Transforming the OR supply chain through integration, analytics, and standardization

UHN Case Study

Operating rooms (ORs) can play a critical role in a health system's financial viability, often functioning as a revenue generator—or in some cases, a drain. Given that 40 to 60 percent of an OR's total spend comes from non-labor costs,[1] the OR supply chain offers opportunities for efficiency improvements. Yet a 2014 Global Healthcare Exchange (GHX) survey[2] of hospital senior executives indicated that OR supply chain deficiencies have slowed organizational decision-making and increased costs and inefficiency.

Today, a growing number of healthcare organizations are scrutinizing their OR supply chain processes more closely. University Health Network (UHN) in Toronto, Canada, is one health system that is already well ahead of that curve. Through its implementation of the Pyxis™ automated point-of-use dispensing system from CareFusion (BD), UHN has radically improved its OR supply chain so that real-time supply data integrates seamlessly with UHN's clinical charting system, while automatically reordering supplies as needed.

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The Challenge: capturing and sharing real-time case costs

UHN's transformation began nearly a decade ago when its leaders formed an OR Transformation Committee that was tasked with streamlining the organization's OR supply chain. When the team began its efforts, UHN—a four-hospital system with ten program areas spread across eight sites and more than 1,200 inpatient beds—was spending $30 million on OR supplies and managing less than 20 percent of that spend with barcode scanning. Clinical staff managed nearly everything else manually, with pen and paper, which was not only inefficient but could not produce data for managing supply costs.

Like most OR's, UHN was relying on surgeon procedure card costs, an effort that presents an industry-wide challenge. Procedure cards, also known as "preference cards," typically only capture 20 percent of an OR's spend in the central processing department while 80 percent of the total spend choice occurs inter-operatively. Thus, while the cards may come close to reflecting what resources are actually used in the OR, they do not provide real-time, accurate costs, *(unless RN time is spent to chart by exception, which is cumbersome)*. "To capture the post-operative, real-time case costs, we wanted to complement the clinical workflow and capture data to share information with the right players who could make the informed choices about what they used in the OR while also making an impact on patient safety," says Wendy Watson, OR Supply Chain Manager for Surgical Services at UHN.

To achieve that, the team knew that they needed to create a sustainable, long-term foundation. "We knew that the solution wasn't about contracting to obtain cheaper items or looking for fast savings because that couldn't bring about the long-term value benefits we were looking for," says Scott McIntaggart, Senior Vice President and Executive Lead, Toronto General Hospital, UHN. "Ultimately, we wanted to move to sharing real-time surgeon procedure costs so that our surgeons could reduce variation in cost without compromising safety or quality of care."

UHN's OR Transformation Committee came up with four specific goals that would help create a supply chain technology-enabled environment:

- Automated stock and direct order-enhanced inventory management
- Automated consignment implant ordering and tracking
- Integration with the GPO, SAP system Item Master and ORSOS, patient charting systems
- Real-time surgeon case costing and data reporting

UHN's team hoped that once these goals were realized, their efforts to transform the OR supply chain would alert surgeons to supply item costs so that they would choose supplies wisely, provide data to identify cost savings opportunities and reduce waste, enable discussion about product standardization, and promote fiscal responsibility. "We are experiencing a cultural shift in healthcare in that a growing number of surgeons want to self-regulate their OR spending," says Timothy D. Jackson, MD, MPH, FRCSC, Division of General Surgery, Toronto Western Hospital, UHN. "The right information will support the movement toward fiscal responsibility with UHN surgeons."

The Solution: building a sustainable infrastructure with Pyxis

UHN's OR Transformation Committee worked through Lean baseline mapping to identify gaps and opportunities, conducted a literature search for OR best practice, and visited leading practice OR hospitals. Soon into the planning process, it became clear that UHN's OR goals required a significant capital investment, which the organization was unable to provide at the time. Convinced that the efficiencies gained from implementing a technology solution would yield a healthy ROI, UHN's Watson turned to Ontario's Ministry of Finance and sought public funding. Based on a detailed business case compiled by Watson and UHN's financial leaders, the proposal was accepted, and the Ministry agreed to fund the project.

With the necessary funding secured, UHN's team landed on Pyxis, an advanced supply management system from CareFusion *(BD)*. Pyxis is composed of a group of point-of-use devices that are integrated within UHN's network to automate the ordering, replenishment, management, and control of supplies. System transactional information can also be passed electronically to other systems/applications for use in an e-commerce replenishment strategy. Furthermore, the system provides detailed procedure supply costs, including total supply spending by procedure and physician. Supplies are identified on the line-item level, and then aggregated to the procedure.

It became clear to the OR Transformation Committee that Pyxis would be the heart of UHN's solution. "The Pyxis leadership team introduced us to a U.S. hospital that helped us to see our future," says UHN's Vice President and Chief Financial Officer, Darlene Dasent. "With the implementation of Pyxis, UHN moved to a new controlled environment where items could no longer be added to the shelf—or the budget—without accountability."

The new process required financial approval, contract verification, item master additions, and finally, physical and electronic additions loaded to the Pyxis™ system by an OR Supply Chain Supervisor. With the inventory now controlled, the team moved to the final phase of streamlining the clinical

workflow. The automation of the unique device identification (UDI) lot and serial number, product identifier (PI) to the clinical chart was a complex but essential ingredient in the solution. After experiencing a GPO system conversion and upgrades to the Pyxis and ORSOS systems, UHN completed the final implementation phase in March 2015. The completed solution provides electronic tracking of all OR inventory as well as automated re-ordering, clinical charting integration with UDI, PI and automated item master standardization for the entire system.

