

OPERATIONS AND LOGISTICS MANAGEMENT

CASE

Presented by

ESG UQAM


Cascades

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Hospitals in the Health and Social Services Ecosystem

Access to care and people's well-being is central to what we do.

Quebec Ministry of Health and Social Services vision

Note: This case depicts a scenario and is not based on real data.

All statements made and ideas conveyed are solely those of the authors of the case and do not imply any responsibility on the part of any organizational entity mentioned or referred to.



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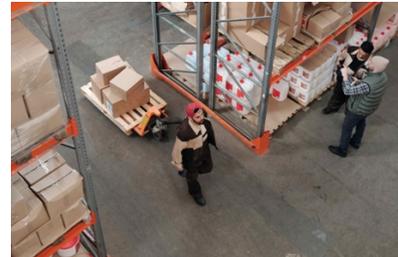


Photo by Tiger Lily—Pexels



The Ministry of Health and Social Services (MSSS) is allocated almost half of the province of Quebec's total budget.¹ This amounts to more than \$40.8 billion for the 2019–2020 fiscal year alone. This budget increases every year. In addition, about 7% of Quebec's active population is working in this sector. **(Appendix 1).**

In order to fulfill its mission, the MSSS relies on a network of institutions (CISSS-integrated health and social services centre, CIUSSS-integrated university health and social services centres, hospitals, family medicine groups, community pharmacies, community organizations, social economy enterprises, private seniors' homes, etc.).²³

The MSSS ensures smooth operation of the 34 public establishments, including 13 CISSS and 9 CIUSSS. They are responsible for planning and organizing health and social services to people in their respective territories. We also find non-merged establishments such as university medical centres (CHU) or university institutes providing specialized services beyond the health region they belong to.⁴ **(Appendix 2).**

The health system must therefore adapt to the changing needs of the clients it serves, regardless of their living environment. The primary mission of any health centre is to provide health care services in a safe environment.

Various elements are putting pressure on the network. An analysis of the external environment has identified that the improvement in life expectancy and the aging of the population translate into a growing demand for health care and social services.⁵

This growth is hampered by the labour scarcity both in terms of health personnel (nurses, nursing assistants, nursing assistants, orderlies, etc.) and in terms of support trades (housekeepers, food service attendants, clerks, etc.). Recruiting, retaining and mobilizing staff are therefore priority issues to meet the population's needs. However, this situation was worsened by the COVID-19 crisis.⁶

¹ The 2018-2019 Budgetary Expenditures and the 2019-2020 Budgetary Estimates: https://www.tresor.gouv.qc.ca/fileadmin/PDF/budget_depenses/19-20/en/7-Additional_Information.pdf

² Ministry of Health and Social Services Strategic Plan for 2019-2023 (french only) | 2 https://cdn-contentu.quebec.ca/cdn-contentu/adm/min/sante-services-sociaux/publications-adm/plan-strategique/PL_19-717-02W_MSSS.pdf?1575489339

³ Within the same region, a CIUSSS brings together hospital centres, local community service centres, long-term care facilities, child and youth protection centres and rehabilitation centres. (source: <https://santemontreal.qc.ca/en/public/montreal-institutions-at-a-glance/ciuss/>)

⁴ Hospital complexes affiliated with universities teaching health sciences, including medicine. There are 3 main axes to the CHU's mission: specialized and superspecialized care, teaching and research.

⁵ "Estimates suggest that the proportion of seniors in the total population will rise to 25% in 203, compared to 18% in 2016 ... the number of people aged 75 years or more will double in the coming years" (source: Government of Quebec). Institut de la statistique du Québec, "Demographic projections for Québec and its regions, 2016-2066" (french only): https://bdso.gouv.qc.ca/docs-ken/multimedia/PB01661FR_Perspective_demo2019H00F00.pdf

⁶ <https://www.msss.gouv.qc.ca/accueil/2020-04-14-0848-covid-19-metiers-en-demande/>



COVID-19: Bringing on complications and highlighting logistical weaknesses

“Without press coverage of the collateral effects of COVID-19, no one would have been interested in the maintenance of ventilation systems or in the supply of personal protective equipment (PPE). Who really takes interest in inventory management, laundry services or maintenance of mechanical rooms? No one! However, the network cannot operate without it.”

Director of Technical Services of a CIUSSS

As a reminder, Radio Canada said that “on December 31, 2019, the Canadian company BlueDot identified the first 27 suspected cases of pneumonia near an animal market in Wuhan, China.⁷ They then alerted the authorities.” As of January 10, 2020, the World Health Organization (WHO) released numerous documents and guidelines on how to manage this new pandemic.⁸ Later that month, the WHO Executive Director stated that the emerging coronavirus was a global public health emergency. On March 11, 2020, the WHO officially declared that the coronavirus disease (COVID-19) is a pandemic. On April 4, 2020, the WHO reported that the first million cases of infected individuals had been reached, a tenfold increase from the previous month. Six months later, 50 million cases were exceeded.

Quebec’s first case of COVID-19 was confirmed on February 28, 2020, and on March 13, a health emergency was declared in the province. The Quebec government created a crisis cell to deal with this unprecedented challenge. Nationally, the Public Health Agency of Canada, working with provinces (and the Institut national de santé publique du Québec), was mobilized to curb the outbreak and prevent further spread of the virus.^{9,10} Yet despite the awareness initiatives, the implemented screening strategies and the scientific recommendations to inform government decision-making and support the health care system, the virus continued to spread.

This crisis revealed the vulnerable state of the health care network, particularly in the management of medical supplies by hospital logistics. The mask shortage in health care facilities soon became obvious¹¹.

