Optimizing Periodic Automatic Replenishment (PAR) Levels Using Enhanced Data and Clinical Guidance

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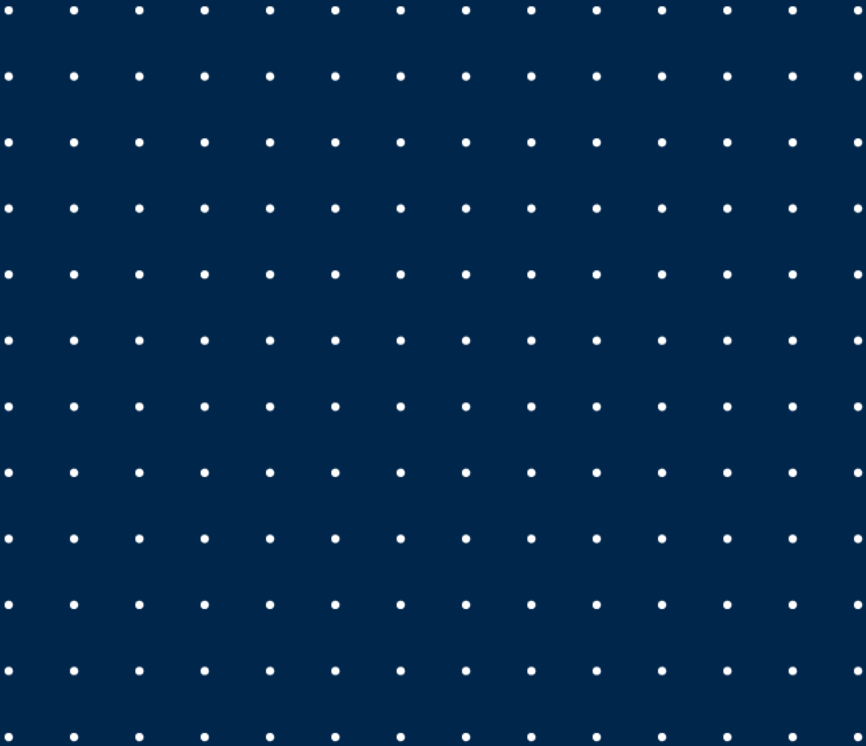
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Healthcare organizations use Periodic Automatic Replenishment (PAR) to assist in keeping the right amount of inventory on hand to avoid excess overstock and risk of product expirations. Traditionally, hospitals have relied on the experience and firsthand working knowledge of inventory management technicians to keep their shelves stocked with needed supplies. However, managing manually based on "gut feel" and/or feedback from nursing can result in missing products or inaccurate inventory ordered in comparison to usage. Manual PAR management historically has created excess costs from rush orders, demand calls, inefficient use of labor (clinical resources), product expirations, and unnecessary rework. It is often too complex or time consuming to pull accurate data, leading to a lack of critical reporting data required to manage product inventory properly throughout the organization.

Implementing standard PAR management operating policies and procedures will reduce cost and variation, create efficiencies, and improve quality of care. Such procedures include training, clinical collaboration, access to clean data, and monitoring easy-to-understand performance improvement metrics.

Setting a Standard Operating Process

PAR levels are set to establish the minimum and maximum number of units of any given item that should be held in inventory at a single time. In a best-practice PAR management system, whenever the number of items in an inventory falls below the minimum PAR level, a reorder is placed up to the maximum PAR level. The optimal maximum PAR levels are set to keep from holding too much of an item in stock and risking expiration.

PAR levels depend on many variables, including the frequency of use, clinical need, product availability, and reorder or lead time. Drivers of poorly managed inventory include unusable and incomplete data, lack of input from clinical staff, and inconsistent processes. Without the right data and clinical input to manage PAR levels, inventory management techs tend to overstock their inventories, which leads to higher expenses for the department and exposure to expired products.

Establishing PAR management standard operating procedures will ensure a consistent process across the organization for supply chain to:

– Assess PAR location usage and supply levels to determine the quantity of items required to bring the stock back to the optimal PAR level.

