TITLE: KanBan for Inventory Management in the GI Lab

May 19, 2014

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Abstract: A review of inventory distribution methods utilized throughout healthcare including advantages, disadvantages, and considerations of best practice to assist with the selection of the correct method to be used in managing variable need supplies for a busy remote GI Lab.

Project Description: Review of inventory distribution methods, decision points, and processes to implement a new distribution method for delivery to GI Lab.

Business Objective: Select the best possible method of inventory management for a distant location served by Central Distribution.

Constituent Group(s) Served: GI Lab staff and Central Distribution staff

Cost and Benefit: Cost was minimal for time for research, card building, and training. The initial card set-up cost $107 for printing and lamination.

Implementation: Item min/max and safety stock was established then cards were built. Education was provided to the GI Staff as well as Central Distribution staff.

Key Obstacles and Solutions: Central Distribution staff voiced concern regarding the need to “bag” the safety Stock items initially. Reeducation focused on the “why” helped overcome this resistance to change.

Benefits Gained: Benefits include the security of knowing the GI Lab staffs have the needed items available and Central Distribution reduced one trip to the GI Lab daily Monday through Friday for a time savings of 4.6 hours per week.

Transportable Tool: n/a
Kanban for Inventory Management in the GI Lab

The new Director of Supply Chain Operations at a 350 bed acute care facility was faced with the challenge of how to manage inventory within a very busy and distant GI Lab. The GI Lab performs near 8,000 procedures annually. The procedures are normally very quick creating rapid room turnover and the storage space for inventory is very limited. The lab recently moved into an ancillary structure outside of the main flow of the hospital. Travel time to the GI Lab from Central Distribution often takes up to twenty minutes one way. Having the correct item, in the correct place, at the correct time to ensure excellent patient care as well as GI Lab staff satisfaction is of utmost importance.

The Director initiated the journey to determine the best distribution method, (physical movement of products to the end-user area), by performing an intense review of distribution services systems and philosophies. Best practices to ensure cost reduction and improvements in service levels were taken into consideration as well as the costs involved in holding inventory, potential ordering pattern changes, related shipping expense fluctuations, and the variable supply requirement which is the nature of the clinical department (Thomas, 2011). The review included random request, emergency requisition, periodic automatic replenishment (PAR), exchange cart, case cart, electronic point of use, just in time, stockless, and kanban. The information was then reviewed with the GI Lab Manager for collaboration in decision making.

Random request system utilizes an on demand philosophy in which the end-user would request needed items and materials would supply (Blount et al., 2012). The method would allow the materials department to deliver to the GI Lab when the products are demanded. The GI Lab staff would be required to submit a requisition for the items as needed (Blount et al., 2012). The GI Lab would be responsible to unpack the items and place them in the correct storage locations (Landry & Philippe, 2004). Since GI Lab staff would also have to assume responsibility for counting on hand inventory and forecasting when additional items should be
requested, this option would not lend value to the goal of improving the process for both GI Lab and Material’s employees.

Emergency requisition system is actually in place currently and needs to be reduced to only truly emergent situations. The emergency requisition system is demonstrated when a GI Lab Staff member travels to Central Distribution to obtain the needed items and then travels back to the department where the item will be utilized. This method of distribution is considered the most rudimentary of all distribution systems (Blount et al., 2012). The method also creates a considerable waste of time for both the GI Lab staff and the Materials staff. Emergency requisitioning should be utilized only for emergent needs.

