

Solutions for Healthcare Logistics:

Expand Accessibility,
Safeguard Integrity
and Leverage Innovation





The Importance of Healthcare Logistics

The healthcare industry encompasses a wide range of products and services – from a patient’s groundbreaking cancer treatment to the hospital bed they recover in. Then there’s every medical device, pharmaceutical product and operative equipment in between. At one point in time, we will all rely on the offerings of the healthcare industry, whether it’s for a life-threatening purpose, or simply to aid mobility. It’s important that integrity can be fully trusted by the recipient, the provider and the manufacturer. Usually, the integrity can be almost guaranteed within the controlled manufacturing environment. But, any healthcare product can be vulnerable to external conditions when it’s transported.

The most vulnerable sector of the healthcare industry is pharmaceutical products. If their chemicals become unbalanced, the side effects can be serious. The sheer amount of people who rely on medication and medical devices heightens the need for utmost care in-transit. In the U.S. alone, more than 45% of people rely on a prescription drug over the course of a year.¹ Here in Canada, 1 in 4 seniors rely on more than 10

prescriptions at any given time.² There are a variety of significant stakeholders in the safe arrival of any healthcare product. Often our healthcare products will travel even further. The expansion of reach is required to create accessible healthcare to everyone. And as innovation continues to infiltrate the healthcare sector, we’re seeing opportunities to provide more of a consumer-empowered healthcare experience. In-transit care is required for more reasons than just safeguarding health.

This report discusses how healthcare businesses can work with a logistics provider to gain reach, assurance and align with innovative new opportunities. Here are the main topics you’ll learn more about:

- ✔ Expanding the accessibility of medical devices.
- ✔ Safeguarding the integrity of pharmaceuticals in-transit.
- ✔ Understanding factors and trends shaping the future of healthcare.

Expanding the reach and accessibility of your medical device products.

Medical devices include an array of equipment and products. Wheelchairs, surgical scissors and MRI scanners all fall under the umbrella of a healthcare device. The World Health Organization defines a medical device as “an article, instrument, apparatus or machine that is used in the prevention, diagnosis or treatment of illness or disease, or for detecting, measuring, restoring, correcting or modifying the structure or function of the body for some health purpose.” When compiling such a range of products into one category, the majority don't need to comply with specific shipping requirements. But, all medical devices still have best practice rules. The availability of standardized mobility devices and surgical tools are widespread and local. Thus, there's less demand for global shipments. But, what about the devices that have been biomedically engineered? Specific life-enhancing and life-saving technology is manufactured in limited locations due to their complexity.

Alongside pharmaceuticals, this is where supply chain management is arguably at its most critical. High value and high demand equipment requires strict adherence from a logistics provider to maintain a safe, accurate and high-quality product for the end consumer or patient, wherever the destination:

- ✓ Suitable stowing in storage and transit
- ✓ Expert handling throughout the supply chain
- ✓ Visibility control, including serial number & lot tracking
- ✓ Time-definite transportation solutions



The healthcare device market in Canada

In Canada, the medical device market is mature with a high demand for top-quality healthcare technology. Currently though, 80% of medical devices used in Canada are imported.³ About 44% are imported from the U.S.⁴ But Canadian exports are on the rise, particularly from Ontario and Quebec. Currently, the U.S. accounts for around 68% of Canada's total exports.⁵

A network to import/export to ensure a speedy and streamlined service

While Canada mainly exports to the U.S., the second-largest export market is the E.U., worth \$675 million in 2018.⁶ This trade is highly lucrative, therefore strong partnerships are needed to maintain streamlined and reliable service. Like domestic deliveries, international suppliers and their patients are highly dependent on receiving medical devices on-time. Companies can't afford to have shipment held at the border. And, missing documentation or invalid documentation are two of the biggest delays.

A logistics partner with a proven track record will ensure every international shipment meets a streamlined customs process. Here are some of the main preparations required for customs clearance:

- ✓ Pre-filed, complete documentation
- ✓ Correctly assigned tariff classification
- ✓ All duties and taxes paid
- ✓ Knowledge and application of any eligible free trade benefits



Requirements for handling medical devices while in-transit

Many regulations regarding medical devices focus on ensuring safe and effective manufacturing. The device manufacturers are liable for the compliance of all regulatory requirements. The rules around transporting and storing medical devices focus on maintaining the integrity. Canada's Food and Drug Act states, "The characteristics and performance of a medical device shall not be adversely affected by transport or conditions of storage, taking into account the manufacturer's instructions and information for transport and storage".⁷

Third parties in the supply chain are entrusted to perform key parts of the distribution processes. It's essential that a device manufacturer carefully reviews a provider's experience and assurance in handling medical devices. As a blanket set of guidelines, the World Health Organization's Best Practice also has standards for any country. It highlights the importance of well-designed packaging and its role during transportation. Medical devices are little risk to anyone handling or transporting them as long as they are properly packaged, even if they are biohazardous. The external packaging and transporting needs to protect the internal packaging. To safeguard your products, ensure your logistics provider has a variety of robust solutions to withstand various stresses.