⁷ Radio Canada (2020). COVID-19: Artificial intelligence as a tool to fight the pandemic. <https://ici.radio-canada.ca/nouvelle/1690700/intelligence-artificielle-combattre-pandemie-covid-coronavirus>

⁸ Timeline: WHO’s COVID-19 response: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline>
⁹ <https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19.html>

¹⁰ <https://www.inspq.qc.ca/en>

¹¹ Indeed, numerous articles have been published on this topic since January 2020: Coronavirus leads to a shortage of masks in Quebec City: <https://ici.radio-canada.ca/nouvelle/1495182/coronavirus-provoque-penurie-masques-quebec> /According to the nurses' union, the lack of



However, this was merely the tip of the iceberg. Other personal protective equipment (PPE) inventories such as latex gloves, disposable gowns or overshirts were rapidly depleted, creating major stockouts. The unforeseen demand for this type of supply, which was completely different from the usual forecasts, created a serious imbalance in hospital logistics team planning and in the global supply chain.

Since most hospitals manage this type of equipment following the same strategies and techniques as other low-value medical supplies (e.g., bandages, syringes, collection tubes—found in self-service depots on different floors), they quickly lost control over its usage.

It quickly became a dog-eat-dog world.¹² Some countries and health networks employed various marketing tactics to secure materials. In addition, the price of PPE, most of which is produced in China, has risen dramatically due to the urgency of orders and the supply/demand equation.¹³

The groups in charge of hospital logistics in Quebec were hit hard by this pandemic. They had to quickly rethink their inventory management strategies to respond to the needs of the network and protect all stakeholders, the “guardian angels,” of their institution.

Meanwhile, the virus continued to spread and a second wave swept across the world. As of December 2020, more than 65 million cases were reported worldwide.

Hospitals have replenished their stocks of PPE by buying in mass quantities to supply the coming months’ needs. Now we need to rethink the day-to-day operations and manage efficiently hundreds of other low-value medical supplies.

What about hospital management?

“Hospital logistics is a vector for generating savings and more actively supporting the delivery of care (...) Although hospital management is aware of this, hospital logistics processes are often rudimentary or fragmented among the various stakeholders in the organization.”

protective equipment is still glaring: <https://ici.radio-canada.ca/nouvelle/1701784/epi-masques-penurie-infirmiers-hopitaux-manitoba-pallister-covid-coronavirus>

¹² Medical supplies: Real shortage and unaffordable items: <https://www.lesoleil.com/actualite/covid-19/materiel-medical-une-reelle-penurie-et-des-articles-hors-de-prix-bcd5e929dac6d50d5f90c3cbddc6c283>

¹³ Global shortage of medical supplies: it’s a dog-eat-dog world: <https://www.journaldemontreal.com/2020/04/03/cest-la-loi-de-la-jungle>



The COVID-19 highlighted the importance of considering all the support services needed to ensure the smooth functioning of the health care network. We must therefore ensure that the institutions' management is aware of the need to equip themselves with the means to provide health care. Because care activities are always in the forefront, support activities, which are crucial to the efficient and safe delivery of service, are often relegated to the background.

An example of this situation is hospital logistics, covering all management activities for the purchase, inventory management and resupply of goods and services surrounding the medical services provided to patients¹⁵.

Hospital logistics is often broken down into a number of different areas, such as inventory management (medical or not), laundry, sterile central, pharmacy, waste (regular or biomedical), kitchens, etc. Here, we are addressing the management of medical supplies used for patient care. Not to mention the time spent on these activities by a host of clerks: inventory counts, storage of supplies, planned and emergency restocking, distribution on the floors, etc. The Montreal Regional General Hospital (MRGH) is no exception.

Logistics at the Montreal General Hospital (MGH)

“Of course, providing nurses with the right supplies, at the right time, in the right quantity for the right patient, and ... at a lower cost would be ideal,”

Mr. Count, Director of Logistics at MGH.

Mr. Dinvantère, director of the MGH's logistics group, would like to present the challenges currently faced by his group. He is currently working with his team to improve the resupply process for low-value medical supplies (e.g., dressings, syringes, needles, latex gloves, masks, sample tubes), of which PPE is a part. All these medical supplies are essential for staff to provide patient care efficiently.

¹⁴ Beaulieu M. and J. Roy (2015). Hospital logistics: conclusions of a Quebec survey: https://www.revuegestion.ca/auteur/pole_sante_hec_montreal

¹⁵ Adapted from Beaulieu, M., S. Landry and J. Roy (2012). [Efficient Logistical Activities in Healthcare Sector](https://cpp.hec.ca/en/efficient-logistical-activities-in-healthcare-sector/). Centre for productivity and Prosperity, HEC Montréal <https://cpp.hec.ca/en/efficient-logistical-activities-in-healthcare-sector/>



Current Processes for Managing Low-Value Medical Supply Inventories

There are currently three low-value medical supply storage locations per floor in a 10-storey building. **(Appendix 3)**. Each depot contains an average of 500 inventory management units (or SKUs-stock keeping units)¹⁶.

“When a nursing staff member needs medical supplies, they go to the nearest depot and check availability. If medical supplies are available in the depot, they take them and return to the patient immediately. If medical supplies are not available, they must check other storage locations until it’s found. They then take it and go to the patient for treatment.

Normally, the resupply of deposits is done by clerks passing by on a regular basis, following a predetermined schedule; On their rounds, they keep track of the items to be resupplied at each depot (according to the items counted vs. the established quotas). They then proceed to the hospital’s central depot and prepare the supply carts, then distribute them to the depots; That said, the current resupplying process is problematic. Finding room to store all the desired SKUs, making sure that medical staff can pick them up without too much difficulty, or that the clerks can make an inventory of the needs and restock easily is not always easy. Shortages are often occurring in the storage locations. To bridge this, the usual strategy is to stock more of each item.

This strategy obviously plays tricks on some occasions. For example, during inventory counts, surprises such as forgotten items or medical supplies gone out of date a few years ago might be discovered!

