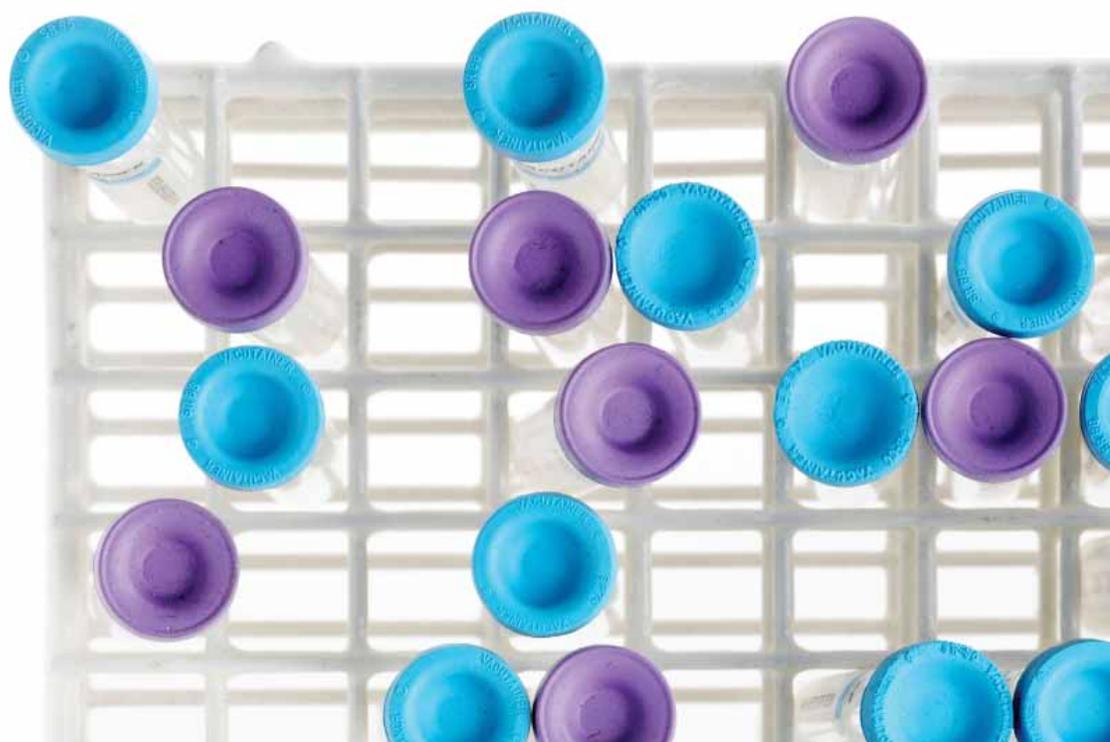




Re-engineer your supply chain to save lives

A framework to successfully track and distribute medication



A crisis in the quality of care

In Canada, approximately 185,000 ADEs occur annually,¹ while in the United States, ADEs and medication errors cause between 44,000 and 98,000 preventable deaths and one million injuries each year.² This takes an exceptional toll on the industry. Aside from the financial costs, which are estimated at \$16,000 to \$24,000 per ADE,³ this high incidence of error interferes with the ability of healthcare organizations to deliver safe, efficient and regulatory-compliant patient care. Most critically, people are dying.

Although higher spending could help reduce the rates of mortality, readmission and ADEs,⁴ tight operating budgets make it difficult for healthcare organizations to implement the state-of-the-art technologies, systems, processes, standards and controls required to track medication across the supply chain. As a result, organizations across the globe are struggling to deliver the “seven rights of medication”⁵ – which involve providing the right drug in the right doses to the right patient across the right route, at the right time using the right equipment and the right documentation.

Become the leader of the future

To reverse this trend, healthcare organizations need to rethink the pharmaceutical supply chain with the aim of centralizing operations across the entire hospital network. By adopting this type of network-wide approach, rather

than viewing these improvement opportunities from a site-by-site perspective, you can do more than improve the efficiency, effectiveness, control, visibility and transparency of your supply chain; you can also enhance your ability to track medication from its point of origin (production and manufacturing) to the point of care (dispensing and patient administration) – vastly reducing the errors that cost both significant sums of money and lives.

