Getting medicines to patients – the role of quality logistics (11 min read)

Access to Medicines

Scott Allison, President of DHL Life Sciences and Healthcare

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Getting medicines to where they are needed requires a hugely complex transport effort - and lives can be at stake if anything works less than perfectly. As a result, medical shipments are governed by a unique set of rules. To protect patients from unsafe medical products, the WHO says it is critical that “no weak link exists in the supply chain” and that transport and storage need to demonstrate an unbroken series of steps.¹ Making sure that this safe and stable access to medicines happens is what Scott Allison’s team does best.

As president of Life Sciences and Healthcare for DHL, the leading logistics service provider in the world, Allison and his division ensure that every medicine, from a simple tablet to a complex infusion, completes its journey safely and on time. Ensuring that delicate pharmaceuticals are handled with the utmost care is part of Allison’s daily business. Transporting biologics, for example, is no easy task. Each shipment of these specialized medications, which are produced using living organisms, requires a strict temperature range of two to eight degrees Celsius and can be worth up to 50 million U.S. dollars. And it’s not just the medicines themselves that can be costly. Although logistics is only one step in the pharma
supplied chain, these shipping processes can represent nearly 40 percent of total operating expenses.\textsuperscript{2}

To guarantee that all medical cargo arrives safely and reliably, the strategic teams in Allison’s department monitor each shipment until it reaches its destination, whether it’s a distribution facility, a hospital or a doctor. Before the journey, they map out every step, anticipating any problems. They coordinate trucks, freight trains, airplanes and even individual couriers to meet manufacturers, customs offices and regulatory agencies, depending on regional and national requirements. Every movement during the journey is tightly choreographed. Afterwards, they analyze performance efficiency. And all of these processes are repeated day and night, in every country around the world.

**Pharma Supply Chain in Ten Steps**

A medicine’s complex journey from manufacturer to patient

A Truly Global Challenge

From his Dallas, Texas office, Allison outlines one of the key challenges: “In the old days, medicine was produced in a factory next to the distribution center, which was close to the patient. Everything was local. But, as production networks have become more global, those supply chains have become more complex. Companies have to absorb transport costs and logistics organization, but still deliver the same product efficacy and safety.” Handling this network expansion without compromising on the quality of medicines is a substantial -- and truly global -- challenge.

Modern pharmaceuticals follow two key control processes. Good manufacturing practices (GMP) help to ensure product quality, with a defined process for each medicine. These practices also aim to guarantee that a product is of the highest quality when it leaves the
warehouse and enters the supply chain. “And then for us,” Allison continues, “we have to follow good distribution practices, or GDP, to ensure the integrity of the product all along the way. For pharmaceutical companies, these GDP requirements are highly controlled under corporate compliance.” A further challenge, he adds, is that GDP standards vary by region. “The same goods may pass GDP in one region, such as Latin America, but have to meet other requirements for the UK.” Since global shipment requirements have to be factored into the whole route, the process grows in complexity.

**Pharma’s GDP**

One reason that so many people are involved in the supply chain is that pharmaceuticals must meet “good distribution practices” (GDP). In 2013, the EU included ‘transportation and storage’ requirements for the safe movement of pharmaceuticals. The World Health Organization describes these E.U. Goods Distribution Practices (GDP) as a guarantee “that no weak links exist in the supply chain, [which is] critical in protecting patients from unsafe medical products.”

**Coordination is Key**

Good distribution practices are among the wide range of requirements placed on pharmaceuticals, and this leads to concerns about whether the supply chain is cost-effective. Allison and others believe that processes may need to adapt. A 2014 research study reported that industry professionals see lack of coordination as a primary problem along the pharma supply chain. In a separate 2015 study published in *Technological Forecasting & Social Change*, researchers concluded: “We need a new generation of supply chain professionals, who are not exposed to a pre-conceptual commitment that healthcare supply chain is different from the rest.”

It may be more cost-effective to enable e-commerce or direct delivery to the patient or doctor.