White glove delivery

A white glove service refers to the specific level of care used when moving products. This service is unlike a regular shipment in that it's given extra special handling. In transportation, a white-glove service translates to providing meticulous care and service, with every precaution taken by the courier and no expense spared. The delivery should supply exactly what's needed for the recipient to utilize the product without further set-up.

Logistic providers can offer in-room delivery, unpacking and removal of packing materials – some providers can go even further. Certified crews provide pre-site inspections, then work with contractors to install the devices. They are then able to train the recipient, or specific personnel, so the equipment remains fully operational. Here are some examples of equipment that can be set up using a white glove service:

- MRI scanners
- 3-D mammography machines
- CT scanners
- Robotically assisted surgical systems
- Ultrasound devices

Ensuring your pharmaceutical products reach their destination, on-time and intact.

Within the pharmaceutical industry, any testing, production and movement of drugs relies heavily on controlled and uncompromised transfer of shipments. Among many nuanced factors, here are some of the main exposures that need to be regulated, to ensure they arrive intact:

- ✔ **Internal temperature**
- ✔ **Humidity levels**
- ✔ **Light**
- ✔ **Vibrations**
- ✔ **Shock**

Governing bodies around the world regulate the standards of pharmaceutical transport. For example, Health Canada develops and enforces the regulations for Canadian distribution. This ensures all pharmaceuticals offered in Canada are safe, effective and of high quality. In the U.S., the FDA (Food & Drug Association) sets the standards for the distribution of healthcare products available within the country. The World Health Organization (WHO) has also compiled a detailed Good Distribution Practice. It can be adopted and adapted by any country.⁸ Here are some of the ways logistics providers safeguard medication, to adhere to regulations around the world.

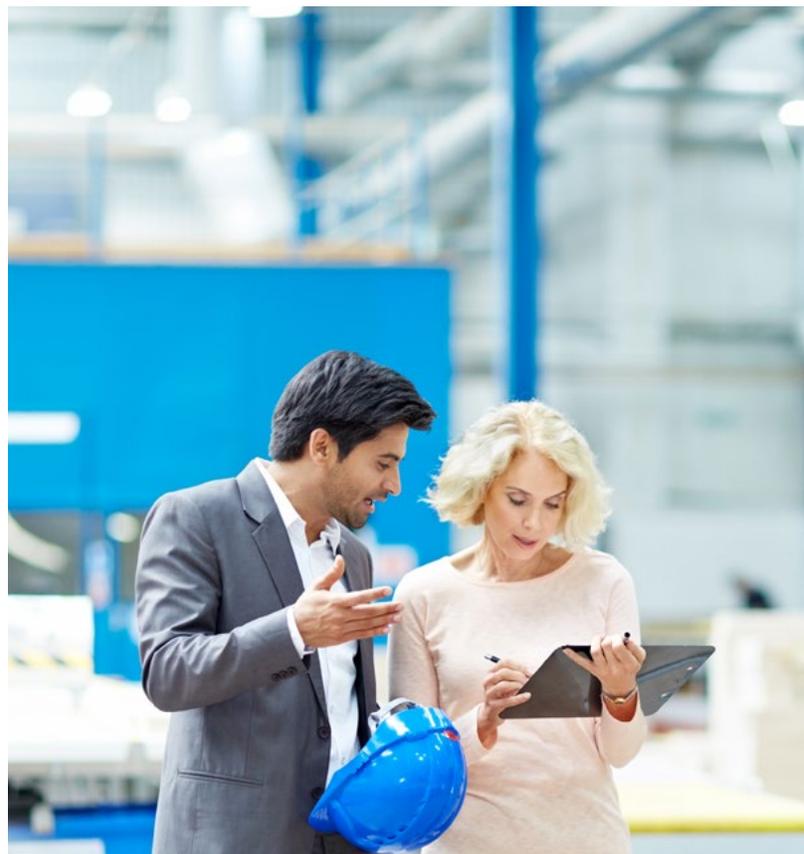
Visibility into the product location and integrity

Not only are pharmaceuticals often temperature-sensitive or life-saving shipments, they're also high-value. Shipments cannot afford to arrive late or damaged without causing some serious predicaments for all parties involved. Your healthcare products have the opportunity to be monitored along their journeys via GPS tracking and sensors. This allows delivery providers to resolve potential issues before they become problematic.

