Proactive monitoring and intervention: key components of an optimal supply chain for temperature-sensitive healthcare products

A step-by-step approach to utilizing state-of-the-art proactive monitoring to lower the total overall cost and risk of shipping cold-chain products.

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Introduction

Every healthcare product that arrives at its destination on time and within efficacy norms is a reputation success for the manufacturer or distributor. Yet, no system is perfect. Weather, unexpected events, extremes in temperature, and a host of other possible events can delay and consequently spoil time- or temperature-sensitive products. Less than 100 percent perfect delivery negatively impacts cost, brand reputation and, most importantly, patient experience.

Through decades of working with healthcare manufacturers and distributors, UPS has researched and developed a comprehensive approach to shipping temperature-sensitive products that organizations large and small can rely on to minimize product losses while enabling products to arrive in the right place, at the right time, and in the right condition every time. These steps are designed to lower the total overall cost of shipping, and they are based on state-of-the-art proactive monitoring systems.

Following the steps in this white paper will help to:

- Improve patient care and the customer experience by reducing the probability that shipment contents may be spoiled by delivery delays
- Protect brand image
- Minimize shipping cost while improving the percentage of shipments arriving in the required condition
- Lessen the costs associated with product spoilage, such as product reships, staffing and inventory
- Lower the possibility of product shortages
- Achieve the lowest possible total cost of shipping temperature-sensitive products

STEP ONE
Conduct failure analysis
- Determine total unit cost
- Gauge spoilage patterns
- Assess shipping channels

STEP TWO
Assess capabilities & needs
- Understand exceptions
- Determine requirements
- Conduct cost-benefit analysis

STEP THREE
Launch pilot program
- Determine pilot scope
- Adjust and observe
- Implementation
- Measure customer impact & ROI

STEP FOUR
Lower financial exposure
- Protect product cost
- Protect commercial value
- Protect consequential losses
Based on tens of thousands of pharmaceutical shipments and follow-up investigations, UPS knows that to achieve optimal supply chain efficiency, it is essential to first identify and form a working group of experts that can:

- Determine the actual total cost of each spoiled unit
- Ascertain patient needs in terms of where, when, and how the patient and/or their family, clinic, or retailer interacts with the product
- Assess how ambient environment, time-in-transit and product packaging potentially affect and protect the product
- Document each product’s in-transit requirements

Consider involving stakeholders from at least the following functional areas:

Experience suggests that a “white-boarding session” is an ideal way for the working group to gather and record pertinent information that will help to map relevant processes. UPS recommends that an experienced logistics expert from a third-party logistics provider can help facilitate such a session.
1.1 Determine total unit cost

It is first necessary for the team to identify each of the touch points between the warehoused product and the end recipient. The team should be sure to look for costs that may not immediately be apparent.

**Examples of costs that may be associated with an outbound shipment include:**

- Packaging and shipping
- Labor for moving the package and managing shipment information

**Examples of costs that may be associated with spoiled product returns include:**

- Acquisition and storage of additional inventory required for re-ships
- Disposal fees for spoiled product
- Cost of documenting spoilages to meet regulatory requirements
- Staff time spent handling returned products
- Cost of expediting replacement product

Through exploration and discussion, the working group will arrive at an estimate of the total unit cost of the product in the delivery channel. It likely will be found that actual costs are significantly higher than any estimates made at the outset of the project.

The team should then quantify the percentage of products spoiled in transit. This helps determine the overall value of product loss. In turn, this value will assist the group to assess the funding available to reduce product loss by, for example, selecting faster shipping service levels or proactive monitoring services. The goal, remember, is to achieve the lowest total cost of shipping, which, paradoxically, may call for greater expenditure in one or more process areas to enable savings in others.

The total unit cost of product spoilage can be as much as 40% higher than was estimated at the outset of the process.
1.2 Establish patterns and nature of spoilage mechanisms

If applicable, the group must determine what percentage of shipments are routed directly to homes versus retail operations, clinics and so on, and characterize the extent and nature of spoilage occurrences along each route.

To assist, the team might consider the following questions:

• Are there any patterns of spoilage? If so, what lies behind them?
• Is there variation in return rates from each category of end recipient (pharmacist, doctor, patient, etc.)?
• Is anecdotal information available on how the product is handled on arrival at its destination?
• Does additional information held by the organization shipping reveal more about the end recipient’s pain points or the cost to the organization of resolving them? (For example, do end users complain they don’t know who to call about delayed shipments?)

Identifying the root causes of events that lead to spoilage is vital. The clearer and fuller the picture, the more the organization can do to lessen product loss.

1.3 Define the effect of shipping channel environment on product requirements

Information about the product and its packaging is essential to review. For example, a ‘flu vaccine may have a 2–8°C storage requirement and its packaging may demand a maximum 36-hour transit duration.