Also, in some cases, the nursing staff prefer to determine their own needs and to deal with suppliers themselves. This is the case of the Central Sterile which places orders for a variety of specific medical supplies for them, but also for other departments. This means hundreds of requests per month, averaging 30 minutes per request.

*Moreover, as the supply readiness directly affects the process of patient care, there is a great pressure to address the problem, especially in the current environment.” **Mr. Count***

Exploring Resupplying Solutions for Low-Value Medical Supplies

In a first meeting with the staff, Mr. Count raised this issue and solicited ideas to improve the resupplying process. He was given two ideas.

¹⁶ Specific item that can be differentiated from the rest of the items in stock and which is characterized, among other things, by its function, style, size, color and physical location.



One of his employees studying in operations management and logistics, has just read an article on the subject. In this article, the authors present a resupplying process in double kanban locker which relies on RFID technologies. In his opinion, the solution outlined in the article would be relevant to the GMHI. A summary of the resupplying process, taken from its operations management book¹⁷, can be found in **Appendix 4**.

This type of system has actually been around for several years, and many companies now offer such turnkey solutions. Logi-D Inc. was one of the leaders in the field of “hospital point-of-use supply chain automation technology.” *The company has since been acquired by Tecsys, a provider of supply chain management solutions.*¹⁸

In this regard, Mr. Count brought out a study he had read on the topic when he was doing his own MBA.¹⁹ A synthesis grid is presented by the authors in order to better understand the possible return on investment of this type of solution. **(Appendix 5)**. Upon consulting it, he discovered interesting performance indicators and impacts. But Mr. Count is not completely convinced yet. He recalls that the feedback from his colleagues who have implemented such solutions is not always very impressive.

Another employee of his reminded Mr. Count that they had met with a *Cardinal Health/WaveMark*’ representative last year²⁰. He gave them a presentation on a simplified inventory management solution that relies on “good old-fashioned barcodes.” **(Appendix 6)**. This resupply management method sounds perfect, but the representative had a well-honed speech. How can we tell the advantages of the solution apart from the sales representative’s pitch?

Following this meeting, Mr. Count sent an email to his entire staff asking for new avenues of resolution. Upon reading the emails he received **(Appendix 7)**, his confusion grew even more and it brought him even more questions.

Questions the Logistics Team Raises

Mr. Count is therefore thinking of inviting a group of experts to help him sort out the relevant solutions. To assist him in structuring his reflection to select a solution, he is asking your help to:

¹⁷ Spooner M.P., Y. Bendavid, S. Marcotte and H. Bourenane. Introduction to Operations Management - Aiming for Operational Excellence, Presses de l'Université du Québec, September 2014.

¹⁸ <https://www.tecsys.com/>

¹⁹ Bendavid, Y., Boeck, H. and Philippe, R. (2010). Redesigning the Replenishment Process of Medical Supplies in Hospitals with RFID. Business Process Management Journal, 16(6), 991–1013. <http://dx.doi.org/10.1108/14637151011093035>

²⁰ WaveMark Supply Management & Workflow Solutions: <https://www.cardinalhealth.com/en/services/acute/medical-services/wavemark-supply-management.html>



- Understand why the current resupply-distribution process is problematic.
- Explain how the delivery can be efficient and effective, in the hospital sector, should not have delays or inventory breakdowns since these are essential materials.
- Identify three solutions you think are most promising to improve the current process efficiency. You are not limited to the solutions presented in the case. Provide a synthesis of these solutions to Mr. Count's team.
- Select a solution among the ones you have identified.
- Indicate the potential impacts of the selected solution on process performance.
- Involve the element of ecology of sustainable development in your solution. It is important that the entire supply chain is considered, from the selection of suppliers to the carrier.
- Give any other recommendations that you feel are relevant to the selected solution.



Appendices

Appendix 1: Government of Quebec's 2020–2021 Budgetary Estimates

Budget de dépenses (en milliers de dollars)		
	2020-2021	2019-2020
	Budget de dépenses	Dépense probable
Assemblée nationale ¹	137 619,3	138 220,9
Personnes désignées par l'Assemblée nationale ¹	110 017,3	107 135,8
Affaires municipales et Habitation	2 315 011,6	2 581 122,4
Agriculture, Pêcheries et Alimentation	995 716,2	971 736,2
Conseil du trésor et Administration gouvernementale	1 912 603,7	1 454 976,3 ²
Conseil exécutif	527 321,5	492 747,4 ²
Culture et Communications	861 322,4	766 419,0
Économie et Innovation	1 112 159,4	1 801 953,7
Éducation et Enseignement supérieur	22 195 762,3	21 206 861,2
Énergie et Ressources naturelles	145 449,5	141 320,8
Environnement et Lutte contre les changements climatiques	281 490,0	211 751,9
Famille	2 903 843,9	2 877 184,9
Finances	189 736,4	113 967,3 ²
Forêts, Faune et Parcs	563 887,1	546 061,8
Immigration, Francisation et Intégration	576 785,3	392 383,0 ²
Justice	1 080 945,4	1 058 292,2
Relations internationales et Francophonie	117 729,3	113 862,5
Santé et Services sociaux	42 786 958,6	40 625 077,6
Sécurité publique	1 682 580,1	1 794 089,9
Tourisme	167 599,6	161 152,4
Transports	1 084 184,9	1 044 359,9
Travail, Emploi et Solidarité sociale	4 442 376,2	4 534 722,9
Pertes estimées sur investissement dans la CSeries	-	(603 000,0)
Dépenses de programmes	86 191 100,0	82 532 400,0
Service de la dette	5 859 151,3	5 560 258,0
Dépenses budgétaires	92 050 251,3	88 092 658,0

¹ L'information portant sur les crédits et les dépenses de ce portefeuille se retrouve dans le volume « Crédits et plans annuels de gestion des dépenses de l'Assemblée nationale et des personnes désignées ».

