



International Centre
for Health Innovation

WESTERN UNIVERSITY - CANADA

Health Sector Supply Chain Strategy & Management.

BEST PRACTICES IN PRODUCT STANDARDIZATION, CATEGORY MANAGEMENT, CLINICIAN ENGAGEMENT, AND BACK OFFICE CONSOLIDATION

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Executive Summary

This study explores different practices, models, frameworks, policies, and processes of health sector supply chains, and answers the following questions:

1. What are the various models of supply chain used in different jurisdictions in health systems globally, as related to clinician engagement, product standardization, category management, and back office consolidation?
2. What are the benefits, challenges, and supply chain metrics of each identified model? In particular, how do these models affect patient care and outcomes?

This study focuses on the following aspects of supply chain management in healthcare in Canada, the United States, the United Kingdom, and Australia:

- ▶ Clinician engagement: understanding how clinicians are engaged in various supply chain models at the levels of hospital, Group Purchasing Organization (GPO), and Shared Services Organization (SSO) purchasing decisions.
- ▶ Product standardization: understanding the implications, risks, and benefits of different approaches to reducing product and service variety.
- ▶ Category management: understanding the implications, risks, and benefits of different approaches to product and service categorization.
- ▶ Back office consolidation: understanding different strategies for consolidating and centralizing hospital support services such as financial services, human resources, and information technology.

The study involved a literature review and environmental scan of academic literature and white papers, 12 key informant interviews with procurement directors from the selected jurisdictions, and 139 key informant surveys with procurement directors from the selected jurisdictions.

Clinician Engagement

Models for clinician engagement in supply chain activities vary greatly, from minimal involvement in product evaluation and standardization committee (PESC) activities, to long-term relationship building outside of standardization efforts. The benefits of engaging clinicians are not limited to clinician buy-in and support, but also for educating procurement staff on clinical activities.

For all clinician engagement activities, in particular building long-term relationships, the concept of goal alignment was raised by participants. Goal alignment of supply chain and clinicians helps to drive engagement, and is facilitated by focusing on patient outcomes, leveraging supply utilization data, and making cost data open and transparent. The most effective strategies used to strengthen clinician-procurement professional relationships are: keeping clinicians regularly informed and involved in PESC activities; hiring clinicians within the supply chain; and regular communication outside of PESC meetings.

Offering incentives to clinicians for participation in supply chain activities can also help to drive engagement. However, incentives must be used consistently across a system to avoid negative impacts on areas of care without incentives. Incentive structures include paying clinicians to sit on supply chain committees, relieving clinicians of other duties such as teaching or research, sharing supply chain cost savings with clinicians, and leveraging clinician competition through making physician variance data transparent.

In addition to traditional physician engagement, nurses were identified as a valuable resource to engage. Procurement nurses bridge clinical activity and commercial requirements and are able to assess the effectiveness of products in real-time focusing on product usability and clinical suitability.

When survey participants were asked about the best practices to facilitate clinician engagement, the most popular responses included; engaging clinicians at the earliest point possible in the standardization process; regular communication with clinical staff and nursing leadership (including one-on-one meetings with key champions); and trialling products and obtaining clinician feedback before final purchasing decisions are made.

Product Standardization

In the traditional health care supply chain, there was less clinical input or the clinical input was resistant to change, such that the incumbent product was almost always chosen and specifications would be written to accommodate that product. However, currently, processes have been improved given the focus on value-based procurement aligned with the needs of patients and providers. As a result, incumbent products are now used to create a baseline from which the focus is on creating next generation products and identifying future need through an iterative process.

One of the most popular methods of facilitating product standardization is by creating PESC. PESC are generally comprised of interdisciplinary groups of clinical, administrative and procurement staff, and they collectively make purchasing decisions for individual hospitals or SSOs. By facilitating collective decision making and centralizing power over a number of clinical departments, PESC can be powerful drivers of product standardization. In the literature, there are many case study examples of successful PESC initiatives, but little research exists on the relative performance, benefits and challenges of various models used for PESC.

Standardization criteria should include cost considerations, but also other, more clinically-relevant criteria. The most recommended criteria are patient outcomes, cost data, and staff feedback. However, for innovative products, the PESC process is different. It is often clinical staff and other end-users that suggest new products for purchase through the work of partnerships, networking, and working groups. Furthermore, for innovative products, price is less of a deciding factor, and clinically-relevant criteria become more important.

Centralizing procurement across a clinical department, hospital, shared services organization (SSO), or health system gives departments more control over product selection, bulk ordering and standardization. Centralizing to higher levels has the potential for greater cost savings, but only to a point. Smaller trusts often secure better pricing than larger trusts, because as trusts get too large medical supply companies are less willing to give lower prices to entire regions.

When survey participants were asked about the best practices to facilitate standardization, the most popular responses included; forming a value analysis team to rigorously analyse product choices; gaining C-suite and executive support and buy-in to standardization activities; and involving a cross-section of departments and staff in the process of standardization.

Category Management

Based on survey answers, category management was the least well-established process amongst the participants. 15% of participants noted that they do not currently use category management practices, and many participants viewed category management and product standardization as the same.

Survey participants who did use category management strategies were asked how they decide which product categories should be used across the organization, and most participants noted that clinical recommendation, industry standards and data analytics were the key drivers of categories.

Supply chain organizations have identified difficulties analyzing utilization data across sites when each site uses a different software program and language. This barrier is compounded because not all organizations are using standard unique device identifiers (UDIs), requiring organizational or state-wide product catalogues in addition to the global catalogue.

Sizing categories depends on many factors, including the use of the product, innovative nature and complexity of the product, product volume, number of vendors, and the resource capacity of the managing SSO/procurement department. Sizing is largely dependent on individual capacity of contract managers.

When survey participants were asked about the best practices to facilitate category management, the most popular responses included; establishing three main categories as commodities, clinician preference, and physician preference; setting categories based on contract grouping in order to facilitate accurate analysis in determining compliance and renewal, and setting categories based on national standards.

Back Office Consolidation

The two key barriers associated with back office functions were identified to be technology requirements and challenges with outsourcing and public-private partnerships. Technology and IT-related initiatives have proven challenging when reforming back office functions, as such initiatives are costly, complex, and require a high-degree of standardization. To lessen the burden of these challenges, participants suggested that hospitals align on common IT systems and ensure accurate specifications.

Survey participants were asked the most common back office functions to be centralized and consolidated, and responded with information technology, accounts payable, and human resources. Other back office functions that were consolidated include procurement, purchasing, sterile processing, and materials management.

When survey participants were asked about the best practices to facilitate back office consolidation, the most popular responses included; accounts payable and purchasing should work closely together to be more efficient; facilitate open communication between departments; and centralize order entry, pharmacy review, and scheduling. Furthermore, data related to cost-savings as a result of back office consolidation is limited and as a result, measurement and benchmarking in this area has been identified as a future priority for SSOs.

A full list of the summarized best practices identified in this report is included in Appendix 1 – Summarized Best Practices.

Abbreviations

AU: Australia
BC: British Columbia (Canada)
BPS: Broader Public Sector (Canada)
CA: Canada
CAC: Clinical Advisory Committee
CRG: Clinical Reference Group
DI: Diagnostic Imaging
EMR: Electronic Medical Record
ERP: Enterprise Resource Planning
GM: General Manager
GPO: Group Purchasing Organization
HMMS: Healthcare Materials Management Services (Canada)
HPV: Health Purchasing Victoria (Australia)
HR: Human Resources
HSP: Health Service Provider
IM: Inventory Management
IT: Information Technology
LHD: Local Health Districts (Australia)
LHIN: Local Health Integration Network (Canada)
MMAC: Materials Management Advisory Committee
MMIS: Materials Management Information System
MOHLTC: Ministry of Health and Long-Term Care (Canada)
NHS: National Health System (UK)
ON: Ontario (Canada)
OR: Operating Room
PESC: Product Evaluation and Standardization Committee
PPI: Physician Preference Item
RFP: Request for Proposal
RFX: Request for Proposal, Request for Information, Request for Quote, or Request for Bid
RN: Registered Nurse
RPN: Registered Practical Nurse
SSO: Shared Services Organization
STARS: Strategic Transformation and Resource Stewardship (US)
UDI: Unique Device Identifier
UK: United Kingdom
US: United States
VAC: Value Analysis Committee

Introduction

Rising global health costs, the rapid growth in the medical device, pharmaceutical and health technology industries, and policy shifts focused on efficiency gains have made supply chain management a priority area for most health systems. However, existing supply chain research efforts have concentrated primarily on the private sector and, in particular, manufacturing industries such as automotive and electronics.¹ Research directed toward public sector supply chains, including health care, has been limited. However, the health care sector is an important part of most industrialized economies and often presents significant supply chain challenges.^{2,3,4,5,6} This study explores different practices, models, frameworks, policies, and processes of health sector supply chains, and answers the following questions:

1. What are the various models of supply chain used in different jurisdictions in health systems globally, as related to clinician engagement, product standardization, category management, and back office consolidation?
2. What are the benefits, challenges, and supply chain metrics of each identified model? In particular, how do these models affect patient care and outcomes?

Research foci

This study focuses on the following aspects of supply chain management in healthcare:

- ▶ **Clinician engagement:** understanding how clinicians are engaged in various supply chain models at the levels of hospital, group purchasing organization (GPO), and shared services organization (SSO) purchasing decisions.
- ▶ **Product standardization:** understanding the implications, risks, and benefits of different approaches to reducing product and service variety.
- ▶ **Category management:** understanding the implications, risks, and benefits of different approaches to product and service categorization.
- ▶ **Back office consolidation:** understanding different strategies for consolidating and centralizing hospital support services such as financial services, human resources, and information technology.

Selected jurisdictions

When examining best practices in the above research foci, four key jurisdictions were selected. The jurisdictions were selected for their diverse, but robust, supply chain networks, and for the availability of secondary supply chain research:

- ▶ Canada
- ▶ United States
- ▶ United Kingdom
- ▶ Australia

¹ Burgess, K., Singh, P.J., Koroglu, R., 2006m. Supply Chain Management: A Structured Literature Review and Implications for Future Research. *International Journal of Operations & Production Management* 28 (7), 703-729.

² Haavik, S., 2000. Building a Demand-Driven, Vendor-Managed Supply System. *Healthcare Financial Management* 45 (2), 56-61.

³ Everard, L.J., 2001. Blueprint for an Efficient Health Care Supply Chain. White paper.

⁴ Burns, L.R., Degraaff, R.A., Danzon, P.M., Kimberly, J.R., Kissick, W.L., Pauly, M.V., 2002. The Wharton School study of the health care value chain, in Burns, L.R. (Ed.). *The healthcare value chain: producers, purchasers, and providers*. John Wiley and Sons, New York.

⁵ Neumann, L., 2003. Streamlining the Supply Chain. *Healthcare Financial Management* 57 (7), 56-62.

⁶ McKone-Sweet, K.F., Hamilton, P., Willis, S.B., 2005. The Ailing Healthcare Supply Chain: A Prescription for Change. *The Journal of Supply Chain Management* 41 (1), 4-17.

Methodology

Literature review & environmental scan

An in depth literature review and environmental scan was conducted, examining all available academic literature focused on health sector supply chain practices, as well as an environmental scan of various reports and websites from health care delivery and support organizations.

Key informant interviews

12 in-depth interviews were conducted with procurement directors from the selected jurisdictions. Interview participants were asked about organizational and jurisdictional best practices and models of the selected research foci.

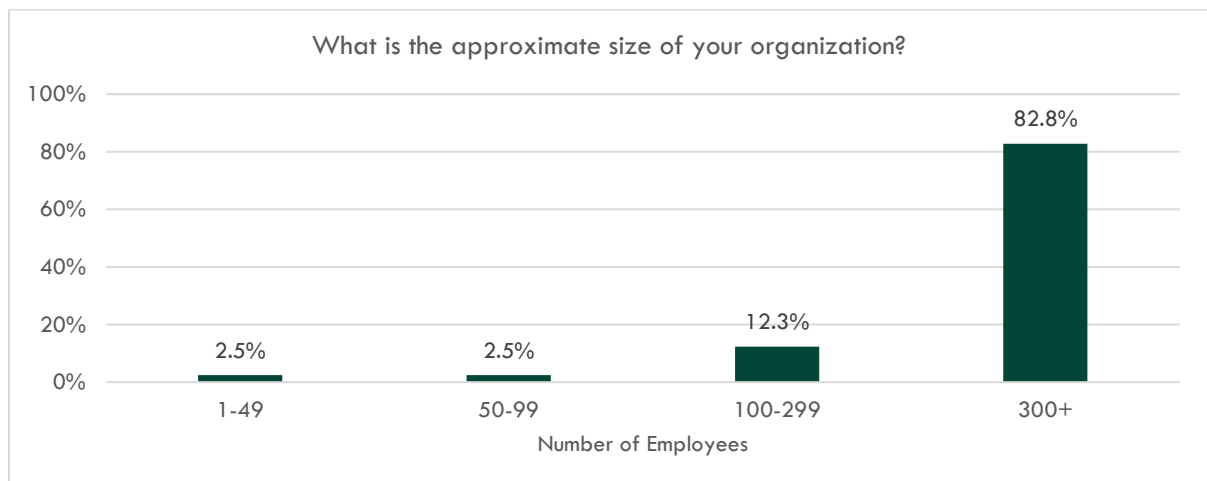
Jurisdiction	Number of Participants
Canada	6
United States	2
Australia	4

Key informant surveys

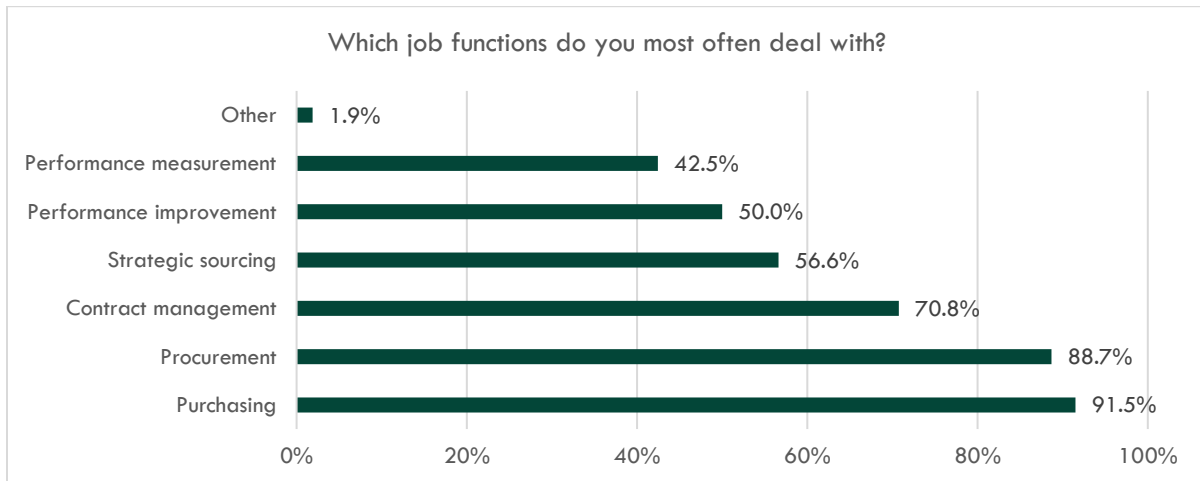
Procurement directors from the selected jurisdictions were contacted and offered participation in the survey. The survey was sent to 836 procurement directors, receiving 139 responses (response rate = 16.6%). Given the variability of expertise related to our survey questions, respondents had the option of answering only the questions they felt they had significant enough experience with. As such, the response rates for each question and concept vary. The majority of participants were from large US organizations. This was largely due to the availability of panel research programs in the US with access to health care procurement directors. No similar research panels were available for any of the other jurisdictions. However, most of the best practices suggested by participants in this report are applicable to organizations of many sizes and from many jurisdictions. Interview and survey responses were regularly compared to ensure that identified practices from one jurisdiction would be relevant in others.

Most respondents were from US organizations, which represented 92% of responses, followed by Canada with 4%, Australia with 3%, and UK with 1%.

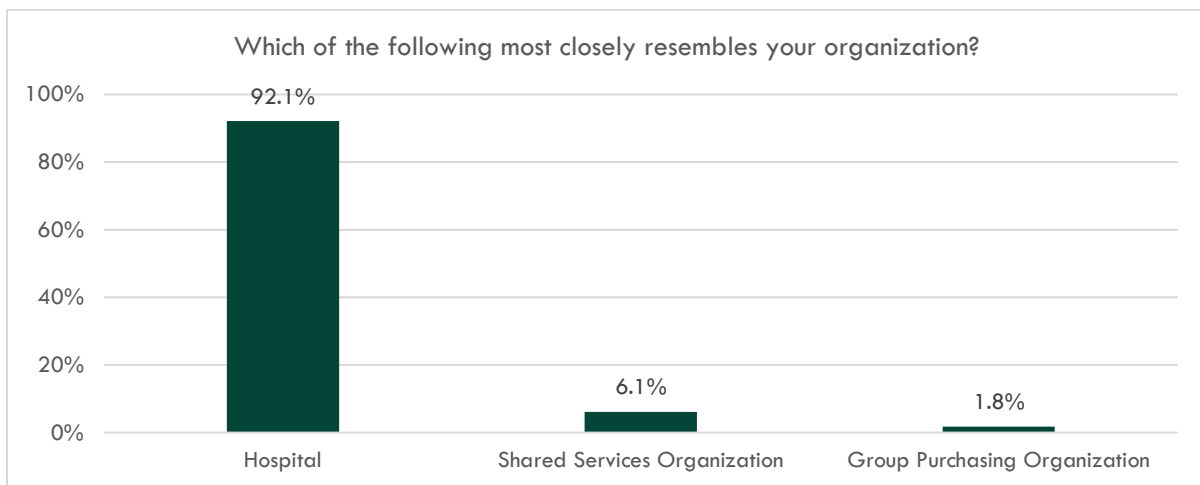
Most of the responding organizations were larger in size, with 82.8% representing organizations with over 300 employees. The distribution of organizational size was as follows:



Most participants focused in job functions of purchasing (91.5%), procurement (88.7%), and contract management (70.8%).



Most participants (92.1%) were from hospital purchasing departments, with the remainder coming from shared services (6.1%) and group purchasing (1.8%) organizations.



1. Clinician Engagement

Chapter at a Glance

- ▶ Goal alignment of supply chain and clinicians helps to drive engagement, and is facilitated by focusing on patient outcomes, leveraging supply utilization data, and making cost data open and transparent.
- ▶ The most effective strategies used to strengthen clinician-procurement professional relationships are: keeping clinicians regularly informed and involved in PESC activities; hiring clinicians within the supply chain; and regular communication outside of PESC meetings.
- ▶ The benefits of engaging clinicians are not limited to clinician buy-in and support, but also for educating procurement staff on clinical activities.
- ▶ The most important criteria for considering physicians to be involved in supply chain activities are area of expertise and physician interest.
- ▶ Offering incentives to clinicians for participation in supply chain activities can help to drive engagement. However, incentives must be used consistently across a system to avoid negative impacts on areas of care without incentives. Incentive structures include paying clinicians to sit on supply chain committees, relieving clinicians of other duties such as teaching or research, sharing supply chain cost savings with clinicians, and leveraging clinician competition through making physician variance data transparent.
- ▶ Procurement nurses bridge clinical activity and commercial requirements and are able to assess the effectiveness of products in real-time focusing on product usability and clinical suitability.
- ▶ When survey participants were asked about the best practices to facilitate clinician engagement, the most popular responses included; engaging clinicians at the earliest point possible in the standardization process; regular communication with clinical staff and nursing leadership (including one-on-one meetings with key champions); and trialling products and obtaining clinician feedback before final purchasing decisions are made.

1.1 Literature Review & Environmental Scan

Clinician engagement in the supply chain has resulted in many benefits such as determining potential cost-saving areas, securing buy-in throughout procurement activities, improving culture by creating integrated teams and communicating with physicians the financial implication of their procurement choices while maintaining an emphasis on patient outcomes. The literature is clear that clinicians need to be engaged in purchasing decisions for clinical products. However, the mechanism of how clinicians are engaged by procurement and purchasing teams differ greatly. These models typically range from minimal involvement in product evaluation and standardization committee (PESC) activities, to long-term relationship building outside of standardization efforts. In the literature review and environmental scan of best practices, three main mechanisms were used to drive clinician engagement: procurement policies & procedures, incentive programs, and education initiatives.

1.1.1 Procurement policies & procedures

All available literature agreed that clinicians are an important component of many supply chain activities. In the UK, the National Health Service (NHS) determined that procurement success is maximized when cost, readmission and infection rates associated with specific products are defined, which requires the involvement of clinicians.⁷ It was advised that clinicians lead the procurement process and become involved at the board level to aid product standardization and cost savings. In Ontario, Canada, many senior healthcare executives believe that hospital purchasing decisions need to begin with clinicians – those assessing and responding the patient needs. However, a challenge common in the literature in terms of involving these clinicians is communicating the importance of supply chain benefits over clinical preference in the procurement of products. Well-planned standardization initiatives and clear rationale for standardization (i.e. improved patient outcomes) are more likely to garner support from physicians.⁸

In addition to a high-level consensus on the benefits of clinician engagement in supply chain activities, the literature and environmental scan identified several specific strategies and policies used to drive effective clinician engagement.

Adopting clinical supply chain teams

Clinical supply chain teams are one engagement strategy all of the selected jurisdictions have implemented. Clinicians play a vital role in developing product requirement specifications and assessing tenders as well as participating in PESC and product decisions. It is suggested that clinicians should be involved at the hospital as well as the SSO level in the supply chain, therefore many SSOs have full-time clinical specialists on their teams.⁹

Perioperative coaching teams have also been adopted in several organizations to assist hospitals in assessing issues and creating action plans. These teams are made up of a physician expert, one to two surgical leaders and one to two perioperative leaders/managers. These teams have demonstrated improvements in the supply chain across the vast majority of hospitals, independent of size, location or type.¹⁰

⁷ Moore, A. (2014, November 28). Clinical engagement roundtable: Take the doctors shopping. Health Services Journal. Retrieved from <http://www.hsj.co.uk/hsj-knowledge/downloads/clinical-engagement-roundtable-take-the-doctors-shopping/5077115.fullarticle>

⁸ MedAssets Inc. (2014) Engaging Clinicians Helps TPC to Save \$107.6 Million in Underlying Cost Structure—and Still Counting. www.live-medassets.cp-access.com/_assets/pdf/ma_cs_tpc_11x17.2.pdf

⁹ Chesler, Cynthia. (2013). Clinical Integration Track: Strategies for True Clinical Collaboration. IDN Summit.

