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LEARNING OBJECTIVES

1. *Examine the common pitfalls and gaps for inventory management.*

2. *Review basic considerations for managing instruments, supplies, and equipment.*

3. *Discuss strategies to take performance to the next level.*

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Optimizing inventory management

Strategies for supplies, instruments, and equipment

by Alison Sonstelie, BS, CHL, CRCST

In healthcare, the management of supplies, instruments, and equipment is performed by different teams and departments that have a stake in the business. To optimize operations in the organization, there must be a harmonized approach. Many frontline leaders are not usually trained or educated in supply chain management, so most learn as they go and the theories and strategies are shaped by current culture. Sometimes, we need to go against the grain to implement best practices.

Reducing unused inventory

Unused and under-utilized supplies, instruments and equipment cause waste in the following ways:

1. It takes up precious space in the facility. Most storage rooms and warehouses are completely filled with products. Storage is a universal problem and products that aren't being consumed create waste by under-utilizing the storage space.

2. Products that aren't used are destined to expire or incur event-related sterility issues. The risk of using an expired or compromised product on a patient is far more expensive than the actual product.

3. The management of unused products is a waste of labor.
   a. Consider the entire value stream of a supply. A purchaser orders it from the vendor, it is received and delivered to a warehouse, someone will order it to be delivered to a point of use storage area, where it must be monitored for outdates and its bin or shelf must be cleaned. When it eventually outdates, it must be removed from the area and disposed or sent to a recycling program.
   b. Consider the value stream of an instrument set. The instruments were planned, purchased, received and delivered to sterile processing. The set was organized and entered into a management system, cleaned, assembled, sterilized, and stored. It will take up room on the shelf and will possibly need to be monitored for outdates, depending on the packaging. It may get dropped or damaged, and the cleaning and sterilization process would have to be redone.

The hours spent managing unused inventory are a waste of time and resources. The associated cost is complicated to determine, but we know it is significant, especially when coupled with the risk of using a compromised product on a patient.

Strategies

The most impactful way to reduce unused inventory is to involve the stakeholders and create a multi-disciplinary team to review the products. The group should consist of frontline employees that use the items on a daily basis. Inventory lists on paper will work, but it will be more successful to lay all the products out so everyone knows exactly what is being discussed. This approach can be used to go through supplies and reconfiguring instrument sets. Simplifying sets is a cost savings that needs to be quantified for your facility, but there are several estimates that put the cost to reprocess between $30 and $50 per set. Removing unused instruments reduces the amount of labor in decontamination, assembly, and sterilization. In addition, the operating room team will have less clutter and a more straightforward set of instruments, reducing confusion and time spent searching for the correct instrument.

Automating transactions

Activity that involves manual counting or record keeping is labor intensive and

has inherent opportunities for errors and defects. Electronic, automated management systems give you real-time visibility to inventory. Implementing a warehouse management system that utilizes scanning, RFID, or weighted bins that transmit information can help automate the reorder process and track the movement of inventory. Equipment RFID software can be used to find the location of one-of-a-kind equipment. Some tracking software can also be used to automate production by getting visibility to equipment par levels on units or by showing how much work is in decontam. In regard to instrument reprocessing, instrument tracking systems can also be used to electronically record that devices have gone through all the proper steps for cleaning, assembly, and sterilization, and can be tied to the technician performing each of those steps.

Strategies

There are benefits to using an instrument tracking system instead of manually recording information in the following areas:

1. Vendor instruments can be tracked using total management systems or with stand-alone systems designed specifically for these sets. Information about the physician, procedure, and patient (with compliance to HIPAA) can be stored and accessed by the teams. Some programs have the ability to interface with IFU hosting sites, instead of using paper copies that may get lost. This ensures technicians can process the instruments in accordance with the IFU from decontam to sterilization.

2. Instrument tracking systems can help ensure sterility assurance. The sterilizer load contents, the type of challenge device, and the sterilizer printout tape can be recorded for each load. Most systems also have the ability to interface with sterility assurance equipment, communicating information about biological indicator test results to the specific load. Electronically capturing this information helps simplify the daunting task of record keeping.