Healthcare organizations and medication providers now have an unprecedented opportunity to decrease ADEs, gain operational efficiencies and improve service levels – all while saving millions of dollars.

7 rights of medication

-  Right **drug**
-  Right **doses**
-  Right **patient**
-  Right **route**
-  Right **time**
-  Right **equipment**
-  Right **documentation**

The imperative of tracking medication to the point of care

The inability to track medication across the supply chain adds millions of dollars to the operating costs of healthcare organizations, and results in preventable ADEs that affect thousands of lives. Without standardized supply chain controls and verification processes, healthcare providers run the risk of failing to achieve the seven rights of medication, putting patients in danger.

We live in a society where supermarkets can track their cereal better than a hospital can track its morphine.

While several factors contribute to this state of affairs, three key issues raise particular concerns: the inability of healthcare technologies to interoperate; lack of inventory controls and monitoring; and the move towards stricter regulations.

Systems and technologies do not speak the same language

Before you can track medication to its point of care, you need systems and technologies that enable real-time visibility and transparency of your information, such as electronic orders, prescriptions and patient identification. Currently, most organizations operate with multiple non-uniform systems and technologies that do not speak the same language. This lack of system integration leads to duplicated efforts, re-entry errors, excess costs and delayed access to information. Most significantly, it puts patient safety at risk as prescribing and transcription errors account for more than 50% of ADEs.

Alarming facts

- ADEs can **cost up to \$5.6M per hospital** depending on size⁶
- Patients experiencing ADEs are hospitalized, on average, eight to 12 days longer than patients not suffering from ADEs, **costing in the range of \$16,000 to \$24,000 per patient**⁷
- Every 100 hospital admissions result in 7.5 ADEs (**28% related specifically to drugs**)⁸
- **38% of ADEs result from the improper administration of medication**⁹
- Due to a lack of clinical information systems, medical/nursing staff allocate up to **25% of their time manually collecting, analyzing, using and communicating information**¹⁰
- On-demand access to clinical information continues to be inadequate, contributing to **duplication of effort, excess costs, increased risk for ADEs and reduced efficiency**¹¹

Inventory obsolescence

Due to poor information visibility and transparency, hospitals and pharmacies cannot properly track medication expiration dates, lot and serial numbers, inventory levels or temperature and storage controls, resulting in extensive inventory waste. Over-reliance on paper-based processes for cycle counts, replenishment, dispensing and packaging creates errors and makes it impossible to share information in real-time across the organization. These poor inventory management practices put patients in danger and raise costs.

The move towards stricter regulations

In an effort to enhance patient safety, governments and regulatory bodies around the world are taking firm measures to improve the tracking of medication to the point of care. By enforcing strict audit trail and pedigree requirements throughout the supply chain – from the manufacturing or production site to the patient – regulators hope to do more than strengthen supply chain processes. They are also aiming to stop the flow of counterfeit drugs infiltrating global supply chains and eroding the bottom lines of pharmaceutical companies and healthcare providers. Currently, there are several impending regulations and standards (e.g., ePedigree, USP Chapter 797, etc.) that are in the process of being implemented and enforced, and additional regulation will likely evolve in the near future. Healthcare organizations, across North America face challenges to achieve compliance with these upcoming, strict standards and regulations.

Alarming facts

- **Operating costs are rising** due to excess inventory, obsolete and expired medication, effort redundancies, theft and shrinkage
- 17.2% of nurses' time is spent preparing and administering medication, resulting in **increasing medication errors**¹²
- Inefficient inventory management **increases medication storage and holding costs**
- Supplies and drugs account for approximately **30% to 35% of hospital operating budgets**¹³
- Healthcare organizations are often **unable to comply with existing standards and regulations** related to medication production, storage and transportation
- Organizations risk facing **law suits, penalties and fees for not complying with impending regulations** (e.g., USP Chapter 797, ePedigree, etc.) **administration of medication**

The causes of inaction

With proper tracking of medication to the point of care, hundreds of millions could potentially be returned to patient care in Canada each year. These savings would be realized by reducing ADEs, lowering medication waste levels and avoiding penalties and lawsuits. Given these benefits, why are so few organizations taking action? There are three primary reasons:

Budgetary pressures

- Tight budgets and cost pressures make it difficult to justify the costly investments required to acquire the necessary equipment for each hospital or drug production or distribution site within non-centralized organizations
- While healthcare stakeholders know that inefficiencies and ADEs waste money, they do not know where to invest the next dollar to reduce this cost burden¹⁴

Varying maturity levels

- Varying maturity levels of organizations and their respective hospitals across provinces, nations and continents make it difficult to implement one uniform solution

Lack of standardization

- Healthcare organizations often use multiple, non-interoperable systems and fail to standardize critical processes, technologies and equipment, resulting in an inability to share information across the organization

Healthcare organizations must act now to stop the escalating costs and the lives affected due to poor tracking of medication. Fortunately, new solutions are emerging to help them reach this goal.



Centralize the supply chain

Healthcare organizations already understand the benefits of a robust supply chain enabled by technology infrastructures, processes, controls and accountability. An optimally-designed supply chain can give you full visibility and transparency into your medication processes and let you share related information across your entire organization. Implemented effectively, your healthcare organization will be empowered to track the entire flow of medication in real-time, across clinical drug selection, order processing and entry, sourcing, purchasing, production, preparation, packaging, storage, distribution, dispensing and administration .

Yet the costs to achieve these benefits are often perceived as prohibitive – until now. A recent trend towards centralization enables healthcare organizations to meet evolving regulatory standards, achieve synergies from economies of scale and reduce ADEs—all while realizing measurable cost savings.

The solution is designed to have healthcare organizations consolidate their operations across a small number of centralized production and distribution facilities. With only a few locations managing all distribution, production, and packaging operations, you can reduce the costs associated with standardizing critical processes. This also reduces the cost of acquiring the technologies, systems and resources you need to track medication to the point of care. Further cost savings are achievable by re-locating and re-using existing equipment, systems and technologies from your previous individual sites to the new consolidated production and distribution facilities. Once the centralized facilities are set up, you can move production of high-risk drugs to the central location, reducing the time it takes for nurses to dispense and administer drugs at each site and positioning you to consistently meet strict regulations and standards of the production and preparation environment of sensitive drugs.

	Clinical drug selection	Order processing and entry	Medication purchasing	Production, inventory and packaging	Care unit storage and inventory	Dispensing and administration
People and processes	<ul style="list-style-type: none"> Clinical pharmacist optimizes drug selection Clinical pharmacists participate in interdisciplinary rounds 	<ul style="list-style-type: none"> Pharmacist reviews all prescriptions 	<ul style="list-style-type: none"> Use group purchasing organization contracts Standardize formulary and drugs Adopt decision-making process for drug purchase and production 	<ul style="list-style-type: none"> Adopt compliant drug preparation standards Limit time nurses spend preparing and mixing drugs on units 	<ul style="list-style-type: none"> Centralize inventory management to reduce waste and track expiry dates Update min/max/ PAR levels on an ongoing basis 	<ul style="list-style-type: none"> Automatically lock nurse-specific medication charts after use Make concerted efforts to reduce the % of overrides
Systems and technology	<ul style="list-style-type: none"> Use electronic prescriber entry 	<ul style="list-style-type: none"> Use electronic order entry systems with integrated alerts and interactions Eliminate order transcription 	<ul style="list-style-type: none"> Integrate pharmacy clinical system and procurement/ inventory systems 	<ul style="list-style-type: none"> Centralize batch production for IV across all acute care Use robotics and automation 	<ul style="list-style-type: none"> Keep minimal ward stock on units Automate replenishment of ward stock 	<ul style="list-style-type: none"> Have cabinets use patient profile dispensing function Work to adopt bar coding at bedside