¹⁰ Ontario Hospital Association. (2011). Optimizing Your Perioperative Supply Chain: A Guide to Improvement Projects. [https://www.oha.com/CurrentIssues/keyinitiatives/SupplyChain/Documents/Final Supply Chain Guidebook.pdf](https://www.oha.com/CurrentIssues/keyinitiatives/SupplyChain/Documents/Final%20Supply%20Chain%20Guidebook.pdf)

Case Study: Adopting clinical advisory committees

HealthPRO, a GPO in Canada, uses frontline clinicians to assess healthcare products at a national level. Their councils and advisory committees involve clinicians from their member institutions. Multiple groups, physicians included, provide strategic support on future procurement practice in their specialities for their member organizations.¹¹ They engage Clinical Advisory Committees (CACs) which are comprised of clinical experts from across the country to offer diverse input from different regions. Clinicians in these committees provide input for product and service evaluations, contract strategies and product contract award decisions while suppliers introduce their products to the frontline clinicians. CACs serve to pre-qualify products and suppliers, define and refine standardized clinical evaluation criteria for products and services and assist in creating contracts and incorporating new products into existing contracts.¹² In the pre-qualification process, products are scored based on clinical scorecards on a regional and national level, which is a unique approach. 80% of the evaluating facilities need to deem the product acceptable for it to be eligible for a contract. Clinicians are then able to evaluate new products by identifying the differences between the newly adopted and previous products.

HealthPRO's Request for Product (RFP) process has also involved clinical debrief meetings to ensure the delivery of the best products and services for members. These meetings are led by a clinical director who visits members and provides a summary of decisions and actions that occurred in the pre-qualification meetings. From these meetings, it is determined if further review is necessary before contract commitment.¹³

HealthPRO's CACs have created scenario-based sourcing in collaboration with clinical advisors interested in flexibility to procure products. This multi-stage contracting strategy begins 18 months before the contract award and involves 50 clinicians representing a broad range of healthcare disciplines from across Canada, a nationally driven strategy. A national advisory committee was formed and each member subsequently organized a local clinical engagement group at their facility. This also serves as a forum for national clinical engagement facilitating sharing of intelligence and knowledge amongst Canadian clinicians. HealthPRO's use of national strategies, meetings and forums is crucial for uniform change in management and implementation.¹⁴ HealthPRO also utilizes a Task Force to help review and make recommendations for specialized clinical products and equipment that the CAC does not deal with.¹⁵

A Materials Management Advisory Committee (MMAC) liaises HealthPRO and their organizations to provide input into contract discussions, evaluate proposals, recommend contracts, and promote meeting decisions. The MMAC is comprised of supply chain practitioners, clinical and business professionals who meet semi-annually.

¹¹ HealthPRO National Multi-Supplier Awards: Driving Member Choice, Significant Savings and Assurance of Supply. (2015). <http://portal.healthprocanada.com/web/healthpro-public/news?assetId=304112>

¹² HealthPRO Procurement Services. The power of collaboration: Incorporating voices in Canadian healthcare into integrated, responsive purchasing networks. (2012). *Healthcare Management Forum*, 25(3), S39-S42. doi:10.1016/j.hcmf.2012.07.016

¹³ HealthPRO Progress. (n.d.). www.healthprocanada.com/healthpro_progress.index.gk?catalog_item_id=2980

¹⁴ HealthPRO members benefit from national purchasing power and collaboration. (n.d.). www.portal.healthprocanada.com/web/healthpro-public/membership

¹⁵ 3SO Strategic Sourcing & Procurement Policies & Procedures (Rep.). (n.d.). http://www.3so.ca/images/File/Documents/3SO_SS_PP.pdf

Hiring an on-site sales representative

An additional strategy for clinician engagement is to use an on-site sales representative who is embraced as part of the team in the OR and creates relationships and has access to hospital leadership. The sales representative is typically an employee of the SSO or GPO, but spends the majority of his/her time in clinical areas, ensuring visibility of supply chain staff. The implementation of one on-site sales representative has demonstrated decreases in the number of staff in the OR and hospital staff feel the representative understands the needs of the institution. These representatives are a conduit of communication to foster connections and communication between the supply chain and clinical teams.¹⁶

Leveraging nursing leadership

Engaging nurses in initial stages of product review or audit enables faster assessment of whether introduction or elimination of a product is feasible from a clinical standpoint.

Procurement nurses bridge clinical activity and commercial requirements and are able to assess the effectiveness of products in real-time focusing on product usability and clinical suitability.

In the UK the Royal Colleges of Nurses, the NHS Supply Chain and the Clinical Procurement Specialist Network have joined forces to aid nurses in utilizing their knowledge and experience to contribute to their trust purchases and utilize key clinical supplies. Nurses have been successfully utilized in clinical commissioning groups and as a clinical procurement nurse in the UK. The nurses define the technical specifications of the products to replace the existing sharps products that comply with the outlined criteria. Procurement nurses bridge clinical activity and commercial requirements and are able to assess the effectiveness of products in real-time focusing on product usability and clinical suitability.¹⁷

Aligning common goals

Many companies now focus on aligning the goals of the clinicians and supply chain managers. A theoretical “trust capital” is formed when the clinician accepts that cost control is in best interest of all parties involved and the supply chain manager trusts the clinicians’ intentions benefit the health system as a whole. Hospitals with collaborative procurement practices have superior relationships with surgeons due to the alignment of philosophies between clinicians and supply chain managers. All jurisdictions are in agreement that high-quality supply chain activities and patient care are complementary.¹⁸

Some strategies to facilitate a positive relationship between clinicians and supply chain managers are to avoid supply chain jargon and emphasize topics that concern the physicians such as comfort level with the product and patient outcomes instead of solely discussing price and the supply chain.¹⁹ Data-driven decisions have also increased physicians’ cooperation. Input about purchasing decisions should be based on hard data to support the recommendations that the individual is presenting.

Involving clinicians based on product type and associated characteristics can also be beneficial. Engaging key clinicians with specific expertise relevant to a product ensures clinicians’ time is used valuably and also alleviates the difficulty with clinicians reaching consensus by decreasing the disparity between the involved clinicians.²⁰ Many high-use products require the input of clinicians but not specialists therefore the choice of which clinician to involve is important. For more complex equipment and specialist products, clinicians who specialize in the field are useful.²¹ In other cases when a new product is being

¹⁶ HealthPRO Procurement Services. The power of collaboration: Incorporating voices in Canadian healthcare into integrated, responsive purchasing networks. (2012). Healthcare Management Forum, 25(3), S39-S42. doi:10.1016/j.hcmf.2012.07.016

¹⁷ HealthPRO Procurement Services. The power of collaboration: Incorporating voices in Canadian healthcare into integrated, responsive purchasing networks. (2012). Healthcare Management Forum, 25(3), S39-S42. doi:10.1016/j.hcmf.2012.07.016

¹⁸ How Clinical Partnerships are Advancing in the Supply Chain. (n.d.). <http://www.medtronic.com/covidien/news/blog/2016/03/how-clinical-partnerships-are-advancing-supply-chain>

¹⁹ 3 Ways to Handle Supply Chain’s Greatest Budget Challenge. (n.d.). <http://www.medtronic.com/covidien/news/blog/2016/03/3-ways-to-handle-supply-chains-greatest-budget-challenge>

²⁰ Moore, A. (2014, November 28). Clinical engagement roundtable: Take the doctors shopping. Health Services Journal. <http://www.hsj.co.uk/hsj-knowledge/downloads/clinical-engagement-roundtable-take-the-doctors-shopping/5077115.fullarticle>

²¹ Main, M. (2014). Clinicians key to supply chain reform. The Health Advocate. ahha.asn.au/system/files/docs/publications/tha_april_2014.pdf

considered the clinician leader includes the associated surgical department in the PESC process so the appropriate department can perform the value analysis.²²

Another purchasing strategy is to align physicians with the supply chain by allowing them to determine the trade-offs between preference and total cost with incentives to support change. One unique approach for large volume purchases is to have a multidisciplinary committee decide the assessment of the proposed new products similar to a legal trial. An individual creates an argument regarding the benefit of adopting the new products while a committee panel argues why it should not be acquired. An administrator then decides if the cost can be rationalized through other methods and if the product should be acquired.²³

1.1.2 Incentives programs

There is no standard practice across the selected jurisdictions for incentivizing clinicians to be engaged in procurement decisions, however many different models are used. Present incentives in Canada include mutually agreed hourly or daily honoraria or a fixed annual payment for administrative responsibilities, however the majority of these physicians are involved on a voluntary basis.²⁴

Paying clinician engagement bonuses

One common incentive strategy in the US is to provide bonuses for clinicians engaged in supply chain activities. Many hospitals offer a bonus to surgeons if the overall cost reduction objective is met. There are also co-management agreements that physicians are involved in which gives them more responsibility and provides monetary compensation. This incentive strategy also ensures the accountability of the physicians for the project they co-manage.²⁵ In the UK, some physicians are engaged freely²⁶ whereas others are contracted for their role in clinical reference groups (CRGs). This remuneration is less clear in Australia, where members at Health Purchasing Victoria (HPV) are entitled to be paid for reasonable expenses incurred due to holding office as a member as well as salary.²⁷

Although incentives can encourage clinician participation in the supply chain, the incentive model used must be consistently applied across a system to avoid negative impacts on the health system.

Although incentives can encourage clinician participation in the supply chain, the incentive model used must be consistently applied across a system to avoid negative impacts on the health system. In the UK it was determined that selectively offering clinician incentives can be more harmful than helpful.²⁸ After selective incentive programs were put in place, quality of care was improved in the short-term (2 years) then reached a plateau in regions with the incentives in place. In the non-incentivized regions, quality of care significantly dropped after three years compared to before the incentive programs were implemented. This demonstrates the potential consequences of offering selective incentive programs for certain aspects of care but not others.

Another unique strategy used is to focus on building longer-term relationships by incentivizing the supply chain representative. The University of Kansas Hospital incentivized the supply chain representatives as

²² Covidien. (n.d.). Surgeons and the Value Analysis Committee: Agents of Change.

<http://www.medtronic.com/content/dam/covidien/library/-us/en/education-training-research/sharing-healthcare-solutions/surgeons-and-the-vac-agents-of-change-white-paper.pdf>

²³ Pathways to Clinical and Supply Chain Standardization. (n.d.). www.medtronic.com/covidien/news/blog/2016/03/pathways-to-clinical-and-supply-chain-standardization

²⁴ OACCA, OFCMHAP & OHA. (2010). Ideas and Opportunities for Bending the Health Care Cost Curve. [www.oha.com/KnowledgeCentre/Library/Documents/Bending%20the%20Health%20Care%20Cost%20Curve%20\(Final%20Report%20-%20April%2013%20202010\).pdf](http://www.oha.com/KnowledgeCentre/Library/Documents/Bending%20the%20Health%20Care%20Cost%20Curve%20(Final%20Report%20-%20April%2013%20202010).pdf)

²⁵ How Can You Incentivize Physicians to Align with Supply Chain? (2013). https://www.youtube.com/watch?v=O_djuHHapMc

²⁶ Watkins, J. (2014). Working Together set to realise £400,000 annual savings from an eAuction on exam gloves. NHS Supply Chain. https://www.supplychain.nhs.uk/~/_/media/Files/publications/US2792%20Working%20Together%20case-%20study%206pg%20web.ashx

²⁷ Australasian Legal Information Institute. (2004). Health Services Act 1988 – Section 134E. www.austlii.edu.au/au/legis/vic/consol_act/hsa1988161/s134e.html

²⁸ Doran, T., Kontopantelis, E., Valderas, J., Campbell, S., Roland, M., & Salisbury, C. (2011). Effect of financial incentives on incentivised and non-incentivised clinical activities: longitudinal analysis of data from the UK Quality and Outcomes Framework. *British Medical Journal*, 342(1). Retrieved from <http://www.bmj.com/content/342/bmj.d3590>

opposed to clinicians. The compensation of the representative is based on the evaluation by clinicians at the hospital.²⁹

Sharing cost savings with clinicians

Another approach to clinician incentives is shared cost savings. New strategies attempting to align clinician and supply chain interests include alternative payment methodologies where hospitals and clinicians bear a shared risk for the cost of care. This increase in risk responsibility for the physicians helps align their priorities with the supply chain and serves as an incentive to actively help improve supply chain processes by reducing cost and increasing quality.

A savings reinvestment model has also been used in some of the jurisdictions to incentivize clinician engagement:

- ▶ In British Columbia, savings are directed to health authorities for frontline care.³⁰
- ▶ At Intermountain Healthcare in the US physicians are given the opportunity to use the clinician engagement savings to purchase equipment, supplies or training.³¹
- ▶ Fletcher Allen Healthcare shares 50% of the savings and reinvests it, which resulted in increased physician participation.³²
- ▶ In Ontario, Canada, clinicians are more receptive to supply chain initiatives when there is clear justification for the proposed changes in terms of patient outcomes.

Making committee membership mandatory

A contrasting clinician engagement incentive strategy is being used in some hospitals that require surgeon participation in a specified number of committees outside of the OR, including PESCOs. In this model, there is a reduction of up to 25% of the surgeon's bonus if they fail to meet this requirement.³³

Leveraging clinician competition

It has been found that leveraging the competitive nature of clinicians is also an incentive strategy. Sharing outcomes, productivity and cost data with clinicians can help encourage them to be involved in the procurement process, especially by showing them their own data and comparing it to that of their colleagues. This can serve as motivation to attain a better result and lower cost than those they are working with.

1.1.3 Education initiatives

Ensuring clinicians understand the supply chain process and that the goal is quality improvement, not simply cost reduction, is a crucial part of engaging clinicians. Facilitating the communication of quality improvement in value analysis is key.

Making data transparent and accessible

Educating clinicians on cost awareness is another tool used. To ensure patients receive the best care, clinicians must make the right purchasing choices, however these decisions are often made without the

²⁹ The University of Kansas Hospital, & Covidien. (n.d.). Case Study: Disrupting the Traditional Hospital Supplier Relationship through Innovative Partnering. <http://www.medtronic.com/content/dam/covidien/library/us/en/education-training-research/sharing-healthcare-solutions/univ-kansas-hospital-partnership-breakthrough-case-study.pdf>

³⁰ HealthPRO members benefit from national purchasing power and collaboration. (n.d.). Retrieved May 16, 2016, from <http://portal.healthprocanada.com/web/healthpro-public/membership>

³¹ Lee, J. (2013). Losing Preferential Treatment. Modern Healthcare. www.modernhealthcare.com/article/20130215/MAGAZINE/302169953

³² How Can You Incentivize Physicians to Align with Supply Chain? (2013). Retrieved from https://www.youtube.com/watch?v=O_djuHHapMc

³³ Covidien. (n.d.). Surgeons and the Value Analysis Committee: Agents of Change. www.medtronic.com/content/dam/covidien/library/us/en-/education-training-research/sharing-healthcare-solutions/surgeons-and-the-vac-agents-of-change-white-paper.pdf

knowledge of the prices of the items they are purchasing. Increasing clinicians' knowledge about the price of device selection can decrease costs and align their goals with the supply chain.³⁴

When physicians are aware of the cost of an item and the reimbursement amount for the item they, are often more motivated to be involved in the purchasing process.³⁵ By sharing cost data related to utilization, outcomes and productivity, especially compared to clinicians' peers, supply chain managers can leverage the cooperative competitiveness of clinicians while also keeping them accountable.

One unique approach to data transparency when hospitals are limited by confidentiality clauses with device manufacturers to share pricing data about the purchased devices is to use a colour-coded sticker system. This educates physicians about cost by colour-coding according to the level of price while maintaining confidentiality clauses.³⁶

By sharing cost data related to utilization, outcomes and productivity, especially compared to clinicians' peers, supply chain managers can leverage the cooperative competitiveness of clinicians while also keeping them accountable.

Providing clinician professional development

Professional events are a final strategy to help educate physicians on the advantages of being engaged in the procurement process. Conferences such as the Annual World Congress Annual Leadership Summit on Healthcare Supply Chain involves discussion topics about physicians and how they should be integrated in the supply chain.³⁷ It was determined that physicians should be educated on the outcomes of the products they use and should be presented with data on other products that may have equal or preferred outcomes. Accurate data about utilization and outcomes should be presented to clinicians in a manner they can understand and apply to their practice.

Professional development can also be a method to encourage clinician involvement in the procurement process, especially when they have ownership of contracts, contribute to decision-making and utilize organizations available through the network. HealthPRO is currently the main organization in Canada using this strategy. Clinicians are involved in committee meetings and there is a consensus that these meetings enhance professional development while adding value to member organization.³⁸

³⁴ Beth Goodbaum. (2015). Streamlining the Hospital Supply Chain: Just What the Doctor Ordered. Inbound Logistics. <http://www.inboundlogistics.com/cms/article/streamlining-the-hospital-supply-chain-just-what-the-doctor-ordered/>

³⁵ Covidien. (n.d.). The Business of Healthcare: The Science Behind VAC Product Adoption. Retrieved from <http://www.medtronic.com/content/dam/covidien/library/us/en/education-training-research/sharing-healthcare-solutions/the-science-behind-vac-product-adoption-white-paper.pdf>

³⁶ Lee, J. (2013). Losing Preferential Treatment. Modern Healthcare. www.modernhealthcare.com/article/20130215/MAGAZINE/302169953

³⁷ The World Congress 9th Annual Leadership Summit on Health Care Supply Chain. (n.d.). <http://www.worldcongress.com/events/HL15006/>.

³⁸ Article, "The Power of Collaboration: Incorporating Voices in Canadian Healthcare into Integrated, Responsive Purchasing Networks."

1.2 Barriers

There were several high-level barriers to clinician engagement which must be considered when planning supply chain activities. Interview participants noted the following barriers:

- ▶ **General resistance to change:** Participants noted that people, including clinicians, tend to resist change, as it is often associated with risk and increased work (real and/or perceived). In light of this, there is a tendency to focus on short-term consequences, rather than long-term outcomes, which may impede engagement within supply chain initiatives.
- ▶ **Generational resistance to change:** Participants noted that physician resistance to standardization of products is affected by the age and demographics of physicians. *“Physicians want what’s best for their patients. There are... young physicians that are pretty adaptable, pretty flexible; there are physicians that have been practicing a long time that are comfortable, they do a great job and they know what their products are, but they’re not quite as eager to look at change.”* (Participant 4, US)
- ▶ **Limited clinician availability:** Given the busy schedule of physicians, time was often a barrier to engagement activities. To account for this barrier, most supply chain groups scheduled meetings with physicians in the early mornings or late evenings. Participants noted the need to be productive, so as to not waste physicians’ time, otherwise long-term engagement suffers.
- ▶ **Independent physician culture:** Physicians are trained to work in teams, but ultimately have responsibility for their own set of patients and have a tendency to act independently. One VP Supply Chain Management noted that *“outside of the physician associations or group practices, physicians still are pretty independent in how they think about things and yet they are also scientific and very collegial with the physicians that they work beside... the challenge is being able to build physicians into a group that understands that together they have so much more power and influence than they do alone.”* (Participant 4, US)
- ▶ **Clinician management & governance:** Physicians who are not employees of a hospital are less likely to be engaged in procurement/purchasing conversations, and are less likely to be strategically aligned with procurement/purchasing. *“We have other [clinical] areas where the [clinician-procurement] alignment is not as strong and that may be because the physicians are not employed so we find that employment helps to drive alignment.”* (Participant 3, US)

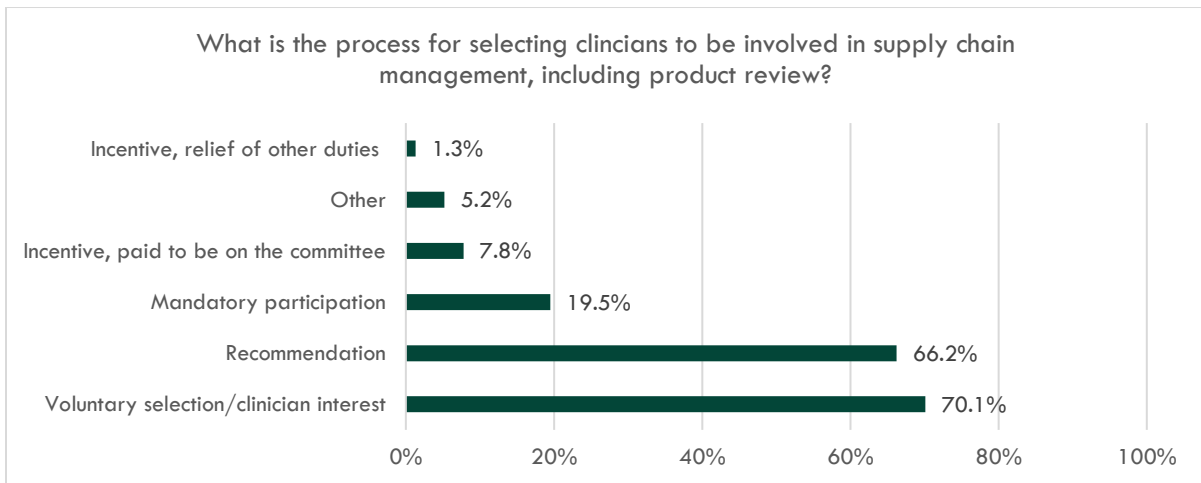
Other barriers to clinician engagement included personality issues, a limited number of supply chain staff to engage physicians, and the entrepreneurial approach to health care that some physicians exhibit.

Solutions to improve clinician engagement included building interdisciplinary teams and leveraging purchasing and supply utilization data to demonstrate need. In addition, clinicians need to be aware that they, and not supply chain organizations, are ultimately responsible for making the decisions, which will engage them in the decision-making process.

1.3 Identification of Need

1.3.1 Selecting clinicians to engage in supply chain activities

When survey participants were asked how clinicians were identified to be engaged in supply chain activities, “voluntary selection/clinician interest” (70.1%) and “recommendation” (66.2%) were the most common responses. Based on survey answers, clinicians were most often recommended to be involved in supply chain activities by nurse managers, the Chief Nursing Officer, or department/clinic managers. In few cases, clinicians were recommended by senior hospital leadership or the Chief Medical Officer. In addition to recommendation and voluntary selection/clinician interest, two other processes were suggested as methods to identify and select clinicians for supply chain involvement. The first is to require mandatory participation that all nursing managers (as employees of the hospital) participate in supply chain meetings. The second is identifying which physicians are likely to be impacted by the specific product change, and request their involvement on the supply chain team.