3. Instrument tracking systems can provide evidence for removing unused instruments or sets and can also help calculate cost savings. Reports generated through tracking systems can show how often instruments are used. Also, the cost of individual instruments can be loaded, which can be helpful when determining the amortized value of an instrument set. When calculating the amortized value of instruments, the cost of the instrument is divided by the number of expected uses before total depreciation, and multiplied by the number of those instruments in the set. This is important when trying to determine the cost savings, because It is not simply the cost of the instrument that needs to be considered. You can also use information in these reports to determine the labor requirements and the non-value added time of sets staging for the next step in the process.

4. Productivity can also be measured using a tracking system. Reports can show how many sets each technician assembles, and the average time it takes to assemble different instrument sets. These reports can track the instances, time of day, and length of time that instruments enter each stage of processing. This can provide insight to bottlenecks in production and evidence to adjust staffing levels to match the workload. See figure 1.
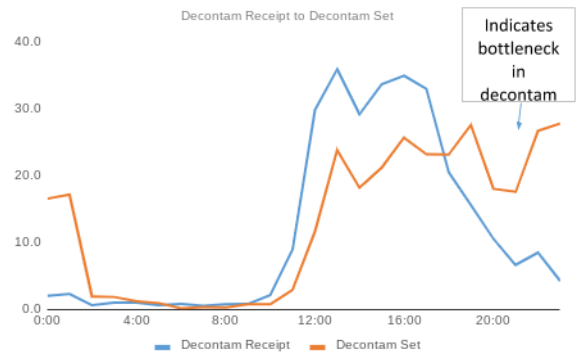

Figure 1

Figure courtesy of Sanford Medical Center - Fargo, North Dakota

This line graph was created using data from an instrument tracking system report. It shows the amount of instrument sets, by time of day, when they enter decontam (in blue) and when the decontamination process begins (in orange). It indicates that there is a bottleneck of work in decontam, and could be used as evidence to increase staffing in decontam during that time of day or to purchase additional equipment to process the sets.

Converting unofficial inventory

Unofficial inventory occurs when a customer removes supplies or instruments from a managed location or independently orders product and stores it in an unmanaged area. It's the result of unreliable service and there's usually emotion and a story involved. This activity looks like small bins and buckets stuffed with supplies or devices that a team member or physician prefers. You can sometimes find them in weird hiding places, like cupboards or drawers. It can cause several problems like outdates, compromised packaging, lack of visibility to the value of inventory in the facility, and missing items.

Strategies

If you have electronic management systems in place, it becomes easy to use that information to make data-based decisions. Sometimes, we end up creating one-off solutions as a reaction to negative incidents. This increases the complexity of training and opportunities for errors. The simplest approach to remedying unofficial inventory is to use the lead time and the consumption to determine where a product should be stored. If the item will be needed emergently, like a crash cart or emergency instrument set, it should be stored as close to point of use as possible. High consumption items should be stored within close proximity of point of use, such as a clean supply room or a par cart in a surgical core, so the end user can have easy access to the items they need. Low consumption items should be stored in a central warehouse and ordered "on-demand." The usage threshold used to determine what is a high vs. low consumption item, in this case, is dependent on the available storage space and the cost of labor to deliver on demand orders. It will be different for each facility. There is no right or wrong number, but once a threshold is developed, it can always be adjusted.

Items that come in multiple sizes can be taken off the surgical procedure card or picklist and placed into a cart or bucket that is replenished after use. For example, drill bit attachments or myringotomy tube sizes are usually unknown until the procedure is underway. This makes all the options available, while limit-

ing the amount of touches, re-work, and opportunities for contamination.

Once these strategies are put into place, determining "who" manages each step of the process becomes a much easier conversation. The criteria and plan should be communicated to the customers and partners so they have a better understanding of the inventory management strategy.

Establishing clear ownership boundaries

It's best to own workflows from beginning to end, but sometimes it's not feasible. When work needs to be handed off or you need work input from another department, there should be clear expectations about how and when it needs to happen.

Strategies

Schedules for when different activities will take place need to be developed and communicated to customers and partners. For example, for counting and replenishing supply par carts, the following questions and the lead time for each should be considered:

1. What time does the customer need the supplies?
2. When will the order be replenished to the inventory location?
3. If the warehouse is off-site, a truck schedule needs to be built to accommodate the amount of product being delivered and the time it is needed.
4. When will the order be picked?
5. When is the inventory counted or when is the order sent to the warehouse?

This work should be done with all the stakeholders. The activities should not be scheduled around when there are employees available to perform the work. Staffing models should be designed around when the work needs to happen based on customer requirements.

