chain efficiency.

"The globalization of clinical trials and the expansion into emerging markets have presented unique challenges and opportunities in supply chain management," he maintains.

PUSH FOR LOCALIZATION

As supply security comes center-stage in the drug making industry, the pharma companies are, in a way, growing more concerned about securing their supplies.

The pandemic gave the innovators a tough lesson to learn, says Drew of Flamma.

"One problem I see," he continues, "is that many innovators are exploring supply chain alternatives and thus asking for quotes on projects that currently do not exist. They are doing their due diligence but seem content to see how things play out."

Outsourcing comes in greater focus here owing to the fact that the suppliers of key raw materials are often far-flung.

Alongside, there is a big push by governments to bring pharmaceutical manufacturing closer to home, to avoid lengthy supply chains and the potential for uncertainties inherent in sourcing from far-off places.

Critics are skeptical if the re-establishment of production to the U.S. or Europe could be the answer considering the current level of dependency. There are a lot of starting materials and precursor chemicals that aren't available from the U.S.; they are only available from China. So, repatriation wouldn't be able to solve the problem unless the particular market can control the supply chain in its entirety.

Localization can definitely help avoid the chances of disruptions due to transport issues or geo-political uncertainty, says Wiggin, the ABI analyst, but countries are finding it difficult to remove the sourcing dependencies they have had for some time.

"India and China are dominating as raw material manufacturers. The U.S. in particular has a strong reliance on both these countries for APIs. I don't see this going away any time soon," he notes. **CP**

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