Survey participants were asked to rank the importance of the criteria for considering physicians to be involved in supply chain activities on a scale of 1 (least important) to 3 (most important). The most important criteria were “area of expertise” and “physician interest.” “Other” criteria that were suggested include identifying the most “difficult” physicians to engage, identify who the financial decision maker is, and identifying which physicians are most likely to be impartial in the decision.

	Average Ranking (1-3, 3 is most important)
Area of expertise	2.81
Physician interest	2.70
Potential impact of product selection	2.43
Physician variance in product costs (high cost physicians given preference to become involved)	2.18
Physician variance in product costs (low cost physicians given preference to become involved)	2.03
Position in clinical hierarchy	2.01
Years of experience	1.92

1.3.2 Engaging physicians for products affecting patient safety & health outcomes

Interview participants noted that not all procurement-related decisions need to involve clinical input. Participants noted that any procurement decisions which would have an impact on patient safety or health, in particular any invasive items used during surgery, should consult physicians for clinical input.

“Anything that’s got anything to do with patient safety, patient health, and in particular anything that is being inserted or used inside patients and used within surgical procedures that’s where we ask them for advice.” (Participant 10, AU)

Specific criteria and strategies for engaging clinicians in product standardization initiatives are included in Section 2: Product Standardization.

1.4 Activities

1.4.1 Establishing relationships both within PESC & outside

Many participants and literature sources identified the need to establish long-term relationship both within PESC activities and outside for broader supply chain activities. There were multiple levels of clinician engagement noted in the interview analysis. These ranged from basic involvement in PESC decisions, to regular contact and relationship-building with clinical staff outside of PESC decisions. Multiple approaches are included below:

- ▶ **Engagement limited to P ESCs:** P ESCs are discussed in Section 2: Product Standardization.
- ▶ **Engagement for broad supply chain decision-making:** Many hospitals, particularly in the US, have physician committees or councils which meet with purchasing/procurement on a regular basis to discuss a variety of issues. Many of these councils have standardization mandates, but also have a broader mandate including elements such as EMR implementation. These groups are very effective at creating ongoing dialogue and relationships between clinicians and procurement leaders. Clinician engagement activities are focused on physician-driven decision-making and collaboration to ensure that physicians are “intimately involved in disclosure of information – everything from pricing to market share to innovation research” to negotiation strategies (Participant 4, US). In this way, all decisions, including strategy-related decisions, are made with physicians. For example, in the US, there is a partnership between supply chain management and a multi-site physician collaborative group, which focuses on collaboration to identify cost-reduction opportunities for physician preference items (PPIs) across the system. “Specialty councils are essentially the employed physicians getting together and discussing a variety of issues. So that may be a discussion around electronic medical records, it maybe products, it may be general best practices that are trying to be shared across the ministry, but that avenue or that communication path exists and we use it extensively to make sure that as we’re contracting and trying to figure out what products are best in what scenario, that we have an open dialogue with our physician population.” (Participant 3, US)
- ▶ **Engagement for relationship-building:** Supply chain management needs to spend a significant amount of time and energy with clinicians to understand what is important to them. For example, one VP Supply Chain Management stated, “I spend a long time where they do their work, I go to our cath labs, I go to surgery, I talk with them about what’s important to them while they’re actually there doing their work. Besides just meeting with them in meetings, I talk with them offline, talk with them on the phone.” (Participant 4, US) This approach was noted to have positive effects on other supply-chain related clinician engagement activities because of the established relationships.

The benefits of engaging clinicians are not limited to clinician buy-in and support, but also for educating procurement staff on clinical activities.

In addition to clinician engagement, several participants spoke of the importance of engaging clinical administrators in supply chain activities. One participant noted the importance of building partnerships with senior-level hospital executives and directors, saying “You basically start a concentric circle, from the director or the vice president of that area, so if it’s IT, it’s IT people, if it’s OR, it’s OR. Directors, managers - they are the ones who said ‘I think we need a couple of nurses.’ ‘I think we need infection prevention and control.’

‘I think we need biomed.’ ‘I think we need some physicians.’ And depending on the size and complexity of the effort, you may have a bigger group than a smaller procurement, if you wish, where three to five people can probably come up with a good recommendation for the hospital.” (Participant 6, ON) Ultimately, peer-to-peer communication is a useful tool, which can build credibility and foster a productive working relationship between procurement staff and clinicians.

Several participants noted that they were working towards developing relationship-building processes within their organizations. This was generally accepted and recommended as a best practice by interview participants. One participant also noted that the benefits of engaging clinicians are not limited to clinician buy-in and support, but also for educating procurement staff on clinical activities. Having an open dialogue with physicians requires that supply chain management research and gain exposure to areas other than supply chain. As one VP Supply Chain Management in the US stated, “I am not a clinician ... so I have to figure out how do I educate myself on the issues from my perspective and then become someone the physicians look to help and work with.” (Participant 4, US) When supply chain experts expect clinicians to become educated and engaged in supply chain processes, clinicians generally have an expectation that the supply chain experts have considered the clinical impact and issues. One VP Supply Chain Management states that, “we actually had to go out and research anything we talk about, the background of it, where it came from, clinically what has it done, what white papers are out there, have I read all these white papers, I mean, all those things need to show that we have to do more due diligence in order to be able to have a meaningful dialogue with physicians about why one strategy is better than another.” (Participant 4, US)

This VP also acknowledged that his role is to collaborate and communicate with physicians by providing input and feedback based on his business expertise. “We do a lot of back and forth and dialogue, but it’s still incumbent on me to make sure that my credibility with them is what they’re looking for and if they ask me something ... I tell them exactly what I’ve learned or if I need to go find out.” (Participant 4, US)

As part of building relationships with clinicians, purchasing and procurement professionals need to educate themselves in clinical areas.

Both the literature review and key informant interviews identified relationship-building as a key element of successful clinician engagement. Survey participants were then asked what the most effective strategies used to strengthen the clinician-procurement professional relationship were. Their responses, in order of decreasing frequency, are as follows:

- ▶ Keep clinicians regularly informed and involved in PESC activities
- ▶ Hiring clinicians within the supply chain
- ▶ Regular communication outside of PESC meetings (including one-on-one meetings)
- ▶ Make supply utilization data (including costs) transparent and easily-accessible
- ▶ Focusing all supply chain conversations on a common goal (i.e., patient safety)
- ▶ Having an open forum to discuss the use and possible outcomes of new products
- ▶ Engaging a clinical champion (i.e., clinical coordinator, senior clinician, VP Medical Affairs) to liaise with clinicians and explain what and why changes are being made
- ▶ Educate clinicians about the costs of healthcare and basic business training on hospital operations

Case Study: Cross-functional teams to drive clinician engagement

At one Canadian SSO, physicians are engaged in two main ways: 1) cross-functional teams during procurement and 2) standardization efforts for hospital procedures. Cross-function teams are first formed by administrators within the relevant area (i.e. IT, OR, etc.), such as directors, managers, and VPs. These administrators then recommend additional team members, such as nurses, surgeons, infection prevention and control, and physicians, based on suggestions by the SSO. These additional members are primarily clinicians and physicians, especially when more sensitive surgical products are being procured. Members are not incentivized to be on these teams and may choose to opt out; however, if they opt out, they are deciding to let other people tell them what products they will use. As some clinicians are more interested to become involved than others, the teams are not always completely random, although also not always composed of the same people. Team size is proportional to the size and complexity of the product and/or effort. For example, a smaller procurement effort would require three to five team members. Within cross-functional teams, clinicians define best value for money and provide the financial and clinical requirements of the specifications that will be included on evaluation bids. Team members then score the bids using these weighted average criteria and award the contract to the highest-scoring vendor. Scoring for particular specifications is done by relevant team members (i.e., financial people score financial component). Of this process, one SSO VP, Supply Chain Services says *“if it’s done well, if the requirements are well-defined, if the right people around the table, and are scored objectively and favourably, then you would typically get the right answer, even though some physicians or folks might have to change, which obviously no one likes change, especially not when you’re playing with people’s lives every day. But, that’s what the procurement rules in the province dictate - is that there is fairness and transparency over these procurement processes to make sure that the public purse gets best value for money.”*(Participant 6, CA)

The second way clinicians are engaged is through standardization efforts, which have been introduced within the last year. This form of engagement was motivated by the fact that for any given procedure, physicians are using different products, such as shavers, glue, and sutures. To highlight this variability, the SSO gathers information from different surgical procedure cards to compare the cost and materials for the same procedure across different physicians. These results are then presented to each physician in an individual package, with names redacted, which allows them to compare themselves to their peers. As a result of this information sharing, physicians would respond with statements such as, *“I don’t mind using the five dollar gown – I didn’t realize that I was paying ten for my gown. I don’t care, that one seems to work just as fine. And if they don’t, they’ll ask their buddy, and they’ll say does this still work fine? Really, it’s about information. We didn’t have a mandate, nor should we, to have a mandate to force anything. All you’re doing is bringing information to them and saying ‘take a look at this, see what you think.’”* (Participant 6, CA) Ultimately, the point of this is to ask physicians *“would you consider using this versus that, because these are your peers. They’re using different things, some less expensive than others, and they’re still getting the same outcomes for patients, so unless you can really show how your stuff is leading to better outcomes, you may want to consider driving down to the lowest common denominator.”* (Participant 6, CA) Although this may be a sensitive topic, clinicians have been appreciative, supportive, and welcoming of the information, as many were previously unaware of the cost of procedures since *“they get paid by procedure, as long as the patient gets the right outcome, their job is done, but they understand that the province is under budget, that surgical theatres are open so many hours, or so many procedures, so if they help play an active role in driving down the cost of the supplies, it’ll benefit them, as well as society, by maybe getting more procedures done in the same year.”* (Participant 6, CA) Ultimately, this approach stimulates dialogue amongst physicians and is an opportunity to drive value through standardization and collaboration.

1.4.2 Leveraging vendor sales reps to engage physicians

In the US, procurement staff commonly leveraged the expertise of vendor sales representatives to strengthen relationships between clinicians and procurement. Once a final purchasing decision has been made, the vendor sales representative can come on-site to train and educate physicians on the benefits and uses of individual products. These sessions were described as being very valuable to physicians. In hospitals that had procurement staff present and facilitating these information sessions, the relationship between procurement and physicians was described as being very strong. *“In physician preference items, the relationship between the physician and the sales representative for company X in category Y is going to be stronger than the relationship between the physician and the administration at the hospital. Because if you’re talking about knee implants, your representative from Stryker is the guy that’s going to come in and say ‘here you go, here’s how the product is made and share valuable information in the OR.’ That is invaluable in the eyes of the surgeons and so that’s the piece that you have to strike the relationships between the administration and the surgeons.”* (Participant 3, US)

1.4.3 Leveraging public reporting of variance rates

In cases where cost and outcome analysis is not enough to convince physicians to change products, some hospitals have begun to leverage the competitive nature of physicians by making cost and physician variance data public. This approach should be reserved for late adopters of the change, as in some cases it was perceived to be punitive and, although not documented in this study, has the potential to negatively affect relationships between physicians and procurement staff. *“It’s not about having to convince [physicians] that [they] have got to do this or else your block cap, that’s the wrong way to approach it. The right way to approach is to sit down and say, ‘Dr. Smith, we see that you’re using a Harmonic scalpel in a laparoscopic cholecystectomy. Nobody else is doing that. We looked at the outcomes. Your outcomes are the same or really no different than your peers, can you try to do this without using that expensive device?’ And they may say yes; they may say no. If they say no then you elevate to the next level where you start to make public, here are the costs associated with surgeon X, Y, Z. And as you can see Dr. Smith is \$800, \$500 more expensive than everybody else. And the outcomes are the same. Because the reality is none of them want to be the worst and that peer pressure is an incredibly powerful motivator.”* (Participant 3, US)

1.4.4 Leveraging nursing leadership in supply chain management

In addition to physicians, several procurement and purchasing organizations have benefited from engaging nurses in purchasing activities. Nurses are engaged in PESC in the US, especially in terms of clinical product usage. *“It’s just as critical that we communicate from the Chief Nursing Officer all the way to whatever type of nursing organization that the organization has within it... you have to understand that process – if they have a governance process that includes stewardship with supply costs and other non-labor costs. We have to become involved in that, so I work as closely with the CNO and with their nurse leadership, as well as on the frontline in nursing, as I do with our physicians.”* (Participant 4, US)

Nursing engagement can range from including few nurses in PESC for nursing-related products to full-time nursing leadership hired by the purchasing department. Few SSOs actually hired full-time nurses as staff for procurement/purchasing activities. At one SSO in Canada, three full-time nurses (two registered nurses and one registered practical nurse) are employed by the SSO and report to the general manager. One of these nurses is a contract administrator, while the other two are clinical specialists. 80% of their time is spent providing input on clinical matters, while the other 20% of their time is spent in meetings and working groups, in which they assist the SSO in building criteria for product evaluation and providing appropriate training and education. Nurses approach each initiative in a neutral manner from a business, rather than nursing, perspective and serve as an impartial expert, which helps drive objective decision-making. This system is invaluable to the SSO, as the role of nurses ensures that the organization is compliant with supply chain code of ethics around personal integrity, professionalism, accountability, transparency, compliance and continuous improvement.

1.5 Performance Measurement & Metrics

None of the participants' organizations used tools to measure or track improvements in the procurement process or clinician variance as a result of clinician engagement.

1.6 Leadership & Governance Structures

1.6.1 Leveraging support from senior hospital leadership

Participants from SSOs noted that clinicians today are more willing to be engaged in procurement decisions than they were in the past. However, several participants noted that this cannot be solely attributed to SSO efforts at engaging clinicians, but rather the hospital buy-in that the SSO model is necessary and the most efficient option available. In particular, support of the hospitals' Chief Financial Officer and Chief Operating Officer is most effective. *"I would suggest that a few years ago that the want of clinicians to be engaged was far less than it is today. However, it couldn't just simply be from the SSO barking for effective clinical engagement, but rather the hospital buy-in to the models that the SSO is presenting. And so I think with support of in particular the Chief Financial Officer, the Operating Officer suite within each hospital."* (Participant 9, CA)

1.7 Change Management Strategies

1.7.1 Collaborating with all supply chain stakeholders

Effective procurement to facilitate positive patient outcomes and strong financial success requires clinician engagement through collaboration. For example, *"a purchasing group can't just go out and pick something and tell people this is what you should use."* (Participant 6, CA) This sentiment was echoed by another participant, who stated, *"the recipe is always the same. It doesn't matter if it's physicians, clinicians, police officers - whatever you're working with, you need to work together on these things. I think it's not really helpful to tell people how they should do their job and what products they should use to do it."* (Participant 4, CA) These perspectives support the idea that all supply chain initiatives require input from all affected stakeholders in an organization. As clinicians work in teams to use evidence-based thinking and build consensus around clinical pathways, it is advantageous for supply chain organizations to leverage this same collaborative process to facilitate supply chain processes; however, to effectively engage clinicians, supply chain management must recognize that their business expertise, including negotiations, contracting, and compliance, is interdependent upon, rather than in conflict with, clinical expertise. Although collaboration with physicians to help build consensus requires a lot of effort, it is *"very rewarding to help physicians understand that they have the ability to influence the market in very, very strong ways but they also need to understand how that influence needs to be molded into a consensus environment."* (Participant 4, CA) To achieve this, supply chain needs to build strong relationships and networks with clinicians and use these networks to leverage the best strategic advantage – a strategy that has worked well throughout Canada, the US, and Australia.

Supply chain management must recognize that their business expertise, including negotiations, contracting, and compliance, is interdependent upon, rather than in conflict with, clinical expertise.

Part of collaboration as a tool for effective clinician engagement is building a relationship of trust and respect between supply chain management and clinicians.

- ▶ **Building trust:** It is essential that physicians trust supply chain management. When supply chain management and clinicians work through various initiatives to achieve an outcome or make a decision together, clinicians are convinced of the outcome or decision and trust it, due to their involvement throughout the process. This trust then builds on itself and can be leveraged towards future engagement in supply chain initiatives.
- ▶ **Establishing an environment of respect:** To effectively engage clinicians in supply chain initiatives, procurement professionals must be cognizant and respectful of the added implications of change within the health care industry. As one participant states, *“I’ve done supply chain outside of health care, but the main difference in health care is you’re talking to people that every day they get up, they put people’s lives in their hands, and so you have to have an extra level of respect for change management. And so it’s easy for me to say, ‘come on, doc, it’s the same stuff,’ but if that doctor was trained on that technology, if that doctor’s been doing that same procedure with the same equipment for ten years, it’s a big deal to show up Monday morning and have a new set of gloves. It can be done, but you have to appreciate the downside risk of change in health care which is much greater than changing a photocopier or changing your Blackberry.”* (Participant 6, CA)

1.7.2 Partnering with clinician champions to drive engagement

In Australia, key surgeons are the biggest influence in the purchasing of new products, but often encounter difficulties when trying to convince the administration to buy a new piece of equipment. This is an opportunity for procurement to assist; procurement would then ask the clinician to help advance their supply chain strategies in return, for instance, by saying, *“if you can encourage your colleagues to trial these products for me I will fight very hard to make sure that you get your new equipment.”* (Participant 8, AU)

1.7.3 Training clinicians on supply chain activities

Before receiving training in supply chain specifically, clinicians need to be educated in basic business principles and supply chain operations. Recognizing that physicians’ education is largely based on one-on-one physician-patient interactions, a basic introduction to the reality of hospital operations is often sufficient to gain physician buy-in to procurement involvement. *“Our Chief Medical Officer and I had a conversation one time, he said ‘you know, you’re a business guy. You went to business school to learn how to work within a broad organization. Physicians go to medical school and medical school is all about the patient-physician interaction. It’s a one-on-one interaction. It’s not a team effort, it’s a solo effort.’ And so part of what we’ve been successful doing is helping to blur those lines or soften the dichotomy between the two, so physicians have a clear understanding of what the financial picture of the hospital system is, why standardization on products is good idea.”* (Participant 3, US)

1.7.4 Assigning resources to look for & disseminate best practices

Several participants, particularly from Canada and the US, noted that health care supply chain professionals do not often share practices with other hospitals or SSOs. One US SSO has had particular successes in standardizing physician preference items through its member hospitals. It is currently in the process of establishing a consulting practice to share these practices with other hospitals in the US. *“We’re standing up a consultant practice specifically around clinician alignment and how to drive better standardization around physician preference items because of the high degree of the high costs associated with that and the fact that its, there’s a lot of physician preference in there, it’s often difficult to drive standardization in that area, but we’ve been very successful in doing that and actively go into the market and help other health systems do that.”* (Participant 3, US)

2. Product Standardization

Chapter at a Glance

- ▶ One of the most popular methods of facilitating product standardization was by creating product evaluation and standardization committees (PESCs). PESCs are generally comprised of interdisciplinary groups of clinical, administrative and procurement staff, and they collectively make purchasing decisions for individual hospitals or SSOs.
- ▶ Centralizing procurement across a clinical department, hospital, SSO, or health system gives departments more control over product selection, bulk ordering and standardization. Centralizing to higher levels has the potential for greater cost savings, but only to a point. Smaller trusts often secure better pricing than larger trusts, because as trusts get too large medical supply companies are less willing to give lower prices to entire regions.
- ▶ The greatest barriers to standardization are difficulty obtaining clinician consensus, difficulty obtaining clinician involvement, cost of standardization, and time required for standardization.
- ▶ Standardization criteria should include cost considerations, but also other, more clinically-relevant criteria. The most recommended criteria are patient outcomes, cost data, and staff feedback.
- ▶ When procuring innovative products, it is often clinical staff and other end-users that suggest new products for purchase through the work of partnerships, networking, and working groups. For innovative products, price is less of a deciding factor.
- ▶ When survey participants were asked about the best practices to facilitate standardization, the most popular responses included; forming a value analysis team to rigorously analyse product choices; gaining C-suite and executive support and buy-in to standardization activities; and involving a cross-section of departments and staff in the process of standardization.

2.1 Literature Review & Environmental Scan

Product standardization—a reduction in the variety of hospital supplies—can facilitate the efficient use of resources and improve patient-centered outcomes by promoting common processes and reducing opportunities for error. In the literature review and environmental scan of best practices, two main mechanisms were used to drive product standardization: procurement policies & procedures and education initiatives.

2.1.1 Procurement policies & procedures

A number of policy strategies that various jurisdictions had used to increase standardization in their supply chains were identified. These strategies are highlighted below.

Establishing product evaluation & standardization committees

One of the most popular methods of facilitating product standardization was by creating product evaluation and standardization committees (PESCs). PESCs are generally comprised of interdisciplinary groups of clinical, administrative and procurement staff, and they collectively make purchasing decisions for individual hospitals or SSOs. By facilitating collective decision making and centralizing power over a number of clinical departments, PESCs can be powerful drivers of product standardization. In the literature, there are many case study examples of successful PESC initiatives, but little research exists on the relative performance, benefits and challenges of various models used for PESCs.

Value analysis committees (VACs) are a specific type of PESC model that has been highlighted in the literature. Value analysis is the “organized, systematic application of recognized techniques that identify the functions of a product or service”, and the committees seek ways to improve performance and manage costs through the review of efficacy and standardization of products, services and processes.³⁹ VACs differ from general PESCs in that they have a more rigorous process with standardized metrics and measures. While PESCs often look at cost solely as the purchase price of a given product/service, VACs tend to have a greater focus on *value*, looking at both the purchase price of a given product/service and projected cost savings from the product’s effect over the entire patient life.