In assessing product requirements, the working group should identify:

• Specified temperature range for the product
• Allowable excursions
• Ambient temperature profiles of shipping routes
• The nature and efficiency of temperature-maintaining packaging
• Patterns in the nature of spoilages

The assessment will provide the working group with an understanding of total unit cost, how product is handled at the end of the pipeline, product packaging, and acceptable temperature ranges.
A competent logistics partner should offer the healthcare manufacturer and distributor multiple monitoring options to mitigate risk in transit, from “self-service,” Web-based capabilities to sophisticated delivery-analysis systems operated by the logistics provider on behalf of the shipper.

The capability to track a package is, of course, good. The ability to predict when a delay might occur is better. But being ready to react to predicted delays, meaning timely intervention to protect products at risk—by re-icing, refrigeration or expediting shipment movement, for example—is best in class.

During the white-board session, the logistics partner should set out for the group the available risk mitigation options, the technology behind each option, and the costs involved. This information is required to facilitate an assessment of the cost/benefit ratios of shipping service levels, and then the application of that information to help inform supply chain decisions.

It is important to establish whether the logistics partner’s available monitoring and intervention options are global capabilities, or merely local or regional.

The working group’s members should bear in mind that, even if their company’s business currently extends only locally, the worldwide demand for healthcare products is accelerating and that “going global” may be the next step in business growth.
2.1 Understand the nature of “exceptions”

A logistics provider’s monitoring technology should quickly anticipate “exceptions,” meaning the point at which a package fails to move as expected, such as when an aircraft is unable to depart because of inclement weather.

Some shipping exceptions “take care of themselves” in the normal course of operations in transit—a shipment being rescheduled onto the next available flight, for example, so it still reaches its destination within its packout limitations.

Global tracking and control allow decisions to be made around the clock on whether an exception will create a delay and, if so, how to manage the event.

2.2 Consider monitoring capabilities

The extent of monitoring and intervention a logistics company can provide is predicated in large part on the infrastructure it has in place: its national and global transportation resources, its personnel, expertise, and information, and—importantly—its monitoring technology.

State-of-the-art monitoring is based on a sophisticated technology platform that takes into account conditions that may impact the transportation of a shipment to its destination: everything from natural disasters to political unrest. The technology flags packages that require proactive monitoring and continuously assesses whether any such shipment will pass through a potential emerging “choke point.”

At UPS, for example, monitoring and intervention is handled under the UPS Proactive Response® service. Logistics experts located at the company’s global control towers are alerted to the location of Proactive Response shipments by robust, proprietary technology and staff there can determine the appropriate action for packages at risk of becoming “distressed.”

Packages can, for example, be intercepted and placed in cold storage or replenished with dry ice to preserve their contents. The manufacturer or distributor is also notified of the delay and the actions taken.

Moreover, action to remediate the package is taken even when the shipper is not available, based on the predetermined standard operating procedures provided by the shipper.

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2.3 Conducting a cost-benefit analysis

With the necessary experts at hand, and an understanding of the logistics partner’s shipping and global proactive monitoring capabilities, the working group can explore the cost-benefit ratio of multiple models, from “next-flight-out,” time-critical service to ground service in conjunction with the logistics provider’s proactive monitoring offerings.

A shipper should ensure that additional remediation options include, as appropriate to the shipper’s operation:

- Upgrade to Saturday service
- Return to sender
- Saturday return to sender
- Reroute to alternative address
- Hold at local distribution center for customer pickup
- Courier movement to destination
- Same-day additional delivery attempt
- Future delivery attempt
- Hold for instructions
- Expedite on commercial airlines or specially chartered aircraft if needed
The information gathered and used during the white-boarding session may produce more than one possible shipping option. For example, a faster shipping service may be seen to reduce spoilage, with the saved cost of spoilage exceeding the additional cost of the faster shipping service. Alternatively, a less-urgent shipping service with proactive monitoring may be an option with similar cost-benefit advantages. UPS has been able to help clients achieve over 300% ROI through this process and less than a one-month payback period.

The results of the white-boarding session are fundamental in designing the pilot program solution. The logistics partner will recommend service levels and proactive monitoring based on the cost-benefit ratio and product spoilage parameters.

The logistics partner may suggest a premium service and highest level proactive monitoring on some shipments, a medium level on others, and lower level on the remainder. These suggestions will be based on the logistics partner’s understanding of the product, package, route, and delivery expectation.

To determine which option works best—or which option works best for each product shipped (different products may have different shipping requirements)—the next step is to test the scenarios in real life with a pilot program.

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**Cost-benefit ratios of shipping and monitoring are calculated on:**

- Percentage of spoiled shipments
- Current total cost of shipping
- Choice of faster or less urgent services
- Current pack-out temperature maintenance times
- Availability of:
  - Monitoring and intervention
  - Financial protection to defray the cost of compromised product or expedited service to get a delayed product to its destination unspoiled

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The results of the white-boarding session are fundamental in designing the pilot program solution.
The manufacturer or distributor should select a problem shipping lane, region, customer, or product type to be the subject of a pilot program aimed at lowering the percentage of product compromised in transit, improving the end-user experience, and achieving the lowest total cost of shipment.

In one such program for a customer that shipped internationally, UPS recommended a combination of next-day shipping, proactive monitoring with financial protection, and custom-designed, reusable packaging.

