The Transformative Power of Supply Chain Management as a Shared Service: Building a Partnership with Nutrition and Food Services

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Author Note

The staff, medical center, and other identifying organizations referred to in this paper will be kept anonymous. Names and other identifying information will also be blinded and referred to using industry standard titles: manager, technician (tech), food service worker, and analyst. The scope of this paper will focus on the Nutrition and Food Services clinical inventory. The catering or cafeteria side of the operation was out-of-scope. Lastly, this paper was produced prior to the COVID-19 pandemic and may not reflect any practice changes as a result.

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Abstract

Tremendous value can be achieved by investing Supply Chain Management (SCM) resources into shared services where optimizing the supply chain is not normally a top priority. This paper will discuss an example where SCM partnered with the Nutrition and Food Services (NFS) department within a medical center. The medical center that this project took place in is a large trauma center, associated with an academic health system. The return-on-investment (ROI) was three-fold: 1) improved patient safety and elimination of clinical time spent managing nutrition items, 2) expansion of Materials Management Information Systems (MMIS) to enable the automation of routine transactional work and enhanced reporting, 3) optimization of the supply chain and maximizing vendor partnerships. The project team consisted of 18+ cross functional members with varying degrees of their labor allocated to the project. Results of this project were a true representation of the Association of Health Care Resource & Materials Management's (AHRMM) (2020) triple aim: cost savings were achieved, resources were re-deployed to improve patient outcomes, and quality of service was enhanced.

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Over the last 30 years, industries across the world have dedicated their efforts to improving efficiencies by right sizing, reengineering, and horizontally & vertically integrating their operations (Ulrich, Smallwood, & Sweetman, 2008). Healthcare organizations have done the same. Health systems specifically, have created integrated shared services for departments such as Pharmacy, Facilities, Housekeeping, Supply Chain Management (SCM), and Nutrition & Food Service (NFS). Each of these departments characteristically sustain critical supply chain business processes and costs.

SCM shared services typically focus on achieving economies through joint purchasing, accounts payable, inventory management, and logistics for a health system (Hanrahan, 2011). Historically, the previously mentioned departments fell outside of SCM's scope and often had their own teams perform each activity. Opportunity exists when these activities do not have SCM involvement.

Departments with supply chains can benefit significantly from leveraging supply chain subject matter experts. A supply chain represents the network of activities around an organization and its suppliers to produce and distribute a product to the end user (Supply Chain, 2020). Therefore, the NFS and other shared services supply chains fall within the traditional supply chain framework.

Situation

SCM was engaged by nursing and NFS leadership to help reduce corrugated cardboard used as shipping containers from going up to nursing units because of the risk it poses to

patients. It was quickly recognized that NFS had opportunities that SCM could help address, in addition to eliminating corrugated cardboard on nursing units. These opportunities included reducing clinical time spent managing nutrition items, optimization of distribution & replenishment processes, and eliminating the need to store product offsite.

The opportunities SCM identified represented the beginnings of a transformation for NFS and a huge opportunity for SCM to build partnerships and market its services. The following paragraphs will walk through the various phases of this project and highlight why SCM is needed in shared services where supply chains are present. Lastly, the results achieved by the team will be shared in reflection of AHRMM's (2020) vision of advancing health care through supply chain excellence by focusing on cost, quality, and outcomes.

Before the Transformation

Disruption is a term that was rarely heard in the NFS department. The NFS team had a long history of running successful operations and responding exceptionally to their customers' needs. However, with long histories of success and no incentives to innovate, even high performing teams with the best intentions can become complacent.

According to the Food Service Director (2017), about 51% of food service operators are self-operated, with 45% contract managed, and the remaining being a combination of both. Hospital A's strategy to self-operate the NFS department creates the necessity to continuously improve to ensure maximum value is attained. The medical center had an unexplored method to leverage supply chain best practices to enhance the value provided by running an NFS team in house.

Discovery

Hospital administration found an opportunity by identifying significant amounts of corrugated cardboard going up to nursing floors which is a risk of violating hospital policy derived from The Joint Commission's position on the subject. According to The Joint Commission, external shipping containers and shipping cartons have been exposed to unknown and potentially high microbial contamination, especially those made of a corrugated material, serve as generators of and reservoirs for dust (Boxing and Shipping Containers, 2020). Essentially, these boxes were increasing the chance of exposing patients to conditions that could increase probabilities of infection.

Supply Chain was contacted and helped with the initial investigation into why so much cardboard was making its way up to nursing units. It was found that thousands of cardboard boxes were going up to the units over the course of a year and that most of the supplies held NFS products. As a result of the initial investigation, SCM partnered with nursing and NFS to see how the process could be improved.