- ▶ The University of Chicago Medicine used PESCs to evaluate and standardize their purchasing of hernia repair mesh products. A PESC at the hospital weighed the benefits of different mesh products, and then selected a single line of products. Surgeons in the hospital used the mesh products for six months and provided feedback on their performance and ease of use. Representatives from the mesh company collaborated with the surgeons to ease the transition, and many surgeons subsequently chose to switch to the new product permanently. Unique to this case study is the collaboration between PESCs and private sector vendors.
- ▶ Piedmont Healthcare, which operates six hospitals in the Atlanta, US area, recently partnered with Novia Strategies to help standardize supply purchasing and reduce non-labour spending. The result of this collaboration, the Strategic Transformation and Resource Stewardship (STARS) program, created multi-disciplinary teams from each hospital department to review the system’s expenses, revenue and operations. These teams consisted of Piedmont department leaders and Novia experts who collaborated to recognize cost-saving opportunities. Physician and nurse advisory committees worked with the teams to ensure that committee ideas were evaluated and supported by users. Additionally, a new value-analysis process was implemented to evaluate each new product or technology through peer review. The results of this program have been a culture shift to reduce non-labour spending, and the STARS teams have identified over 150 initiatives, saving \$35 million.⁴⁰

³⁹ Panneerselvam, R. (2012). Production and operations management. PHI Learning Pvt. Ltd., p. 34

⁴⁰ Novia Strategies. (n.d.). Sustainable Success: Delivering \$35 million in non-labor savings at Piedmont Healthcare. Retrieved from www.noviastrategies.com/piedmont/

Creating member associations to drive supply chain transformation

Many jurisdictions established member associations—groups of hospitals or government bodies—to push forward a supply chain transformation agenda. Member associations often had specific performance measures and could demonstrate cost savings as a result of the transformation.

- ▶ In 2005, OntarioBuys program was established, which facilitated the creation of health SSOs. These SSOs are comprised of hospitals that collaborate on supply chain improvement projects. One SSO, made up of six Ontario hospitals, created the e-Supply Chain Project, which explored opportunities to modernize supply chain management in the health sector. The goal of the project was to achieve savings through better inventory management, standardization and joint contract administration. Projected savings were estimated at \$50 million annually, and the initial investment in the project was recovered in 1.5 years on average.⁴¹
- ▶ In the UK, similar member organizations have been used. One example of a member association improving their product standardization was the 2014 *Working Together Program* in the NHS. Seven acute care hospitals agreed to procure products collectively, and began the project by standardizing their purchase of exam gloves. Supplies bid for 12 months in an eAuction for the business of these seven trusts, and the result was a 24% reduction in exam glove spending, from £2.1 million to £1.7 million.⁴²

Centralizing surgical warehouses

Centralizing the surgical supply storage facilities away from the operating rooms can significantly benefit hospitals. Centralized surgical warehouses give the supply chain specialists at each hospital responsibility for the purchase, storage and distribution of operating room products. At many hospitals, OR nurses have traditionally handled these duties, but removing storage facilities from the ORs provides nurses more time for patient care.⁴³ A 2004 study by Sullivan Health Care Consulting found that centralization of OR inventory can also reduce excess inventory, prevent inventory duplication, and allow staff better access to products when needed.⁴⁴

Optimizing data and performance monitoring

In the literature, the majority of case studies on product standardization efforts measure cost savings alone. When it comes to performance monitoring and non-financial metrics, the literature is very limited, and other benefits to standardization—reduction of excess inventory, reduced clinical frustration, and a better use of staff time—are not generally reported. Ontario's 2009 *Performance Measurement: Phase II – A Framework for Action* report by OntarioBuys was one of the few documents to offer hospitals a set of performance metrics to use when rearranging their supply chains.

Data optimization is another important aspect of supply chain improvement efforts. Data optimization is the logical step-by-step process for improving the quality of data stored in the databases of the hospital supply chain. The ideal data storage system is a single-item master file that serves all hospital departments, and which is integrated with other systems in the hospital. For example, the ECCnet Registry, Canada's healthcare product registry, is the source for standardized medical & surgical product data, and is accessible by hospitals. A few case studies on performance monitoring and data optimization are highlighted below:

⁴¹ Hanrahan, C. Shared Services in Health Care [Environmental Scan issue 24]. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2011.

⁴² Watkins, J. (2014). Working Together set to realise £400,000 annual savings from an eAuction on exam gloves. NHS Supply Chain. Retrieved from https://www.supplychain.nhs.uk/~/_/media/Files/publications/US2792%20Working%20Together%20case%20study%206pg%20web.ashx

⁴³ Buys, O., & Network, H. S. (2011). Supply chain modernization in Ontario health care: Improving patient care, enhancing service levels and reducing costs: A report on the e-supply chain project. Ontario Ministry of Finance, 2007.

⁴⁴ Sullivan Healthcare Consulting Canada (2004). Operational overview: prepared for Interior Health Authority. Peterborough ON.

- ▶ GPO HealthPRO, a Canadian hospital member organization, uses scorecard scoring systems to evaluate products and facilitate standardization. Each year, a Materials Management Advisory Committee allocates weights for each category based on clinical, financial and service criteria. The scoring is then done by a Clinical Advisory Committee to allow clinicians to assess and provide feedback on the products.⁴⁵
- ▶ The NHS' 2014 E-Procurement Strategy aims to automate the exchange of procurement data and allow procurement expenditures to be benchmarked across trusts and healthcare providers. This data will hopefully increase transparency in the online purchasing process, and will have the added bonus of allowing product barcodes to be standardized. The centralized data pool will use GS1 and PEPPOL product identification standards so that the NHS can obtain invoices, shipping notifications and information on recalls on all the healthcare products purchased. Increases in patient safety as a result of this standardization are an additional expected outcome.⁴⁶

Adopting shared service organization models

Centralizing procurement across a clinical department, hospital, SSO, or health system was a common theme in the literature. The goal of such centralization is to give departments more control over product selection, bulk ordering and standardization. The level of centralization varied greatly across and within jurisdictions, ranging from individual hospitals with consolidated purchasing to national funds for country-wide shared services. Australia has adopted another strategy by requiring that health care delivery and procurement are managed by separate organizations.

- ▶ Healthcare Materials Management Services (HMMS) is a joint venture between London Health Sciences Centre and St. Joseph's Health Care in London, ON. HMMS operates as an SSO, and has helped the hospitals achieve a number of standardization objectives, including:
 - *Cost Savings*: Reduced the number of inventory items, negotiated large-scale service contracts, and standardized ordering, delivery and accounts payable processes.
 - *Patient Safety*: Standardization of policies and procedures has allowed staff to transition seamlessly between hospitals, and allows the hospitals to coordinate services and more easily react to system changes.
 - *Space Saving*: The partnership has freed up 40,000 square feet of hospital space.⁴⁷
- ▶ In Australia, the federal government has mandated that organizations that handle procurement of products and services are separate from those that provide healthcare services. State SSO's are responsible for procurement, which Local Health Districts are responsibly for healthcare provision. Separating these functions centralize their financial and knowledge resources and increased purchasing power, resulting in cost savings.
- ▶ The UK's NHS created a "Capital Equipment Fund" in 2013 to secure better value for expensive medical equipment. Over the next year, this fund purchased £102 million of equipment, with savings of £12.2 million. These cost savings were achieved using collective purchasing approaches, improving hospital-supplier relationships, and building clinicians' skills in making purchasing decisions.⁴⁸

⁴⁵ Contract innovations give members more input, choice and flexibility. (2012, January).

www.healthprocanada.com/healthpro_progress.index.gk?catalog_item_id=2980

⁴⁶ Moore, A. (2013, October 25). Buying power - an HSJ procurement supplement. <http://www.hsj.co.uk/hsj-knowledge/downloads/buying-power-an-hsj-procurement-supplement/5064565.fullarticle>

⁴⁷ Rosser, M. (2005). Advancing health system integration through supply chain improvement. *Healthcare quarterly* (Toronto, Ont.), 9(1), 62-6. <http://www.longwoods.com/content/17906>

⁴⁸ Hinrichs, S., Jahagirdar, D., Miani, C., Guerin, B., & Nolte, E. (2014). Learning for the NHS on procurement and supply chain management: a rapid evidence assessment. *National Institute for Health Research: Health Services and Delivery Research*, 2(55), 2050-4389. Retrieved from http://www.journalslibrary.nihr.ac.uk/_data/assets/pdf_file/0005/131747/FullReport-hsdr02550.pdf

Interestingly, in the UK, the recent *Carter Report* analyzed current efficiencies in hospital procurement, and found large discrepancies in the buying practices and product prices between hospitals. Specifically, it was found that smaller trusts often secure better pricing than larger trusts, because as trusts get too large medical supply companies are less willing to give lower prices to entire regions. This suggests there is an optimal trust size to maximize efficiency. To help facilitate standardization, UK trusts are now required to publish their month receipts for commonly-purchased medical supplies, which is intended to increase purchasing transparency and reduce price variances between hospitals.⁴⁹

Smaller trusts often secure better pricing than larger trusts, because as trusts get too large medical supply companies are less willing to give lower prices to entire regions.

Establishing product registries & formularies

Product registries for medical supplies can help drive standardization efforts in a number of ways. Organizations and governments can develop a list of approved products and services that can receive funding. This limits the availability of certain products within hospitals so that standardization is driven from top-down.

- ▶ In 2008, the UK government instituted a tiered system of clinical product coverage based on national cost averages for each type of product. The government covers the costs of certain types of medical products, while not covering others, in the hope that it will reduce variability in type and cost of products. Before this system was instituted, 32 different types of artificial hips were being used by NHS trusts. The NHS mandated that only five models of artificial hip would be eligible for reimbursement, thereby influencing the purchasing decisions of the hospital trusts.⁵⁰
- ▶ British Columbia, Canada has created a province-wide Preferred Product Catalogue to educate clinicians on the advantages of using standard medical products. The catalogue is routinely updated to meet evolving clinical practices, and reduce the number of products used and the purchase price.⁵¹

2.1.2 Education Initiatives

In a recent Ontario report on healthcare standardization, interviews showed that 96% of clinicians and suppliers believed that physicians were generally unsupportive of standardization.⁵² However, physicians are often willing to standardize if the initiatives are well supported by scientific evidence, highlighting the need for improved education on the benefits of product standardization. Educating clinicians and frontline care workers on the necessity of standardization can often be the most cost-effective strategy to reduce hospital supply costs. Specific education strategies that were found in the literature include:

- ▶ **Certificate programs:** Education initiatives can often have a formal curriculum, structure and certification. For example, in Ontario a Healthcare Supply Chain Certification has been

⁴⁹ Carter of Coles, Lord. (2016). Operational productivity and performance in English NHS acute hospitals: Unwarranted variations. Independent report for the Department of Health. Retrieved from

www.gov.uk/government/uploads/system/uploads/attachment_data/file/499229-/Operational_productivity_A.pdf

⁵⁰ Cost Conscious Buyers Call the Tune. (2008, April 11). Retrieved from <http://www.hospitalmanagement.net/features/feature1868/>

⁵¹ McKinsey & Company. (n.d.). Building New Strengths in the Healthcare Supply Chain. Retrieved from http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/pharma%20and%20medical%20products/pmp%20new/pdfs/mckinsey%20white%20paper%20-%20building%20new%20strenghts%20in%20the%20healthcare%20supply%20chain%20vf.ashx

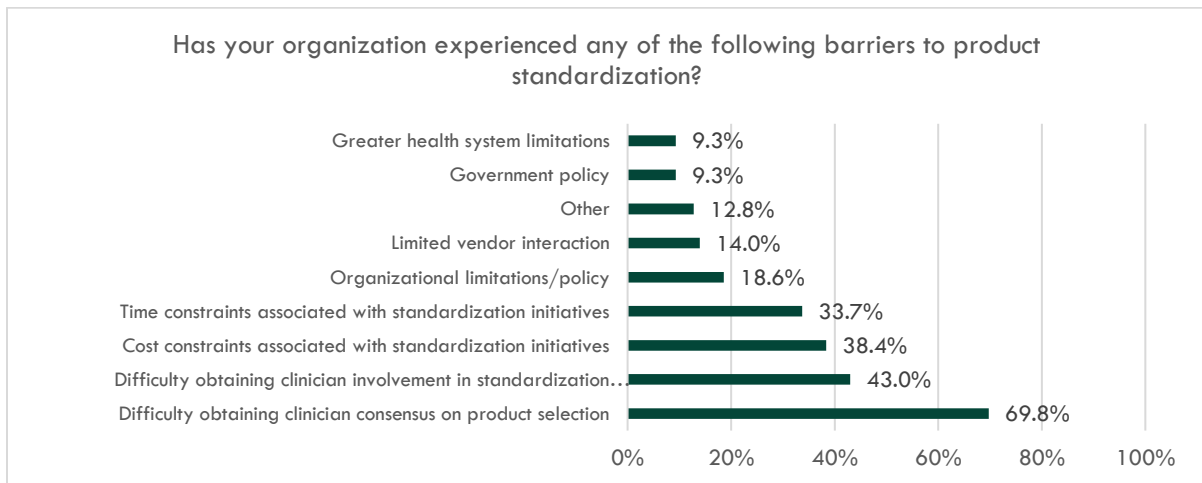
⁵² Zarzuela et al. (2015) "Defining Standardization within the Healthcare Industry: An in-Depth Analysis of Standardization from the Perspective of Key Stakeholders."

developed to better educate healthcare professionals on supply chain topics, including standardization.⁵³

- ▶ **Expert panels & best practice guidelines:** Expert panels and best practice guidelines can drive standardization efforts by giving stakeholders necessary tools and knowledge to enact change. Generally comprised of hospital executives, academics, government leaders, and health organization board members, these committees are given a mandate from the government to provide one-time recommendations. Ontario used this strategy in 2004 when it established the Surgical Process Analysis & Improvement Expert Panel, which created strategies to improve product procurement and the perioperative process in Ontario⁵⁴. As a follow up, in 2007 the Ontario Ministry of Finance launched the Operating Room Supply Chain Pilot Program, a similar expert panel that included a tool to help hospitals implement their own supply chain improvement projects.⁵⁵

2.2 Barriers

Survey participants were asked to list the barriers that they found most difficult when dealing with standardization efforts. The most common responses noted by participants were difficulty obtaining clinician consensus (69.8%) and involvement (43.0%), as well as cost (38.4%) and time (33.7%) constraints. “Other” barriers most commonly noted by participants included managing physician preference items and an inability of local vendors to supply complete product lines.



2.2.1 Clinician resistance to change

There is a general resistance to changing product selection through standardization, particularly with clinicians. For example, Participant 2 stated, “we [SSO] never have a problem when we stay with the incumbent. It’s when you go away from the incumbent. So their [clinician’s] perspective is we’re just doing this to save money.” (Participant 2, CA) To minimize this perception, there has been a focus on appropriate terminology for communication with clinicians. For example, Participant 3 stated, “we

⁵³ Healthcare Supply Chain Network. (n.d.). Healthcare Supply Chain Certification - Healthcare Supply Chain Network. <http://www.hscn.org/healthcare-supply-chain-certification.aspx>

⁵⁴ Chesler, C. (2013). Clinical Integration Track: Strategies for True Clinical Collaboration [PPT]. IDN Summit.

⁵⁵ Government of Ontario, Ministry of Health and Long Term Care. (2010). Reference Guide and Toolkit for Improvements in Perioperative Practice in Ontario. <http://www.health.gov.on.ca/en/pro/programs/ecfa/docs/guide.pdf>

actually don't use that term [standardization]. We talk more about reduction in variation than we do about product standardization because that's a more palatable term for the physicians here.” (Participant 3, US)

Another barrier to standardization is that it depends on relationships with clinicians and requires clinical buy-in through internal testing and assessment processes. Many participants described difficulties in leading standardization initiatives from the supply chain without a clinician champion. As Participant 8 stated, *“ultimately I'm an administrator, I'm not a clinician, I'm not clinically trained, so I'm not really in a position to be able to tell clinicians what is the best product that they should be using, so to produce better clinical outcomes.” (Participant 8, AU)*

“We actually don't use that term [standardization]. We talk more about reduction in variation than we do about product standardization because that's a more palatable term for the physicians here.” (Participant 3, US).

2.2.2 Overcoming limited clinician supply chain training

The time and effort required to educate and train clinicians in the area of product standardization presents a barrier to such processes. This challenge is further exacerbated due to the high turnover of products. For example, Participant 5 recalls that *“you would have people who would be off on the training leave, and they would come back months later and find themselves standing in front of a new machine.” (Participant 5, CA)* One solution that has been successful in Ontario is to utilize available nursing staff to help manage the change and work directly with physicians to show them the products and assist throughout the transition.

2.2.3 Navigating a siloed system structure

One key area for improvement in the future is for the SSO to work more collaboratively with other health services due to cost pressures. Said Participant 7, *“if we had health services working in clusters or collaborative groups around supply chain and procurement by default, they'd have to start thinking about the standardization of products. If I had a cluster of eight health services and each of them uses a different brand of needles and syringes, which makes procurement really hard. It also goes along with the ability to get the economy to scale, and if they also have some sort of logistics arrangement. We have no master plan right now around that because each situation is quite different and has to be handled differently...I think there's a trend more and more for clustering, for regionalization, for working together.” (Participant 7, AU)* An example of this collaboration and clustering occurred when eight hospitals in Victoria, Australia came up with a logistics framework for four warehouses to move to one warehouse, which required hospitals to identify purchasing patterns across the hospitals and plan for future purchases. This process of consolidation has been very difficult, as it requires that people agree and work together. To facilitate this process, the SSO offered data analysis reports.

These clusters could potentially expand into PESCOs. Most PESCOs operate independently, with each group servicing only its own organization, which can result in duplication in product evaluation efforts. For example, Participant 7 questioned, *“why does every hospital have to do that duplication work? Again, it's almost like ‘I don't trust you, I want to do it myself only to prove that you've done it right’ ... So I think there's a real opportunity in the future for us to go down that path.” (Participant 7, AU)* One solution to this problem is to centrally manage these groups, which is what a health service organization in Victoria, Australia is attempting to do by creating a central clinical PESCO, in which the various health services can participate.

2.2.4 Time required for RFP development

A barrier to the procurement of innovative technologies is the time required to build innovative RFPs within the government timeline, as one Participant 1 stated, *“building an innovative RFP and using some of the other tools that are out there like Ontario Tender Portal, etc., it all takes time. The government gives us money with 4 and 5 months to go and tells us we have to have this innovative solution spent by March 31st. Well guess what? Christmas is right around the corner, by the time January comes around we strike a working group, we build the documents, we get it on the street, we make an award. We're beyond April*

1st, trust me. So it's one of our greatest challenges... It flies in the face of their own supply chain code of ethics... I'm here trying to drive the most value for the process and you're really pushing the rules because you don't want to lose out on funding, but you could have done a better job if they gave you two extra months." (Participant 1, CA) The preferred timeline for such initiatives, as recommended by Participant 1, would be a minimum of six months, but closer to eight to 12 months.

2.2.5 Catching up with technology-based systems

Participants from each jurisdiction commented on challenges with newer technology-based platforms designed to facilitate procurement activities. A challenge with these systems, such as electronic tendering portals and electronic recall systems, is that users are still not completely familiar with how to properly use these portals or have functional problems with the system. For example, most product evaluation has traditionally been subjective in nature, where clinicians give their expert judgements and select a product. Alternatively, technology-based systems typically require that the majority of criteria are objective, yes/no type questions. This requires a shift not only in technology, but also in process and evaluation.

A second challenge with technology-based procurement systems is that there is a wide variety of systems and modules in use, such as GS1, which results in different datasets.

E-tendering is an important innovation that aims to remove some of the subjectivity from the procurement process by reducing human error and manual steps, thereby reducing the potential for error. However, as 3 Participants noted, the notion that e-tendering expedites or simplifies the procurement process is a misconception; rather, the value of e-tendering is that it drives proper decision-making through rigorous methods. As Participant 1 noted, *"sometimes we get too hung up in trying to turn things around too quickly and therefore when you rush, you tend to migrate back to the simplest solution. That's not really what we want to do."* (Participant 1, CA)

2.2.6 Managing increasing supplier power

As noted by a Participant in Australia, within the health care industry, there is a power imbalance between suppliers and the organizations they supply. These power dynamics create a barrier by allowing suppliers to control the conversation and how much information is known. Furthermore, suppliers also often hold a monopoly within the industry and it was noted that there is little that can be done about this challenge.

Suppliers often do not want standardization, as outlined by Participant 3, who stated *"suppliers want a free for all with no contracting and just go in because if you're actually driving standardization and you're on the outside and you're health system is actually able to maintain the standardization, your business is zero. If they're actually able to drive standardization and you win, sure you get the business and that's great, but in a good health system you're going to try and erode your margin over time. You're going to say I'm driving 80% compliance to your contract for ball point pens, you'd sure better give me the most amazing price out there."* (Participant 3, US)

There are a select few companies, including Medtronic, Striker, and Johnson & Johnson, which have achieved influential power through building strong brand loyalty throughout the years. By way of extremely active marketing and by influencing doctors early in their careers, these suppliers have made standardization difficult from a commercial perspective, as Participant 8 stated, *"surgeons have come to believe that whatever it is that they're using they need that, and companies and expertise in that type of a product to make sure that they are using it correctly, and they've managed to embed themselves into the organization."* (Participant 8, AU) Although health services are trying to standardize on terms and conditions of contract, this is challenging because suppliers push against these efforts, by working and influencing clinicians, directly.

2.2.7 Variability in global pricing

In Australia, one major barrier is the concept of "Australian premiums," in which Australia pays more than the UK, US, and Singapore for equivalent products due to extreme mark-up costs, which can range from

3000 to 5000%. To address this challenge, the State of Victoria needs to identify strategies for supplier relationship and management, as Participant 8 stated, “you need to warm up to your suppliers in order to produce a greater value for what you bring in to the system. And that’s great in theory and we can all be nice to each other and do the right thing but sometimes you have to be less than convivial to get your point across. And unfortunately there is not a great appetite to do that because I think a lot of people just do not want to confront it. And then the consequences you get ripped off ... I’ve had some success because of my negotiating style and basically because I do my homework. I’ll even go to an organization’s website to understand what their values are, what they expect from their suppliers and then I’ll turn that on the organization themselves and say ‘okay, this is what you expect from your suppliers and this is what I expect from my suppliers and this is what my suppliers are doing.’ And, and I’ve had some success with that because I had to do that to deal with them.” (Participant 8, AU)

2.3 Identification of Need

2.3.1 Identifying products to be standardized

Survey participants were asked to rank the weighting of different criteria used to identify which products/services should be standardized. Participants ranked the criteria from 1 (least important) to 5 (most important) and explained how each criterion is understood and obtained (data sources).