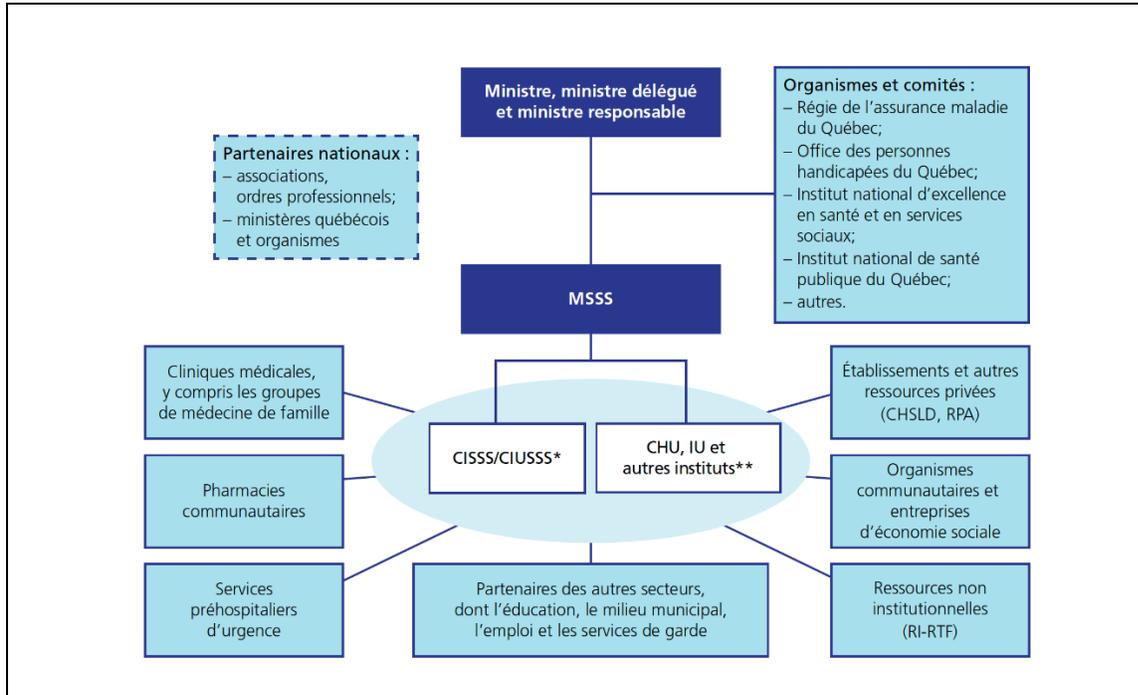
² Ce portefeuille contient une ou des provisions qui permettent des transferts de crédits à d'autres portefeuilles et les dépenses qui y sont comptabilisées en 2019-2020 tiennent compte des virements à l'un ou l'autre des portefeuilles.

Government of Quebec—2020. BUDGETARY ESTIMATES 2020•2021 VOL. 3,
ESTIMATES OF THE DEPARTMENT AND BODIES
https://www.tresor.gouv.qc.ca/fileadmin/PDF/budget_depenses/19-20/en/3-Estimates_Departments_Bodies.pdf

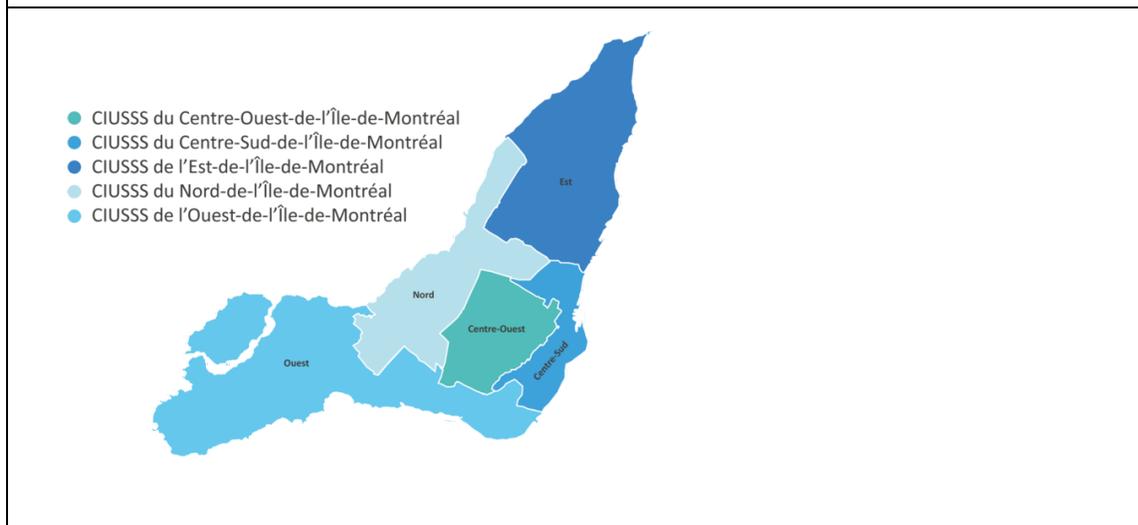


Appendix 2: Health and Social Services System Structure

The Montreal General Hospital (MGH) referred to in this case is one of the health care institutions belonging to the Montreal CIUSSS



French Abbreviations: CHSLD: residential and long-term care centre; CHU: university hospital centre; CISSS: integrated health and social services centre; CIUSSS: integrated university health and social services centre; IU: university institutes; RI-RTF: intermediate and family-type resources; RPA: private seniors' residence.



