PODCAST 272: LEAN SUPPLY CHAIN LESSONS FOR HOSPITALS

By Mark Graban

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Cardinal Health's Patient Driven Supply Network initiative is aligning all platforms, distribution and flow to demand signals.

My guest for episode 272 of the Lean Blog Podcast was Steve Thompson, who is currently the Director of Patient Driven Supply Network at Cardinal Health.

Though he now works in the field of healthcare, Steve spent much of his career in the automotive industry, beginning at General Motors as a college intern.

"It's been a lot of fun going from automotive, which I think is very mature in this area, coming into health care, which is clearly still very new to Lean thinking," Steve said. "Here we are in 2016, talking about things that we did in automotive 40 years ago."

Steve has been a certified Lean Six Sigma Master Black Belt for almost 20 years now, which sparked my interest in how he thinks Lean and Six Sigma should be best combined.

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"It's funny. I was doing Lean before it was called Lean," Steve answered."[I] happened to be a college intern at a facility that had inherited a Sloan Fellow that had just come back from being in Japan with folks like Jeffrey Liker and Jim Womack, who had learned essentially the Toyota Production System."

A few years later, when Steve began working at Lear Corporation, they had a senior executive who had come from TOYO in Japan, and was one of the first westerners to work at Toyota in that supply chain. That executive heard about Steve's background and asked him to be on his team, to help incorporate Six Sigma into Lean. Steve said that Lear got into Six Sigma in the

late 90s with a lot of influence from Ford Motor Company.

"The skill set made a lot of sense to me because I loved Lean," Steve said. "But what Lean wasn't capable of doing was understanding how to work with multiple variables simultaneously, which is something that Six Sigma does. So, over the course of about ten years, I came to rationalize that they weren't two different things, that they actually really worked well together, which is one of the reasons why I came to Cardinal Health when they asked because they were trying to put them together [as well]."

Lean, Six Sigma and Quality

I agreed with Steve that they are complementary and asked him what he thought about the false construct that "Lean is all about efficiency, and Six Sigma is the only way you improve quality," as some say.

> ***"Six Sigma is an inch wide and a mile deep, where sometimes Lean can be an inch deep and a mile wide."***

"One of the tenets of Six Sigma is having controlled statistical data that is working within an acceptable bound so that you know that your information is actually valid. What we learned early on is that we did Lean first to get processes under control, before we could even consider applying Six Sigma tools to make improvements," Steve explained. "I think once upon a time the Six Sigma piece was very elitist. It was highly educated statisticians in a closed room who had no idea what the process was. We're past those days now and we understand that, 'I can use the Six Sigma skills to measure and control the improvements I made in a process using Lean.'"

Steve suggested that learning to apply the basic Lean principles, matching the inputs to the outputs, first and then using Six Sigma skills to keep control and measure whether or not you're still in control was a good plan of action.

"The other thing that happens with Lean is, Lean teaches an organization how to be friendly toward change," Steve said. "One of my favorite ways of looking at the two is, from a Six Sigma standpoint, Six Sigma is an inch wide and a mile deep, where sometimes Lean can be an inch deep and a mile wide."

Materials Management, Supply Chains, and Supply Networks

Eager to gather more of Steve's lessons from the auto industry and how he has been helping healthcare organizations apply some of these methods and tactics, I asked about materials management, supply chains, and supply networks.

Steve began by explaining that in automotive, especially in Japan where natural resources are minimal, material is expensive and represents about 85 percent of the total production cost. If it's accepted that material is expensive, it's natural to focus sharply on reducing that waste in the supply chain.

In healthcare, Steve continued, 55 or 60 percent of the total expense is labor. With that said, all the changes in healthcare over the last decade or two, including the reduction of nurses at hospitals and the simultaneous change in population demographics, have decreased the appetite to reduce any more nurses from the system.

> ***"This is a perfect analogy to healthcare. I would much rather have the population seeing primary care physicians and having problems dealt with early, as opposed to people showing up with $800,000 problems when they are acute."***

"Once you can't reduce cost from your labor pool, you've got to go to the next biggest bucket, which is material. Whereas automotive was thinking this way, at least in North America, in the late 80s going into the 90s, especially with the recession, healthcare is now under tremendous cost pressure, and reimbursement pressure, and is looking everywhere it possibly can to save. It's just been in the last several years that supply chains, materials management, have come under that microscope, which is great for people like me."

Leading in a Lean Environment

On leadership, Steve explained that, in any large organization, frontline employees tend to understand things quickly and the leaders at the top, who are ultimately responsible for decision making and strategy, understand it at a different level. As you get lower into the organization from the top down, you run into a group of people that are not change friendly. One of the reasons for this resistance to change was the idea of transferring decision making to lower levels of the organization, which doesn't necessarily make sense to some classically-trained leaders.