The periodic automatic replenishment (PAR) distribution method is also in use currently. According to Richard Bahn, the PAR method is utilized in the majority of hospitals in the United States. Bahn also mentions that proponents to PAR level management argue that it is the only replenishment method that allows for adequate control in a variable usage environment (Bahn, 2012). This method utilizes an established maximum volume for each specific item. The maximum level is based on lead time, carrying costs, ordering costs, available space, and historical usage with the clinician’s agreement (Blount et al., 2012). If the facility expenses materials to the point of use when the supplies are transferred, the PAR system can automatically perform the transaction via electronic applications (McKesson, Oracle, EPIC, etc.). This can be an advantage by reducing inventory, increasing the inventory accuracy, and ensuring expenses are transferred to the correct account (Weeks, 2014). The practice of establishing maximum levels of stock jointly with Materials and Clinicians should discourage nurses from hording items, which is traditional in areas where supplies frequently stock out (Donatelli, 2006). The PAR method worked relatively well for the GI Lab and Materials until the department moved into an ancillary building which now places the department approximately twenty minutes away from Central Distribution. Making two trips to the GI Lab (one to count and one to deliver) is consuming more time
than available to commit to this one area. Counting the PAR area is also very time consuming and occasionally inaccurate as staff sometimes feel rushed and shortcut the process by “eyeballing” the bin quantities instead of actually counting. Finding an option that would omit the trip to count and reduce the amount of frustration from the GI Lab would be a win-win for both departments.

Another option for a distribution method would be the exchange cart system. This system requires two identical carts. One cart would be in the GI Lab for use; the other cart would be in Central Distribution to be filled to the previously established maximum levels. The cart would need to be exchanged daily (Blount et al., 2012). Advantages for this system include reducing the travel time to the GI Lab in half and the clinicians having a freshly filled cart daily. Disadvantages include the costs for additional carts, lack of storage space for the carts in the GI Lab, and the physical need required by the Materials staff to move the full (heavy) cart throughout the facility, tunnel, and three elevators to reach the GI Lab. Even though the advantages are noteworthy, the disadvantages deem this option impractical currently.

The case cart system method is currently in use for the Surgery Department. This method has the Materials staff place specific items for a specific case considering the surgeons preferences into a case cart. The case carts are placed in the clean staging area the evening prior to scheduled surgery. Clean staging ensures that the carts are stored under sterile, operating room conditions (Blount et al., 2012). This method works well for surgery cases but would not be beneficial for the GI Lab due to the number of cases daily, the length of travel between GI Lab and Central Distribution (each cart sent must be returned), the size of the carts (only four fit in the elevator at a time; thirty GI cases would require eight trips to deliver then eight trips to return), and the amount of items needed for the GI Lab procedures are fewer and less predictable than surgical procedures.

The electronic point of use system of distribution management is also an option for the GI Lab. This method uses either a closed cabinet or an open shelf method. The closed cabinet would require the user to
electronically enter identification information to gain access to the cabinet and then to select the patient which the supplies will be utilized. The open shelf method requires the user to select the patient then enter the item (mostly via scanning a bar code), and quantity taken for the patient. Materials would then replenish the cabinet or shelf based on the items and quantities that the user entered (Blount et al., 2012). Planning and education for all involved is the key to a successful implementation. Both Clinicians and Materials staff must be engaged to ensure the reordering of items occurs (Sargent, 2006). Unfortunately, clinicians often fail to scan items which results in the lack of queuing materials that items need to be replenished. The cost of the electronic hardware is also a deterrent in the GI Lab. The disadvantages of costs related to the hardware and historical scanning non-compliancy at the hospital deem this option unworkable.

Just in time (JIT) distribution utilizes a supplier to ship a predetermined amount of products on predetermined schedule. Only the amount needed is delivered at one time. This method also requires a nearby distribution center (Hamlett, 2006). This method allows for a reduction of Central Distribution storage space and carrying cost. Disadvantages of this method include more frequent deliveries which could increase costs and extensive planning needed to ensure the predetermined amount will actually meet but not exceed the requirement as patient flows change (Blount et al., 2012). The hospital utilizes this method via the contracted distributor. The contracted distributor is a nationwide distributor which also provides the advantage of often being able to send unwanted products to other contracted facilities should one facility wish to convert to a different product. If a product is converted and no other facility utilizes, the hospital will have to exhaust the on hands supply at the distributor prior to converting or consider the amount on hand at the distributor as a sunk cost. Within the facility, a JIT method is utilized to establish the maximum levels for each item. The maximum level is aimed at providing the adequate number of items to cover a set period of time (usually a 24 hour period)
with minimal demand requisitions and little overstock. This process requires a delicate balance in estimating supply need and availability while keeping shipping and receiving costs to a minimum.