The result was a reduction of over 30 percent in total unit shipping cost over the customer’s previous arrangement, which utilized a specialized courier service. UPS was able to put in place a true end-to-end solution—a distinct advantage over the former arrangement, which required considerable effort to manage more than one logistics provider.

Service levels are generally adjusted during the pilot program. Challenges can be identified and rectified.

After a pilot program has demonstrated success, it is appropriate to begin a phased implementation throughout the company’s shipping system. The phased rollout typically uncovers and then rectifies unforeseen, often localized, problems. Ultimately, improvements seen in the pilot program should cascade down through the wider distribution network.

In a successful pilot program:
- Fewer products are spoiled or returned
- Lower total overall cost is achieved
- Customer satisfaction is higher
The results of Steps 1, 2, and 3

The ability to cost effectively deliver temperature- or time-sensitive medicines precisely where and when the clinic, retailer, or patient requires them represents a strategic advantage for the manufacturer and distributor. And if this cost-effective service nears 100 percent accuracy, the total unit cost will be minimized, creating a positive experience for all parties. Interestingly, it is also a more sustainable shipping model, because it reduces waste and optimizes consumption of materials and energy.

The white-boarding exercise and the analysis that follows it also provide a platform for a capable logistics provider to customize and create unique combinations of solutions—in other words, to treat each end recipient as a discrete entity with its own needs. Creating an optimal solution, however, is only possible with a sophisticated technology base, a deep and far-reaching expertise, and the most extensive infrastructure—preferably owned and operated by the logistics partner directly.

The benefits of proactive monitoring, and intervention and remediation are clear, but it is worth remembering that the service, in essence, is a physical one that relies on human intervention. The shipper may consider that the most effective intervention services are likely to be provided by a logistics partner that handles shipments itself from end-to-end. Handoffs and the use of additional providers increase the risk to shipments. UPS considers that the greatest reliability is achieved when every individual involved in shipping, monitoring and intervention wears the same uniform.
Even with all of these processes in place, spoilages will inevitably happen. Financial protection, which will be offered by a competent logistics provider, helps to lower the shipper’s exposure when the unexpected happens.

Ask the logistics partner to make recommendations on the lowest cost/highest effectiveness risk mitigation options available. Choices should include at least basic liability coverage for the cost of the shipment (some logistics providers refer to this as “declared value”) and also coverage for the product’s commercial (retail) value. In addition, a best-in-class logistics provider will offer protection for consequential losses related to delayed shipments.

The competent logistics partner’s in-depth understanding of total unit cost and the points of risk helps enable a targeted approach to insurance which can assist in providing a greater consistency in cash flow and also may help protect the manufacturer or distributor’s bottom line. In other words, coverage can have a profoundly positive effect.

### Step 4: Lowering financial exposure to “near-zero”

**Cloud-based tracking**

Shipper can locate shipments at any point in time, but without the ability to actively manage shipping.

**Predictive monitoring**

Logistics provider can predict when a shipment is likely to be late and promptly inform the customer.

**Proactive intervention**

Logistics provider can predict when a shipment is likely to be late, and locate and remediate the shipment if necessary.
Conclusion

Achieving true efficiency and establishing visibility and control of shipments—even during transit—involves the expertise of a greater number of knowledgeable parties than might initially be imagined. But only by accurately and thoroughly mapping the supply chain can pinch points be identified, and solutions explored and tested.

The process may be expedited by bringing an experienced and capable third-party logistics provider to the planning table to provide insight and guidance on turning problems into opportunities.

At UPS, we strongly advocate including such expertise in sessions to map and analyze the supply chain. While the exercise may be one the shipper undertakes on an occasional basis only, the capable logistics provider can offer a deeper perspective that can come only with the experience of conducting such assessments on a routine basis.

The shipper must take care to engage a logistics provider that provides proactive monitoring and intervention services, as well as a complete range of shipping services from same-day to ground, and from small package to freight.

In addition, it is preferable that the logistics provider demonstrate the capability to review, assess and redesign packaging to add a further dimension to the cost-benefit analysis. Only
a logistics provider with a broad portfolio of solutions has the “tools” to identify and implement the widest scope of solutions to shipping challenges.

Getting shipping right using services such as proactive monitoring and intervention can boost efficiency, save money and may provide a key competitive advantage in a tight market. The simple four-step process outlined above can deliver the highest level of customer satisfaction at the lowest total cost of shipment, and the method has proven itself thousands of times.

In UPS’s experience, the effort expended in carrying out an interdisciplinary white boarding session will most likely be well worthwhile, and we highly recommend it to all healthcare manufacturers and distributors.

We look forward to continuing this conversation on better ways to protect product integrity and deliver more to your customers. In the meantime, you can visit ups.com/healthcarelogistics to learn more about our healthcare logistics leadership or to contact UPS.
About the author

Vincent Pusateri is a product manager with UPS’s Global Healthcare Logistics Strategy. He develops strategies and designs solutions that help elevate shippers of time- and temperature-sensitive above their market competitors, while also increasing profits by determining how to get healthcare products to market faster and more efficiently. Vincent has extensive experience with healthcare operations management.

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