NFS Supply Chain Evaluation

The project officially kicked off with a scoping phase in January of 2018. SCM engaged with NFS immediately to understand their processes and help identify underlying opportunities. The first task was to gain an understanding of NFS' operations including: distribution processes, storage, reporting, and systems. The project team also reached out to neighboring health systems in the region to see if their NFS and Supply Chain teams have partnered in past projects to see if anything could be learned. It was enlightening to find that they had not partnered to the depth the

team was anticipating. The initial assessment took about one month resulting in the following observations.

Bulk Storage Requirements

NFS had one onsite bulk warehouse and due to space constraints, had one offsite warehouse location for additional bulk storage. The onsite location received a combination of items direct from suppliers and daily shipments from the offsite warehouse.

Offsite Warehouse

The offsite warehouse was managed by SCM with a bulk storage location dedicated to NFS products such as: food containers, utensils, formula, and other beverages and snack products. The warehouse dedicated about 25% of its space and pallet racking to hold the NFS inventory. The primary function of this warehouse was to hold emergency supplies.

It was found that the SCM purchasing office was supporting the NFS volume by having products delivered to the offsite warehouse where 3-6 months' worth of inventory was held and then distributed via internal courier service to the onsite storage location. The inventory total value of the NFS product was about $20,000.

Lastly, the offsite warehouse was going to be significantly reduced as part of a SCM cost savings initiative. This meant that the other products stored at this location in perpetual inventory would also have to be eliminated. The NFS work would serve as a baseline for how to remove the other products. The remaining inventory would be solely pandemic stock and transition over to a 5,000 sq. ft. warehouse with significantly less overhead.

Onsite Warehouse

The onsite warehouse was approximately 3,000 sq. ft. and in addition to the inventory housed off site, also held menu ingredients for the cafeteria. The warehouse utilized standard Metro racking and single shelf storage. The supplies were organized by type but not labeled or managed with formal Periodic Automatic Replenishment (PAR) levels.

Nursing Floor Storage

NFS pantries used a combination of plastic Ackro bins, Metro racks, cupboards, and drawers in various sizes to store product on the nursing units and pantries. These locations were organized, but not labeled or set to SCM standards. This included a lack of standardization by having a variety of different items at inconsistent levels and layouts.

Corrugated Cardboard

According to Miller (2020), corrugated cardboard is quickly disappearing from supply chains due to distributors and fulfillment centers such as Amazon pushing manufacturers to reduce packaging waste. This observation is seen in the healthcare industry with an added benefit of increasing patient safety. The root cause for most of the cardboard being delivered to the nursing units was that it was being couriered directly from the offsite warehouse and by-passing the NFS and onsite SCM teams.

Distribution Equipment

NFS utilized a 2’x2’x6’ restocking cart to distribute a combination of perishable and non-perishable inventory. These carts were extremely heavy and difficult to maneuver throughout the

hospital. NFS leadership reported that they averaged 1-2 Labor & Industry (L&I) claims per year related to these carts. The average cost of these claims was about $30,500.

The restocking carts were used for replenishing the 24 pantry locations throughout the medical center. The restocking carts needed to be refilled from the onsite warehouse multiple times throughout the day as the pantries were replenished by the food service workers. As the staff replenished the pantries, they needed to take note of the product and quantity they replenished. Often the NFS team would have to cull through the inventory to ensure nothing was expired. Shrinkage wasn't tracked, but the team's belief was that there was a high amount of waste due to expiration.

Process Observations

NFS had its core pantry replenishment processes in place since 2014. When taking a deeper dive into the background, SCM identified the following processes as opportunities for improvement.

Pantry Responsibility Splits. Nursing, NFS, and SCM co-ordered supplies to maintain pantries. It was found through interviewing the various teams that a lack of standardization added to the lack of clarity and limited awareness to promote process ownership. For example, SCM, NFS, and nursing might be replenishing the same items across multiple departments because they don't know who is responsible for them. One consistent product category that the NFS team stocked was perishable food items such as bread and milk.

Nursing Observation. The pantry inefficiencies resulted in 30 mins of clinical staff labor per week needed to manage pantry items. NFS and SCM took an active approach to try to minimize nursing's involvement with replenishment. According to an internal study conducted

across the system, Hospital A had near 350% higher patient cost per day than a sister site as a result of wage mix and product replenished.

Inventory Replenishment. Ad hoc customer orders were placed in a variety of ways including fax, email, in-person, and phone. The NFS staff then had to document on a clipboard to record the request before finding the product and making a delivery. This manual recording process applied to replenishing the onsite warehouse and tracking all outbound material to support the pantries, cafeteria, and ancillary department needs. Lastly, the manual documentation was inconsistent and not reviewed for accuracy.

Order Reconciliation and Reporting. Due to the manual recording of products taken from the onsite warehouse, an analyst was needed to dedicate 40+ hours per month to reconcile and bill the nursing units. The analyst was required to take the handwritten forms and put them into Excel to organize them before they were added to their main accounting system. This process made it difficult to collect historical usage for reporting.

