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9B19D004

CPDN: IMPROVING SUPPLY CHAIN RESILIENCE

Professor P. Fraser Johnson wrote this case solely to provide material for class discussion. The author does not intend to illustrate either effective or ineffective handling of a managerial situation. The author may have disguised certain names and other identifying information to protect confidentiality.

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As Scott Gibson, director of operations at Canadian Pharmaceutical Distribution Network (CPDN), sat in front of his laptop at the company’s office in Mississauga, Ontario, he reflected on the issues confronting the organization. It was Friday, January 18, 2019, and CPDN was facing a number of critical challenges in its supply chain; however, at the top of his list of priorities was dealing with the growing problem of drug supply shortages. Sav DiPasquale, president of CPDN, had asked Scott to evaluate CPDN’s supply chain performance and to develop recommendations that could be presented to the board of directors the following month. During their meeting the previous week, Sav made the following comments regarding the issue of shortages:

As you know all too well, drug shortages are one of our biggest problems. When hospitals, clinics, and pharmacies are not able to get drugs when needed they face difficult decisions about rationing and altering patient treatment plans. Meanwhile, managing shortages is taking up a significant amount of our time, negatively impacting our customer service levels and driving up our distribution costs. We have a board meeting the middle of next month and I believe we have reached a point where CPDN should re-evaluate its approach to product shortages. I would appreciate if you would assess our options and make recommendations. Let’s plan on meeting in two weeks and finalize our proposal to the board. In the meantime, I will add this to the board meeting agenda.

The data Scott had collected confirmed that drug shortages were a growing problem. He was still unsure which alternative would be best for CPDN and the industry as a whole, but Scott recognized that he had to finalize his recommendation before his meeting with Sav the following week.

CPDN

Annual expenditures on pharmaceuticals in Canada was estimated at $33.7 billion[[1]](#footnote-1) in 2018, an increase of 4.2 per cent from the previous year and up from $24.8 billion in 2009. Approximately $2.2 billion was spent on drugs dispensed in hospitals, and roughly one-third of hospital drug spending was on cancer drugs.[[2]](#footnote-2)

Established in 1995, CPDN was an association of pharmaceutical manufacturers that jointly provided distribution of their products to Canadian hospitals. Revenues in 2018 were approximately $900 million.

The creation of CPDN was motivated by two industry trends affecting Canadian pharmaceutical manufacturers. First, distributors, such as Cardinal Health and McKesson Corporation, were increasing their market share in the Canadian pharmaceutical hospital market. As a result, manufacturers were becoming disconnected from their traditional customers, hospital pharmacists, and doctors. Second, the emergence of hospital buying groups placed pressure on pharmaceutical suppliers to reduce costs. CPDN allowed hospitals to consolidate orders while providing access to existing suppliers, thereby reducing administrative and logistics costs. In 2019, Roche Canada, Pfizer Canada, AstraZeneca Canada, and GlaxoSmithKline Canada were CPDN shareholders, and approximately 30 other pharmaceutical companies were CPDN associates. The pharmaceutical companies that used CPDN’s services (e.g., shareholders and associates) were collectively referred to as “members.”

CPDN represented a single point of contact for hospital pharmacy managers, who used its secure online portal to place orders and manage returns. Customer orders could also be placed through the CPDN call centre. Orders were consolidated into a single shipment, and the hospitals received one invoice.

Distribution

The CPDN head office included a small staff that was responsible for member relationship management, hospital relationship management, and operations. CPDN carried 2,100 products, and each month it received approximately 8,000 orders, consisting of about 37,000 lines, and shipped about 1.2 million units.[[3]](#footnote-3) While approximately 1,050 hospitals, clinics, and health care facilities ordered pharmaceutical products from CPDN, these customers also had the option to order directly from the pharmaceutical companies, if they desired.

Product distribution—including the order desk, warehousing, inventory control, picking and packing, transportation, accounts receivable, and returns—was outsourced to Lynden International Logistics (Lynden). Lynden was responsible for accounts receivable collection and processed payments to members and administered product return activities. It had warehouses in Delta, British Columbia; Calgary, Alberta; and Vaughan, Ontario, which provided the capabilities to provide next-day shipping across Canada for most CPDN orders. Product handling capabilities included narcotic, ambient, cold chain, and cytotoxic drugs.

Members placed inventories at CPDN warehouses on consignment and were responsible for replenishment and forecasting. CPDN’s online portal provided members with real-time information on customer orders and inventory levels (see Exhibit 1). Members paid an annual fee that covered administration expenses; they also paid their share of the monthly distribution costs.

CPDN operational and supply chain performance was monitored using 17 key performance indicators (KPIs) (see Exhibit 2). Since members were responsible for forecasting and controlled consignment inventory levels, CPDN KPIs focused on the fulfilment process, inventory control, and call centre responsiveness. Scott described how the KPIs were set up and used:

Members are responsible for forecasting, planning and inventory replenishment. We want to measure the operational effectiveness of our logistics service provider, Lynden, so our KPIs focus on the controllable areas. For example, our measure for line fill rate is calculated as the number of lines shipped during the month, less the number of lines that could not be shipped during the month, divided by the total number of lines shipped, expressed as a percentage. If a product listed in our catalog is not available, it results in backorder and negatively affects the fill rate KPI. Inventory accuracy is well controlled by Lynden, so ultimately it is the responsibility of the manufacturer to make sure CPDN has stock available.

Five of our KPIs are classified as “critical,” and closely monitored each month—on-time shipment, order accuracy, inventory accuracy, collections from customers and remittance to manufacturers. The other 12 are classified as “key KPIs.”

THE DRUG SHORTAGE ISSUE

One of the biggest issues confronting the Canadian health care sector was drug shortages. There were approximately 1,000 drug shortages in Canada each year, affecting about 10 per cent of active drugs available. The types of drugs affected by shortages were wide-ranging. Approximately three-quarters of drug shortages involved generics, and the balance affected innovator drugs, which represented the relative prescription volume of generic and innovator drugs.[[4]](#footnote-4)

In 2015, the Canadian government announced a new mandatory regulation requiring companies to report when they were not able to meet the demand for a product and when a product was being discontinued, or else they would risk being “named and shamed.” Two years later, Health Canada launched a new website, Drug Shortages Canada, for reporting drug shortages and discontinuations.[[5]](#footnote-5)

While the causes of shortages were difficult to establish, the two most frequent causes cited were manufacturing and quality problems and raw material shortages. Market factors also played a role, such as generic manufacturers discontinuing production of drugs because of concerns about low margins. Global demand, especially for new markets in emerging regions, also affected availability. Despite efforts by the pharmaceutical industry and government, the number of shortages appeared to be increasing.[[6]](#footnote-6)

Scott commented on the drug shortage problem: “Supply security is a major issue. Frequently there are only a few companies making a drug. With thin margins, manufacturing challenges, and fragile supply chains, it does not take much to create a shortage.”

Drug shortages not only affected patient care but also health care costs. Shortages of drugs resulted in postponed or cancelled medical procedures and longer times for patients in hospital. In some cases, patients were forced to pay for more expensive alternative medications, which often included the hassles of prescribing and locating drug substitutes, not to mention the potential of adverse side effects. Hospitals and doctors also faced ethical problems concerning how to ration drugs when shortages arose.

Drug shortages created a number of problems for CPDN. First, stock-outs of pharmaceuticals resulted in lost revenue and created extra costs associated with expediting. For example, transportation costs increased for rush orders both inbound to CPDN distribution centres and outbound to the hospitals. Second, inventory management became more complex. As shortages arose, hospitals, clinics, and pharmacies started to hoard stock and began opportunistic buying. As shortages were addressed, CPDN would be left holding additional inventory as customers used up their surplus inventory.

Scott described how CPDN dealt with supply problems:

On average, approximately 200 products per month are affected by supply shortages [see Exhibit 3]. Typically our system would look at historical data and provide an average, and then if the hospitals needed more it would be negotiated so as not to deplete stock faster. The justification would depend on the drug. For example, water for injection would be little justification as it is used daily, but another more complex drug, such as a cancer treatment product, would need further review.

ALTERNATIVES

Scott was contemplating four alternatives: CPDN could follow the current approach, restrict stock and allocate on a case-by-case basis, give manufacturers control, or use a rationing system. Scott was concerned that if CPDN maintained its current approach, where hospitals received the product pro-rated based on historical volumes on a first-come, first-served basis, current problems would persist, with some hospitals hoarding stock, leaving others unable to purchase pharmaceuticals.

One option Scott was considering was to restrict stock and distribute drugs in short supply on a case-by-case basis. Scott commented:

This is a zero-based approach, where each order would need to be justified, and alternatives would be considered. For example opportunities for alternative drugs and treatments would be weighed. CPDN would then decide if and how much would be provided, giving us control and oversight of the industry’s supply. However, it would require additional management resources and increase fulfillment costs. We would need to hire a pharmacist, at a cost of $120,000 per year plus benefits. In addition, instead of making one bulk shipment, order volumes would be reduced and spread out over a longer period, increasing costs in areas such as order processing, invoicing and transportation.