**Scott Allison**, President of DHL Life Sciences and Healthcare

Allison agrees. “In the technology field, where I began my career, we understood the strategic importance of supply chain practices. In pharmaceuticals, there’s been less attention to this for a variety of reasons. No one wants to make it seem like medicine is only about ‘the bottom line.’ But without making the supply chain more effective, medicine is too costly to produce or obtain.”
Where the journey begins: Pharmaceutical manufacturers use modern machines and techniques to produce medicines that require great care and supervision – from research to packaging. Credit: Novartis Brand Lab
On the road: Forwarders provide special trucks for transportation of healthcare products. Sensors monitor the goods during the journey and, particularly for biological medication, make sure the cold chain is consistent. Credit: Deutsche Post DHL Group
By sea: When speed does not matter, using ships for transportation is a cost-efficient alternative. Containers are loaded directly from truck to ships. Credit: Vetta/Getty Images / Tobias Helbig
By air: When time is of the utmost, medicines are sent by plane. However, it can be a challenge to monitor air freight shipments and make sure the temperature of sensitive materials remains constant. Credit: Deutsche Post DHL Group
At the warehouse: As in other industries, incoming shipments are sorted into batches large and small. Boxes are stored short-term before they are dispatched to the next location or their destinations, such as hospitals and pharmacies. Credit: picture alliance/Westend61
By hand: At logistic centers for mail-order and delivery to physicians or patients, medicines are sorted into order bins and recorded one at a time before continuing the journey. Credit: Keystone Schweiz/laif / Gaetan Bally
Destination pharmacy: Pharmaceuticals are stocked within an arm’s reach. Some pharmacies and hospitals receive several deliveries per day, so that patients rarely have to wait more than a few hours for their medicine. Credit: mauritius images / Juice Images / Ian Lishman

Using Technology
To Allison, the overall pharma supply chain has a number of opportunities to reduce costs. Technology is offering new ways to coordinate tasks. “Just five years ago, there was one temperature sensor, and another would track the location, stability and so on. Now one sensor can measure all of this and make many other control measures, for a fraction of what it used to cost.” Mobile and radio-based satellite systems, along with technology like GPS, are constant companions as the products travel. This ability to tag and fully monitor a product through its life cycle is a crucial asset, Allison says.

Allison also sees opportunities for less sensitive medicines: “These can be moved via slower methods, say ocean shipping instead of airplanes, so we can increase loads and lower costs. Saving money here offsets the cost of more critical journeys and sensitive medicines. Overall, we can innovate ways to extend transportation time to markets, which will reduce costs while maintaining quality. An all-in-one sensor alongside more basic logistic tools like vacuum seals and blankets has to be part of the strategy.”

**Providing Biologics**

Although healthcare logistics is only one step in the pharma supply chain, it can be 38 percent of total operating expenses, compared to five percent for the retail industry and two percent for electronics. During every step in the supply chain, product conditions must be maintained and monitored. A medicine generally passes through at least “ten hands” from the time it is manufactured to the time a doctor or patient receives it. A failure in the chain is damaging to any drug, but particularly so to highly temperature-sensitive drugs such as biologics. Biologics require special transport conditions such as maintaining a strict standard cold temperature (cold chain) and a controlled room temperature (CRT). And there’s an additional factor: Biopharmaceuticals may have, “annual per-patient treatment costs...(of) 100,000 U.S. dollars. This means a single consignment may be worth upwards of 50 million U.S. dollars.” By 2022, biologics are predicted to be 50 percent of the Top 100 pharmaceutical product sales, according to a recent estimate by EvaluatePharma.


Another improvement in the process may come by more directly coordinating what is known in supply chain management as the “design stage” (product manufacturing) and the “operations stage” (demand management, capacity planning and logistics). “Pharmaceutical companies used to make medicines, but they were not as involved by the time the medicines reached a hospital or doctor. Different organizations and people took over along the products’ journeys.” He suggests consolidating the number of people who oversee the process, and more strictly defining their responsibilities so they don’t overlap – practices that are common in supply chain management for other fields.