"Leaders need to learn how

to lead differently in a Lean environment," Steve said.

Agreeing with me that in healthcare many people have old habits, including jumping in and giving people answers, Steve added," Real leadership is not being the person that goes in and fixes it. Real leadership is being the person that creates an environment that stops it from happening in the first place.

"This is a perfect analogy to healthcare. I would much rather have the population seeing primary care physicians and having problems dealt with early, as opposed to people showing up with $800,000 problems when they are acute, at the most expensive location of care, which is the hospital."

Steve added that hospital leaders are starting to understand this and are beginning to create larger systems that flow smoothly.

"You think what's happened in the last eight years since the advent of the Affordable Care Act, is we've seen a lot of consolidation. A bunch of individual hospitals, and medical centers, and surgery centers, and doctor's offices, have now come together to form systems. Those systems are treating differently than they have historically. They are treating by actually creating a value stream that paths through from the primary care physician, all the way through diagnostics, through treatment, through post-procedure care, all the way back to the home," he said.

Design for Manufacturability

Steve then linked this idea to the idea of Design for Manufacturability (DFM), which led me to bring up the studies of *The Machine That Changed the World* and the fact that Japanese auto plants had such a higher productivity than American plants, a problem that has been falsely blamed on American workers being lazy, when a lot of it came down to the Japanese cars being designed to be easier to build. I asked if he saw a parallel in this idea, where some hospitals are designed and being built these days in a way that leads to productivity, and that materials and supply chain systems can be designed in a way that leads to better flow or productivity.

"I think it was unfair in some ways to compare the Japanese workers to the North American and European workers, because our workers were having to do so much extra stuff to accomplish simple tasks. Because we didn't have the delivery methods and we hadn't thought through the seven wastes that Toyota had, and so Toyota's workers were able to apply more time doing value added direct labor, versus our folks who were doing a lot of extra handling, a lot of extra motion," Steve began answering. "I grew up in union Big Three environment, and I'll tell you, those folks worked hard, and had tremendous pride in what they did."

Bringing the discussion to healthcare, Steve explained that nurses spend upwards of 25 percent of their time doing inventory management and materials management work

"If you just visualize what a nurse does, a nurse will go into a material closet looking for a component. Often times that component is in a closed cabinet delivery method that's supposed to be an inventory tracking system. That nurse will go to a computer, sign in or swipe in, will bring up a component they're looking for. It'll take them a moment to find it. They'll identify it, a cabinet will open, they'll have to go over to that door, open that cabinet, take the component out, and then press the button that basically is a take button. Close it so it locks, go back over, identify that they've completed that task, and then assign it to a patient for charge or for data capture, for record retention, and then close out of the system." Steve said. "That takes anywhere from 45 to 75 seconds. For the sake of argument, let's call that a 60-second activity. If they do that at 120 times a shift, that's two hours. Without even being an industrial engineer, I just figured out that there's two hours of waste in a nurse's day. It's the most expensive non-physician labor in a hospital. [It] doesn't make sense for that person to be doing it."

> ***"[The] biggest difference between manufacturing, be it automotive, or aerospace, or consumer goods, and the delivery of healthcare is the bill of materials."***

In regards to designing hospitals better to make delivery of healthcare easier, Steve doesn't think we're quite there yet. Architectural firms are typically compensated for delivering as much revenue-generating floor space as possible in a hospital, but historically they haven't thought through inventory storage expense. While with Lean in automotive, it's known that finished goods are an expense until they are sold, hospitals are only starting to think about creating a flow of goods, and

operating in a way that they don't have to task one of the most expensive labor resources with materials management.

Bill of Materials

"[The] biggest difference between manufacturing, be it automotive, or aerospace, or consumer goods, and the delivery of healthcare is the bill of materials. In automotive, for example, we know exactly what we need to create whatever our product is that we're making. How much metal, how much plastic, how much paint, how much adhesive, how much labor, how much electricity," Steve said. "We don't have that in healthcare."

Steve went on to outline three obstacles to creating a set bill of materials in a healthcare setting: the prevalent idea that every patient is different; the lack of consistent practice from caregiver to caregiver, often because of learning and professionals working toward better outcomes through the act of medical practice; and the emotional fear of running out of something and putting a patient in a traumatic position.

> ***"A 300-bed hospital has anywhere from 15,000 to 20,000 individual stocking locations. Each one of these needs to be looked at to understand how to do it correctly."***

To combat this, Steve says that he stays a little bit away from the actual delivery of care, and focuses on the delivery of the components and the things that allow or enable those caregivers to provide that care.