The most heavily-weighted criteria were patient outcomes, cost data, and staff feedback, with average scores of 4.51, 4.41, and 3.95, respectively. The relative scores and data sources of all criteria are included in the table below:

Criteria	Average Score (out of 5, 5 is most important)	Data Sources
Patient Outcomes	4.51	Clinical outcome data, user feedback, comparative effectiveness
Cost Data	4.41	Cost per case, cost per procedure, spend reports, MMIS reports
Staff Feedback	3.95	User feedback, product surveys, product review committee
Usage Rates	3.86	Utilization rates, EMR/MMIS data, slow moving stock reports
End of Product Contract	3.08	Contract calendar, vendor notification, MMIS system
Variance Reports	2.96	Budget reports, backorders, fill rates, department benchmarking
Activity-based Costing	2.50	Cost per case, cost per procedure, financial management system
Other	0.66	Vendor relations, market analysis, sustainability

Across most participating organizations, the decision to standardize a product was traditionally made by supply chain professionals based on financial data. All participants described how this process has changed, and is much more engaging of clinicians and other system stakeholders now. There were a number of ways hospitals and SSOs identified products to be standardized. These included:

- ▶ **Contract expiration:** any contracts which have expired or need to be renewed are examined for standardization opportunities.
- ▶ **Annual review:** any contracts over \$100,000 are automatically reviewed annually.
- ▶ **Hospital feedback:** regular communication lines are made available so that hospitals can report any issues with products/contracts.

- ▶ **Vendor performance scorecard:** annual performance score cards are completed and an audit is used to provide feedback to both the hospital and suppliers in a two stage process. If a score of 70% is attained in stage 1, the audit is passed; however, if a score of 70% is not attained, the audit proceeds to stage 2, which consists of *“a much deeper dive and it involves going line-by-line through the contract and identifying areas that they failed to meet, and we [SSO] reconcile any deliverables that they [hospital or vendor] haven’t met and we insure that we get the full value on the contract.”* (Participant 1, CA)
- ▶ **Supply utilization data analysis:** few hospitals used data analysis and variance spending to determine areas for savings opportunities.

Most of the participants used simpler measures for deciding which products to standardize, such as contract expiration, annual review, and hospital feedback. The few organizations which used rigorous data analysis or vendor performance measures described financial improvements versus more traditional models, as well as improved clinician relationships.

2.3.2 Leveraging clinicians for innovative product identification

Most of these strategies relied on the efforts of the procurement or purchasing team to identify the products to go through standardization efforts; however, for new, innovative products, it is often clinical staff and other end-users that suggest new products for purchase through the work of partnerships, networking, and working groups. In this way, procuring innovation is enabled by end-users, not procurement staff. This is a particularly effective strategy, as Participant 1 stated, *“they’re the ones that are reading the journals and hearing about things and probably going to the right type of conferences, and then they’ll throw out these ideas and say, ‘company A has this new product, boy it looks like the best thing in the world and it’s got a great safety cap on it and I’d really like to bring it in.’”* (Participant 1, CA)

For new, innovative products, it is often clinical staff and other end-users that suggest new products for purchase through the work of partnerships, networking, and working groups.

Although the procurement of innovative technologies is not often initially led by the SSO, it ultimately depends on the product, Participant 1 continued, *“we don’t like to create monopolistic positions so sometimes we won’t be the first out of the blocks buying something innovative. But there comes times where if it’s safety related or patient risk related, then we will do it, but it just depends really on the commodity that we’re looking at. There’s advantages to being first out of the gates, and there’s advantages to being in the middle of the pack.”* (Participant 1, CA) Participants from each selected jurisdiction shared this sentiment.

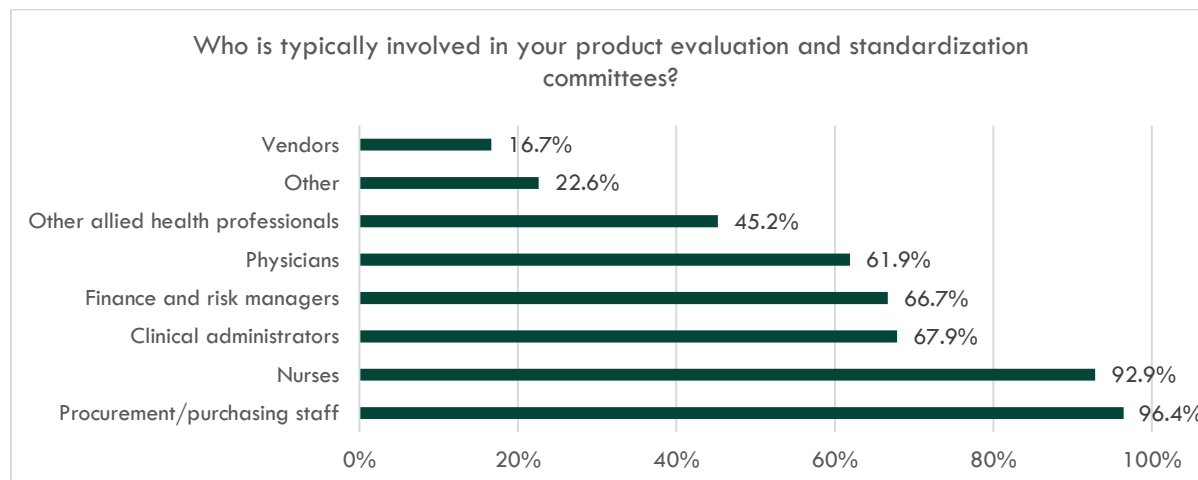
2.3.3 Segmenting products by type

Standardization processes depend on the product type, as there is a distinction between the “tried and true,” common products, as compared to more innovative products. In the industry of more common products, innovations and modifications in this market are much slower. Further, these products adhere more closely to their contracts, have longer-term contracts, and facilitate strong relationships with GPOs. As a result, supply chain must have a thorough understanding of any issues related to those products. In contrast, innovative products are on more flexible contracts and have a shorter-term cycle of approximately 1-2 years to allow for frequent review, as the market is fluid and may result in cost changes.

2.4 Activities

2.4.1 Establishing product evaluation and standardization committees

Of the organizations surveyed, only two did not use a PESC model. All others had some form of product evaluation committee, and membership varied across organizations. Procurement/purchasing staff (96.4%) and nurses (92.9%) were the most commonly represented member groups on PESC. “Other” types of members included infection control staff and materials management.



Participants were asked to rank 13 PESC criteria that were commonly found in the literature based on a scale of 1 (most important) to 14 (least important). The rankings revealed that clinician input/feedback and patient outcome data are the most important factors when analyzing products to be standardized, with average rankings of 2.72 and 2.99, respectively. “Other” criteria that were suggested by participants included the need for a new product and the use of a product by the hospital’s GPO.

	Average Ranking (1-14, 1 is most important)
Clinician input/feedback	2.72
Patient outcome data	2.99
Value analysis (cost of product vs. expected outcomes)	4.30
Cost analysis	4.57
Product research/evidence	5.46
Procurement staff input/feedback	6.07
Patient input/feedback	6.71
Market analysis (availability of alternative products)	8.00
Vendor input/feedback	9.69
Industry standards	9.82
Innovation potential	9.93
Variance data	10.17
Peer hospital selection	10.86
Other	13.70

When looking at the process for product evaluation activities, 58.3% of survey respondents noted that the process is the same for all products, while 41.7% noted that the process is dependent on the products.

For participants who said that the process was dependent on the products, the most common reasons given were (in order of decreasing frequency):

- ▶ Extensive clinician engagement in PPI
- ▶ Low sensitivity items require less scrutiny and have less clinician engagement
- ▶ Routine commodity items are standardized without going to the PESC
- ▶ Products used in only one or very few clinics use a different process (at the level of the clinic)
- ▶ Capital products do not go to the PESC – only patient care products

One interview participant described the differences in procuring innovative versus non innovative products. One significant change in approach for innovative products is the relative weighting of cost criteria. For RFX initiatives, after categories have been established, the SSO GM works with a team of 3 nurses, a strategic sourcing manager, a data manager, and a distribution manager to develop proper specifications. For innovative products, price becomes less and less of a deciding factor and “the financials generally score between 25 and 40% [of the total weighting] and if we’re buying something very simplistic in nature, like a widget, it would be closer to 80-90%.” (Participant 1, CA)

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In addition to determining RFP criteria, as elaborated upon below, clinicians involved in PESC are responsible for making product decisions. Given that clinicians make the decisions, the role of the SSO is to put together a product package based on clinician requirements, which is then sent to the market.

In addition to providing a product package, the role of the SSO is to ensure that PESC have a cross-functional forum in which new products can be introduced and standardized. For example, “if a doctor or somebody goes to a conference and sees, we can do gallbladder surgeries with a little laser, it costs fifteen grand, which is more than just a knife, but the outcome’s better, the patient goes home two days earlier. So it’s a forum to bring in almost like a business case approach to introduction to new products and/or standardization.” (Participant 6, CA) Ultimately, the objective of these forums is to make decisions on new products, so that the products are then well-received in practice. Said Participant 6, “you always have an open mind for introduction. It’s never a static state. Health Canada can approve something new, and so who then can be looked at to see if this is something that will benefit the hospital in some way, shape, or form.” (Participant 6, CA)

2.4.2 Forming PESC teams

User groups, including PESC, are product dependent, as members are engaged to determine the important features of a product that will lead to better patient outcomes. For example, if a clinical product is under review, the group would be comprised of appropriate clinicians and nurses. As a result, composition of PESC teams varies across organization, as indicated below:

- ▶ Participant 1’s PESC is formed predominantly by clinicians and may also include IT, information systems, risk management, occupational health and safety, three to four SSO representatives, a strategic sourcing manager, data manager, and distribution manager. Three nurses (two RNs and one RPN) are also engaged on a full-time basis with the SSO as the clinical experts. The nurses have titles of clinical specialist and contract administrator. Their primary activities are developing the proper specifications prior to the award, making sure that stakeholders are participating fully in the contract, and evaluating and delivering any necessary evaluation or training depending on the results of the reward. Of the importance of leveraging nurses, Participant 1 stated, “when I have nursing people working for me, it really helps in that they are taking off their nursing cap and they’re putting on more of a business cap in facilitating with no

preconceived notions. They're looking at it and saying company A, B and C, despite the fact we use A, company A, B and C are all very comparable products. So they help to drive objective decision making." (Participant 1, CA) Participant 1's organization used nurses for their clinical expertise 80% of the time, mostly developing evaluation criteria, and providing education and training.

- ▶ Participant 3's organization included almost solely physicians, perioperative leadership, and general administration.
- ▶ Participant 9's organization included nursing staff, materials management staff, led by the data analytics staff from the SSO. Once this group has made a decision, they bring the recommendation to physicians, who then bring the results back to the product evaluation team. If accepted, it is implemented by the SSO staff.

For some products/services, it may be necessary to bring in other individuals, such as finance, IT, and facilities; however, this is rare in clinical product selection. In the same way, some standardization decisions can be made without clinical advisement, if driven solely by cost. For example, Participant 9 stated *"not too long ago, we had a box of baby tissues –it was \$1 for the one box and it was \$0.60 for a box of 40 tissues. So, you would say on a per tissue basis, the larger box was actually the greater value, except when you're placing that into a patient's room in a hospital environment. As soon as that patient is discharged, the boxes are thrown in the garbage. And so we were actually finding that the amount that we were throwing in the garbage, when you factored in that waste, the more expensive per tissue was actually the better optimized out value for utilization."* (Participant 9, CA)

The size of such groups depends on the complexity of the product/service decision, although typically varies from 3-4 for a simple decision, to up to 10 for complex problems. This size range is ideal, as Participant 1 stated, *"we try to never go beyond in that 7 to 9 range because it becomes a little onerous at that point and the process really starts to grind. So, there is a trust element that if you're sitting on the committee you're going to do the work necessary to make a decision for the benefit of a larger group."* (Participant 1, CA)

Case Study: Multidisciplinary procurement teams

One SSO in Ontario creates working groups to make decisions on clinical products. These groups are comprised predominantly of clinicians, supply chain leads, a contract procurement specialist, and a buyer. For the procurement of non-clinical products, financial representatives are also present. In these groups, the contract procurement specialist is the lead facilitator and provides RFP specialty, while the buyer is responsible for relations management based on existing relationships with hospital managers. The relationship between the SSO and hospital works very well, as there is an element of trust, in that if you are on the committee, you are committed to making a decision to benefit the larger group. Within these committees, scoring is based on the invasiveness, complexity, and innovative nature of the product, which indicates the distribution of financial and clinical points. For example, criteria include ease of use, risk, environmental impact, anticipated outcomes, sterility, and existing distribution agreements. This model is designed to drive value-based decisions that improve patient outcomes. Financial input for scoring depends on how definable the goods, services, and capital are; however, this portion usually comprises between 25-40% of the score, unless the product is very simplistic, in which case the financial score would comprise 80-90% of the total score.

There is also a strategic group, which leads RFX initiatives by defining their scope, criteria, and requirements. The aim of RFXs are to be objective through yes/no questions, well-defined specifications, and numerical scoring. After the contract is awarded, the SSO ensures that customers and stakeholders are fully participating in the contract and conduct further evaluation and training, if needed. This function is carried out by the SSO's contract administrator, who assures that the vendor is fulfilling their contractual obligation.

2.4.3 Establishing objective standardization criteria

RFP criteria varies by product and is used to drive standardization. This criteria is developed by engaging the appropriate specific user group for each RFP, depending on the clinical and financial components of the product. For example, within PESCs, criteria to evaluate clinical products are developed primarily by clinicians.

The weight of clinical criteria (in comparison to financial) may vary according to product, depending on its invasiveness. For example, more invasive products allocate higher points for clinical categories.

When developing criteria, it is advisable to include as many yes/no questions as possible, so as to remove subjectivity from the process, as according to Participant 2, *“you need a good mixture of yes or no questions or else you will never leave the incumbent. A clinician will always score their incumbent as a 10 and everybody else is a zero.”* (Participant 2, CA) On this point, Participant 1 noted that *“unless you’re buying a widget, there will always be a relative subjectivity to the decision-making process. But, the cleaner your specs are, the less likely subjectivity prevails and it ends up being more of a numerical objective scoring process.”* (Participant 1, CA)

“You need a good mixture of yes or no questions or else you will never leave the incumbent. A clinician will always score their incumbent as a 10 and everybody else is a zero.”
(Participant 1, CA)

Once the RFP criteria is established, it is listed within an RFP to make vendors aware of the evaluation tool.

2.4.4 Capturing quality research evidence to support change

Participants had mixed views on the role that research evidence plays in standardization activities. All participants agreed that clinical evidence is required to justify a product change, however, the level of evidence required varied across organizations and jurisdictions.

Many organizations required evidence capable of demonstrating a quantifiable improvement over the status quo. As Participant 4 stated, *“if what you’re doing is working, that’s your baseline. So, you don’t really want to change from that unless you have evidence that proves that there’s a reason to move away from that. Getting to standardization also needs to be integrated into clinical thinking and what does the evidence say and the realization that evidence may continually change, so we have to continually educate ourselves as to what that evidence is.”* (Participant 4, US).

Some participants noted that creating a requirement for a specific level of evidence, however, was not recommended. Research and evidence requirements for standardization decisions do not currently exist in any of the participating organizations, and many believe that these requirements would stall the standardization process and make it more costly, as Participant 5 stated, *“if it were that way, then physicians could call that card and they would say, well, if you haven’t got any research, I’m not switching. And I would say, well, wait a minute, you haven’t got any research, why are you using it? So, I think we’d have a stalemate there.”* (Participant 5, CA)

2.4.5 Leveraging supplier knowledge to identify products

Sales representatives also drive the procurement of innovative technologies, although not to the extent that they used to, as according to Participant 1, *“they’re cutting back on the number of sales people. You tend to see them more at conferences nowadays showing their latest and greatest products, and so the innovation is figuring out a way how to write it to meet our needs, not necessarily say to have the fanciest latest, I mean if you’re a car buff, a C7 corvette when a C6 corvette would work quite well.”* (Participant 1, CA)

Participant 1’s SSO and suppliers communicate regularly throughout the year, in addition to during the annual forum, in which all suppliers attend to discuss strategic initiatives and performance. The forum is a half-day auditorium-style meeting with guest speakers, in which suppliers are broken off into groups to discuss various topics, including supply chain and equipment. The primary goal of this forum is to inform suppliers about the objectives and key strategic initiatives for the upcoming year, and to inform supply chain professionals about new product pipelines. A second goal of this forum is to maintain relationships and engage with suppliers, with a focus towards future partnerships. To supplement the annual forum, the SSO issues a monthly newsletter to suppliers and other subscribers to keep them up-to-date.

2.4.6 Leveraging technology to advance standardization

In terms of technology used for standardization, there are three key areas that can facilitate standardization noted by participants: 1) data management software, 2) electronic tendering portals, such as the Ontario Tender Portal and Bonfire Solutions Benefits, and 3) the ability to upload and download contract information into customer ERP systems and supply chain management software systems. These areas of innovation have the benefit of automation, which lessens the chance of human error, and increased objectivity. However, while they often drive a more rigorous process, they do not always decrease the workload involved with procurement. Specifically referencing electronic tendering portals, one SSO GM points out that *“they’re not going to shave the kind of time that people think they’re going to shave because in the end, we need the input from our end-users and our end-users are not sitting around waiting to work on the next RFP that we put on the street. And in any given year, we could tap in to the same department 8, 10, 12 times on different initiatives. So they become a little overwhelmed sometimes with the detail of the RFPs that we’re building and they’re becoming more and more detailed as we get better and better at what we do. So we’re going to gain on the one hand the outcome side of things, you might lose time in the middle piece... it’s a little bit of an oxymoron when people always think that e-commerce expedites things. In actual fact, it brings more rigidity sometimes to it, but it does drive the right decisions. That’s the most important thing. Sometimes we get too hung up in trying to turn things around too quickly and therefore when you rush, you tend to migrate back to the simplest solution. That’s not really what we want to do.”* (Participant 1, CA)

2.4.7 Sharing supply utilization and pricing data

Many hospitals and SSOs share supplier pricing data with one another to ensure best possible pricing. As Participant 9 stated, *“we now collectively have this ability to access each vendor’s price points that they’re charging, and they’re charging different costs in the two different [regions], and a lot of that has to do with the time that they competitively procured or you know or sources a preferred proponent.”* (Participant 9, CA) Hospitals are now using this data to collaborate with other hospitals (or establishing SSOs) to ensure that all organizations across a region or jurisdiction are receiving the best possible pricing.

2.4.8 Centralized vs. collaborative standardization

There are two levels of approach to product standardization, which vary according to commodity and degree of difficulty to standardize. The first approach is regional, in which standardization occurs first within an organization and then spreads across the region. This approach includes the review and trial of several products, after which one is chosen based on pre-established criteria. This approach is grounded in patient safety, as all users are trained with one standard piece of equipment. IV pumps are an example of a commodity that would be standardized through this approach. The second approach is procedure-based, in which multiple physicians across many sites standardize their product utilization for procedures. This approach includes analysis of costs associated with each physician PPI using a physician report card which compares product utilization of physicians compared to their peers. The lowest cost product is identified for a specific procedure and these results are presented to the physician to drive toward a standard product list for a particular surgery.

2.5 Performance Measurement & Metrics

In Ontario, health care is moving towards quality-based procedures and benchmarking hospitals to identify which hospitals are either lower cost or higher performing, as there is an incentive to be identified as such, as those hospitals will have the most procedures shifted to them, especially from either higher cost or lower performing hospitals. Similarly, in the United States, it is a priority for PESCOs to become more robust through comparative analytics, outcome impact, and product utilization data.

The importance of data analytics was evident throughout participant interviews, as exemplified by Participant 9, who stated, *“our [SSO] focus on data and analytics in terms of driving best cost-based, utilization-based outcomes is, has been a real strength for our organization over the course of, in particular the last couple of years. We really shifted our focus on everything needing to be evidence based by the numbers driven through volume utilization and analytics.”* (Participant 9, CA)

2.5.1 Focusing on financial metrics

Data management and spend analytics are common and recommended across all participating SSOs and end-users, as increased data allows for the identification of necessary changes and/or disciplinary actions, although this may result in mixed reception. For example, Participant 1 stated, *“if employee A, B, C does 50 transactions a day and employee D does 10, maybe employee D needs some education. And so data does tend to trigger action items which do tend to then generate change in outcomes, personnel, behaviours, etc.”* (Participant 1, CA) All participants actively monitor financial data, including that related to spend (per vendor), purchase order data, number of transactions (per buyer), back order data, freight cost.

In Ontario, access to financial metrics has fostered regional, provincial, and national collaborative partnerships to achieve price unification, as this is an opportunity for multi-million dollar cost savings. According to Participant 9, *“our [SSO] focus has been on that [price unification] for probably the last 6 to 9 months quite heavily. So, to me, that’s the results that will be borne out by that over the course of the next half a year to a year. We will begin to see some real cost savings not just in [our LHIN], but right*

across Canada because we've been driving data to unified price and leveraging our GPO activity with the vendors that we've let participate with us.” (Participant 9, CA)

Throughout the interviews, the SSOs were most aware of their financials, likely due to their reliance on cost savings as a business strategy. SSOs track cost savings for their member organizations, and use these values to drive future business development. *“We're pretty active in the market place and in recruiting new members and what we find is that new members see between 5 to 12% reduction in their total supply stand when they join [our SSO]. And it's really driven off of the approach that we have in driving standardization and reduction of variation in PPI.” (Participant 3, US)*

2.5.2 Difficulty measuring impact on patient outcomes

It is difficult to measure patient outcomes, as participants, particularly in Canada and Australia, noted a market need for linking EMRs with ERPs. Difficulties linking data from hospitals' EMRs and ERPs, or the associated high costs, prevented many procurement teams from including patient outcomes in tendering evaluation. As stated by Participant 1, *“outcomes, it's a hard thing to measure. I don't know if we have the sophistication in our medical records to bridge that back to why outcomes got better or worse because we changed product A, B or C. We just don't have an interface that can draw those correlations and I'm not aware of any interfaces that exist.” (Participant 1, CA)*

Furthermore, most SSO structures of the participating organizations were set up to establish contracts and then facilitate a relationship between suppliers and hospitals. However, once a contract is established, the role of the SSO is primarily related to financial monitoring, unless there is a significant problem with a product brought to the SSO by a clinical team. As Participant 7 stated, *“we set the contract up and the hospitals buy from that contract. And then the relationship continues with the hospital and the supplier. So, how our products flow through the system ultimately for the patient and the metrics of those along the way we don't necessarily have visibility to. So, unless something goes wrong and if there's a problem with the product we find out about pretty quickly, but generally not, our systems and data isn't that sophisticated.” (Participant 7, AU)* As indicated by Participant 5, a consequence of this lack of data is that *“in the absence of any literature on difference in outcome, then you have to go with practice, maybe not be best practice, but you have to go with practice. And unfortunately, some preference.” (Participant 5, CA)* Despite a general lack of data related to patient outcomes, some organizations have started collecting patient data related to diagnostic imaging and general clinical services; however, none of the organizations interviewed used patient outcomes or feedback input for surgical products.