**Leading the Way**

Ultimately, Allison envisions that developing nations may lead improvements in the process. “Take a country like Angola, or the Republic of Congo. The infrastructure isn’t as firmly
developed, and it’s too costly to imitate the infrastructure and the type of consumption typical elsewhere. There, they can look more pragmatically and say, ‘It may be more cost-effective to enable e-commerce, or direct delivery to the patient or doctor, rather than create a longer series of logistical points.’” Allison compares this approach to the business model for e-retailer Amazon: supplier consolidation, central distribution and an IT-based demand platform, serving as a channel for sellers - but with the model adapted for medicines. Developing possibilities like these, says Allison, to transform business and improve access to medicines, is what keeps him motivated.

Handle with Care
Monitoring the pharmaceutical journey via satellite tech

Sensors attached to the freight measure and report conditions on the truck, ship or plane. Monitoring via satellite helps to maintain the "cool chain" (temperature-controlled supply chain) of 2°–8°C.

Allied Visions
Miroslav Tukaric, Novartis Regional Supply Manager for Central and Eastern Europe, the Middle East and Africa

Someone who can speak specifically to the challenges and opportunities of developing regions is Miroslav Tukaric. Based in Slovenia’s capital of Ljubljana, Tukaric serves as the Novartis Regional Supply Manager for Central and Eastern Europe, the Middle East and Africa.

Like Scott Allison, Tukaric came from IT. Fourteen years into his work in supply chain management, Tukaric explains the complexities of his role. “On the one hand, it is all about supply and demand. But we have to add in medical need,” he says. “And in working with developing nations, or in nations where the infrastructure is less than ideal, we have to pay close attention to ensure that the medicine’s quality is not affected under these circumstances.”

Tukaric is experienced with unique logistical situations: “People can say, ‘If we need to send medicines to destinations far away from the manufacturing sites, let’s go by plane.’ But it’s more complex than this, and it’s not only about the costs. For example, if you need to secure the cool chain, sometimes it can be really tricky to go with a plane. Direct sunshine might start heating the goods, and this could be hard to control at the airport before loading onto a plane. Sometimes this is much easier to control when we ship by sea. When it comes to speed, of course, that’s different. But speed doesn’t matter if we can’t fully secure the requested quality of the medicine.”

Speed of delivery doesn’t matter if we can’t fully secure the requested quality of the medicine.

Miroslav Tukaric, Novartis Regional Supply Manager for Central and Eastern Europe, the Middle East and Africa
Improving Coordination

In the Middle East and Africa, specifically, with more than 60 countries and an extremely fragmented pharmaceutical market, pharma supply chains face additional challenges. Tukaric’s responsibilities include analyzing the climate and geo-political factors, as well as monitoring emergency situations. With so many topical concerns, Tukaric also sees the potential for tighter coordination: “We see how many different production facilities we have, and the number of routes that we’re using. There are synergies where companies and patients can benefit in the end, if properly planned.” Like Allison, Tukaric also looks toward optimizing the role of pharmaceutical companies in the process: “In the coming years, there is tremendous potential in streamlining our transportation routes for better planning across our divisions, and with our logistics partners as well as NGOs in the region.”

Consolidating Tasks

Managing a global pharmaceutical supply chain, including the medication’s logistical journeys, is as intrinsically complicated as world-class chess. It requires strategic thinking at every move and the ability to anticipate unforeseen events, coupled with the determination to reach one’s destination efficiently. Like Allison, Tukaric also anticipates how Amazon’s business model can be adapted to different parts of the pharma supply chain. “Consolidating our efforts like this also means we can absorb losses and lower profits for some routes and medicines, because we have a base level of profits from others.”

“The question for pharmaceuticals is, who needs to be in the process – to maintain product security and stability, and patient safety – and where can we consolidate our tasks, so that patients can get their medicines efficiently.” Tukaric is confident that even small changes can have a tremendous impact: “All of us are already looking for better ways to do this. We must.”

1. DHL Life Sciences and Healthcare; https://www.wdsrx.com/new-rx-pharmaceutical-cold-chain-logistics/[1]

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