The Results: a fully integrated inventory management solution

With the implementation of Pyxis and the creation of a fully integrated inventory management solution, UHN experienced immediate and significant wins. Clinical chart accuracy improved by scanned implant lot number and serial number. Prior to UHN's efforts, adding implant information was a manual process that included looking up the item description, and manually entering the lot and serial number in ORSOS. With the integration, 99 percent of implants are electronically documented. Only suppliers without barcodes require manual entry and there are increasingly fewer of these. This not only saves the nurse time, but it increases the accuracy of the UDI, PI, lot and serial recorded in the patient chart by eliminating the manual data entry of the lot and serial numbers. Stockouts are minimized with automated re-orders, and expiration dates and recalls are identified electronically. The value of all inventory is automated, visible, secure, and no longer dependent on annual manual counts. Daily cycle counts ensure that the system values are accurate and annual counts now consist of randomly chosen spot checks to verify accuracy. A report of on-hand value can be run at any time of stock, non-stock and consignment *(including tray value of screws and plates).*

Furthermore, UHN surgeons have access to real-time procedure cost data *(for all items actually used, stock, non-stock and consignment)* and detailed analysis of operations that includes procedure costing as well as utilization trends. "Everything happens behind the scenes, literally with the touch of a button, while enhancing clinical workflow and patient safety," says Kim McKinlay, a Patient Care Coordinator at UHN. "At the end of a procedure, an OR nurse and surgeon can view all supplies used and the precise cost of the procedure. At the same time, supplies are automatically re-ordered, and data for savings and review are captured."

With a fully integrated, automated, streamlined process, UHN was able to implement Pyxis to create a leading practice solution in their OR supply chain. The ROI for this project exceeded the expectations of UHN's team. Financial outcomes were realized in hard and soft savings resulting in $14 million* over 5 years. The organization experienced $9.8 million in hard savings, including:

- Consignment savings and product standardization from GPO contracting savings, aided by Pyxis data and a controlled system: $3 million
- Inventory efficiencies savings from reduced carrying costs: $4.8 million
- Inventory efficiencies savings from par-levels based on Pyxis utilization data: $120,000
- Inventory efficiencies savings by eliminating back-ups that were no longer needed because of the Pyxis solution's reliability: $130,000

Furthermore, the new system provided **$4.6 million** in soft savings, which included more than $3 million attributable to clinical and nonclinical time saved with the use of the Pyxis automated electronic cabinets, developed interfaces, and associated new processes. An additional $863,000 of soft savings was achieved by reducing MDR pick and OR scrub nurse time spent opening packs.

"The Pyxis system contributed features and benefits we had not dreamed were possible from our current state," says UHN's Watson.

"That vision really helped shape our strategy of where we wanted to go and as a result, the Pyxis group became our partners, not just a vendor."

~Wendy Watson
OR Supply Chain Manager, Surgical Services, UHN

After a focused, committed effort, UHN's team attained its goals of improving patient safety, clinical time savings and real-time surgeon cost data, thus bringing the organization to the leading edge of OR supply chain efficiency.

"It has been a journey of continuous improvement that has completely transformed our OR supply chain,"

~Wendy Watson
OR Supply Chain Manager, Surgical Services, UHN

"The success of the multi-year project is primarily attributed to it being a ground-up OR initiative, with Ministry funding, coupled with our partnership with CareFusion (BD), and the unwavering commitment and support of senior leadership."

Lessons Learned

Secure buy-in at all levels from the beginning, while respecting staff time:

- Focus on OR research and planning—this stage is critical to a successful, sustainable outcome.
- Engage OR Clinical and business segments from the onset, and maintain ongoing support from senior leadership throughout the project.
- Form a Steering Committee, and establish its voting members, before any decisions may be required.
- Remember staff will have to balance their daily operations jobs in addition to a full-time project. Subject matter experts in each area are essential to the success of the project.
- Build the appropriate inventory team to support the system and clinical staff.
- Ensure IT is engaged from the start of the project. For UHN, considerable internal and external IT time was required for the final interface to the ORSOS clinical chart.

Prepare for Item Master to be one of the most resource-intensive parts of the project:

- Be aware the Item Master may be incomplete and cause considerable delays. You may need inventory staff support for manual and new automated processes—at UHN, the 60-character length at the Pyxis station was shorter than SAP and required a translation table.
- Reduce the Item Master interface update from hourly to daily to reduce system overload issues.
- Plan enough time and resources for the Item Master cleanse and alignment to the clinical system.
- Contract conversions will require more time for the Item Master to be updated and for the station to be rebuilt.

Keep up morale!

- Stay focused on the project goals and the OR needs, when cross-discipline feedback is not aligned.
- Celebrate milestones along the way and ensure the team feels valued for their transformational work.

References
1 Gamble M. Six cornerstones of operating room efficiency: best practices for each. Becker's Hospital Review. January 18, 2013. Accessed July 6, 2017. at http://www.beckershospitalreview.com/or-efficiencies/6-cornerstones-of-operatingroom-efficiency-best-practices-for-each.html. **2** Research respondents recognize supply chain deficiencies keeping hospital operating rooms in the "stone age." GHX website. http://ghx.com/newsroomevents/news-releases/2014/research-recognizes-deficiencies-keeping-hospital-operating-rooms-in-the-stone-age/. Accessed July 6, 2017.

* Ontario Ministry of Finance: Savings of $5.9 million have been validated by the Ministry of Government and Consumer Services as of October, 2014 based on ministry criteria. However, all savings have been internally validated and are actual hard and soft savings achieved by UHN.

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