Service agreements, like those we have with vendors, can help establish clear expectations for when and how work needs to be completed. They can be developed for customers and partner departments and referenced when there are process breakdowns.

Storage

Storage is also an important factor of inventory management. The design should help maintain the integrity of sterile packaging, the products should be organized, labeled, and easy to find, and a date checking and cleaning policy should be developed.

Strategies

Section 11 of ANSI/AAMI ST79:2017 provides guidelines for storage of sterile product. This includes bottom shelves being solid and at least 8-10" from the floor, products on the top shelf being at least 18" from the ceiling and sprinkler heads, and product being stored in such a way that the sterility is not compromised.[1] The facility's accreditation, infection prevention, and building services may have additional requirements for storage. A multi-disciplinary team should review the storage areas for proper temperature, humidity, and airflow requirements, and environmental cleaning needs.

For sterile instrument set storage, ANSI/AAMI ST79:2017 states rigid containers should not be stacked on top of wrapped sets. It also defers to the sterilization wrap IFU for guidelines on stacking wrapped instrument sets on top of each other.[1] Some wrap manufacturer's state in their IFU that sets should not be stacked because it compresses and compromises the wrap. The wrap IFU should to be consulted when reviewing or designing storage systems.

Date checking and cleaning policies should be developed with the infection prevention and accreditation department in order to prevent outdated products from being used on a patient and to maintain product sterility. Surveyors may request to see the policy or ask questions about the date checking process.

Thoughtful organization and labeling can help the end user quickly locate the product they need. Color coding bins, cart covers, drawers, etc, by type of product is simple and effective. Visual cues such as kanban cards or a 2-bin system can help stabilize workflows and improve inventory control. If the end user needs to pull a card or bin, make sure the expectation is clearly communicated and the practice is followed. See figure 2.

Conclusion

Optimizing inventory management by reducing waste, gaining visibility to real-time inventory, and improving the department's reliability will increase customer satisfaction and help create efficiencies for all departments involved. It

Figure 2

Photo courtesy of Sanford Medical Center - Fargo, North Dakota

This shows products that have been organized into color-coded bins. Similar families or types of product are stored in the same color bin, making it easier for the end-user to locate the product they need.

is imperative that leaders invest time and resources into these initiatives.

References

1. ANSI/AAMI ST79:2017 Comprehensive guide to steam sterilization and sterility assurance in health care facilities. (2017). Arlington, VA: Association for the Advancement of Medical Instrumentation.

Alison Sonstelie, BS, CHL, CRCST, is the Supply Chain Operations Manager at the Sanford Medical Center in Fargo, North Dakota. She has held various positions in Supply Chain and Sterile Processing. Both departments have received several awards and accolades during this time, including HPN's 2014 CS/SPD Department of the Year, the IAHCSMM Confidence Builder Award, and winning Sanford Health's Process Improvement Symposium in 2016. She is also active in AAMI, IAHCSMM, and AHRMM. She is a member of ST/WG 40 (ST79) and the Vice President of the Prairie Pioneers IAHCSMM Chapter. Alison is also the president of NoCoast Consulting, LLC, providing education, audits, and sterile processing and supply chain consulting services.

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Strategies for supplies, instruments, and equipment

Circle the one correct answer:

1. The best practice for removing unused inventory from storage is to involve a multidisciplinary group of stakeholders to review the products.
   A. True   B. False

2. Manual record keeping and inventory management reduces the opportunities for errors and defects.
   A. True   B. False

3. A warehouse management system can utilize scanning, RFID tags, or weighted bins to transmit information that automates the reorder process and tracks the movement of inventory.
   A. True   B. False

4. Instrument tracking systems can be used to electronically record that devices have gone through all the proper steps for cleaning, assembly, and sterilization, and can be tied to the technician performing each of those steps.
   A. True   B. False

5. The sterilizer load contents, the type of challenge device, and the sterilizer printout tape cannot be recorded in instrument tracking systems.
   A. True   B. False

6. The amortized value of an instrument is the same as the purchase price of the instrument.
   A. True   B. False

7. Electronic inventory management systems can help provide information to make data-driven decisions.
   A. True   B. False

8. Emergent items should be stored as close to point of use as possible.
   A. True   B. False

9. Work schedules should be developed based on when staffing levels allow the work to be performed.
   A. True   B. False

10. AAMI ST79:2017 states that wrapped instrument sets cannot be stacked on top of each other.
    A. True   B. False

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