

WHO HANDLES YOUR MEDICINE?

The health care industry constitutes about 14 percent of gross domestic product (GDP), representing a large segment of the United States economy. While the first goal of the medical profession is to provide patient care, cost and safety have become increasingly important during the past 10 years. Of late, patient safety issues relating to the distribution and administration of drugs have gained prominence in the United States. The modern practice of medicine depends on drug therapy as a means of treating many short-term and chronic diseases. Ensuring that the proper drug is given to the patient and that the drug is authentic remains a challenge for the medical care industry.

According to a report by the U.S. government, between 44,000 and 98,000 people die in hospitals each year from medical errors that could have been avoided. Some of these errors include the improper administration of drugs by the incorrect dosage, the wrong drug, or a counterfeit one. Even when the proper drug is given to a patient, there is always the question of potency. Many pharmaceutical products are composed of highly complex molecules that are engineered to tight specifications. Not existing naturally, these substances are often unstable under conditions of improper temperature, humidity, or exposure to light. As a result, the process of tracking and tracing drugs during movement through the pharmaceutical supply chain to the patient is gaining importance as a critical aspect of the health care delivery system.

Three primary distributors handle about 90 percent of drugs sold in the United States. In addition to these primary distributors, there is also an active secondary market. Add in the new complexity brought about by Internet pharmacies, which can exist domestically or internationally, and the chance for potential disruptions in the pharmaceutical supply chain continues to grow.

This makes it hard to trace the path of drugs through to consumers, raising the opportunity for mishandling and counterfeiting. Once drugs have arrived at hospitals, there are the additional concerns of ensuring that each patient receives the correct drug in terms of dosage and timing. This type of situation presents a difficult problem in scheduling and coordination that involves the entire supply chain from manufacture to drug delivery.

The first step in solving such problems involves obtaining information on inventory, location, history of movement, and demand for drugs. This type of visibility within the supply chain takes on

great importance when dealing with medical situations.

For example, the recent shortage of flu vaccine was aggravated in part by the lack of information about demand for the vaccine and the location of current supplies. With more information about the logistical aspects of the pharmaceutical supply chains, medical administrators can make better decisions about deployment of inventory. Increased telemetry capabilities will serve as an effective way to monitor the conditions under which pharmaceutical products are distributed and stored at wholesalers, warehouses, and hospitals.

Auto-ID technology, developed at Massachusetts Institute of Technology, provides a number of interesting possibilities in monitoring and controlling pharmaceutical supply chains. Because most drugs have a relatively high value, the investment in inventory and the corresponding carrying costs are huge. With more stockkeeping units on the way, the supply chain will become even more complex.

In this case, the investment in auto-ID technology makes sense to improve supply chain visibility and accountability for the flow of drugs to patients. With the advent of the decoding of the human genome and the rise of the biotechnology industry, there will be a flood of new drug therapies designed to treat specific diseases for groups of individuals that share similar genes. As a result, the complexity of the pharmaceutical supply chain will increase dramatically. We know of few supply chains that are so closely related to life-and-death situations.

It is conceivable that within the next 10 years, the delivery of drugs to patients will become the most intricate supply chain in the world. Information is the primary effective means to deal with this level of complexity and to ensure patient safety. Auto-ID technology will play an important role in providing supply chain-wide visibility for the pharmaceutical industry through enabling real-time information.

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For more information on pharmaceutical supply chains, watch for

"To Track and Trace," an article by Schuster and Koh, in the February 2004 issue of APICS--The Performance Advantage.