Usage Analysis. Supply Chain and NFS pulled PO history from multiple systems to generate forecasts for each item stored in the onsite warehouse. After review, it was determined that the inventory kept offsite was not needed. The offsite inventory could possibly be used up and everything needed could be kept onsite going forward.

Usage outside of PO history was extremely hard to piece together. Most of it relied on short observation periods and food service worker feedback. This challenge represented another opportunity to address in increasing data availability and transparency.

Shrinkage. The NFS team conducted an audit to gather usage from the pantries. They found several items that were expiring or not used representing significant costs to the medical

center. These products were also taking up valuable space that could be re-deployed to higher use items.

Unique Shrinkage Observation. Bread was one of the highest waste items from the pantries. It was found that nursing was primarily using it for toast and sandwiches. However, it was also identified that preparing a peanut butter sandwich for a patient requires the preparer to have a state issued food handler permit.

It was not a realistic expectation to have all clinical staff train for food handler permits. This led to the option of removing the bread and instruct nursing to call down to the cafeteria if their patients needed some food that the pantry could not support. Other food that needed preparation was also reviewed.

Technology Assessment

The NFS team used a combination of systems including supplier portals, food service systems and material management systems to manage its inventory. The specific systems were CBORD and McKesson. CBORD provides information systems for more than 6,000 customers worldwide (CBORD, 2020). A couple of CBORD's main functions are managing food service menu planning and patient nutrition. McKesson was the health system's Material Management Information System (MMIS). The food service system was utilized by the medical center for most of its nutrition care needs while McKesson was used primarily for medical and pantry supplies such as feeding tubes and formula.

When first exploring the food service system's capabilities, NFS and Supply Chain determined they could leverage more functionality from it including some standard features they had access to but had not built out. For example, PAR level and warehousing functions were

available. However, dedicating a person to exploring and developing the system would have put a large strain on resources and was out of scope for this project. It was ultimately determined to leverage both McKesson and supplier portals for replenishment and inventory management in the warehouse and pantries.

Transformation Goals

After the assessment was concluded, it was unanimously decided by the team and hospital administration that this project had the potential for a significant return on investment (ROI). NFS, nursing, and SCM collaborated to create the business case for the transformation they would like to see as a result of their investment. The business case or purpose was "to improve patient safety and enhance NFS operations". To embrace this, the team developed the following transformation goals to achieve through implementation:

1. Significantly reduce corrugated cardboard traveling to patient care areas
2. Reduce nursing time spent managing NFS items
3. Implement technology and equipment to automate and improve operations and logistics
4. Implement 5-S standards in pantries and onsite warehouse
5. Eliminate waste

Strategic Planning

The strategic plan for the project was focused on maximizing value, stakeholder adoption, and patient safety. It also prioritized leveraging partner core competencies, in this case SCM, NFS, and nursing. The NFS and nursing teams had the largest change impacts and would

need a higher degree of engagement to ensure understanding and adoption. Metrics were also developed to help measure the team's success against the business case and transformation goals.

66% of organizational change initiatives fall short of success (Runsdorf, 2019). The changes that the project team needed to implement would require a significant amount of change management and a meticulous focus on end user adoption. The most critical piece of the strategic plan was to have a strong approach to change management.

Change Management Strategy

Change management planning represents pouring the foundation for achieving stakeholder buy-in (Roeske, 2019). It's imperative to have the right people involved to ensure the most complete perspective on the scope of the project and its change impacts. In addition to the project team, a process improvement committee with nursing and shared services leadership was leveraged to help formulate how to best engage stakeholders throughout the medical center.

Stakeholder Engagement

According to Roseke (2019), ensuring your stakeholders have a voice in the design process is critical to user adoption. Engaging with stakeholders helped to identify pain points that could be proactively addressed and solutions for those pain points added as part of the design and implementation. The method of sharing information was tailored specifically for each team.

Kelly McLaughlin (Director of Contracting and Procurement) stated that, "One of the things that differentiates us from a lot of other supply chain teams is that our mission is to understand what clinicians need to practice medicine and understanding those needs so we can negotiate the best value that we can to support clinical activities," (LaPointe, 2017). In this industry, clinical staff is of high importance and power. The team prioritized gathering the best

range of perspectives and having the right level of leadership for key decisions from nursing administration.

It cannot be overstated that it was critical to pursue feedback on ideas and changes before being implemented. This process supported the acquiring of information for how to best facilitate the changes for each audience. The following teams were identified as key stakeholders.

Nursing Priority. Nursing buy-in was paramount as this group could be extremely vocal if they did not understand the changes or felt it was negatively impacting patient care. To kick start this, the team worked hand-in-hand with a nursing administrator and some of her top leaders to craft communications and brought frontline stakeholders into the design process. For example, nursing was heavily engaged when the NFS team started to review the pantry stock. This engagement helped relieve some of the emotions as products were being considered for removal or a change in process for how certain things would be made available for patient consumption.