Although data collection on patient outcomes is currently lacking in the selected jurisdictions, it is becoming a priority area for supply chain activities, as several participants explained.

2.5.3 Adopting benchmarking to ensure best pricing

Benchmarking was discussed extensively amongst interview participants, particularly with Ontario hospitals and SSOs. It was a priority for all participants, primarily to drive cost savings by ensuring the best possible vendor pricing.

In terms of the cost and impact of investing in benchmarking, Participant 3 stated *“I've invested \$600,000, \$750,000 in benchmarking software to make sure that I know the price points that are coming up across the country. And if I find out, and I do, that my price points are X when they should be 20% below, I may say we're no longer going to standardize you, we're going to go somewhere else because you essentially lost the trust.” (Participant 3, US)* In practice, this form of analytics-based benchmarking requires an understanding of *“the price points on the market, what are the relative products, what are the products that are relatively the same in a given category and how do we arm ourselves with the information to then to be able to drive some of the standardization and the best practices?” (Participant 3, US)* For example, this organization used benchmarking to determine overpaid contracts, as Participant 3 stated, *“we know what other hospitals are paying across the country and if we find within a category that is out of market we'll basically re-negotiate that category. And there are certain categories where you know that's going to happen –like drug alluding stents as an example –the price points there are just are dropping*

through the floor. But, there are also things that are going to surprise you and so you may not expect to be re-negotiating.” (Participant 3, US)

2.6 Leadership & Governance Structures

Several participants spoke of the importance of attracting and keeping talented personnel. For example, across the state of Victoria, Australia, the level of expertise to deliver value and efficiency across the health system was previously low due to minimal investment in the skill set required for procurement and logistics; however, in 2000, the Victorian government created an organization to modernize and improve procurement, namely through increased efficiency. As one VP, Supply Chain Services explains that *“really our only product is good people that really can navigate through so many things to be successful. It sounds easier said than done, to work with various providers and drive value, but you need project management, you need time management, you need knowledge of the procurement rules in the province. You need all that to be successful. So for me, our success is 100% correlated to having quality people so I spend a lot of time trying to attract and keep our good people.”* (Participant 6, CA) For example, a lack of leadership within NHS England has resulted in fragmentation and less realized value.

In terms of hiring, certified professional purchasers, contract specialists, accountants, and nurses are critical to driving results and when it comes to remuneration for these critical hires, one SSO GM believes that *“cutting corners, paying somebody \$5000 less and getting second best candidates doesn’t make sense to me ... You can hire a contract specialist for \$75,000 or you could hire one for \$80,000 and that person handles \$5 million in contracts in a year. Or \$10 million or \$25 million... Why would you want to chance on a few thousand dollars when you’re having somebody handle millions and millions of dollars?”* (Participant 1, CA)

2.6.1 Leveraging clinicians with business experience/expertise

Participant 3 advised to trust and leverage the business expertise and experience of clinicians that have been formally trained in business-related aspects of the health service. *“I would say of all the specialty counsels they are the most advanced and they’re the most business savvy just by virtue of the fact that the guy that runs the cardiology specialty counsel just happens to have been a certified public accountant before going back to medical school, so he gets the business piece.”* (Participant 3, US)

2.6.2 SSO engagement for multi-hospital standardization

The role of the SSO in product standardization is not to do everything for the hospital, rather collaboration between hospitals is fundamental to the process. At one Ontario SSO, a minimum of two hospitals are needed to participate for an SSO to standardize a contract, as Participant 1 stated, *“everything we do is around collaboration, so we’re encouraging that, but if a hospital goes out on its own for a contract, and we have no involvement in it, we just don’t have the resources to take on every single initiative that might have a value of \$10,000 or \$50,000. We’re going after the \$100 grand and bigger. When you’re overseeing in our case about \$430 million, you can appreciate that it’s all about return on your investment.”* (Participant 1, CA)

2.6.3 Tiered approach to standardization

In terms of a future recommendation to improve sourcing, a tiered-approach, which would focus on provincial, regional, and local levels, was recommended by most participants. At the provincial level, it was suggested that major clinical commodities be standardized to two or three suppliers. At the regional level, it was suggested that tools and technology platforms be standardized, as currently, different platforms and associated support are used throughout different hospitals. At the local level, it was recommended that communication platforms, including webpages, way finding, and signage, be standardized.

2.6.4 Clinical product advisors

In Australia, several hospitals have developed new roles titled “clinical product advisors”. These advisors are appointed by the clinical nursing staff, and are tasked with assisting the medical personnel when selecting, evaluating, and procuring medical devices, equipment, clinical products, and consumables. They work with all of the medical personnel, as well as ancillary services such as infection control, pharmacy, and health and safety. The advisor has the following responsibilities:

- ▶ Work collaboratively with staff to identify the most suitable clinical products
- ▶ Coordinate trials & evaluations to facilitate the selection of clinically appropriate products
- ▶ Assess, standardize, and rationalize clinical products purchased by the hospital
- ▶ Ensure systems and processes are in place to properly specify and evaluate products before purchase
- ▶ Ensure outcomes are properly documented

2.7 Change Management Strategies

The transition between products requires a complete plan for change management, including communication and education with the appropriate committees within the organization. The scale of the transition depends on three factors: 1) the critical nature of the product, as more risk requires more planning (for example, transitioning anaesthetic gas machines requires more transitional planning and training than transitioning pens and paper); 2) integration of the product; and 3) the end-users.

One SSO's approach to change management throughout product standardization is both bottom-up and top-down. To get buy-in at the top, the SSO “committed to a 5-year business plan what we thought we could accomplish and we laid out very clearly the terms of reference to our steering committee... I also went out and gave presentations to the hospitals management groups and said this is what we want to do.” (Participant 1, CA) This approach was aided by the Broader Public Sector (BPS) directive, which “really helped also in giving us some significant heat in the process of driving greater value and the fact that we couldn't just continue to roll contracts over.” (Participant 1, CA) In terms of bottom-up, supply chain representatives are part of the decision-making process, as the SSO GM says “we have regular meetings, we produce reports every month on savings, we produce reports on participation, and it's a great tool when you're communicating and nobody wants to get embarrassed. So you're making them accountable.” (Participant 1, CA)

2.7.1 Educating clinicians on new products

In the US and UK, knowledge translation was given a significant amount of attention, and there was often a specific employee within the SSO or GPO model whom was solely tasked with driving the adoption of standardized products. Participant 3 described this team, stating “we've developed a team whose job is to take those ideas and then basically drive them into our member organizations. And so that's their whole job. So [for example,] Expirel is a pain medication used primarily in total joint, like knee replacements. And this utilization team saw data that was recently published that said there is no clinical benefit associated with the use of Expirel on these patients... And so then those teams would go and meet with the surgeons that were using Expirel and say, 'look, here's a study, here's what the data suggests, this is the cost impact to your cases and would you consider not using Expirel and learning what impact might be there?’” (Participant 3, US)

In Canada, this approach was not seen; rather, many change management strategies focused almost solely on changing the packaging and labelling. In particular, participants discussed the “80/20” rule, whereby change management for adopting standardized products was simply a case of changing the

labelling 80% of the time, representing 20% of the work. Conversely, 20% of the adopted standardized products required a change in clinical process, representing 80% of the work. Of this process, Participant 9 stated, *“I think we need to appreciate and be mindful that typically the transition from one product to another is packaging, as opposed to anything material. In many cases, we’re not changing practice, we’re changing product and so it’s really a conversion from one product to another, placing a new product on a shelf and reaching out for that product.”* (Participant 9, CA)

The “80/20” rule: change management for adopting standardized products was simply a case of changing the labelling 80% of the time, representing 20% of the work. Conversely, 20% of the adopted standardized products required a change in clinical process, representing 80% of the work.

In the case of disposable products, the transition process takes place at the hospital level and is, at least in theory, spread out over a number of weeks to ensure that most of the existing supply is decreased; however, in practice, this process may not always be as sophisticated, given that quantities and location of stock varies. Once the organization is left with only a few products, the SSO will *“write that product off in some cases and/or package up and send off to a small hospital.”* (Participant 1, CA) The material situational manager facilitates this process and throughout the

process, clinicians help the SSO determine when a product needs training. For example, when a new product is introduced, nurses may need training on the product, as Participant 1 stated, *“you think an IV catheter was an IV catheter, but in actual fact the bevels can be slightly different, the angle of insertion can be slightly different, the two finger touch on the IV catheter might be slightly different to steady your hand when you’re doing the injection or you’re penetrating the skin.”* (Participant 1, CA) Training is often led by an external vendor or supplier, with the exception of more hands-on training, which may be completed through the SSO’s learning and development group. The vendors and suppliers have effective educational tools, such as pictograph charts, simulations, and mannequins, which are useful because people are often aided by visual tools.

2.7.2 Building accountability and transparency

Central to the success of any change management strategy is the establishment of guiding principles and values to steer conversations towards a more neutral and academic decision. This was outlined by Participant 1, who stated, *“we’re [SSO] following the supply chain code of ethics around personal integrity, professionalism, around accountability, transparency, and about compliance and continuous improvement. And we don’t have an axe to grind. We go in to every initiative totally neutral.”* (Participant 1, CA)

Participants discussed the importance of ensuring all stakeholders are invested in the standardization process before it starts. Stakeholders need to understand the process, the goals, and the rationale for selecting products. Some SSOs have established accountability teams to enhance the level of transparency and accountability. Accountability teams are responsible for reporting cost-savings and missed opportunities to member hospitals. According to Participant 9, *“I very specifically chair a meeting of a strategic advisory committee. It’s comprised of the five CFOs of each hospital. One of the reports that we bring on a bi-monthly basis is to we bring a report that identifies cost-savings opportunities, opportunities that have been accepted, when they’ve been implemented and what the overall impact is of their implementation – and those recommendations that have not been implemented and the reasons for why they have not been implemented. So, now, it’s not just as easy for a manager of a department to say ‘we’re not doing that because I don’t like Johnson & Johnson and I want to be with Freeman, or I don’t want to change out a practice or you don’t know what you’re talking about, or whatever that reason happens to be. Then, we have to cite the reason. We cite the department, the reason for not implementing the change, and if it’s clinical or if it’s best practice or if it’s cost of change management. Those can be very readily accepted, but we have to cite this back to the CFOs and the CFOs then have to reach back; they don’t have to, but they can chose to and I suspect in most cases they do given the significant pressure that they’re under. They reach back to those departments, they arrange this meeting, it was cited that X, Y, Z occurred and that X, Y, Z was not accepted for this reason and we substantiate the reasoning behind this, and then they need to vet. The manager or director needs to vet that through their VP and the executive committee, and so, I find more*

and more of the transparency between the work that we do with the hospital operationally and the work that we do with, at committee-level with the operators and chief financial officers, it has been successful in driving better outcomes.” (Participant 9, CA)

2.7.3 Engaging clinician champions

Clinician champions, on staff at the supply chain organization, are utilized to convince other clinicians of the cost benefits associated with standardization. Said Participant 7, *“it’s about peer-to-peer with clinicians we find. So, for example, in our pharmacy contract, we’ve got a guy on staff who looks after the pharmaceutical side and he’s a doctor so straight away there’s a whole different respect from the clinician point of view. It’s very much peer-based, so if we get a champion peer we find that that works well, but if you’re just a purchasing person coming in and saying we should change purchasing patterns, it’s a little bit harder.” (Participant 7, AU)* For example, according to this participant, clinicians initially said *“there’s no way we can operate with that supplier even on the ward, but then when we showed them the money they all went wow, there was millions of dollars difference and some of those who said no way went okay, so sometimes money does it, but not always... there’s no silver bullet with clinicians but sometimes its money, sometimes its peer to peer, sometimes it’s some sort of pilot [testing].” (Participant 7, AU)* In terms of pilot testing, in some contracts, it is a requirement that a hospital be 80-90% compliant to the contract which gives them 10-20% of room to buy outside of the contract. This allows hospitals to pilot a new product that is not in their contract, while still complying with their contract.

2.7.4 Communicating effectively with vendors

Communication is especially important in Ontario, Canada as it was suggested that a misinterpretation of the BPS directive has resulted in a change in the way suppliers interface with vendors before an RFP is issued. Through the interviews, some participants noted that the BPS directive was initially perceived to limit vendor-hospital interaction. However, participants noted that soon after the interpretation was clarified and this challenge was mitigated. Regardless, to address this challenge, open communication must be maintained to keep both parties informed. For example, at one Ontario SSO, constant communication occurs between the SSO and vendors regarding matters including the following: how to better utilize their products, new literature, and published outcomes. Communication also occurs during the RFP process, which includes opportunities for vendors to respond to questions presented by the SSO.

Another change management strategy is to leverage vendor sales’ force to drive standardization and product transition through clinician education initiatives. On this topic, Participant 3 provided the following example, *“we’re [supply chain] going to standardize for that suture manufacturer and we actually work with them on an ongoing basis when we find physicians who are using off-contract suture manufactures. We work with our contracted suture maker and say ‘look, I need you to go and engage your sales people to talk to Dr. Johnson, we’re going to talk to administration at that hospital and we’re going to get this thing fixed.” (Participant 3, US)*

3. Category Management

Chapter at a Glance

- ▶ Based on survey answers, category management was the least well-established process amongst the participants. 15% of participants noted that they do not currently use category management practices, and many participants viewed category management and product standardization as the same.
- ▶ Survey participants were asked how they decide which product categories should be used across the organization, and most participants noted that clinical recommendation, industry standards and data analytics were the key drivers of categories.
- ▶ Supply chain organizations have identified difficulties analysing utilization data across sites when each site uses a different software program and language. This barrier is compounded because not all organizations are using standard UDIs, requiring organizational or state-wide product catalogues in addition to the global catalogue.
- ▶ Sizing categories depends on many factors, including the use of the product, innovative nature and complexity of the product, product volume, number of vendors, and the resource capacity of the managing SSO/procurement department. Sizing is largely dependent on individual capacity of contract managers.
- ▶ When survey participants were asked about the best practices to facilitate category management, the most popular responses included; establishing three main categories as commodities, clinician preference, and physician preference; setting categories based on contract grouping in order to facilitate accurate analysis in determining compliance and renewal; and setting categories based on national standards.

3.1 Literature Review & Environmental Scan

Throughout the literature, category management was frequently used interchangeably with standardization, and is not generally seen as a goal in and of itself. One sample case study found in the literature was based in Australia.

- ▶ In Australia, Health Purchasing Victoria (HPV) took a category management perspective when procuring orthopaedic products. The organization examined 12,000 different orthopaedic products, and categorized them into 15 construct types for hips and 20 for knees. Contracts for items in each category were then opened up for suppliers to bid on, and each category is managed independently by a dedicated official. As well, the category management efforts led to the development of a mini product catalogue for surgeons, giving them a transparent view of different product combinations and prices across suppliers. HPV uses Zendesk, an online customer ticketing system, to record and track contract management issues.⁵⁶

3.2 Barriers

3.2.1 Variation in product standards

Supply chain organizations have identified difficulties analyzing utilization data across sites when each site uses a different software program and language. For example, Participant 10 stated that “we are currently running three different ERP solutions in the state [Victoria], and there is no commonality with the item scripting. So when one health service is using a particular type of gloves, they describe it in their own way as a different item number than any of the other health services.” (Participant 10, AU)

“Policy should drive how the solution is being built and not the other way around. Before we start building a technology solution around a common catalogue we need to know how we are going to build it up, so what will the categories be, how items are categorized in terms of unique identifiers and common identifiers.” (Participant 10, AU)

In addition to challenges associated with different software programs and languages, there are also difficulties comparing site metrics when not all are using standard UDIs. Participant 10 noted that in Australia, not all hospitals are using UDIs yet, and instead, “set up their own standards or their own categorizations and identifiers internally, which makes it extremely difficult to communicate between the hospitals.” (Participant 10, AU) As a result, the use of a manual, state-wide product catalogue is required, in addition to the GS1 global catalogue. To address this problem, one solution is to develop national standards (i.e. a common catalogue) that would eliminate the need for separate state catalogues, and would facilitate the use of the GS1 global catalogue.

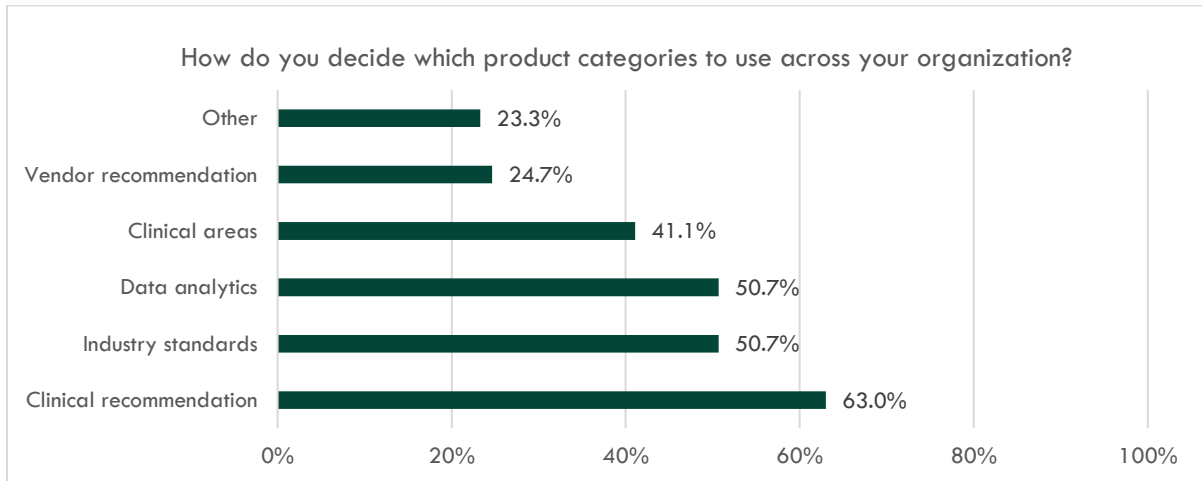
In Australia, supply chain organizations are leveraging third-party standards to inform their own cataloguing standards and policies. According to Participant 10, “what we are doing is slightly different, and that is to develop a cataloguing policy - where we decide how items should be categorized in the catalogue. And policy should drive how the solution is being built and not the other way around. Before we start building a technology solution around a common catalogue we need to know how we are going to build it up, so what will the categories be, how items are categorized in terms of unique identifiers and common identifiers. So we’re working very closely with GS1.” (Participant 10, AU) Participant 10 also called for a national cataloguing policy, but recognizes that this shift will require leadership that is not currently available.

⁵⁶ Hui, C. (2015). Streamlining orthopaedic prostheses purchasing. Retrieved from www.hpv.org.au/assets/Media/2015-12-17-Orthopaedic-Prostheses-article-Health-Advocate.pdf

3.3 Identification of Need

3.3.1 Selecting product/service categories

Survey participants were asked how they decide which product categories should be used across the organization, and most participants noted that “clinical recommendation” (63.0%), “industry standards” (50.7%) and “data analytics” (50.7%) were the key drivers of categories. “Other” methods noted by participants included GPO standards and patient needs.



Products are commonly divided into the following four areas: diagnostic imaging, operative services, clinical services, and all other programs (i.e., maintenance, biomedical engineering, purchasing). These four areas are then divided into commodity groupings for foods, services, and capital. According to Participant 1, “we [SSO] divide the actual buying [into] diagnostic imaging, operative services, clinical services, and all other programs, which [are] typically operations, such as maintenance, biomedical engineering, purchasing, [and the] administrative corporate services group. So we have 4 areas that we then segregate from there.” (Participant 1, CA) Beyond the high level categories, products and services are divided into “commodity grouping” for goods, services and capital. It should be noted, however, that particularly for innovative and complex products and services, categories are often fluid.

3.3.2 Finding appropriate category sizing

Ultimately, the goal of category management is to ensure that as many goods and services are bundled under like categories in order to create the largest buying power that is also manageable to drive the best financial offerings. To achieve this, categories need to be divided into manageable pieces and therefore, it is critical to know when to stop increasing a category’s size. Sizing categories depends on many factors, including the use of the product, innovative nature and complexity of the product, product volume, number of vendors, and the resource capacity of the managing SSO/procurement department.

Sizing categories depends on many factors, including the use of the product, innovative nature and complexity of the product, product volume, number of vendors, and the resource capacity of the managing SSO/procurement department.

In terms of the use of the product, some commodities, such as wound care, are very generic and can be applied to a range of patients, while other commodities, such as an IV catheter, are their own unique categories as they cross multiple clinical departments. For these more specific commodities, categories should remain unique, so as not to “water down” or make the commodity groups too broad because in that case, fewer vendors can bid on the product. As Participant 1 said, “you always want to create a situation where you’ve got three or more companies that can bid. As soon as you start driving solutions that

more or less create a sole source situation or an oligopoly you're not driving best value.” (Participant 1, CA)

Participant 9 indicated the importance of product volume and resource capacity in informing categories, stating that *“our greatest struggle was in the information technology and information management spheres and we had one individual who was, frankly, grasping for air trying to manage that category for five hospitals. And so we've broken that apart between IT and IM. It's typically heavily volume-based.”* (Participant 9, CA)

3.3.3 Leveraging data analysis

When deciding which categories to create, Participant 4 analyzes big data for product lines, such as expected reimbursement, cost per procedure, and supply costs, to identify areas for diversification in all areas of spend. For example, if physicians are using similar products from many different vendors, those products are further considered based on engagement with those physicians.