The business case for centralization

- **Generates** costs savings by reducing the number of resources required at each site
- **Enables** transportation synergies and freight savings from consolidated deliveries
- **Reduces** nurses and clinical staff required to verify, control and dispense medication at each location, resulting in cost savings and efficient utilization of resources
- **Creates** economies of scale and synergies across an organization
- **Allows** for implementation of uniform state-of-the-art technology infrastructure, information systems and automation equipment, such as:
 - ➔ Real-time tracking and location systems (e.g., bar coding, RFID, wristbands and wireless technologies) that can be deployed in a patient care environment to **improve clinical workflow, increase patient safety and enhance access to real-time information**
 - ➔ Real-time traceability systems (serialization, electronic pedigree) to track medication and create records of each touch point across the supply chain to **patient administration**
 - ➔ Interoperable clinical information systems enabling real-time sharing of information to increase the transparency and visibility of information and to **alert healthcare professionals of relevant patient information/history**
 - ➔ Systems to **optimize and automate inventory management**, including tracking of medication expiry dates and stock levels, and performing cycle counts
 - ➔ Automated medication production, packaging and dispensing equipment that **increases productivity and reduces medication errors**

Cost savings derived from the centralized facilities can be re-invested in automated administration and dispensing cabinets at each individual site within your network, further improving tracking of medication to the point of care.

From concept to reality

Although your approach to centralization will vary depending on your size, ownership structure and the maturity of your operations, you still stand to benefit from a centralized operational model.

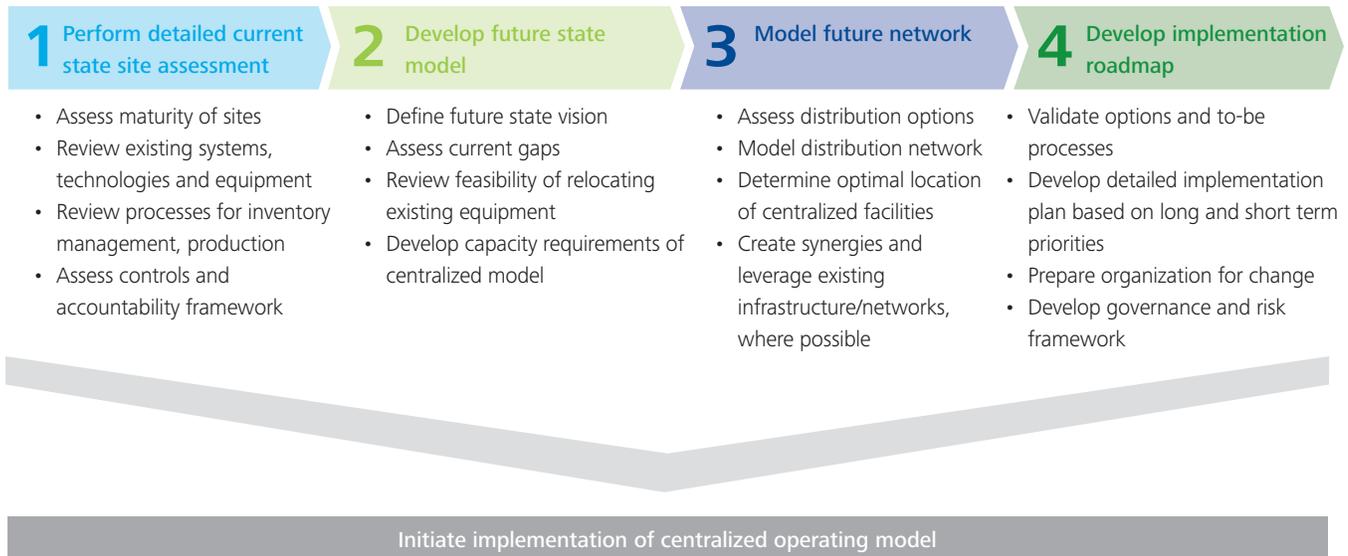
For instance, by restructuring their current networks and centralizing critical internal operations on their own, large private or publicly-owned organizations can achieve the economies of scale necessary to justify the implementation of new standards, processes, technologies, automated systems and tracking equipment.

For their part, smaller organizations that lack the ability, resources, and number of sites to centralize its operations

solely on its own, can achieve centralization through collaboration and strategic partnerships and by leveraging the scale of large third-party distributors who can handle sensitive medication storage, production and distribution processes. Smaller scale organizations should leverage these third-party distributors that have the scale and resources necessary to generate economies and to adopt state-of-the-art equipment, systems and technologies. Outsourcing of critical processes to larger specialized third or fourth-party logistics providers (3PL or 4PL) can help smaller organizations achieve significant benefits while ensuring compliance with regulation and standards.