– Train inventory staff, establish, and implement policies and procedures for a clear understanding of inventory management processes by the entire organization.

– Set PAR levels for each item based on clinical input, usage, and lead time.

> Determine optimal location of items based on high use and product category (group based on clinical need/product locality of items that are pulled together).

> Maintain consistency across units by product category, adjusting based on unit specialty focus.

> Ensure the PAR location is neat, clean, and well organized.

– Deploy LEAN 7S principles: Straighten, Set in Order, Shine, Standardize, Sustain, Safety, and Spirit.

– Coordinate supply room cleaning schedule with environmental services.

– Replenish the stock levels in PAR locations.

> Rotate stock to help avoid supplies expiring.

> Manage the changing and evolving supply needs by updating PAR levels periodically based on usage data, evolving clinical trends, changing patient populations, and anticipated unusual demands.

> Use handheld technology to automate the ordering process.

– Develop analytics to maintain and manage the PAR locations.

> Use metrics to track and measure performance of inventory locations.

> Refresh metrics monthly.

Getting the Data for Setting PAR Levels

Hospital supply chains often face challenges conducting inventory management of PAR locations across the organization. Lack of data infrastructure or accurate and complete data in the item master hinders proper inventory management. Most healthcare providers have PAR reports, but these reports typically do not contain the usage or purchase history needed to determine key opportunities, such as no-move items, items ordered outside of the PAR, or guidelines to set the correct PAR levels. Data is extracted from multiple reports, making it challenging for inventory management staff to have proper visibility to conduct PAR management activities and address and prioritize opportunities.

Using the purchase order or usage detail provides customers/clinicians with the correct visibility into the product utilization needed to set the appropriate PAR levels. Through the implementation of new processes, reliable usage data, performance metrics, and clinical input, supply chain and nursing can manage inventory based on clinical needs and demand to align with patient care needs.

Determining the "Right" PAR Levels

Inventory management techs must strike the optimal balance between setting PAR levels too low, resulting in stock-out situations and extra trips by supply personnel; and setting PAR levels too high, resulting in excess inventories and carrying costs. Healthcare providers must rely on a combination of usage data, clinical input, and experience of inventory management techs to determine optimal PAR levels. Several factors are involved with setting optimal PAR levels that meet the clinical demands within a hospital environment:

– Determine which supplies are needed and the replenishment frequencies for each supply area to optimize labor productivity and eliminate waste.

– Conduct a physical inventory count and track usage periodically to help monitor and adjust to more accurate levels.

– Monitor and work with nursing to ensure the PAR locations are organized according to product category and clinical need to effectively care for the patient.

– Inventory management techs also must factor in the criticality of a supply item and area when putting in place the inventory system that may work best. Factors to consider include:

– Specific patient needs

– Critical items that must be kept on the shelf "just in case," even if used rarely

– Conducting a physical count annually, and updating data and adjusting PAR levels and labels daily/monthly

Giving guidelines for the right PAR levels is difficult. Many health systems are starting at a range from three to five days on hand (meaning the inventory will last an average of three to five days). Manufacturer and distributor lead times must be taken into account when determining the optimal days of inventory on hand. General guidelines for setting PAR levels are:

– Set PAR levels higher if you are trying to reduce labor cost or stock-outs, or if reordering lead times are long

– Set PAR levels lower if items are expensive or space is at a premium

4

When establishing PAR levels, it is critical to have a reliable and accurate set of usage/purchase order data readily available for all PAR locations and a partnership with nursing to review the data periodically throughout the year. To do this effectively and properly, organizations should develop standard criteria to assess and understand where to set PAR levels, beginning with the highly utilized items. By evaluating one PAR location at a time, opportunities for rightsizing, eliminating overstock, and organizing products by clinical need will be realized.