The primary methods of communication with nursing included presenting to all-hands meetings, email distribution from nursing administration, and posters hung in the pantries. Additionally, information was also shared during weekly and monthly leadership meetings. The primary information being shared through each method was: what was changing, why, when, and who to contact for support or questions.

NFS Team. The NFS team was shadowed by SCM to understand current processes and build the relationship. The NFS team was apprehensive to start, but once they understood how the changes were going to help them, became very excited. An “ah-ha” moment for NFS occurred when they had a chance to observe supply chain processes around PAR management

and replenishment cycles. Having technology to enhance their tool kits became something to look forward to.

Value Analysis Team. It became clear once pantry stock was being reviewed that better controls needed to be in place. One of the processes that NFS adopted was to leverage SCM's current Value Analysis Team (VAT) process for making changes to products. This helped create a logic-based, open, and transparent forum for clinicians to advocate for and against certain product decisions and helped remove most of the emotion from the equation.

Accounting. Accounting leadership was engaged to ensure that the processes around source to settlement that supply chain utilizes would be appropriate for NFS. It was identified that some products with pricing that did not fluctuate as much could be run through standard supply chain process, but other perishable food related items needed to remain within the supplier portals.

Supply Chain Informatics. SCM's internal applications support team was engaged to ensure that bandwidth was available to help procurement with supplier and item master building and onboarding with EDI. Due to this being an expansion of SCM's current services, no other research was needed on larger IT infrastructure to facilitate the changes. The distribution and procurement teams helped lead the vendor and logistics configuration both physically and virtually.

Measuring Success

The transformation goals were measured against a set of values that the team would track before and after the transformation. These values included:

1. The amount of corrugated cardboard going to nursing floors and pantries

2. Clinical time spent managing pantries
3. Efficiency gains and cost savings
4. Reporting enhancements
5. Change impacts around the nursing and NFS teams

The Transformation

NFS, nursing, and SCM partnered closely over a six-month period from 1/12/2018-06/30/2018, to execute a project plan with the transformation goals at the forefront. Each of the transformation goals had a recommended approach to solving the challenges around improving patient safety, clinical satisfactions, and enhancing internal controls.

Demand Planning

SCM created PAR levels for the storeroom and pantries after usage was gathered from six different sources. The sources included purchase orders, paper requisitions, phone log, stat log, supplier portals, and interviews. During this process, it was verified that the offsite warehouse inventory could be eliminated due to usage. The standard formula given to NFS to calculate PAR levels is as follows:

Standard Reorder Theory Minimum –

(Daily Usage x Lead Time) = Days Required Stock-On-Hand (DRSOH)

x Safety %

Safety % - Percentage of standard deviation of lead time above average (365-day review)

(If standard deviation can't be used, simply add additional DRSOH to increase safety %)

Standard Reorder Theory Maximum –

(DRSOH x Safety %) x 2

Example: Product A is consumed 10 each per day and has a one-day lead time, 4 day minimum and the organization requires a 25% safety stock level

Minimum = (10 x 4) x 125% = 50

Maximum = 50 x 2 = 100

Reorder Theory = 50 min, 100 max

Prime Vendor Strategy

NFS had many items they were ordering direct from the manufacturers which increases the lead time and therefore inventory levels. A SCM strategy for just-in-time replenishment is to enter forecasts with prime vendors to carry all products that meet usage requirements. This resulted in decreasing lead time from 5-10 days to 24 hours and significantly reducing inventory holding needs for most of the bulk product.

Pantry Optimization

Through data and stakeholder engagement, NFS created standardized pantry inventory listings and PAR levels. This included ensuring that the NFS team was replenishing and maintaining the entirety of the pantry stock and creating clear roles and responsibilities between NFS, SCM, and nursing.

Pantry 5-S

A key piece in standardizing the pantries after the item lists were approved was ensuring the organization, PAR levels, and labeling was consistent. This not only helped with being able

to find product but ensured in-stock conditions met clinical needs and increased the level of customer service NFS could provide.

Pantry Restocking Carts

The restocking carts were eliminated due the high risk for employee injuries. They were replaced with U-boats and totes. The U-boats were easier to maneuver through the hospital and provided better visibility and ergonomics to the NFS staff. The totes helped protect the food items from exposure as the carts traveled around the hospital.

Staffing

Staffing was not reduced but instead reallocated to new activities. The NFS team re-deployed a staff member to PAR inventory, pick, and stage product overnight to be ready for the day shift. The product was stored in totes and organized onto U-boats by unit for efficient delivery.

The staff that previously performed all aspects of the replenishment model were transitioned to delivery and stocking. Removing the ordering from their routines enabled them to service more areas and take on the management of product where nursing or SCM had previously. These additional activities represented a clarification of roles and an increase in service provided by NFS.

