COLD CHAIN 2030

PART II

3 EMERGING TECHNOLOGIES POISED TO TRANSFORM THE TEMPERATURE CONTROLLED LIFE SCIENCES SUPPLY CHAIN

2019 INDUSTRY BRIEF

The temperature controlled life sciences supply chain landscape has never been riper for disruption. Though the pharmaceutical industry has changed dramatically over the past 30 years, the pharmaceutical supply chain has remained largely unchangeed. In fact, according to research conducted by CargoSense:

- 30 percent of discarded pharmaceuticals can be attributed solely to logistic issues.
- 25 percent of vaccines reach their destination degraded due to incorrect shipping.
- 20 percent of temperature-sensitive products are damaged during transport due to a broken cold chain.

With the influx of biologics and personalized medicine, the growing costs of R&D, increased global regulatory pressure and numerous other emerging trends, the pharmaceutical supply chain is only expected to grow in complexity and expense for the foreseeable future. Given all of the challenges ahead, we asked our Cold Chain Spring 2019 speaker faculty what new, innovations and solutions are on the horizon that could help reinvent the pharmaceutical cold chain industry as we know it. The following is an overview of the top 3 technologies poised to usher in the next era of temperature-controlled life sciences logistics.

#1

BLOCKCHAIN

While blockchain is most frequently associated with cryptocurrencies such as Bitcoin, the reality is that blockchain can be applied to any sector in need of absolute, publicly accessible form of data to confirm actions. Essentially a distributed, incorruptible digital ledger of economic transactions, blockchain technology ensures that data is accurately collected, safely stored and easily accessible.

Mark Karhoff, Supply Chain Project Manager DSCSA Workgroup Member HDA, GS1, MediLedger explained, "**the growing number of track, trace and serialization laws along with the increase in outcome based contracts and bedside scanning are natural drivers to an interoperable, more transparent and connected supply chain. Consumers will see options like Amazon Pill Pack as the new standard in delivery and tracking & the industry must recognize that blockchain provides an alternative but requires higher collaboration across the industry and alignment on solutions.**" A major barrier to large-scale implementation of blockchain in the supply chain is participation. In order to employ blockchain technology to gain efficiency and transparency in supply chains, all players have to cooperate and this can be especially difficult to achieve in disciplines as complex as supply chain.

Scott Mooney, Vice President Distribution Operations Supply Chain Assurance, McKesson Pharmaceutical, also cautions that, "**blockchains may improve accuracy and efficiency in select spaces in the pharmaceutical supply chain BUT blockchains by themselves are not necessarily good for everything.**" Given the expense and logistical complexity of current blockchain systems, *Gartner Hype Cycle* predicts that, across all industries, we won't see larger, focused investments in blockchain until 2022 and large-scale, global value-add won't begin until 2027.

WANT TO LEARN MORE?
Read our full Blockchain in Pharma Logistic Whitepaper **here**

#2
ADVANCED ANALYTICS

As Dr. Kenneth Stedman, Center for Life in Extreme Environments, Department of Biology Portland State University explained, going forward, "**advanced analytics will be critical for quality assurance of delivered product.**" Big data solutions of the future will integrate data from multiple channels, such as manufacturers, warehouses, carriers, suppliers, 3PL partners and provider facilities, in order to track the product through its complete life-cycle. This will allow stakeholders to identify and address potential areas of risk or exposure along the way.

According to *Deloitte*, this influx of data and intelligence created by connected systems will not only offer companies the visibility they need to "make smarter planning decisions, enabling them to reduce costs, remove reliance on 'tribal knowledge,' gain deeper and broader insights into their supply chains, dramatically improve decision-making processes, and increase the agility of their digital supply networks (DSNs)," but could ultimately change the way we think about supply chain planning in general: **from a static, linear sequence to a dynamic, interconnected system.**

#3
Artificial Intelligence

From seamless temperature monitoring and control to increased operational efficiency, the potential for Artificial Intelligence to dramatically transform the pharma supply chain appears limitless. For starters, "**AI will be able to assist in figuring out the best method to move something from point A to point B, given all the variables in the situation/equation,**" Kevin Hickman, Senior Manager, Supply Chain Distribution, Gilead Sciences, Inc., told us. Though machine learning has been used to improve demand forecasting since the early 2000s, with its robust cognitive automation abilities, AI can be applied to examine and improve processes across almost every area of the supply chain inclduing manufacturing performance, assessments of supplier reliability, security and inventory optimization.

In the future, AI-powered drones and other autonomous vehicles will be used to not only transport products from place to place but also conduct warehouse and/or vehicle inspections. By integrating and applying machine learning to data from across numerous, disparate systems, AI systems will enable improved decision making related to everything from manufacturing processes to patient delivery. Furthermore, chat-bots and virtual agents will be used to automate as well as improve the customer experience. Using AI to predict demand and optimize the flow of those critical parts to keep production moving smoothly, pharma manufacturers will also be able to reduce supply chain latency for parts utilized in the most popular or highly customized products.

THANK YOU TO OUR CONTRIBUTORS

Kevin Hickman

Senior Manager, Supply Chain Distribution

Gilead Sciences, Inc.

SEE KEVIN PRESENT!
9:30AM on Tuesday, June 11, 2019
Vendor Management: Developing a Win-Win Relationship

Scott Mooney

VP Distribution Operations Supply Chain Assurance

McKesson Pharmaceutical

SEE SCOTT PRESENT!
8:45AM on Tuesday, June 11, 2019
Combining Unique Product Identification with Blockchain

Mark Karhoff

Supply Chain Project Manager

DSCSA Workgroup Member HDA, GS1, MediLedger

SEE MARK PRESENT!
8:00AM on Monday, June 10, 2019
**WORKSHOP B: DSCSA 2023: A Path to Aligning on
Interoperability Across the Prescription Pharma Industry**

Dr. Kenneth Stedman

Center for Life in Extreme Environments, Department of Biology

Portland State University

SEE DR. STEDMAN PRESENT!
8:45AM on Tuesday, June 11, 2019
**Exploring New Stabilization Technologies and Enhancing
Last Mile Supply Chain Logistics**

Want to learn more about the technologies disrupting the pharma supply chain?

June 10-12, 2019 // San Diego, CA

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Sources:

1. Precision medicine and pharmacogenomics; The Mayo Clinic. **https://www.mayoclinic.org/healthy-lifestyle/consumer-health/in-depth/personalized-medicine/art-20044300**

2. Challenges in the Personalized Medicine Supply Chain; Chris Striffler. **https://clarkstonconsulting.com/insights/personalized-medicine-supply-chain/**

3. SHOWCASE: Supply Chain: Rethinking the Supply Chain in the Personalized Medicine Age; PharmaVOICE. **https://www.pharmavoice.com/article/2018-10-personalized-medicine-supply-chain/**