3.4 Activities

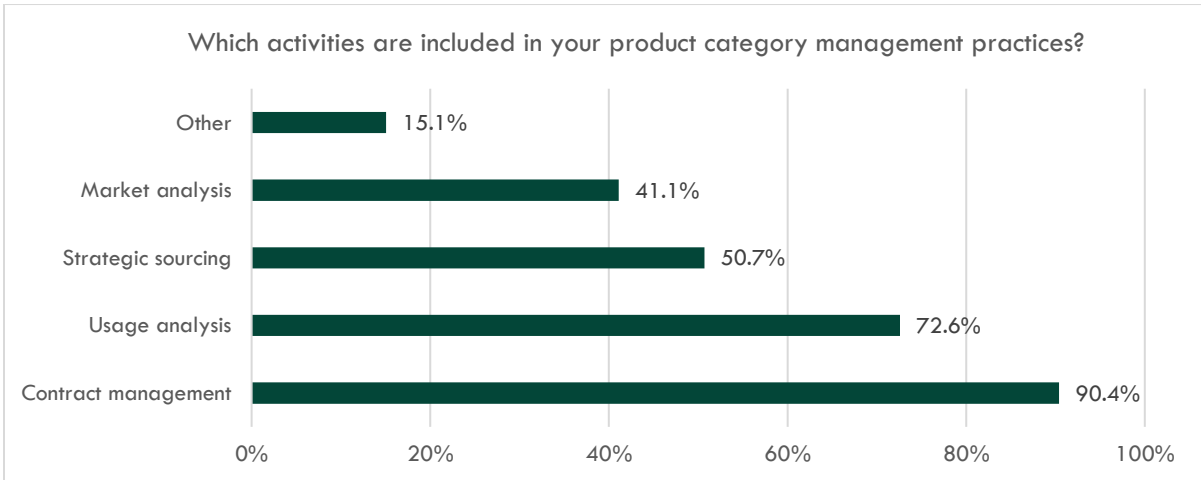
Based on survey answers, category management was the least well-established process amongst the participants. 21 participants (15.4%) noted that they do not currently use category management practices, and many participants viewed category management and product standardization as the same.

When examining which high-level product categories the participant organizations used, common categorizations included:

- ▶ Commodities, clinician preference items, physician preference items (most often surgery items)
- ▶ “All acute care categories” – many participants noted that there were too many categories to list (up to 150)
- ▶ General surgery, general medical, patient care, orthopaedic, infection control
- ▶ Medical surgical, perioperative areas, support services
- ▶ Clinical, non-clinical

Many organizations who use GPOs note that they use the same categories as their GPO.

Survey participants were asked what activities were most commonly associated with product category management. The most common activities noted by participants were “contract management” (90.4%), “usage analysis” (72.6%), and “strategic sourcing” (50.7%). “Other” activities noted included technology assessment services, implementation impact analysis, and identifying equivalent products currently in use when a new item is being requested.



Participants were also asked to define how each of the above category management activities is managed. A large portion of contract management activities were managed by GPOs rather than individual hospital procurement departments.

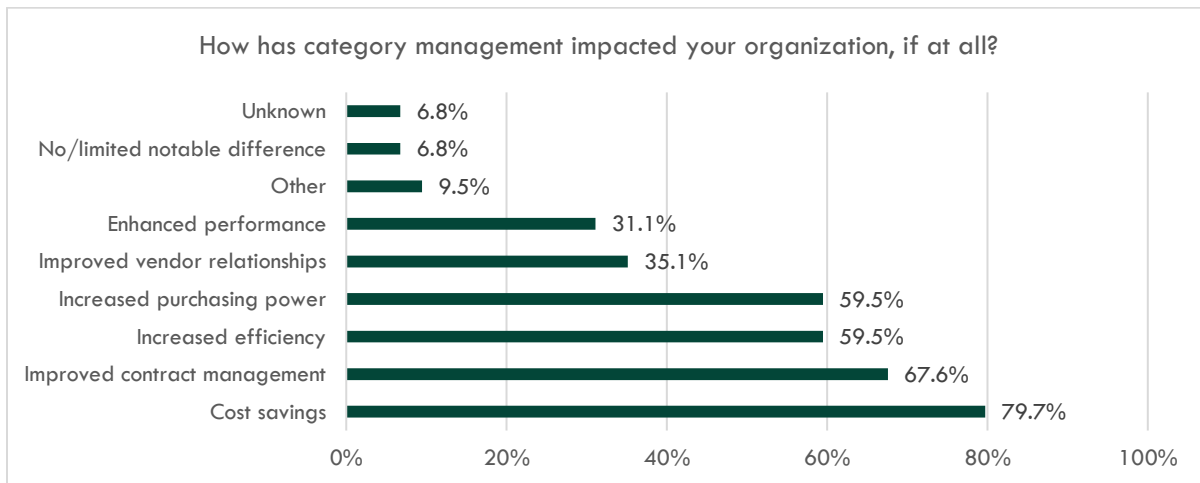
Product Category Management Activity	Key Management Components
Contract management	GPO contract management (GPO provides notification of contract expiration), monthly contract review, unified contract database
Usage analysis	Rely on third party vendor for usage analysis, in-house analysts measure materials usage
Strategic sourcing	Rely on GPO for strategic sourcing, offer alternatives and cost analysis, leverage a value analysis manager to identify less expensive products
Market analysis	Price benchmarking by product categories, GPO provides market analysis reports, built into PESC analysis

3.4.1 Continuous category review

Within working groups, category review occurs continuously and the outcome of such reviews may be that categories are adjusted marginally or break off into different categories. Says Participant 1, “categories can move back and forth marginally on some commodity groups, like we might put a tender out for wound care and we might do one for advanced wound care or we might do something on insurance in its broadest sense and then the next time around we could break it off into different categories. It’s constantly under review.” (Participant 1, CA)

3.5 Performance Measurement & Metrics

None of the selected participants had formal metrics to measure category management activities. However, when asked about the primary benefits of category management activities, survey participants responded with “cost savings” (79.7%), “improved contract management” (67.6%), “increased efficiency” (59.5%) and “increased purchasing power” (59.5%). Few organizations (6.8%) saw no notable difference by adopting category management activities, suggesting that although it is underutilized, there are clear benefits to category management. Another benefit noted by participants was improved clinical relationships.



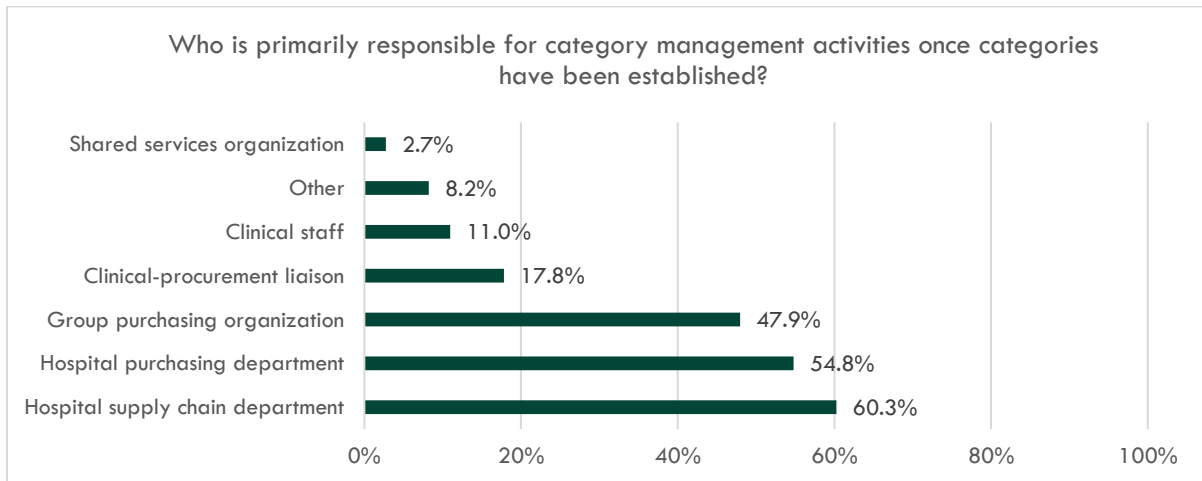
In terms of supplier consolidation:

- ▶ 67.1% of participants agreed that category management has driven supplier consolidation, ultimately improving procurement efficiency;
- ▶ 11.0% indicated that category management has driven supplier consolidation, but has had no effect on procurement efficiency; and
- ▶ 15.1% of participants indicated that category management has had no effect on supplier consolidation.

3.6 Leadership & Governance Structures

3.6.1 Responsibility of category management activities

Survey participants noted that the majority of category management activities are conducted by hospital supply chain (60.3%) and purchasing departments (54.8%). Group purchasing organizations also played a large role in managing category management for 47.9% of the responding organizations. Participants who responded “Other” noted that they have a contract analyst position that is responsible for managing categorization activities.



3.6.2 Facilitating hospital-led category management

In the United States, supply chain often provides staffing support to health care organizations to facilitate supply chain processes, including product category management. For example, Participant 3 stated that “we [SSO] have a contingent labor force, so we basically have staffing brokers that help hospitals make sure they have enough temporary staff on hand to support their needs.” (Participant 3, US)

An Ontario SSO has a similar practice, as category management is led by a contract specialist and buyer, which are assigned to each category and work directly together at both the SSO and hospital levels. For example, Participant 9 states, “we have sourcing individuals who manage sourcing activity for facilities, another one that manages sourcing activity for IT, another one for information management, another one for med/surg and then we have perioperative specialists for the OR... To lineate it to source activity and to standardize products across the 5 hospitals, we have sourcing specialists that do that work typically by category. But we have purchasing specialists, so then once products are sourced, it’s the purchasing specialist within each hospital who are assigned to different hospital campuses.” (Participant 9, CA) In addition, when there is workload to necessitate it, some contract specialists act as generalists and assist with the four aforementioned commodity groups.

4. Back Office Consolidation

Chapter at a Glance

- ▶ The two key barriers associated with back office functions were identified to be technology requirements and challenges with outsourcing and public-private partnerships. Technology and IT-related initiatives have proven challenging when reforming back office functions, as such initiatives are costly, complex, and require a high-degree of standardization. To lessen the burden of these challenges, participants suggested that hospitals align on common IT systems and ensure accurate specifications.
- ▶ Data related to cost-savings as a result of back office consolidation is limited and as a result, measurement and benchmarking in this area has been identified as a future priority for SSOs.
- ▶ Back office consolidation policies are organization-specific. Additional personnel are often required for such policies and should be responsible for the successful execution of back office initiatives. For example, committees for project management and IT strategy have been identified and are responsible for specific back office issues.
- ▶ Survey participants were asked the most common back office functions to be centralized and consolidated, and responded with information technology, accounts payable, and human resources. Other back office functions that were consolidated include procurement, purchasing, sterile processing, and materials management.
- ▶ When survey participants were asked about the best practices to facilitate back office consolidation, the most popular responses included; accounts payable and purchasing should work closely together to be more efficient; facilitate open communication between departments; and centralize order entry, pharmacy review, and scheduling.

4.1 Literature Review & Environmental Scan

In an age of constrained government spending, optimal back-office management is essential to waste reduction and the efficient operation of public enterprises. This literature review evaluated human resources, information technology, and finance reform policies in Canada, Finland, the UK, and the US. In the literature review and environmental scan of best practices, three main mechanisms were used to drive back office consolidation: procurement policies & procedures, incentive programs, and education initiatives.

4.1.1 Procurement policies & procedures Consolidating & collaborating through shared services

Back-office consolidation initiatives improve operational performance by replacing fragmented, duplicated systems with specialized and differentiated ones. In Ontario, Canada, these initiatives have occurred within the government, health and education sectors, outlined below.

- ▶ **Government sector:** In 2012, the Commission on the Reform of Ontario's Public Services recommended that consolidation of procurement functions expand to the Broader Public Sector (BPS), defined as hospitals, school boards, universities, and other publicly-funded organizations. The Commission suggested that a standardized procurement framework would enable the BPS to leverage its purchasing power through collaborative purchasing and back-office consolidation.⁵⁷
- ▶ **Health sector:** SSOs among hospitals have been shown to reduce procurement costs, but they may also include the consolidation of logistics, payroll, and other HR functions. By centralizing functions, SSOs can improve operating efficiencies and facilitate sharing of resources, information, and expertise.⁵⁸
- ▶ **Education sector:** Over the last few years, school boards have improved their collaboration, and have begun consolidating services to facilitate cost and benefit sharing. Examples include sharing a common building, participating in a joint consortium for purchasing or transportation, and creating Centres of Excellence for back-office IT systems. Despite these successes, the current level of collaboration between school boards is inconsistent, and there is evidence that they should begin using shared service models as a means to increase administrative efficiencies.⁵⁹

Other jurisdictions have undergone similar back office consolidation initiatives. The most common model noted in the literature was using an SSO to consolidate and deliver back office functions. This was either done by a public SSO established by member hospitals, or through outsourcing to a private company. Most back office consolidation initiatives were led by member hospitals creating a new SSO model or using an existing one. The UK and Finland were the only jurisdictions noted that had government-facilitated back office consolidation initiatives.

Government organizations in the UK are currently in the process of transitioning in-house back office functions (HR, IT and finance) to outsourced shared services. Many of these shared services will be run as joint ventures between the government and Steria Limited, a private technology consulting company. In a 2015 review, it was estimated that this outsourcing created €90 million in savings.⁶⁰

⁵⁷ Commission on the Reform of Ontario's Public Services. (2012). Public Services for Ontarians: A path to sustainability and excellence. www.fin.gov.on.ca/en/reformcommission/chapters/report.pdf

⁵⁸ Ontario Health Innovation Council. (2015) The Catalyst Towards an Ontario Health Innovation Strategy. www.ohic.ca/sites/default/files/Ontario%20Health%20Innovation%20Council%20Report.pdf

⁵⁹ Ontario Ministry of Education. (2013). The road ahead: a report on continuous improvement in school board operations. efis.fma.csc.gov.on.ca/faab/Memos/SB2013/Ontario%20Ministry%20of%20Education%20Op%20Review%20Report%20-Sept%2012%202013.pdf

⁶⁰ A Morse, "Shared Services Centres" (National Audit Office, 2016), <https://www.nao.org.uk/wp-content/uploads/2016/05/Shared-services-centres.pdf>.

Finland has established many shared service centres. In particular, the Financial and Personnel Service Centre provides invoicing, salary payment and personnel administration services to the Justice, Defense, Interior, Financial and University Administrations.⁶¹

Integrating back office functions

In addition to centralizing back office functions, many organizations have tried to integrate back office functions from several organizations into a single system. This strategy also involves consolidation and centralization of back office functions, but also aims to use a single common software platform across all member organizations. Research findings in the literature demonstrate that expected cost savings may not be reaped when the consolidation is too large (system-wide). The findings suggest that a more efficient model is a regional approach in which member organizations in a specified region integrate their back office functions, and use benchmarking to ensure the achievement of levels similar to other jurisdictions.

- ▶ **Social services sector:** Through its *Benefits Transformation* initiative, the Ontario government is integrating its public benefits delivery for public sector employees. The program is streamlining applications for benefit programs and increasing automation of back-office functions by consolidating management of back office functions into a centralized platform. The overarching goal is to take a fragmented delivery system and transform it into one that provides integrated service at a lower cost.⁶²
- ▶ **Health sector:** In its 2012 report, the Commission on the Reform of Ontario's Public Services recommended that healthcare back-office functions be integrated at the level of the LHINs, and that spending on these functions should be benchmarked to levels achieved by other provinces. To assist the LHINs in back-office integration, the Ontario Government established the LHIN Shared Service Office, responsible for providing Ontario's fourteen LHINs with shared IT, HR, payroll, finance, legal, and audit services. None of the LHINs have mandated back-office integration amongst their health service providers (HSPs), and they have refrained from taking a direct implementation role in integration efforts of their HSPs. The findings from this initiative showed that no substantive cost savings could be achieved from large-scale service integration within Central West LHIN HSPs. Two factors contributed to these findings: each HSP used proprietary back-office technology that would make the migration costs of a common technology platform prohibitively high, and many HSPs were already engaged in shared-service arrangements and were not motivated to join wider-scale integration initiatives. The results also found that HSP service quality could be improved through smaller-scale back-office integration, including resource sharing, creating uniform and consistent business processes, and the implementation of control mechanisms to oversee disparate business activities. In addition, HSPs reported that HR activities had the lowest perceived barriers to collaboration, indicating that HR centralization could be considered a priority area for collaboration.⁶³

⁶¹ Department of Economic and Social Affairs of the United Nations. (2005). Unlocking the Human Potential for Public Sector Performance: World Public Sector Report 2005. publicadministration.un.org/publications/content/PDFs/E-Library%20Archives/World%20Public%20Sector%20Report%20series/World%20Public%20Sector%20Report.2005.pdf

⁶² 2016 OMSSA Leadership Symposium and General Annual Meeting. (2016). TPAM, BT, Community Hubs, Social Assistance Reform Presentation. www.omssa.com/education/conferences/2016OMSSALS/presentations/Transformation%20Information%20from%20Across%20the%20Province.pdf

⁶³ PricewaterhouseCoopers LLP. (July 17, 2009). Central West Local Health Integration Network Back-office Integration Options and Directions. www.centralwestlhin.on.ca/~media/sites/cw/uploadedfiles/Home_Page/Report_and_Publications/-Central%20West%20LHIN%20Back%20Office%20Integration%20-%20FINAL%20Report%20VJuly%2017%202009.pdf

Leveraging public-private partnerships

Leveraging private organizations to deliver efficient back office functions was a common strategy, particularly in the US and UK. In Canada, these partnerships are growing in popularity, but are still uncommon and very rarely have reliable outcome data.

A 2013 report by the Ontario Chamber of Commerce, *Public Service Problems, Private Sector Solutions* argued that government should partner with the private and not-for-profit sectors to create alternative service delivery models. Because the private sector has access to expertise, technology and capital that governments do not, efficiencies can be realized without compromising service quality. The paper identifies email hosting, health insurance processing and IT functions as candidates for alternate service delivery, which will be discussed below.⁶⁴

- ▶ **Email hosting:** The Ontario public sector generally uses a hardware technology that is costlier, and arguably less efficient, than the cloud computing programs used in the United States. The report indicated that there is a large incentive for Ontario to adopt this alternate service delivery, as there are large cost-saving benefits, and many organizations already use Google applications as an inexpensive replacement to high-maintenance hardware.
- ▶ **Health insurance processing:** Transferring the processing of Ontario Health Insurance Plan (OHIP) claims to the private sector is feasible because there are high potential cost savings and few barriers, as the Ontario Drug Benefit program is already processed by a private organization.
- ▶ **IT functions:** There is medium potential for Ontario to switch to private services for IT functions. Although the possible cost savings are high, bureaucratic incentives may be misaligned and government officials rarely have experience with private IT relationships.

In British Columbia, Canada, MAXIMUS, a private sector organization, operates BC's health and benefits processing functions. This partnership has significantly improved the customer service at the call centres.

In 2004, the UK's NHS Shared Financial Services announced that it would partner with an external company, the NHS Shared Business Services Limited, to transform its financial back-office functions. It is estimated that this joint venture reduced costs by 20-40% due to economies of scale.

4.1.2 Incentive programs

Few organizations and jurisdictions offered incentives (beyond potential cost savings) for back office consolidation and consolidation. No Canadian examples of incentive programs were noted.

Remunerating investments in integration

Some health care providers, particularly in private health care systems, offered incentives to HSPs to transition software solutions to an interoperable platform capable of consolidating back office function delivery.

- ▶ In the US, Electronic Health Record incentive programs were established in 2009 which paid professionals and hospitals to adopt interoperable health information technologies. Payments were as much as \$44,000 for doctors over 5 years for the Medicare incentive program.⁶⁵

Sharing cost savings

In order to fund incentives for back office consolidation adoption, several organizations in Finland offer profit-sharing for their employees who are driving cost efficiencies. This acts as an active incentive for

⁶⁴ Ontario Chamber of Commerce. (2013). *Public Sector Problems, Private Sector Solutions Transforming Government in Ontario*. www.occ.ca/Publications/Public-Sector-Problems-Private-Sector-Solutions_Electronic.pdf

⁶⁵ Centers for Medicare and Medicaid Services. (2015). *Medicare and Medicaid Programs; Electronic Health Record Incentive Program- Stage 3 and Modifications to Meaningful Use in 2015 Through 2017*. www.federalregister.gov/articles/2015/10/16/2015-25595/medicare-and-medicaid-programs-electronic-health-record-incentive-program-stage-3-and-modifications#h-21.

employees to drive adoption of best practices, while avoiding organization risk in paying incentives that potentially outweigh cost savings.

- ▶ In Finland, organizational downsizing is achieved by passing operating cost savings onto employees. For instance, if the number of staff are decreased, 50% of the savings are cut from the budget, and the other 50% is left within the organization as an incentive.⁶⁶

4.1.3 Education initiatives

Literature regarding education programs for back-office reform initiatives is limited. However, the need to educate public sector employees in change management is well recognized, as a 2003 OECD survey found that 61% of government managers listed “project and change management skills” as a very important challenge amongst their employees.⁶⁷

- ▶ In Ontario, Canada, the only symposium that discussed back-office reform education programs was the 2016 Ontario Municipal Social Services Association Leadership Symposium
- ▶ The UK uses the *Professional Skills for Development* program, which is a long-term educational program for government employees. It defines three career groupings—leadership, core skills, and professional expertise—which identify the type of educational experience individuals will require to perform their jobs.⁶⁸
- ▶ The Education ICT Conference held annually in the UK has speakers and workshops focusing on back-office reform strategies.

4.2 Barriers

4.2.1 Financing necessary technology upgrades

In Ontario, one key barrier associated with consolidation of back-office functions *“is that it also means that you’re required to do something on the technology side to support it. So, if you’ve got half a dozen hospitals and you want them all to come together on HR, now we’ve got to decide on which HR platform we’re going to use, and everybody’s using something different right now. It means a whole new system implementation and it costs a gazillion dollars. And that’s why I still think the attention needs to be faced on the utilization on the clinical side, because that’s a much easier one to handle without the huge technology investment.”* (Participant 5, CA) Australia is susceptible to this problem as well, as the country’s independent hospital model has caused all hospitals to be on different ERP systems.