Montreal CIUSSS Map



Figure 1: Health and Social Services System Structure ²¹

²¹ https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/sante-services-sociaux/publications-adm/rapport-annuel-de-gestion/RA_20-102-01W_MSSS.pdf?1601562378



Appendix 3: Floor Storage Examples



Figure 2: Floor storage examples



Appendix 4: Double-bin Kanban RFID Solution

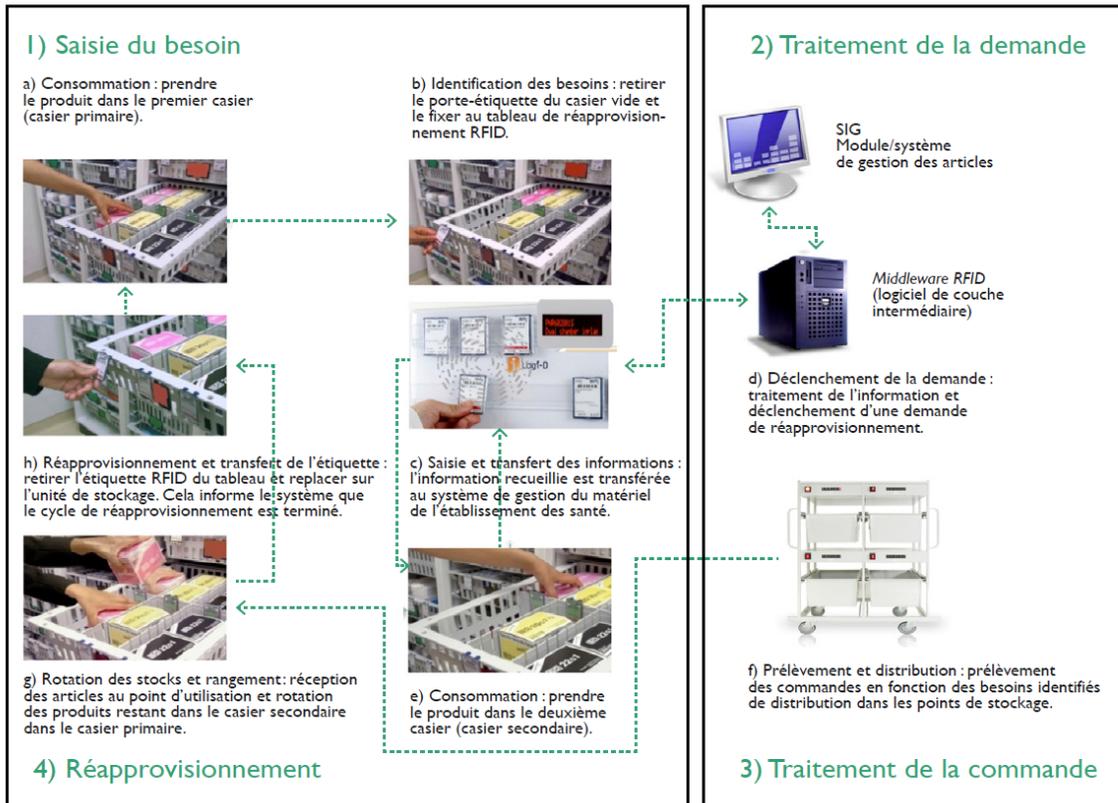


Figure 3: RFID-based resupply process

As we can see in figure 3, a given amount of an item is distributed between two compartments of a storage module. When **a)** the first compartment (primary bin) is empty in an operating room, examination room, laboratory or care unit, **b)** the user removes a tag equipped with an RFID transponder and **c)** places it on a resupplying board equipped with an RFID antenna, **d)** which automatically triggers a resupply request in accordance with preset internal management rules in the software. The processed information is then transferred to the health care facility's material management system so that a picking ticket (for in-stock items) corresponding to the needs is generated or a purchase order is given for out-of-stock items.

Awaiting supply, as required, **(e)** Requesting staff may use the supplies from the second bin to carry on with their work. In order to track the request processing, **f)** the staff collects the items according to the identified needs and distributes them to the storage units. When new supplies are delivered to the needed location, items remaining in the secondary bin are transferred to the primary bin. New items, **g)** are stored in the secondary bin. This ensures stock rotation. At this point, **h)** the tags corresponding to the delivered items are removed from the RFID supply board



and placed onto the front of the appropriate bin. This notifies the system that the resupplying cycle has been completed.



Appendix 5: Expected Impacts of a Kanban Double-bin RFID Solution

Table1: Summary of the expected benefits of a 2Bin Kanban RFID solution

Description	Details	Savings/ 1 year (Hours)	Savings / 1 year (\$)	Savings / 5 years (\$)
Recurring time savings				
Productivity gains for logistics processes	Nursing staff (e.g., time required by the nursing personnel to pick products from the different units; transferring responsibility/time spent on item ordering for non-stock items)	(2 480)	\$(153 883)	\$ (769 415)
	(Central) Store personnel (e.g., new responsibilities for supply management, replenish the bins of a wider range of products and in different storage locations,)	9 239	\$220 130	\$1 100 650
	Auxiliary personnel (e.g., count/assess the demand for stock and non-stock needs at different storage locations/constrained areas)	(24 281)	\$(589 424)	\$(2 947 120)
Time not directly related to logistic processes (e.g. recover some “non-productive” time by reengineering the process)	(Central) Store personnel	(4 799)	\$(113 287)	\$(566 437)
	Administrative clerk	(617)	\$(13 467)	\$(67 335)
Impact on nursing staff (e.g. improvement from personnel movements/walking distance and retrieval of products from storage locations -eq. 7.5 minutes/day/nurse/working shift)		(78 521)	\$(3 097 373)	\$(15 486 865)
Sub-total (recurring time savings)				
Inventory shrinkage	Stock items		\$(109 453)	\$(547 265)