GPS tracking is a common feature, offering particular location updates for the recipient. It's provided for an abundance of reasons, including simply offering a better consumer experience. But in the medical world, location updates are especially important. Manufacturers cater to a range of delivery needs, including just-in-time deliveries. These deliveries work with a hospital's surgery schedule and routine inventory replenishments.

While logistics providers can use GPS to view fleets in real-time, the same visibility isn't often available for the end-user. Providing complete location transparency raises concerns. Security, privacy and theft are risks if other recipients on-route are also seeing the delivery. A bulk shipment of pharmaceuticals could also pose a similar vulnerability. More commonly available for recipients is updated location data. This is provided when barcodes are scanned along certain points of the journey.

Besides GPS tracking attached to the vehicles, there are ways to monitor the location and the integrity of pharmaceuticals. Logistics providers can use RFID (radio frequency identification data) for real-time temperature and humidity, linked to computer systems. Thus, gaining insight into problems straight away should they occur.



For customer visibility, some healthcare logistics providers and third parties are now offering sensor-based monitoring systems. These are individual devices that allow full visibility into an entire supply chain, and its complete integrity too. Features can include whether a shipment has been opened or subjected to a change in the environment. For example, updates to its temperature, light exposure, humidity levels, or any sudden movements.



Chain of signature

While sensors can record and monitor metrics to ensure stability, pharmaceuticals and other regulated substances require strict human accountability too. The chain of signature works as a further measure to minimize the risk of healthcare products in-transit. It also works to ensure a thorough and complete oversight of the supply chain.

The bill of lading is signed throughout the shipment process through different points along its journey. Signatures are required for all distribution and sorting points, as it exchanges through hands. Generally, only authorized employees that are trained in conforming to Health Canada's regulations would be able to sign it, and handle the package. All employees involved are assigned with rigid personal responsibility of the shipment until it reaches the next recipient's signed acceptance.

Temperature-controlled environments

Many pharmaceuticals are very sensitive to temperature. If they're exposed to variant temperatures, they risk becoming ineffective or even harmful. Though, it's certainly not as simple as refrigerating all medicines.

A supply chain survey shows the spectrum of temperatures required. Out of all temperature-sensitive products transported, 51% required an ambient warmth, 31% were refrigerated, 17% were frozen, and 32% were not allowed to freeze.⁹ Temperature monitoring needs extreme vigilance. The sensitivity of their integrity shows that about 20% of these products are damaged during transport due to a broken cold chain.¹⁰ There are a few ways this can be done:

→ **Dry ice** is a PCM (phase change material) that constitutes of solid carbon dioxide granules. They're extremely cold (about -80°C) and capable of keeping pharmaceuticals frozen for an extensive period of time. Dry ice does not melt, instead, it sublimates when it comes in contact with air. Dry ice is generally packaged inside an EPS (expanded polystyrene) foam container for insulation. It's then placed inside a sturdy cardboard box.

→ **Gel packs** are generally used for medicines that need to be kept chilled. There are large amounts of pharmaceutical shipments classified as chilled products (stored between 2 and 8°C), so it's a popular solution. Gel packs are also a PCM. Depending on the shipping requirements, these packs can either start in a frozen or refrigerated state. During transportation, they melt into a liquid state. At the same time, they capture escaping energy and maintaining an internal temperature.

→ **Reefers** are thermostat-controlled refrigerated containers. They're an active packaging solution that can be found as part of a van, truck or as a standard ISO container. These units are insulated and designed to allow temperature-controlled circulating. This method can keep the temperature cool and warm. A reefer relies on external power from electrical power points. For long distances, pharmaceuticals are rarely transported in reefer containers – if a large container breaks down, an entire load of products is compromised, creating a devastating loss of revenue.

Project Last Mile

Delivering vaccines to remote Africa, with help from Coca-Cola.

Medication can easily become jeopardized in the extreme heat in some African countries. Even if it isn't overly temperature-sensitive. Meanwhile, you can still buy a chilled Coca-Cola anywhere in the world. Since 2010, Coca-Cola has teamed up with several countries including Tanzania and Kenya. The company has trained health ministries on how to procure and maintain refrigeration suitable for the last mile. This has helped to greatly improve the safety of distributing vaccines to local hospitals.¹¹



The future of the healthcare industry, and what this means for your supply chain.

A rise of social media, app capabilities and cloud technologies has aided the heightened expectations. Predominantly B2C players, such as retail businesses, continue to leverage online technology to provide a more seamless experience. Companies are cutting out the middleman, providing a controlled, convenient and brand-centric experience. Over the past decade, this direct-to-consumer model, abbreviated as DTC, has taken off in the retail space. Today, we are starting to see the same trends take place in the healthcare industry too. "There's a disruption in the marketplace. Traditionally healthcare products would be shipped to facilities, establishments and so forth. But patients are becoming more empowered now. And, we're starting to see

a shift – products are shipping straight to the patient." says Jason Mohammed, Strategic Account Executive for Purolator. Working in the healthcare vertical for eight years, he's well aware of the change in recipients. Healthcare logistics providers that predominantly serve B2B, are now serving DTC. "There's a high demand for the transition. Customer experience is now patient experience."