Onsite Warehouse Optimization

NFS and SCM worked together to physically re-configure the warehouse. It was identified that the aisle spacing and air gaps in shelving could be optimized. This process consisted of setting PAR levels and bin locations for all items including the pantry products and

cafeteria ingredients. The NFS team was able to help organize the products by like items with heavier and faster moving products categories kept toward the front of the storeroom.

Technology Deployment

The team decided to leverage Horizon Enterprise Materials Management (HEMM) to support inventory management functions until a resource could be identified to expand CBORD capabilities. This process was able to leverage the existing accounts within HEMM and build upon current infrastructure. This deployment consisted of several steps and careful planning with accounting and technology resources. The following represents an outline of the major bodies of work to deploy the MMIS.

1. Engage with IT and Finance to ensure timing and alignment in the expansion of HEMM
    a. These meetings were set up to ensure what the team wanted to do was possible
2. Cataloging all inventory and building item master
    a. This work was extremely manual and required a walkthrough to gather item details for each item stocked in the onsite warehouse
3. Creating suppliers and vendors
    a. After the item details were gathered, a line by line analysis was conducted to research where each product was purchased from
    b. A buyer had to reach out to each supplier/manufacturer to validate information and ensure they could receive PO's
4. Connecting with suppliers for Electronic Data Interchange (EDI) onboarding
    a. This was standard onboarding for most of the suppliers that could be routed through the prime vendor
    b. Most of the cafeteria items needed to be routed through a supplier portal

5. Creating perpetual inventory
    a. Built in Excel and uploaded to MMIS
6. Creating PAR locations
    a. Built in Excel and then uploaded to MMIS
7. Purchase and configure mobile devices
    a. Three mobile devices were purchased and loaded with the ERP software
8. Labeling locations
    a. SCM and NFS resource worked together to label the warehouse and PAR's
9. Training of users
    a. Scheduled training of super users one month out from Go-Live
    b. Scheduled training of NFS staff 2 weeks out from Go-Live
        i. Training of end users occurred during this same window
10. Testing
    a. Testing was conducted one month out from Go-Live
        i. This activity included following stock, non-stock, and JIT requisitions through the system procurement routing process
        ii. Once the system was validated, physical processes were also tested and revised
11. Support
    a. Developed support process document for how to quickly access ERP support and dedicated resources
    b. Supply Chain dedicated team members to run point for day-to-day operational questions

Offsite Warehouse Reduction

The team started work on increasing the inventory levels onsite and using up the inventory offsite while the MMIS was being built out. Essentially, the re-order points were turned off and the products were discontinued from the offsite warehouse. The product was transferred over once it was used up to a level that the onsite warehouse could absorb.

While the NFS inventory was being absorbed, SCM was also working to remove the inventory that belonged to other departments. A similar transition plan to NFS was utilized and was very successful. It took about 4 months to effectively transition all inventory once the re-order points were removed and each item had a remediation plan.

Results of the Transformation

The results from the transformation were considered a substantial achievement by hospital administration. To start, this was the first time NFS, nursing, and SCM collaborated on a process improvement initiative in the history of the health system. The team's mission to improve patient safety and enhance NFS supply chain operations was met in full with tremendous user adoption and minimal issues. Second, the team confirmed that SCM best practices could be applied across different shared services and that supply chains are all similar in nature despite the different business models and core competencies of the team involved. Lastly, the team met most of its transformation goals and were able to identify next steps to advance their supply chain strategy. The following paragraphs will highlight the major results in greater detail.

Clinical Enhancements

Through internal benchmarking, it was found that nursing spent an average of 12 hours per week managing NFS inventory. This totaled up to about 624 hours or $11,232 per year. The changes to establish clear roles and responsibilities as well as standardization effort across the pantries helped take nursing out of the NFS replenishment process. Aside from any ad hoc needs, the clinical staff was able to redirect those resources back to patient care.

Patient Safety

Corrugated cardboard was significantly reduced from entering the facility and making its way to nursing floors by optimizing inventory levels, distribution processes, and partnering with a prime vendor. The medical center found a decrease of 5,100lbs of corrugated cardboard over a three-month period following implementation. Additionally, it was proven that nursing floors would see about 10,500 less corrugated cardboard boxes annually due to the prime vendor next day service and NFS utilizing totes. Lastly, corrugated cardboard was completely removed from the pantries.

Warehousing and Storage

Offsite Warehouse

The offsite warehouse was reduced from a 15,500 sq. ft. space to a 5,000 sq. ft. space. This new space would provide close access for pandemic supplies and would no longer be used for any type of product distribution. Increasing capacity and improved demand planning at the onsite warehouse helped contribute to the success of this initiative. Most cost savings for this piece of the project were reported with another initiative focusing on the offsite warehouse.