In terms of IT evolution throughout back office processes, *“a lot of barriers are just perceived and ...you need to have a team of people that want to and are willing to look at innovation and at least try and come up with some way of getting some of that in the door and getting it implemented and using it.”* (Participant 8, AU) Furthermore, if specifications are not completely correct at the beginning of a contract, it will end up being very costly. To prevent this issue, new IT systems need to be “future-proofed” and contracts must be initially correct, since IT suppliers have been described as “unscrupulous” in the way that they apply prices. Despite these precautions, *“IT is such a complex and difficult area, even if you have the best*

⁶⁶ Organisation for Economic Co-operation and Development. (2003). OECD E-Government Studies: Finland 2003. www.oecd-ilibrary.org/docserver-/download/4203081e.pdf?expires=1477405561&id=id&accname=ocid177512&checksum=F3E0076D9C05FD66E5B76E7C80BD0119

⁶⁷ Organisation for Economic Co-operation and Development. (2003). OECD E-Government Studies: Finland 2003. www.oecd-ilibrary.org/docserver-/download/4203081e.pdf?expires=1477405561&id=id&accname=ocid177512&checksum=F3E0076D9C05FD66E5B76E7C80BD0119

⁶⁸ Organisation for Economic Co-operation and Development. (2014). Humans Resources Management Country Profiles: United Kingdom. www.oecd.org/gov/pem/OECD%20HRM%20Profile%20-%20United%20Kingdom.pdf

minds sitting around the table negotiating a deal, you can really eliminate 85% of the pitfalls, but it's the other 15% that gets you in trouble." (Participant 8, AU)

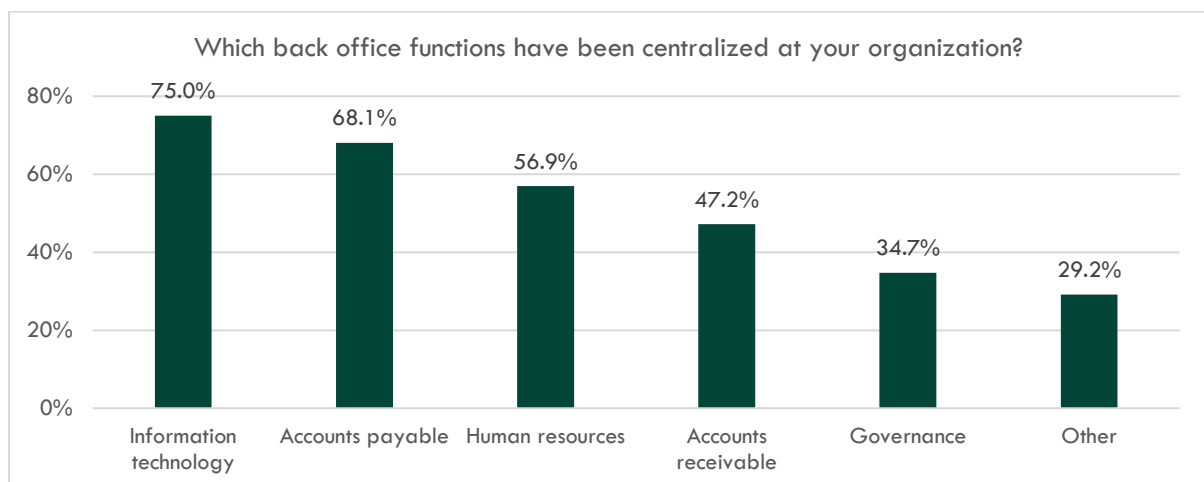
4.2.2 Outsourcing & public-private partnerships

Another challenge with back office consolidation is related to outsourcing and, subsequently, the formation of public-private partnerships. Outsourcing is a complex practice that often occurs because of "inherent problems" within an organization, as often, these problems can only be solved through outsourcing; however, outsourcing does not always create efficiency and value for money. To ensure efficiency and value, a senior manager with the expertise and understanding required to manage the resultant contract should always be retained within the organization, so that the contract can be successfully managed. Additionally, the delivery of the outsourced service needs to be reviewed after a certain time period to decide whether it should continue to be outsourced, since outsourcing is costly and therefore, the capital used to outsource could be used for patient care.

Aside from retaining the appropriate personnel, another challenge faced by hospitals outsourcing to a private organization is that public-private partnerships tend to not work out or may not achieve significant benefits due to financial constraints of public organizations and a lack of health-related experience of private organizations. According to Participant 5, *"the number one resource in the hospital is its people, and it's often a very important part of their strategy on how they retain, recruit, and develop people in the organization. So, there's less confidence that they can turn that over to the private sector, and that they could even afford the private sector to do that for them. I just don't think private sector organizations get it when it comes to the nature of health care."* (Participant 5, CA) For example, in terms of finance, it is challenging to take accounts payable out of the hospital and, for example, into an SSO because *"there are so many complex commitments coming from the Ministry, with the accountability agreement that, people haven't really outsourced anything within their finance area .. people get really antsy when you're dipping their fingers into their finance pot. So, I'm not sure that the public-private approach has reaped significant benefits that would lead everybody to believe that that's what they should be doing. I don't know of any major success stories out there."* (Participant 5, CA)

4.3 Activities

Survey participants were asked the most common back office functions to be centralized and consolidated, and responded with "information technology" (75.0%), "accounts payable" (68.1%), and "human resources" (56.9%). "Other" back office functions that were consolidated include procurement, purchasing, sterile processing, and materials management.



In terms of delivery of back office functions, participants were asked whether they partner with any third-party organizations to delivery back office services. To this question,

- ▶ 52.8% of participants indicated that they did not partner with any third-party organizations and were not interested in partnering in the future; and
- ▶ 26.4% of participants did partner with third-party organizations for back office service delivery, and indicated that they were satisfied with this arrangement. The most common examples given of these partnerships included Cerner for IT services and Staples for office supplies.

From the survey participants, several smaller organizations noted that achieving back office consolidation was not yet feasible due to size constraints, but were planning to consolidate the back office in the future as the organizations grow.

4.3.1 Areas of focus

Participant 5 was confident that Ontario's hospital system *"has done a great job of managing its costs"* and should be focused on clinical savings, rather than savings in the back office, stating that *"I worry that we've got all this attention on trying to squeeze a little more juice out of the lemon on the back office, and not focused on how do we manage the wastage that's being spent on the clinical side"* (Participant 5, CA) Ultimately, it was suggested that clinical areas be prioritized for reform over back office, as the biggest costs are associated with clinical care (i.e. higher wage earners), rather than administration (i.e., lower wage earners), and therefore, there is a longer-term impact if clinical strategies are reformed. To support this idea, Participant 5 stated, *"I'd rather see them working on wound care strategy for the province than I would for centralizing the HR department."* (Participant 5, CA) As another example, an SSO did an OR standardization project and found that *"If we were to move to the lowest cost products, it would save over a million dollars across eight different hospitals. Like, that's huge. And that's only across eight hospitals. We've got 150 hospitals in this province, so if you want to find money, you find it in the wastage in the, on the clinical side, and not the people on the account payable side."* (Participant 5, CA) Furthermore, Participant 5 suggested too many lab tests and radiology exams, among others, as sources of wastage.

Back-office reform initiatives are "constantly evolving" at varying degrees across Canada and Australia; however, most are supply chain-related, in the areas of HR (i.e. standardizing employee benefits, health, and employee assistance program), IT (i.e. repositories and consolidation), diagnostic imaging repositories, and finance (i.e. accounts payable).

- ▶ In one Canadian SSO, the following six back office services have been identified: procurement and logistics, linens, a play system program, a diagnostic imaging repository, and accounts payable. Other potential back office areas identified are accounts receivable and payroll. Beyond financial services, other targets include a central intake for MRI.
- ▶ Of back office-related activities, Participant 2 stated *"the low hanging fruit is in the back office, especially in the finance area – payroll, accounts receivable, even HR functions are some pretty obvious ones. In non-clinical, we're already doing laundry, but there's food, nutrition, facilities, housekeeping, so there's a number of areas that could be targeted there. Under clinical, we have actually in one of our LHINs something called CoLabs where they've created an entity that centralizes the labs and we're working on trying to transition that into our SSO, but there's also pharmacy and DI, which we're also in to."* (Participant 2, CA)

4.3.2 Managing facilities and large capital projects

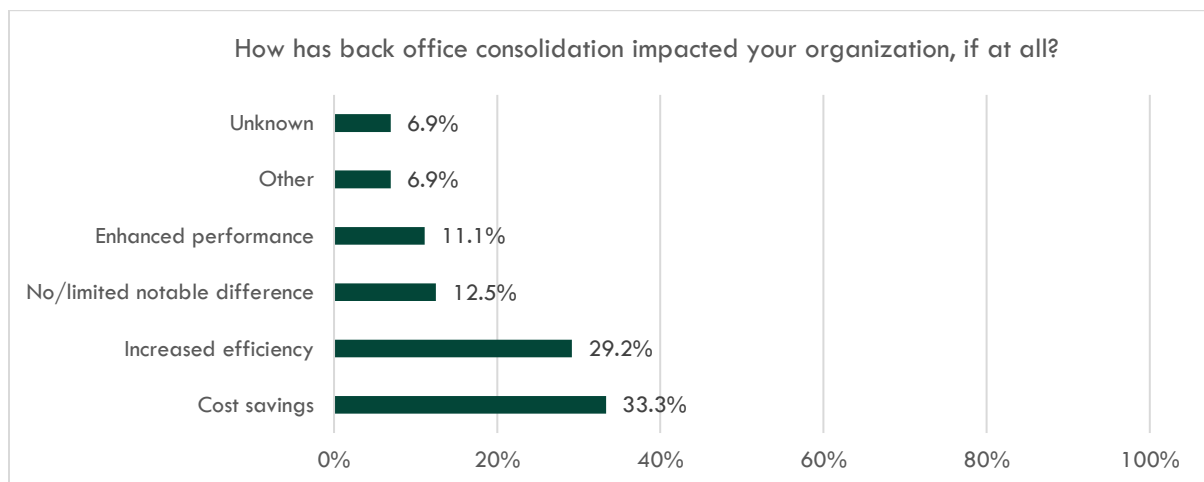
One Canadian SSO completed a project on leases and found that when health care providers were individually negotiating their leases, there was great variation in price. As a result, that SSO will take on the role of negotiator on behalf of the health care provider.

In terms of public-private partnerships, one Canadian SSO has a team for capital and development, which helps hospitals manage major builds and renovations with the private sector. This SSO-hospital partnership has saved hundreds of millions of dollars, as Participant 5 states, “we have found so many instances where the private sector’s making off like bandits with hospitals in major redevelopment projects. So, it’s something that we are out there talking to the other SSOs about and just willing to share all this knowledge that we have about all the vendors and the things that they do.” (Participant 5, CA) Similarly, in Victoria, Australia, some health services partner with private companies to accumulate the capital required for projects (i.e., to build and operate a new facility). In these public-private partnerships, clinical administration is responsible for patient care and core back office functions, such as HR and finance, while other back office work, such as IT, retail opportunities, environmental services, food services, waste management and facilities management, are the responsibility of the private partner. In these arrangements, the private partner is paid a management fee.

4.4 Performance Measurement & Metrics

In terms of cost savings, no participants were aware of any cost-savings data related to the impact of back-office reform. Based on this, an area for improvement for SSOs is to identify and use benchmark tools to assess the cost of back office services, “people talk about consolidating back office services, but we haven’t established an approach to benchmarking a cost for those things, and I know there are some comparisons done nowadays that are high level around administration costs by hospital or per patient day, and I think we need to spend a little more time looking at those benchmarks.” (Participant 5, CA)

When survey participants were asked of the impact of back office consolidation within participant organizations, 33.3% of respondents indicated “cost savings” and 29.2% indicated “increased efficiency”. “Other” impacts included improved contract compliance.



4.5 Leadership & Governance Structures

Within Canadian SSOs, selection of the back office services to reform is the responsibility of committees and boards, which are presented areas of opportunity based on engagements with member hospitals. Following presentation of these areas of opportunity, SSO management is then responsible for gaining

support from the board for a particular process or business case. This governance process has been active through each of the aforementioned six services that have been identified.

In Canada, there has been a trend of SSOs partnering with each other for back office management rather than private sector organizations, as Participant 9 suggests, *“we’re going to be moving our third party logistics, our distribution, away from private sector parties, like Cardinal and Stevens, and we’re going to be transitioning to [another SSO]. We’re finding that we’re buying the same product and we’re buying it for two different price points. So, we now have an opportunity between the two organizations to manage the spend of 20 hospitals and drive the price down to the lowest cost just simply by utilizing data comparative information between the two parties.”* (Participant 9, CA)

4.6 Change Management Strategies

Based on available funds, supply chain management tries to implement what is feasible. In terms of implementation and transition strategies, there is both an HR element and a change management element, which are intertwined. Of the HR element and overall process required to outsource a service, Participant 2 advised, *“you need to go down something that’s called a voluntary integration and something that’s called contracting out. If you can show that this is a voluntary integration which is what we did, and you go down a road of dealing with the unions and the jobs on site, and there’s PLSTRA. That really outlines the process of how you would take a service to a voluntary integration out of the office. It’s got all the steps of the time period, the communication, the work with the LHINs, right up to the actual votes of the employees that get to you know decide whether they want to stay with the union or move outside of their union. So you got that whole piece to work through from an HR perspective, and obviously from a culture because you’re taking them out of their locations and you’re centralizing them to a new location which may or may not be a union environment, right.”* (Participant 2, CA)

Of the change management required, Participant 2 stated *“when you go on to an automated system you go back to the hospitals through the process you have to identify what’s going to change because of automation and software. So when we went through this we had an actual steering committee, we hired in a project manager team, a director from the hospital who lived this and we spent an enormous amount of time understanding all the different process per hospitals, building it in to our delivery and our launch and then having a ton of training, and after service visitations with each location and you started getting them used to the new world.”* (Participant 2, CA)

Appendix 1: Summarized Best Practices

Best Practices in Clinician Engagement

When survey participants were asked about the best practices to facilitate clinician engagement, the following responses were noted (in order of decreasing frequency):

- ▶ Engage clinicians at the earliest point possible in the standardization process
- ▶ Regular communication with clinical staff and nursing leadership (including one-on-one meetings with key champions)
- ▶ Trial products before final purchasing decision is made, and obtain clinician feedback
- ▶ Engage the Chief Medical Officer to appoint physicians to the VAC or PESC
- ▶ Encourage physicians to submit products to the PESC to be reviewed
- ▶ Have a clinical staff (nurse or physician) chair the PESC
- ▶ Establish relationships with clinical staff outside of PESC activities
- ▶ Invite vocal clinicians to join VAC or PESC
- ▶ Appoint a medical director to be responsible for each service line
- ▶ Make PESC meetings mandatory for clinicians that are employees of a hospital (i.e., staff or residents)
- ▶ Recognize clinical leaders for participation via “success stories” to administration and corporate communications

Other best practices arising from the literature review, environmental scan, and key informant interviews include:

- ▶ **Leveraging nursing leadership:** Procurement nurses bridge clinical activity and commercial requirements and are able to assess the effectiveness of products in real-time focusing on product usability and clinical suitability. Hiring full-time nurses within the supply chain team was suggested as a means to bridging the gap between supply chain and clinical expertise at a lower cost than engaging physicians.
- ▶ **Aligning common goals:** A theoretical “trust capital” is formed when the clinician accepts that cost control is in best interest of all parties involved and the supply chain manager trusts the clinicians’ intentions benefit the health system as a whole. Goal alignment is facilitated by focusing on patient outcomes, leveraging supply utilization data, and making cost data open and transparent.
- ▶ **Incentivizing clinician engagement:** Offering incentives to clinicians for participation in supply chain activities can help to drive engagement. However, incentives must be used consistently across a system to avoid negative impacts on areas of care without incentives. Incentive structures include paying clinicians to sit on supply chain committees, relieving clinicians of other duties such as teaching or research, sharing supply chain cost savings with clinicians, and leveraging clinician competition through making physician variance data transparent.
- ▶ **Voluntary selection of clinicians:** The most common methods of identifying clinicians to participate in supply chain activities were voluntary selection/clinician interest and recommendation. Based on survey answers, clinicians were most often recommended to be

involved in supply chain activities by nurse managers, the Chief Nursing Officer, or department/clinic managers. Selecting clinicians through these means is more likely to produce invested and engaged clinician involvement.

- ▶ **Selecting clinicians based on area of expertise and interest:** The most important criteria for considering physicians to be involved in supply chain activities are area of expertise and physician interest.
- ▶ **Engage clinicians both within and outside of PESC activities:** Some organizations engaged clinicians not only within PESC meetings, but also outside as part of a broader relationship-building. One participant also noted that the benefits of engaging clinicians are not limited to clinician buy-in and support, but also for educating procurement staff on clinical activities. Having an open dialogue with physicians requires that supply chain management research and gain exposure to areas other than supply chain. The most effective strategies used to strengthen clinician-procurement professional relationships are: keeping clinicians regularly informed and involved in PESC activities; hiring clinicians within the supply chain; and regular communication outside of PESC meetings.

Best Practices in Product Standardization

When survey participants were asked about the best practices to facilitate product standardization, the following responses were noted (in order of decreasing frequency):

- ▶ Form a value analysis team to rigorously analyse product choices
- ▶ Gain C-suite and executive support and buy-in to standardization activities
- ▶ Involve a cross-section of departments and staff in process of standardization
- ▶ Engage clinicians and other end-users in choice selections that affect their practice
- ▶ Engage clinicians and other end-users in all decisions, early and often
- ▶ Identify physician champions in each specialty and enlist them to support product standardization initiatives
- ▶ Concede to clinicians in early standardization discussions to gain their engagement, gradually get more aggressive in standardizing products once they are engaged
- ▶ Make utilization and cost data of products transparent across the organization
- ▶ Communicate regularly and effectively with clinicians, nurses, and other end-users of products (such as product newsletters and web pages)
- ▶ Have a clinical position within the supply chain such as a nurse, make the clinical position the chair/co-chair of value analysis committees to discuss new product requests with physicians and staff
- ▶ Engage in regular and active contract management and compliance
- ▶ Make decisions on which products are “clinically acceptable” rather than simply voting “yes” or “no” to a product change
- ▶ Identify a clear chain of command for purchasing to avoid duplicate orders
- ▶ Standardize OR custom procedure packs
- ▶ Standardize not only with products, but standardize across entire service lines and then try to standardize across multiple service lines with one vendor

- ▶ Develop a Kanban system for ordering products
- ▶ Ensure and drive data accuracy for supply utilization and cost

Other best practices arising from the literature review, environmental scan, and key informant interviews include:

- ▶ **Centralize procurement:** Centralizing procurement across a clinical department, hospital, SSO, or health system gives departments more control over product selection, bulk ordering and standardization. The level of centralization varies greatly across and within jurisdictions, ranging from individual hospitals with consolidated purchasing to national funds for country-wide shared services. Centralizing to higher levels has the potential for greater cost savings, but only to a point. Smaller trusts often secure better pricing than larger trusts, because as trusts get too large medical supply companies are less willing to give lower prices to entire regions.
- ▶ **Centralizing surgical warehouses:** Removing the surgical supply storage facilities from ORs and putting supply chain specialists in charge of them has been shown to reduce inventory costs and provide OR nurses with more time for patient care.
- ▶ **Adopt project registries:** Organizations and governments can develop a list of approved products and services that can receive funding. This limits the availability of certain products within hospitals so that standardization is driven from top-down.
- ▶ **Adopt clinically-friendly language:** Clinicians are often not familiar with supply chain jargon, and can sometimes make assumptions that all supply chain standardization efforts are purely driven by cost considerations. Adopting more clinically-palatable language such as “reducing product variety” rather than “standardization” can help engagement.
- ▶ **Expand standardization criteria:** Standardization criteria should include cost considerations, but also other, more clinically-relevant criteria. The most recommended criteria are patient outcomes, cost data, and staff feedback.
- ▶ **Identify products to be standardized through data-driven approaches:** There are a number of ways hospitals and SSOs identify products to be standardized, including contract expiration, annual review, hospital feedback, vendor performance scorecards, and supply utilization and physician variance data. Organizations that use rigorous data analysis or vendor performance measures described financial improvements versus more traditional models, as well as improved clinician relationships.
- ▶ **Develop objective RFP criteria:** To avoid subjectivity and overcome physician preferences and biases, develop objective RFP criteria rather than traditional weighted scale criteria (i.e., yes/no questions vs. score 1-10 questions). This is particularly important for organizations using technology-assisted tendering processes.
- ▶ **Share benchmarking data:** To ensure best possible pricing, it is advisable that hospitals and SSOs share supplier pricing data. Further, evaluation criteria should not be written to favour small or large supplier organizations, but rather the needs of the majority of health services.

Best Practices in Category Management

When survey participants were asked about the best practices to facilitate product category management, the following responses were noted (in order of decreasing frequency):

- ▶ Establish three main categories as commodities, clinician preference, and physician preference, with sub-categories within each
- ▶ Set categories based on contract grouping in order to facilitate accurate analysis in determining compliance and renewal
- ▶ Set categories based on national standards
- ▶ Set categories based on areas of oversight of the members of the VAC or PESC
- ▶ Actively monitor same and similar items for each product category
- ▶ Define your commodity products, which should be based on costs alone
- ▶ Periodically ask for new technology presentations by the vendor community

Other best practices arising from the literature review, environmental scan, and key informant interviews include:

- ▶ **Select product categories based on clinical recommendation:** Rather than selecting product categories based on supply chain preferences and constraints, categories should be selected based on clinical recommendations, industry standards, and data analytics.
- ▶ **Leverage data analytics to appropriately size categories:** To identify which categories are required, participants relayed the importance of utilizing data analysis techniques. In order to drive best value, it is a best practice to ensure that the categories are sized such that an adequate number of products are bundled under like categories to create the largest buying power; however, the categories must also be manageable by individual sourcing specialists. For more generic products, categories may be broader than those for more unique products.
- ▶ **Conduct continuous, iterative review of categories:** To ensure optimal category management, participants noted that the review of product and service categories should be continuous and iterative.

Best Practices in Back Office Consolidation

When survey participants were asked about the best practices to facilitate back office consolidation, the following responses were noted (in order of decreasing frequency):

- ▶ Accounts payable and purchasing should work closely together to be more efficient – has helped organizations keep up with invoices and payment terms, taking discount, and maintain flow of supplies
- ▶ Facilitate open communication between departments – house back office functions in close proximity in the same building
- ▶ Centralize order entry, pharmacy review, scheduling
- ▶ Consolidate back office functions

Other best practices arising from the literature review, environmental scan, and key informant interviews include:

- ▶ **Measure and monitor back office consolidation activities:** Data related to cost-savings as a result of back office consolidation is limited and as a result, measurement and benchmarking in this area has been identified as a future priority for SSOs.

- ▶ **Hire additional resources for consolidation efforts:** Back office consolidation policies are organization-specific. Additional personnel are often required for such policies and should be responsible for the successful execution of back office initiatives. For example, committees for project management and IT strategy have been identified and are responsible for specific back office issues.



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