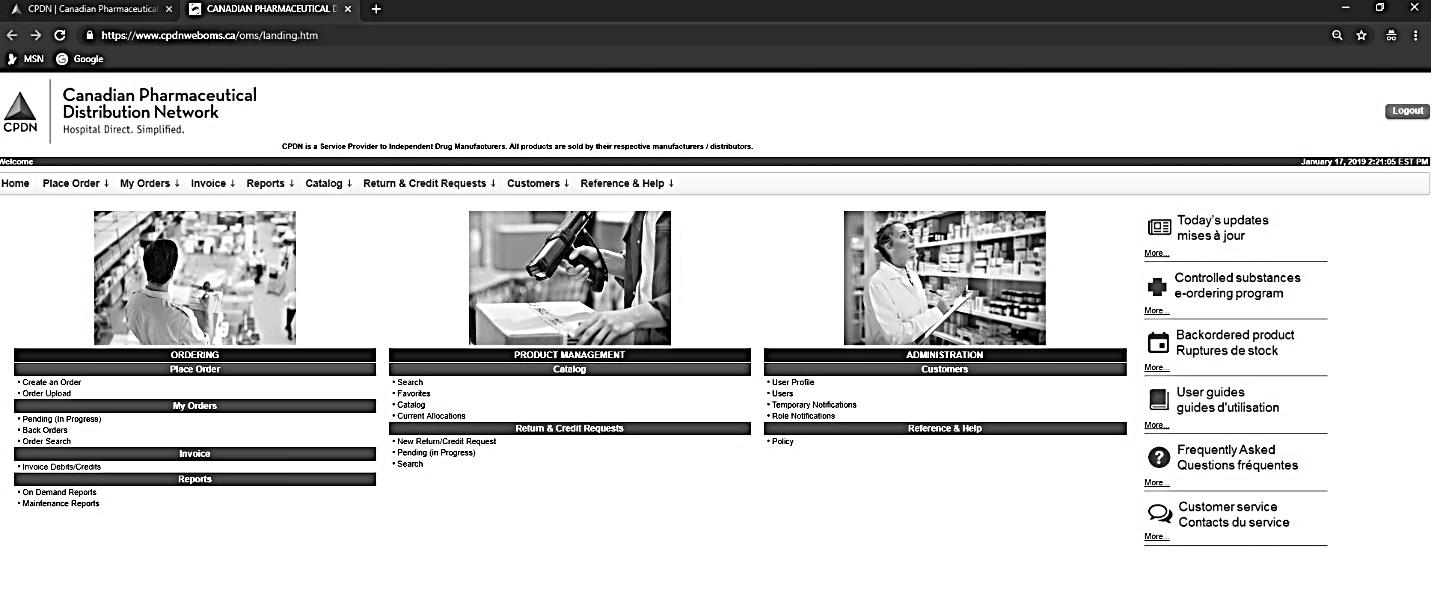
Another alternative was to give control to the members, who could set their own policies for drug allocations. However, Scott was concerned that members would give priorities to their important customers, making it difficult for smaller hospitals and clinics to obtain drugs in short supply. Furthermore, members sometimes had penalty clauses in contracts if they were unable to provide the product. Thus, some members could decide to avoid the financial consequences of a stock-out and only provide products to customers with existing contracts.

A final option was for CPDN to develop an algorithm to allocate supply. Scott described how this approach would work: “We could create an algorithm that would factor in variables, such as availability, seasonality of demand and projected length of the shortage, to ration drugs. This would eliminate the administrative hassles and costs, but would remove human judgement in areas such as implications for patient care, alternative treatments and total costs to the health care system.” Scott estimated it would cost approximately $50,000 to develop the new drug allocation system and take six months to deploy.

PREPARING FOR THE MEETING WITH SAV DIPASQUALE

Scott knew his recommendation would weigh heavily with Sav, so he wanted to make sure he had explored all possible options. How could CPDN best manage the impact of drug shortages for all stakeholders? Where there any other alternatives he had not considered? A major consideration for Scott and Sav would be the perspective of the board and CPDN members. Their support and buy-in at the board meeting in February would be essential.

Exhibit 1: CPDN Online Portal



Source: Canadian Pharmaceutical Distribution Network, accessed January 17, 2019, www.cpdn.ca.

Exhibit 2: CPDN KPIs—December 2018



Note: KPI = key performance indicator; LP Systems Availability = Logistics provider system availability, including warehouse management, order management and transport management systems

Source: Company files.

Exhibit 3: CPDN Drug Shortage History

|  |  |
| --- | --- |
| **Month** | **Number**  **of Orders Affected** |
| January | 1,482 |
| February | 1,841 |
| March | 1,450 |
| April | 1,318 |
| May | 1,458 |
| June | 1,540 |
| July | 1,118 |
| August | 1,363 |
| September | 1,001 |
| October | 1,404 |
| November | 1,252 |
| December | 1,545 |
| Total | 16,772 |

Source: Company files.

1. All dollar amounts are in Canadian dollars unless otherwise indicated. [↑](#footnote-ref-1)
2. Canadian Institute for Health Information (CIHI), *Prescribed Drug Spending in Canada: A Focus on Public Drug Programs*, 2018, CIHI, accessed January 11, 2019, www.cihi.ca/sites/default/files/document/pdex-report-2018-en-web.pdf. [↑](#footnote-ref-2)
3. A line represents the items in an order. Most orders contain multiple lines, which specify the unit volumes and price. [↑](#footnote-ref-3)
4. Jessy Donelle, Jacalyn Duffin, Jon Pipitone, and Brian White-Guay, *Assessing Canada’s Drug Shortage Problem,* C.D. Howe Institute, Commentary no. 515, accessed January 14, 2019, www.cdhowe.org/sites/default/files/attachments/research\_papers.

   /mixed/Commentary\_515.pdf. [↑](#footnote-ref-4)
5. Ibid. [↑](#footnote-ref-5)
6. Ibid. [↑](#footnote-ref-6)