(reduction estimated @ 3% of value of items distributed vs. initial rate)	Non-stock items		\$(65 367)	\$(326 833)
Sub-total (inventory shrinkage savings)		0	\$(174 820)	\$(874 098)
Sub-total of recurring time and inventory shrinkage related savings		(101 459)	\$(3 922 124)	\$(19 610 620)
Non-recurring inventory related savings				
Optimization of inventory levels (i.e., improved visibility of consumption. Replenishment triggered automatically = better control over ordered quantities and reduces inventory levels)	Auxiliary personnel - stock items		\$(43 335)	\$(83 961)
	Auxiliary personnel - non-stock items		\$(319 407)	\$(618 851)
	Central service - stocks		\$(32 453)	\$(32 453)
Sub-total - non-recurring inventory related savings		0	\$(395 195)	\$(735 265)
Total		(101 459)	\$(4 317 319)	\$(20 345 885)

Appendix 6: Kanban Solution with Double Bins and Barcode

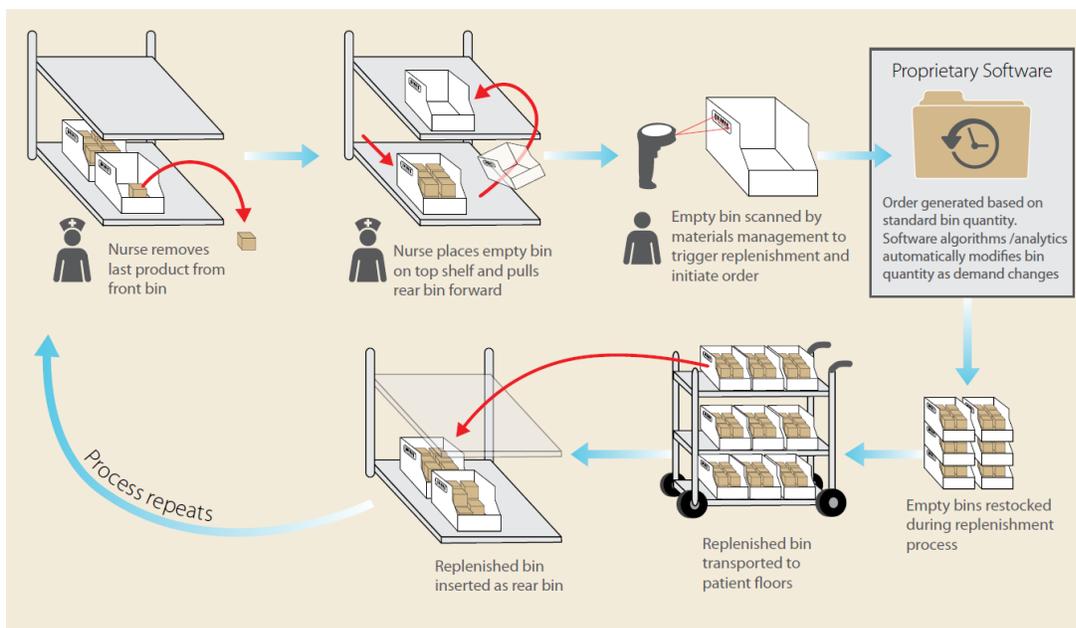


Figure 4: Resupplying process for double kanban-barcode bins ²²

In the 2-bin kanban system²³, each item is stored in two bins placed on shelves, one in front of the other, ensuring the use of first-in-first-out (FIFO). This prevents the medical supplies managed by box or crate (vs. per item) to expire.

- The nursing staff pick up the item they need from the front bin first. If they take the last item, they need to remove the empty bin from the shelf and place it on the specified shelf for collection. Then, they bring the full storage bin forward to pick the desired supplies. When a bin is empty and placed in the collection area, a simple workflow is followed.
- When empty bins are in the collection area, it signals that supplies are needed. During their tour, a logistics team member picks up the empty bins and scans them with a barcode scanner, initiating the resupply process.
- The software automatically triggers a transaction and sends information on low quantity supply requirements to the inventory management information system. Once the distribution centre receives the order, the required items are prepared to resupply each storage location.
- The logistics team refills the bins and scans each one to update the software to indicate that the bin has been filled.
- The logistics clerk then puts the full bins behind the bins in use.

Note 1: During the evaluation, the customer determines whether a barcode or radio frequency identification (RFID) tag will be used for scanning.

Note 2: With medical supplies not stored at the hospital, the information is automatically sent to suppliers then the supplies are directly delivered.

²² <https://www.cardinalhealth.com/content/dam/corp/web/documents/case-study/cardinal-health-2-bin-kanban-case-study.pdf>

²³ Adapted from <https://www.cardinalhealth.com/en/services/acute/medical-services/wavemark-supply-management/supply-management-for-nursing-floors.html>



Appendix 7: Email Exchanges of the MGH Logistics Group around Alternative Solutions

From: G. Count <G.Count@MGH.ca>
Date: Wednesday, October 28, 2020, at 8:17 a.m.
To: “Logistics Group” <Logistics.group@MGH.ca>
Subject: Inventory Management Solution

Hello everyone!

Thank you all for sharing with me alternative solutions to address our difficulties in resupplying low value medical supplies in the storage locations.

While this has answered some questions, it has opened up many leads. We will have to assess the most interesting options and make a judicious choice.

I will invite a group of experts to help us sort it out and structure our thinking towards selecting a solution.

G. Count,
Logistics Manager/. Montreal General Hospital (MGH).
G. [Count@MGH.ca](mailto:G.Count@MGH.ca)

From: A. Puy <A.Puy@MGH.ca>
Date: Tuesday, October 27, 2020, at 4:42 p.m.
To: “Logistics Group” <Logistics.group@MGH.ca>
Subject: RE: Inventory Management Solution (innovation is key)

I agree all the way! We try to solve tomorrow’s problems with yesterday’s solutions. Any health magazine you open is full of truly innovative solutions. (e.g., <https://healthtechmagazine.net/>; <https://medicalfuturist.com/>; <https://healthcareweekly.com/>; <http://www.healthcarebusinesstech.com/>). That’s the direction we must take, period.
We should consider artificial intelligence, for example.