Onsite Warehouse

The onsite warehouse's original capacity was 56, 4'x2' foot Metro style racks with various other end cap storage. In redesigning the layout of the space, NFS was able to increase capacity by 21.4%, to 68 racks as well as improving the layout of other storage units within the warehouse (See Appendix A). All items were reorganized by type, labeled with item identification information, and bin locations to complete the 5-S process.

Pantry Optimization

Pantries were standardized with an approved list of products to satisfy patient needs and resource stewardship. This work helped significantly reduce inventory shrinkage, improved the nursing experience, and enhanced the food service workers' ability to replenish inventory. The efficiency gains represented a 540% ROI from a $144,000 decrease in spend and a 42.5% reduction in steps in the replenishment process (See Appendix B).

Distribution Carts. Accidents from utilizing the previous bulky restocking carts were reduced to zero. This represents over 800 days accident free at the time of this writing. Furthermore, the carts are now used throughout the department for replenishing the coolers, freezers, and other areas within NFS (See Appendix C).

Technology Deployment

Introducing a MMIS and mobile technology helped to standardize the NFS team's replenishment process and inventory management. This work included building PAR's and a perpetual inventory to automate replenishment and inventory tracking. This data was then fed into a dashboard updated daily and weekly to help highlight recommendations with pantry

inventory levels and quickly identify any perpetual inventory needs such as past due open orders and days out of stock.

Order Reconciliation

Previous orders were reconciled with pen and paper and charging accounts with manual data entry. The MMIS removed the need to track orders manually and enabled the instant charge of accounts upon distribution of inventory through the PAR and stock issue process. Over 480 hours per year were redirected to higher functioning responsibilities such as the proactive management of inventory and forecasting patient formula needs with nursing.

Reporting

Previously, most usage was analyzed manually. The inventory was not tracked accurately and after it was stocked in the onsite warehouse, it was challenging to see where it was distributed to. Once the MMIS was in place, the NFS team had access to requisition history from the onsite warehouse to the pantries and departments being serviced. This reporting was developed into a real-time dashboard using the same models SCM uses to push out recommendations for PAR level management including increase/decrease PAR, potential obsolete, abnormal usage pattern, and tracking items ordered by the department but not in the pantry.

Lessons learned

This project represented the medical center's first attempt to interweave SCM core competencies with a department where its supply chain was not a strategic focus. To help bridge this gap, the team came up with the following:

NFS's core competencies align with nutrition care and hospitality: to ensure inventory is available to support excellence with nutrition care and hospitality. In comparison to the supply chain side: to ensure inventory is available to support excellence in patient care and comfort. These parallels helped shape the new NFS supply chain strategy to add supply chain management as a core competency in delivering excellent care and service.

As the project worked through its different phases, the team recorded some very meaningful takeaways to apply in future endeavors. The most prominent lessons learned were around communication and the requirements of technology that can best support the NFS department. The next sections will discuss these topics and next steps in detail.

Communication

Even with all the communication and transparency, the team was approached with concerns from nursing staff who felt uncomfortable with the changes to their pantries. One change that stood out was removing loaves of bread. Nursing thought they didn't have the ability to offer their patients a snack during off hours because bread was no longer available. This change was more emotionally charged than anticipated. The communication could have been clearer on why this was being done and how nursing would still be able to provide a snack for their patients. More focus was needed to ensure nursing understood that they could still request bread from the NFS team when their patients were in need.

Technology Deployment

Deploying SCM's MMIS was a huge success in testing the assumptions that it could improve process automation, enhance inventory management, and reporting. However, SCM's MMIS could not meet all NFS requirements around their business needs. For example, the

cafeteria and menu planning requirements were needs that could be best met by systems that are specifically designed with those functional requirements. It was previously found that NFS's food service system had functionality that had not been fully explored. After review, this system's functionality met more requirements for the overall NFS operation.

Next Steps

NFS

The NFS team was thrilled to have a better understanding of supply chain processes and how to leverage technology to enhance workflows and access to data. This result inspired an initiative to build out their food service system and enhance its capabilities to address current gaps and replace the SCM MMIS. The food service system has warehousing and pantry replenishment in addition to meal and menu planning capabilities. Next steps for the NFS team included dedicating support to their supply chain and building out functionality within the food service system.

The NFS team also had access to continue leveraging and consulting with the SCM team to work on continuous improvements around technology and logistics. An outstanding result of this effort was that the NFS team now had a framework for how to build out these enhancements. Additionally, NFS also had a much stronger vision for the future of their department as it relates to their supply chain.

SCM

The NFS team was the first group of many to come in partnering with SCM to explore process improvements related to supply chain. At the time of this writing, SCM has partnered with the pharmacy team and will be working to build out new capabilities around supply chain

management. SCM anticipates other departments to follow and will prioritize them based on organizational strategy.