"The only real safe way to do it is to extrapolate based on what they've done historically and use that as a starting point," Steve said. "One of the issues that we have in this industry is that a lot, if not most of the things that we buy have expiration dates. I liken it running the dairy department at a grocery store. I have to find that balance between having enough on hand that I don't dissatisfy my customer, and yet not having so much on hand that I have to throw a lot of it away. And today, we throw a lot of it away."

A Plan for Every Part (and Variable)

To find that sweet spot where organizations are protected against the cost of too much inventory, which includes stuff expiring, the cost of the space, the cost of the handling—weighed against the cost of stocking out, without overdoing it, Steve said that a "plan for every part" method is the right philosophy. To start, you should understand demand history at a component level. Steve went on to say that, at the same time, you must remember the Six Sigma idea that when you put multiple variables together, you create new variables.

"For example, if I was the CEO of a tire company and we wanted to develop a brand new, high performance, all-season radial tire, and I broke my design team into four groups. One group is going to focus on best-in-class for cold, one for best-in-class for hot, one for wet, one for dry. We put all these together to create the best tire we could and put those tires on my car.

"Tonight I'm driving home, and I'm in Columbus, Ohio. It is snowing today. I might drive home. It's both cold and wet at the same time, and I lose traction and crashed my car. I forgot to remember that these variables, when put together, create new variables. Ice just formed by my cold and my wet," Steve said.

Steve explained that this happens in healthcare as well.

> ***"...it's about $5 billion in supply chain waste in healthcare in North America just in the supply chain for devices and implantables."***

"We end up having to build elaborate models, but we've done this. We've done this for the number of customers where they've come to us and say, 'Hey, we've got a problem. I've got 32,000 odd components that need to be put into this health care delivery network. I've got no place to put it,'" Steve said, "I would look at, from my perspective, as what do you actually need? What do you need today? What do you need at a different today? What if today is not this time of the year, what if it's a different time of the year? What are the major drivers of variation? That should go into our model as well. A lot of folks do this with a simple spreadsheet. At Cardinal Health, we actually have more sensitive, stronger analytics way of doing it."

Steve explained that Cardinal Health acquired WaveMark several years ago, which was a company that was adept at understanding demand at the point of use.

"Once we're solid with what that delivery network looks like, how strong we are and our capabilities, that tells us how much risk we can or cannot take. We do the forward location stocking to say, "OK, you used to have 30 here. You only need four, but because of the different

variations and elements, we're going to put nine here," Steve said. "But we have the ability to replenish these things next day, or that afternoon, or that same week, etc. You've got to do it at a plan for every part level. A lot of folks struggle with this. A 300-bed hospital has anywhere from 15,000 to 20,000 individual stocking locations. Each one of these needs to be looked at to understand how to do it correctly."

Steve admits this is not the sexy part of healthcare.

"The reality is when a chief financial officer looks at their balance sheet, materials management represents somewhere around 30 or 35 percent of the total expense. It is the logical place to go, given the fact that we should not be impacting labor," Steve explained. "GHX did a great study where they identified that it's about $5 billion in supply chain waste in healthcare in North America just in the supply chain for devices and implantables."

According to Steve, that loss is not that difficult to eliminate, it's simply a matter of changing the methods.

Steve said that he meets very few executives in healthcare today that don't understand the power of Lean, which is positive as he has been fighting to bring Lean into healthcare despite a tremendous amount of early resistance.

Patient-Driven Supply Network

More recently, he's been working on patient-driven supply network, which comes from the concept of the consumer-driven supply network.

"If you think about consumer goods when this started 10 or 15 years ago, this idea of understanding when something is used by consumer at the point of consumption and using that as a demand signal to ensure that every time that that customer goes to the store, that that item they want to purchase is there." Steve explained. "Forget forecasting. Why wouldn't we want to just understand what demand actually looks like and have a system, which is so nimble that we are able to flow? This is something we learned in automotive. That when I had a lot of inventory on hand and I ran out of something, I was in trouble. When I had very little inventory on hand, I never got in trouble because it was always moving. I could reach out and get it.

"It's going to save me a lot in [the cost of] obsolete [inventory]. It's going to save me a lot in an expired product. More importantly, I'm going to satisfy my customer every time they need something because it's always going to be there."

If you would like to contact Steve, he can be reached at steve.thompson@cardinalhealth.com or you can visit cardinalhealth.com. You can also catch him speaking at LogiMed in Austin, Texas, March 7 to 9 on topics around managing demand, and demand variability, and how to align your process and your products to that signal.

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