Reorganizing Supply Areas

Neat, clean, and well-organized supply areas support effective and efficient PAR management:

- Determine the optimal location of items based on high usage, product category, and clinical needs.
- Work with clinicians to group categories of supplies and items frequently used together. Color-coding for product categories makes them easily identifiable, decreasing the time it takes to restock and retrieve products.
- Maintain consistency across all similar specialty units in the organization by product category. When multiple supply rooms across a similar specialty are in place, the supply rooms should be identical from a product orientation and layout perspective to ensure that clinical staff can locate products effectively and in a timely manner.
- Organize items by type and use barcode-labeled shelves to make it easier for clinicians and inventory management techs to find and replenish what is needed. Make sure product labels contain all the pertinent information and staff can read them. (For example, is the product available in the central storeroom at the hospital?)

When redesigning and reorganizing the inventory management process, the principles of LEAN methodology will help eliminate waste and variation, increase efficiency, and improve employee productivity.

- Straighten: Arrange supplies that optimize process efficiency for clinical staff.
- Set in Order: Keep items in the proper order based on location that makes it easy for clinical staff to access them when they are needed.
- Shine: Clean and organize the work area daily. Coordinate with environmental services to ensure that the room is cleaned properly and regularly. Supply chain should also rotate the stock and clean the bins to make sure items are in proper locations and usable condition.
- Standardize: Standardize processes and procedures so that expectations are clear and communicated effectively, and procedures are followed consistently.
- Sustain: Commit to maintaining improvements and new practices. Establish procedures to address problems that arise and changes that may be needed as operations evolve.
- Safety: Pay attention to safety (e.g., product expiration dates).
- Spirit: Create a culture of pride and ownership within the team to provide a higher standard focusing on efficiency, cleanliness, safety, and patient care.

PAR Level Optimization in Action

A six-hundred-bed system reviewed two PAR locations and determined there were 1,302 items on the PAR, with 215 items without usage ("No Move"), and a total PAR value of $37,610. Clinical staff and inventory management techs collaborated to remove 183 no-move items and right-size the items in each location:

- Removed excess inventory in PAR locations
    - Reduced on-hand inventory (reduced dollar value of PARs by 40 percent)
    - Created additional storage space by reducing no-move items by 85 percent
    - Reduced waste, product expiration, and product loss
    - Organized products by category and clinical need across like stocking locations (reduced product variability)
    - Reduced the cost to manage inventory

> Implemented standard processes and technology providing enhanced visibility to reduce variation, and aligned with clinical need

> Improved tracking and visibility to consumption

– Developed and hardwired standard operating procedures on how inventory management techs should be reviewing usage data and maintaining optimal stock levels

> Identified key data to be included in standardized reporting and metrics

> Utilized 7S approach (2-Bin Kanban System) to manage PAR locations

> Mimicked the supply organization in all like-PAR locations to reduce clinical staff's time of searching for supplies

> Established ongoing PAR management reviews with input from clinicians

> Resulted in labor savings of supply chain and nursing staff due to reduction of demand calls and implementation of standard processes

> Strengthened relationships and trust between inventory management techs and nursing

Location	Before			After			% Changes	
	# of Par Items	# of Items w/o Usage	PAR Value	# of Par Items	# of Items w/o Usage	PAR Value	Item Change	$ Change
Medical Oncology	454	59	$12,802	401	19	$10,583	-11.7%	-37.0%
Ortho/Surg	848	156	$20,808	677	13	$12,241	-20.2%	-41.2%
Total	1,302	215	$37,610	1,078	32	$22,284	-17.2%	-39.3%

Value Delivered

Instinctively managing PAR inventories almost always results in missing products or too much/too little inventory being ordered compared to usage. In the current healthcare environment, it is imperative to manage PAR inventories proactively and optimize supply chain processes to properly analyze inventory usage, improve clinical collaboration, reduce labor and inventory cost, and ensure that products are available for the patient when needed.

Figure 1: Before adjustments

Figure 2: After adjustments

The data/metrics contained in the above case study have been modified and are used for educational purposes only.

About BRG

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