A.P.



From: Tuy. Raive <T.Raive@MGH.ca>

Date: Tuesday, October 27, 2020, at 4:02 p.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: RE: Inventory Management Solution (Something like Amazon Go)

Hold on, I think that with all that is being said, we are exploring trails outside the right track. With everything on the market, I can't believe that there are no solutions where (i) you walk into a depot (ii) you take what you need (iii) you walk out and everything you took is automatically scanned and linked to you. I saw an Amazon video about it in their famous Amazon Go stores. It's been working since 2017! (<https://www.youtube.com/watch?v=NrmMk1Myrxc>)

Tuy



From: T.Care <T.Care@MGH.ca>
Date: Tuesday, October 27, 2020, at 3:54 p.m.
To: "Logistics Group" <Logistics.group@MGH.ca>
Subject: RE: Inventory Management Solution (carts, more worries☺)



Who's going to buy the carts? Bio Med's department?
What about their maintenance? Tech services?
Who's going to control the stock and fill the carts? I guess the warehouse staff will then be in charge of loading the carts again? Using which approach? By level? Exchanging carts?

T.

From: K.I.Easy<K.I_Easy@MGH.ca>
Date: Tuesday, October 27, 2020, at 3:44 p.m.
To: "Logistics Group" <Logistics.group@MGH.ca>
Subject: RE: Inventory Management Solution (carts, fewer worries☺)

That's an idea. I also remember reading somewhere that "another way to reduce outstanding items is to bring the workstations closer together." It gave me the idea of bringing medical supplies closer to the treatment points, but instead of increasing the number of storage locations, we could use carts containing the most common supplies.

Nursing staff travel would be greatly reduced; their medical supplies being readily available.

Kiss ☺

From: F.Nquoi<F.Nquoi@MGH.ca>
Date: Tuesday, October 27, 2020, at 3:12 p.m.
To: "Logistics Group" <Logistics.group@MGH.ca>
Subject: RE: Inventory Management Solution (more storage locations, fewer worries☺)



I would like to pick up on Kiss's idea. In the same vein, it would be just as effective to increase the number of storage locations on each floor, reducing the time required for the nursing staff to walk around and pick up what they need.

François

From: K.I.Easy<K.I_Easy@MGH.ca>

Date: Tuesday, October 27, 2020, at 2:45 p.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: RE: Inventory Management Solution (more bins, fewer worries☺)

Let's get back to the solutions, then we can discuss the project.

Personally, I think there is too little stock available on the nursing staff's shelves.

There are only 2 bins on these shelves. If there were 4 bins in stock or 2 bins with twice the capacity, there would be fewer trips to do by the resupply staff. Indeed, with greater inventory, fewer refills would be needed per week, which would greatly reduce personnel costs, as time-consuming travel would be reduced.

Kiss ☺

From: H.Sertec <H.Sertec@MGH.ca>

Date: Tuesday, October 27, 2020, at 2:56 p.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: RE: Inventory Management Solution (Project Team)

I think Stéphane makes a good point.

Actually, we can look at our processes and think about our team, but as a service centre, our department (Nursing) has to consider our clients and our work with other groups like bio-Med for the equipment selection, technical services for installation, etc. Maybe we should bring them into the discussion?

Hamid



From: S.Ecuriti <S.Ecuriti@MGH.ca>

Date: Tuesday, October 27, 2020, at 2:03 p.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: RE: Inventory Management Solution (beware of cyber attacks?)

Your plans for medical supply chips and robots are all very nice, but I don't know which one of you is going to explain our decision to the IT department. Don't know if you've seen in the news this week the wave of cyber attacks and the impact on the Montreal Jewish General Hospital and the West Island Centre CIUSS. They had to shut down their computer networks on Wednesday. (<https://ici.radio-canada.ca/nouvelle/1745268/attaque-informatique-hopitaux-canada-etats-unis-quebec-virus-rancon>). We'd look pretty sharp without our systems.

Stephane

From: D.Drive <D.XX@MGH.ca>

Date: Tuesday, October 27, 2020, at 2:03 p.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: RE: Inventory Management Solution (robots!!!!)

If we want to stop adding interventions in the process, then why don't we consider robots? CHUM has been using a robot carting system to distribute products on the floors for the past five years. (<https://www.journaldemontreal.com/2015/01/15/une-autoroute-de-robots-au-chum>).

I read that a product can be delivered in just 5 minutes.

A friend of mine went on an organized tour and sent me some pictures. Impressive!



Danielle

From: J.M.Luis <JML@HGrM.ca>
Date: Tuesday, October 27, 2020, at 1:08 p.m.
To: "Logistics Group" <Logistics.group@MGH.ca>
Subject: RE: Inventory Management Solution (removing interventions)

I believe that limiting interventions in the process is what we should be thinking about. This is the key. For example, if you go in with the barcode, you can make it simple: as soon as a nurse empties a box in a depot, he or she scans the barcode—no need to depend on the clerk anymore. This would free up more time for warehouse managers and clerks to fill and transport the orders to the hospital's storage locations.

Plus, the time wasted between when a bin is emptied in a storage location and when the clerk is scanning the bins in that location would be eliminated. There you go 😊♂

Luis

From: M.AlaSol <M.Ala_Sol@MGH.ca>
Date: Tuesday, October 27, 2020, at 12:36 p.m.
To: "Logistics Group" <Logistics.group@MGH.ca>
Subject: RE: Inventory Management Solution (RFID 2Bin Kanban other variants)

Perhaps the barcode is an option. This technology has many advantages and is being implemented in a number of hospitals. I wonder what the marginal contribution of using RFID vs. barcode for the same process is.