Conclusion

In conclusion, the project was a tremendous success and embodied AHRMM's (2020) vision of advancing health care through supply chain excellence. The results of this initiative help prove that supply chain subject matter experts can add incredible value to departments where supply chain activity is apparent, but not a top priority. From an organizational and strategic perspective, SCM should be engaged in all areas with supply chain processes.

This project's purpose, to improve patient safety and enhance NFS operations was carried out strategically through effective change management and teamwork. The transformation goals centered around reducing the cost of doing business, enhancing quality, and improving patient outcomes. Patients are safer by reducing corrugated cardboard entering nursing floors by over 10K boxes annually and eliminating them completely from pantries. Nursing can focus on patient care instead of worrying if their pantries are stocked. The NFS team is more efficient and now has access to supply chain best practices and data to help continuously improve their operations. Lastly, the organization saw a six-figure reduction in spend and has a path forward for continued innovation and partnerships around supply chain management.

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Appendix A

Figure A1: Before the Onsite Warehouse Redesign

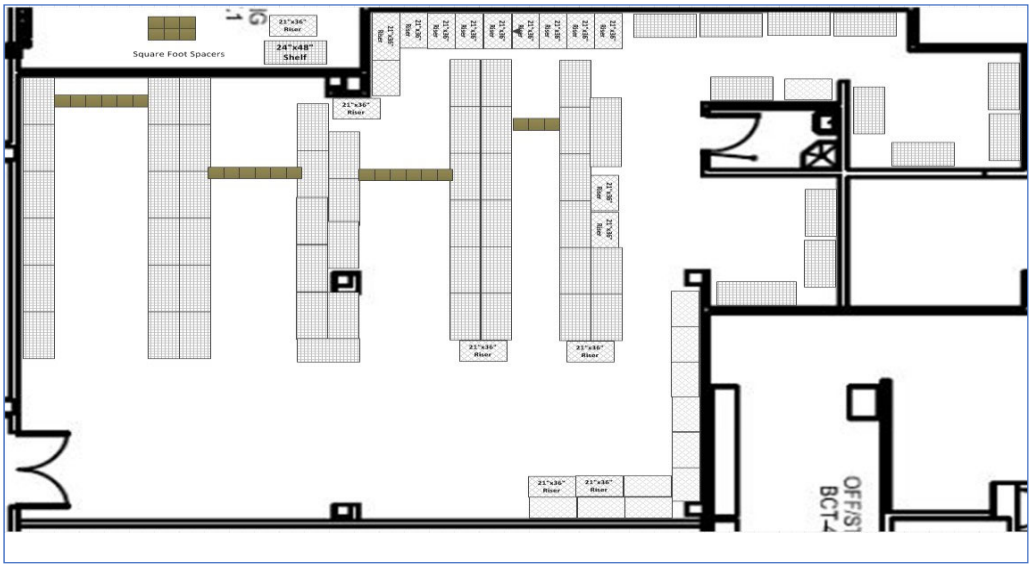
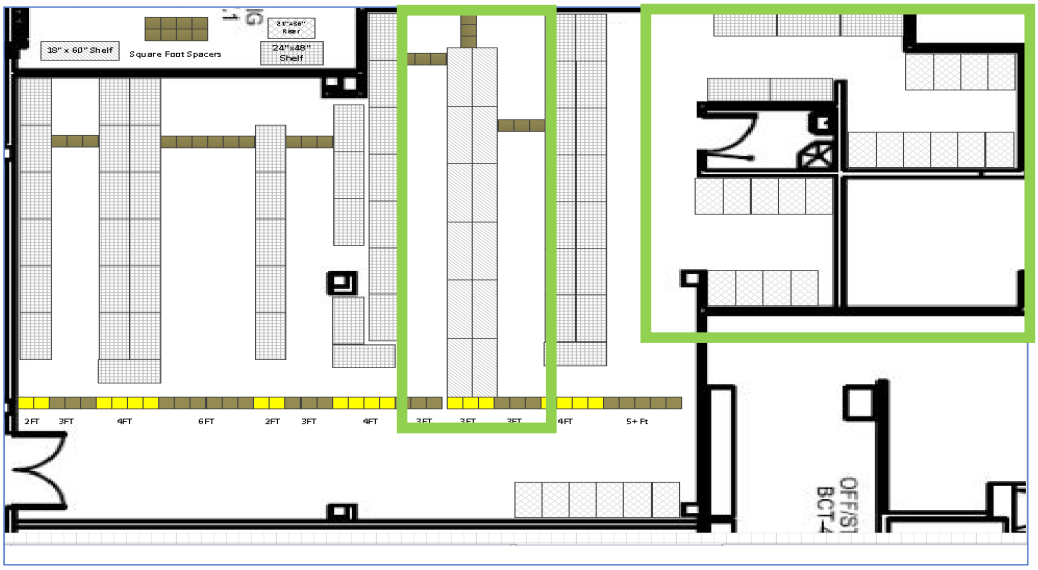
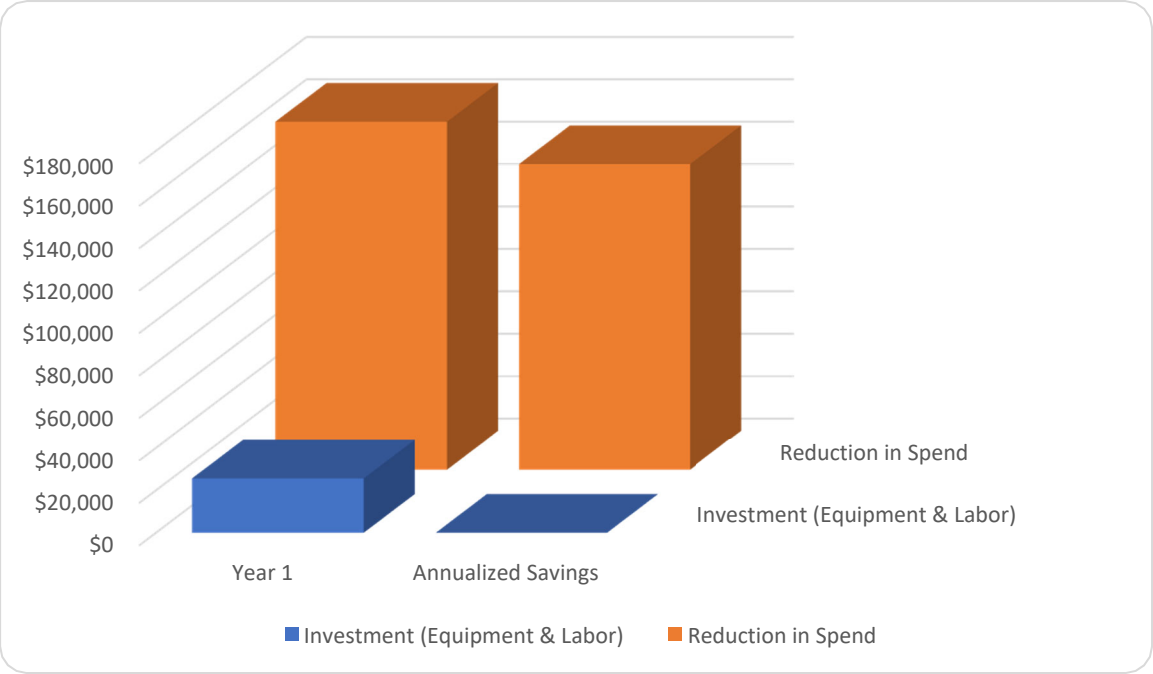