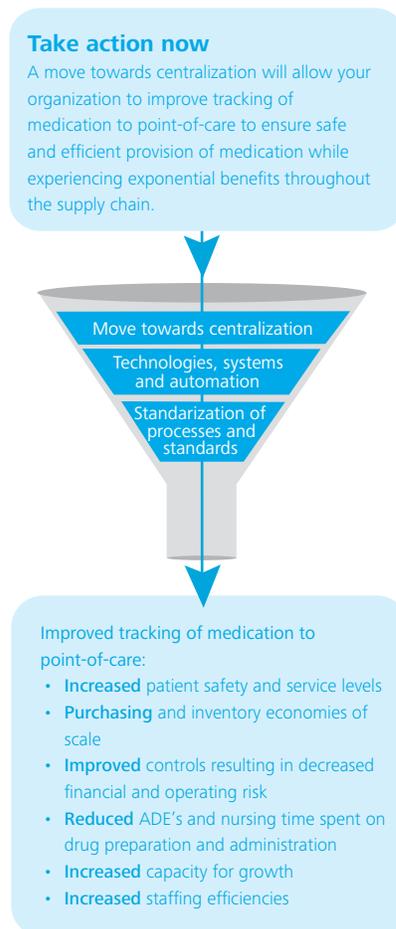
Although there are no one-size-fits-all solutions, you can begin to adopt a centralized approach by following these four primary steps:

The following steps will assist you to determine how centralization applies to your organization:



Take action and save lives

By taking action to improve the tracking of medication to the point of care, your organization will experience exponential benefits. In addition to meeting regulatory standards, you can improve operational efficiency, realize significant cost savings, deliver exceptional service levels and enhance patient safety.



By reducing ADEs and improving operational efficiency, organizations can save millions of dollars and realize a wide range of benefits, such as:

Increased patient safety and service levels

- **Reduce** ADEs with a state-of-the-art production and distribution system that provides high-quality, ready-to-use drug products with bar coding capability
- **Provide** regulatory-compliant products to all sites
- **Decrease** waiting and cycle times

Purchasing and inventory economies of scale

- **Enjoy** savings related to consolidation of purchase orders and streamlined procure-to-pay functions
- **Lower** overall cost of purchasing

Improved controls resulting in decreased financial and operating risk

- **Adopt** a strong control environment to minimize financial and operational risks and improve patient safety
- **Increase** accountability for drug administration
- **Reduce** waste and obsolete inventory with tighter inventory controls, accurate information flows and proper storage conditions

Reduced ADEs and nursing time spent on drug preparation and administration

- **Vastly reduce** nursing time spent on drug preparation by having medication prepared at the central facility and ready for administration when delivered to each hospital
- **Reduce** duplicated efforts
- **Enhance** job satisfaction and reduce pressures due to increased confidence in safety of drug distribution

Increased capacity for growth

- **Increase** efficiency and production capacity to meet future demand with centralized facilities that feature best-in-class technologies

Increased staffing efficiencies

- **Reduce** manual and labour-intensive production to realize resource efficiencies

Become the change you want to see

With patients' lives at stake, healthcare organizations need to continue to improve the tracking of medication to its point of care. Despite historically tight budgets, the recent trend toward centralization can help you reduce ADEs, meet evolving regulatory requirements and achieve significant gains in productivity, service levels, inventory management and operational efficiency. By performing a detailed review of your current state operations, you can begin to determine how centralization – either independently or through strategic collaboration with a third-party organization – applies to your organization. Ultimately, by taking action today, you can position your organization to become a leader of tomorrow.

Contacts

Niklas Virta
nvirta@deloitte.ca
780-421-3672

Sarah-Ann Herbers
sherbers@deloitte.ca
780-421-3660

Genevieve Giguere
ggiguere@deloitte.ca
514-393-7353

Paul Marc Frenette
pfrenette@deloitte.ca
780-421-3770

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