However, I think the 2Bin Kanban RFID solution mentioned by our director deserves to be further explored. I'm sure other "variants" exist for these solutions? And certainly several vendors can supply us.

In any case, regardless of the solution chosen, we really need to identify the right performance indicators (KPIs) to gauge the impact on our operations.

Anyway, it's not that simple.



Maria

From: B.Scaneet <B.Scan@MGH.ca>

Date: Tuesday, October 27, 2020, at 11:45 a.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: RE: Inventory Management Solution (barcode label & Kanban)

Before looking for new solutions, why don't we take another look at a more traditional solution? At the bottom of the front bin, a Kanban label with a barcode containing the following information is placed: product numbers and the details of the storage location (floor number and storage location number).

When a nurse picks the last item, they take the Kanban label and places the empty bin on top of the drop-off point. Afterwards, they go to the control station (a computer equipped with a barcode reader and a wall-mounted rack to place the kanban labels). The label is scanned and placed in the wall rack. The computer system sends a request to the supply clerk at the time of the request. The clerk will then make his resupplying round. It begins with the control station to pick up the label. The clerk needs to re-scan it to confirm the resupply and then moves to the drop-off point. They put the kanban label back in the bottom of the current bin and places the new bin behind it.

Brian

From: D.M.Achine <D.M_Achine@MGH.ca>

Date: Tuesday, October 27, 2020, at 11:30 a.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: RE: Inventory Management Solution (dispensers!!!)

I believe we should look at automation. It is an established trend that we cannot ignore. What if we replaced the warehouses with connected dispensing machines that would keep a real-time inventory, and bring certain products closer to areas that often use the same items.

Every staff member will have to scan their card to get the product they want. Once a minimum level of a SKU is reached, a list of all missing items in the vending machine is automatically



generated with the quantities required to bring the inventory back to 100%. Clerks will only have to go to the vending machines to fill them.

Somewhat like a soda machine, but dispensing Band-Aids, gloves, etc. I've even seen some at Cribmaster <https://www.cribmaster.com/>

Doris

From: B.Weight <B.Weight@MGH.ca>

Date: Tuesday, October 27, 2020, at 11:20 a.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: RE: Inventory Management Solution (pressure sensors?)

Wouldn't it be a better idea to add pressure sensors that would send a signal by WIFI when stock levels reach a set threshold?

Brigitte

From: S.Sauport<S.Sauport@MGH.ca>

Date: Tuesday, October 27, 2020, at 11:15 a.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: RE: Inventory Management Solution ("smart" bins)

I think we should stick with the same infrastructure, but add more technology to it. I like the idea of a solution where bins and products communicate together using a centralized inventory management system.

When the last item is picked, the bin detects that it is empty and automatically notifies the warehouse staff with information on which products and storage locations need to be resupplied. Clerks would take the opportunity to collect empty bins. At the same time, the centralized system would automatically update the inventory and trigger an order as soon as a certain inventory level threshold is reached.

Sophia



From: A.Antinov <A.Antinov@MGH.ca>
Date: Tuesday, October 27, 2020, at 11:05 a.m.
To: "Logistics Group" <Logistics.group@MGH.ca>
Subject: RE: Inventory management solution (as with cosmetics)

Hello everyone!

I don't really agree with Max.

Max is known to be a technophile, but why we make things complicated when there are surely simpler solutions. What about completely eliminating the use of bins?

Medical supplies will be stored in a drawer with rails.

This system is already employed by superstore cosmetics departments. When a nurse picks up an item, a second item automatically takes over the position of the first. This saves time for nurses as they do not have to move the bins.

Then we go in with a resupply as soon as a safety stock level is reached.

Alex

From: Yann D.Accord <Y.D.Accord@MGH.ca>
Date: Tuesday, October 27, 2020, at 10:05 a.m.
To: "Logistics Group" <Logistics.group@MGH.ca>
Subject: RE: Inventory Management Solution (what about smart cabinets?)

Yann 👍

From: Max.Reeds <M.Reeds@MGH.ca>
Date: Tuesday, October 27, 2020, at 9:05 a.m.
To: "Logistics Group" <Logistics.group@MGH.ca>
Subject: RE: Inventory Management Solution (what about smart cabinets?)

Hello everyone!



Personally, I think we should go for a “smart cabinet” type solution. There’s no better way to ensure visibility of the process. Each cabinet is fitted with a reader, and every time a product is picked up, the cabinet registers:

- What has been picked up (since each product has an RFID tag).
- Which employee picked up the item (an access card is required to open the cabinet)
- When the item was picked up (automatic time-stamping).

I think this is the solution to our problem.

Max

From: Sémoi Q. P. <Sémoi.Q.P@MGH.ca>

Date: October 26, 2020, at 4:02 p.m.

To: “Logistics Group” <Logistics.group@MGH.ca>

Subject: Inventory Management Solution (back to the Kanban RFID solution)

Hey

As I suggested during the meeting, I believe that the RFID-based, 2 bin solution is the right fit for restocking medical items.

These are pictures of an installation at a local hospital.



Q.P



From: G. Count <G.Count@MGH.ca>

Date: October 26, 2020, at 11:05 a.m.

To: "Logistics Group" <Logistics.group@MGH.ca>

Subject: Inventory Management Solution (meeting follow-up)

Hello everyone!

I would like to follow up with you regarding the first meeting we had on the difficulties in restocking low value medical supplies in the storage locations on the different floors.

Please send me your ideas. Let's start the discussion.

Stay cautious in the meantime.

G. Count

Logistics Manager at the Montreal General Hospital (MGH)

G. [Count@MGH.ca](mailto:G.Count@MGH.ca)