Figure A2: After the Onsite Warehouse Redesign



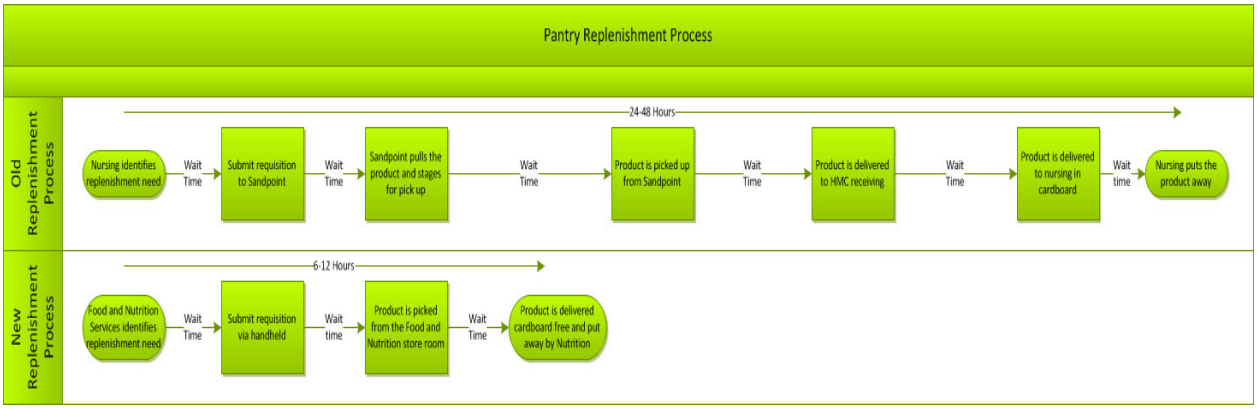
Appendix B

Figure B1: Return on Investment (ROI)



Note: ROI was 540% year one with $144,000 annual savings going forward.

Figure B2: Before and After Replenishment Process Review



Note: 42.85% reduction in steps.

Appendix C

Figure C1: Old Restocking Cart

Figure C2: New U-boat with Totes