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. Within the controlled manufacturing environment, integrity can be almost guaranteed but any product can be vulnerable to external conditions when it's transported.

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During the global pandemic of COVID-19, healthcare logistics has become a topic at the forefront of the media. For months, there have been shortages of PPE (personal protective equipment), hospital beds and even entire hospital buildings around the world. Global supply chains have had to react faster than ever to try to meet a demand from various bodies of authority – and that demand changes pace each day.

While a vaccine for COVID-19 is yet to be discovered, it's important to acknowledge the logistical difficulties for when (or if) there is a vaccine released. The most vulnerable sector of the healthcare industry is pharmaceutical products, which includes vaccines. If chemicals become unbalanced, the side

effects can be serious. Regardless of the pandemic, the sheer amount of people who rely on medication and <u>medical devices</u> <u>heightens the need for utmost care in-transit</u>. 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.

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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 <u>supply chain</u> <u>management</u> 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 <u>white glove service</u> 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

The benefits of an allin-one look healthcare logistics provider

Just like many industries, healthcare products will need more than one mode of transportation along its journey from production to the final destination. Along routes, the majority of healthcare deliveries will likely need both courier and freight/LTL services. To limit hand-offs, look for an allin-one healthcare logistics provider that has both options.

Courier services. Ideal for fast and reliable shipments, courier services generally travel directly from the point of pickup to the end customer, without a stop at a warehouse or distribution centre.

This transportation is preferable for smaller shipments, such as home deliveries, scheduled inventory replenishment to hospitals and health care centres and for emergencylevel needs.



Time-definite guaranteed delivery

Expedited border

clearance



No hand-offs

Heightened

security



Convenient last mile

Freight/LTL services. Freight and LTL (less-than-truckload) generally consist of larger shipments from multiple sources that travel via a single truck.

These services can both save you money and be highly flexible since drivers generally make multiple stops to pick up packages or make deliveries.



Economical





Wide range of delivery options

Flexible and scalable



White glove service



Dangerous goods handling



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
- ⊘ Vibrations

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- ⊘ Humidity levels
- 🕗 Light

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 but 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 realtime, 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 temperaturecontrolled 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

In 2020 we've witnessed the COVID-19 outbreak cause unprecedented impact to our economy and society – its existence has impacted even the smallest details of our day-to-day. The healthcare industry has witnessed an unparalleled demand for personal protective equipment (PPE) to protect front-line workers in hospitals and long term care homes while being overwhelmed with a rapid increase of critically ill patients, which is weighing heavily on the pharmaceutical industry. The trajectory of this impact is still somewhat unknown, but it's likely that some pre-pandemic trends will be even more important to our future. Services that allow patients to remain in their own homes, while getting the same quality of care are now more than just convenient, they could be a life saving measure.

Before the pandemic outbreak, we were seeing many healthcare shifts spearheaded by social media, app capabilities and cloud technologies – subsequently heightening consumers 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 (DTC) model has taken off in the retail space. Today, we are starting to see the same trends take place in the healthcare industry too.

In 2019, Jason Mohammed, a Strategic Account Executive for Purolator, spoke about the shift. "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". 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 <u>healthcare supply chains</u> 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 boom 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 1921.¹³ 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 With citizens living longer, more are suffering from chronic conditions requiring full-time care. Furthermore, a report from the Canadian Life and Health Insurance Association noted serious capacity issues in long-term care facilities,¹⁴ long before the outbreak of COVID-19.

What does this mean for the healthcare industry? The combination of a growing and ageing population is driving a hard, unmanageable demand and Canadian health care providers are under pressure to reassess all traditional practices. The general shortage of hospital beds and the long wait times for care are obvious indicators that change



is necessary. In short, hospital services, home care, palliative care and health and wellness programs will all be affected in the coming years. 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.¹⁵

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-thecounter 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.¹⁶ 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.



Building the right foundation for any healthcare delivery

Delivering healthcare to varied types of customers and businesses requires innovative thinking about your <u>supply</u> <u>chain</u>. While healthcare products and devices have a wide range of transit requirements and logistical durability, all healthcare deliveries require a high level of reliability, expertise and care. Here, we've summarized the basic factors to prioritize when looking for a trusted healthcare logistics partner.

- Reduced transit times. Stock-outs of medical supplies are unacceptable. But since stockrooms and supply closets in most Canadian hospitals and community facilities cannot accommodate large quantities of supplies, a steady supply of inventory must be continually accessible within a short window of time.
- Guaranteed delivery times. Customers often expect a date-certain – sometimes even a time-certain – promise of when a shipment will arrive. Failure to deliver on those promises will not only dissatisfy a business but could have serious health-related consequences to its patients.
- Ability to be flexible/scalable. While most medical facilities maintain a steady supply of frequently used consumables, you must be prepared to address "emergency" demand to rapidly increase inventory. The unprecedented impacts of COVID-19, for example, have caused a surge in demand for surgical masks and other PPE around the world.

- Inventory visibility and tracking. With multiple types of products possibly spread across multiple locations, you need to monitor precise inventory levels. As shipments leave your warehouse for their intended destination, tracking their progress from your loading dock to your customer's door is vital.
- Cost efficient. As you know, Canada's medical supply industry is highly competitive, especially as non-Canadian ecommerce businesses expand their inventories to include medical supplies, often at discounted prices. Canadian businesses are, therefore, under intense pressure to reduce costs without sacrificing customer service expectations for fast, on-time deliveries.
- Efficient global sourcing. Roughly 80% of all medical device products are imported from other countries.³ Distributors must have the resources to identify international suppliers and build a supply chain for bringing goods into Canada. This includes adhering to all customs requirements and complying with Health Canada and other agency requirements for packaging, content, advertising, storage and transport.

Delivering the healthcare industry, for now and beyond

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.¹⁷ There 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, working with an experienced healthcare logistics provider can play a large part in your business prosperity, from improving accessibility of medical devices to ensuring the safeguarding of sensitive products in-transit. As Canada's health care services industry aligns with a new reality due to the pandemic, what will undoubtedly emerge will be a more efficient, patient-centric system away from traditional points of care. For medical supply manufacturers and distributors, though, adapting to this new normal will require a significant reworking of traditional supply chain practices. For most, an experienced and innovative supply chain partner will be integral to helping make the necessary adjustments.





Are You Ready for the Future of Delivery?

Shipping for the Healthcare Industry demands specialized handling and on-time deliveries. Learn how Purolator can help.

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Resources

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