It's fair to say steps towards DTC healthcare supply chains are influenced somewhat by trends in the B2C space. In healthcare, there are some industry-specific factors that are driving the change for medical distribution.

An ageing population

In Canada (and many other countries), we are seeing a pattern of an ageing population. This is caused by two main factors: an ageing baby boomer generation and a longer life expectancy. There's ample evidence that Canadians are living longer. According to Statistics Canada, the average life expectancy in 2016 was 82 years old,¹² compared to 57.1 years old in 1921. By mid-century, seniors will amount to 25% from 15% currently. The majority of this rise will occur over the next 15 years as the baby boomers age.¹³

What does this mean for the healthcare industry? The combination of a growing and ageing population is driving a hard, unmanageable demand. Hospital services, home care, palliative care and health and wellness programs will all be affected. Therefore, less labour-intensive alternatives are required to continue maintaining health services.





Increasing demand for online pharmacy orders

Consumers are getting used to ordering almost everything online. The healthcare industry is now making it possible too. Filling prescriptions online has been around for some time. Though, the market has experienced a share of risk-prone illegitimate providers and foreign services. The rise of telemedicine has created a larger space for legitimate and simple filling of online prescriptions. Telemedicine is the remote delivery of healthcare services using video calling, telephones or text services. This equates to many more home deliveries for pharmaceutical products. One of Canada's leading telemedicine companies, Maple, saw a record-breaking 2019, with 600% revenue growth and serving over 400,000 online patients.¹⁴

Tele-health assessments are conducted by general practitioners. They e-meet a patient, diagnose and prescribe common medication – which is delivered to their home. From the exterior of a package, medication is sent in the same way as any e-commerce, and delivered by a courier service, with healthcare experience. Medication such as narcotics cannot yet be delivered this way via a telemedical appointment.

While drug misuse or integrity breaches can occur from any distribution method, healthcare providers and carriers must ensure steps are taken to reduce the risk. Medication should ship in a tamper-evident, unmarked corrugated box. Temperature indicators on a product or packaging can be added to reveal whether the product remains in good condition. In some provinces, a signature is required upon delivery, though this could be required out of preference by the company too. As there's no indication of the contents, the delivery driver wouldn't have the information. This doesn't mean a lack of specific care and attention should be expected. An experienced healthcare logistics provider should be aware of the likelihood they're handling high-value, high-risk items. Safeguarding strategies throughout the supply chain should be in place to protect all in-transit items.

Alternative to pharmaceuticals for courier

Innovative home testing devices are replacing the need for as many doctor visits. Previously, over-the-counter prescriptions were required to complete certain medical evaluations. These products allow frequent and consistent testing, without the need for a healthcare professional. While this is beneficial in terms of convenience, it also empowers patients to take control of their own medical care.

As an example, Abbott Laboratories has produced an innovative home testing device. Using the latest technology, Abbott has created a glucose monitoring system for diabetes patients. The home testing device uses a scanner, sensor and an app to determine and monitor glucose levels.¹⁵ There is no need to use a needle to monitor glucose, removing the stigma and hassles of pricking a finger. While needles can only be used once safely, a device that relies on new innovation limits the need for replenishing equipment.

There are many other up-and-coming home testing devices for sale. Beneficial for the patient and the healthcare provider, kits can be sent via a regular courier service – unlike some of the specialized equipment that was once required to complete a similar procedure.



Delivering the healthcare industry, for now and then.

The healthcare industry is vast, lucrative and extremely risk-prone. But the output is extremely rewarding. Global supply chains continue to grow in strength and direction. But, there's pressure to accelerate manufacturing and accessibility, while reducing transit times. Furthermore, some innovation influenced by the B2C space is benefiting, yet challenging the ways that medical services are delivered.

Research has determined that supply chain considerations account for more than 25% of pharmaceutical costs and 40% of medical device costs. There's really isn't room for error. Ensuring full compliance to deliver products on-time and intact is of the utmost importance when health is involved.

For any products within the healthcare sector, partnering with an experienced healthcare logistics provider can play a large part in business prosperity. Choose a logistics partner that can provide the security and reach required to grow now, with innovative solutions that align with the future of healthcare.

Resources

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Purolator Inc | 2727 Meadowpine Blvd | Mississauga | ON | L5N 0E1 | 1 888 SHIP-123 | purolator.com



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