Another distribution method that resembles JIT is the stockless system. This method allows the vendor to be responsible for the maintenance of inventory. The stockless system offers savings as the items are no longer considered hospital inventory and inventory holding costs are reduced (Blount et al., 2012). A study performed in 1993 when comparing stockless systems to more traditional systems concluded that the stockless system created less employee resistance, reduced problems with large inventories, and improved responsiveness to demand fluctuations (Kim & Schneiderjans, 1993). Unfortunately, the stockless system would require more clinician’s time to work with the vendors and most of the items used in the GI Lab are purchased in bulk. These two factors deem the stockless system to not be an option for the GI Lab.

Kanban is a form of JIT with an emphasis on being a pull system as opposed to a push system. The focus of Kanban is to deliver what is needed when it is needed. “Kan” means “visual” and “ban” means “card” according to Hisham Sabry of the Process Excellence Network (Sabry, 2014). One can find statements that kanban refers to “sign” as well. Kanban can be thought of as a means to limit inventory. When the bin is full, no activity is needed. When the bin is empty, supplies need to be replenished (Harris, 2013). Due to this simple bin system, hospitals have adapted a form of kanban often referred to as the “two bin” system. The system allows Clinicians to have the tools at hand needed to care for patients and reduces the workload for Materials staff. No counting, scanning, or requisitioning is needed to promote the flow of supplies (Weed, 2010). A card system could also be used for Kanban if space for duplicate bins is an issue. The card serves as the signal to replenish instead of the empty bin. The card is placed with an established amount of safety stock to be pulled when the user reaches the card and placed in a designated place. Materials retrieves the cards and replenishes stock in the department following first in first out philosophies as forced by Kanban’s need to place safety stock
behind loose stock (Laksham, 2008). Kanban advantages include reduction of inventory based on more accurate forecasting, no requirements of end-users except to place the bin or card in the specified location when the bin is empty or safety stock is reached, no expensive hardware required, and the ability to eliminate daily counting of supplies in the department. Disadvantages may include the investment of time required to develop the bin or card system, establish accurate safety stock, and staff training. The two bin system seems to work better between clinical staff and materials staff than other methods per HEC Montreal study of 2009 (HEC Montreal, 2009). By working as a team, the clinicians and materials staff at the University of Chicago Medical Center developed needed levels and a two bin kanban system that proved to be simple for both staffs. Initial stock outs were traced back to the error of not queuing the bin for replenishment. The system depends on the kanban card or bin serving as a signal for refill. No sign equals stock out (Handfield, 2013). Richard Bahn comments that “kanban is not magic” but when compared to labor intensive PAR level management for variable inventories, kanban wins. Advantages of kanban when compared to PAR management include no requirements for counting, the ability to standardize the quantities for replenishment, eliminating the temptation to “eyeball” supply quantities, and kanban allows for increased number of replenishment cycles should the need occur without increasing materials handling costs (Bahn, 2012). Kanban appears to be a very feasible distribution to use for the GI Lab.

After analyzing the distribution methods, the Director of Supply Chain and the GI Lab Manager decided to move forward with a Kanban card system. The option to have the Materials Manager pick up the Kanban cards for items needing replenishment during his morning department rounding opposed to Materials staff making the trip to count the storeroom in the GI Lab appealed to the Supply Chain Director. Plus, the financial requirement needed to initiate the Kanban card system was within budget for the project. The GI Lab Manager was certain that her staff would be compliant with the task of placing the kanban cards in an established wall
envelope for the Materials Manager to retrieve. The GI Lab Staff will be happy since this process should reduce the need for both demand and emergency requisition as well. The advantages outweighed the disadvantages and both departments decided to move forward with implementing kanban in the GI Lab.
References:


