Clever Ways to Use Kanban Signals to Improve Lab Inventory Management, Lower Costs, and Minimize Stock-outs of Reagents and Date Dependant Materials

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Background

How Did We Get Here?

- Simrit Sandhu, the Executive Director of Supply Chain at the Cleveland Clinic and Steve Pohlman Sr. Director Materials Management assumed the Supply Chain functions for Pathology & Laboratory Medicine (PLMI)
- Their goal is to have Lab Techs work at the top of their Licensure as requested by Jim Carson, PhD, Executive Director PLMI
- The anticipated improvements were:
  - Decrease shipping costs
  - Reduce stock-outs and interruptions
  - Improve Communications

What Is a Kanban Signal System?

What is a Visual Ordering System

- A system that manages the inventory of one or more products critical to the operations of Lab
- A means to prevent shutting down a system due to unavailability of reagents or goods needed to operate
- A means to prevent unnecessary work associated with too frequently changing lot numbers or receiving too many shipments that need verification or some form of QC
- Suggested Uses:
  - Chemistry
  - Hematology
  - Flow Cytometry
  - Histology
  - Immunology
  - Transfusion Medicine
  - Toxicology
  - Any critical operation
- The Cleveland Clinic is extremely focused on good patient care
- They focus on “the right product in the right place at the right time in the right quantity”

Multi-Bin System

- The two bin system is a Kanban Visual system to ensure proper ordering and inventory control of items
- BUT… you are not limited to just two bins
- Use the number or types of containers that work for the inventoried item(s)
- Determine constraints of the product
  - Lot number dependant (meaning calibration, verification etc.) must be done on every new lot number
  - Shipment validation (make sure the product was not damaged in shipment and performs as expected)
- You will most likely need more bins than just two to minimize the cost of initializing a new lot number

The Multi-Bin Process…

By Containerizing Materials, You Ensure Rotation of Stock and Create Visual Control

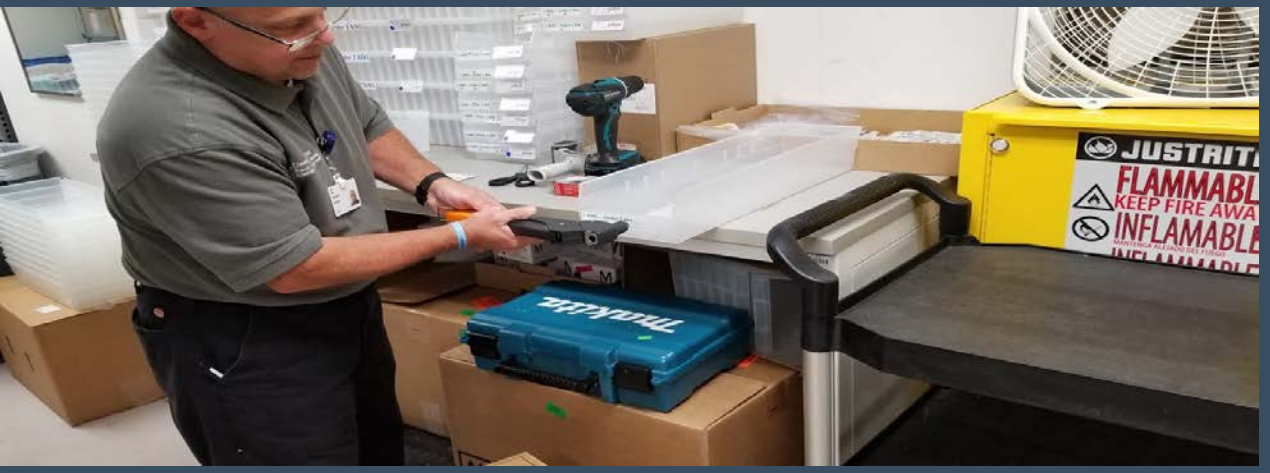
How it Works…

- Select appropriate size bin to hold the material
  - Should be sufficient to last 2 ordering cycles
  - If it is 1 week from order to arrival, you must have 2 weeks supply in 1 bin
- Select the appropriate number of bins based on:
  - Expiration date of the product
  - Dependency on lot number or delivery verification, calibration etc.
- 2 bin processes, create a green font label & attach to the plastic bin
- 3 bin processes, create a blue font & attach to the plastic bin
- 4 bin processes create a purple font label & attach to the plastic bin
- 5 bin process create a black font label & attach to the plastic bin
- 6 bin process create an orange font & attach to the plastic bin

How it Works… (cont.)

- Create a label capable of scanning to order materials
  - Label must be easy to update; vendor and quantity can be changed
  - Attach label securely to bin
  - Par amount for the item MUST be displayed on the label, and MUST be the sum of all bins
  - The reorder point MUST be displayed on the label and MUST be the quantity held in 1 bin
- Establish a dedicated location for EMPTY bins awaiting reordering
  - Reorder material when the empty bins equals the proper number
  - Scan label on empty bin(s) and order material
    - Don’t worry if some material has already been removed from the remaining bin
    - Reorder point & par in 1 bin suffices 2 ordering cycles
  - Order sufficient material to fill the par (all empty bins)

Workflow from Build to Order



Examples


3 BINS – Order 2 BIN
ALBT2
C3
C4
LIDO
2 BINS – Order 1 BIN
GGT2
HAPT2
HOMCYS
2 BINS – Order 1 BIN
2 BINS – Order 1 BIN
2 BINS – Order 1 BIN
2 BINS – Order 1 BIN
AAT
ASO
CERULO
RF II

Examples


3 BINS – Order 2 BINS
3 BINS – Order 2 BINS
CK-MB-STAT
3 BINS – Order 2 BINS
3 BINS – Order 2 BINS
3 BINS – Order 2 BINS
3 BINS – Order 2 BINS
3 BINS – Order 2 BINS
DHEAS
2 BINS – Order 1 BIN
2 BINS – Order 1 BIN

Receiving in the Goods!

- Material is placed in the empty bins to the amount listed for each bin
  - If you are ordering for more than one location use a different color of bin for each of the locations
- If paperwork must accompany new material insert it in the bin
  - Seal bin with red lid secured with closures to prevent accidental use of the material before QC etc.
- Replenished bins are placed under or behind the in-use bin
- After material is QC’d etc. flip the red lid to the green side indicating material is OK to use
- If instrument adjustments must be made include that information in the bin with the green lid
- Bin with green lid is placed on top of or in front of bins with same lot # or received date

Receiving & Replenishment

Alternatives to Bins

- Use of carts
- Select the appropriate size cart to hold the amount of material that will suffice to last 2 ordering cycles on that cart
  - Select number of carts based on the expiration date of the product, dependency on lot #, delivery verification etc.
  - Use the same font color as described above creating labels for the carts as you would a bin
  - You cannot mix materials on a cart since usage may not be identical for mixed items
- A red sign (Material Not Ready for Use) is hung from the top shelf of any cart if material requires QC, validation, etc.
- Flip the sign to the green side once material ready for use

What if I Can’t Use Bins or Carts?

- Use of mats
- Label mat with the amount of material that will suffice to last 2 ordering cycles
- Indicate the ordering Unit of Measure
  - Case, Box, etc.
- Select the appropriate number of cases/UOM based on the expiration date, lot number, etc.
  - For 2 mat processes, use a green font to label mat
  - For 3 mat processes, create a blue font to label mat
- When the material arrives and is placed in inventory a red ‘Material Not Ready for Use” sign is attached to the top container
  - The sign is turned over to the green side once material is ready for use (as with the bins & carts)

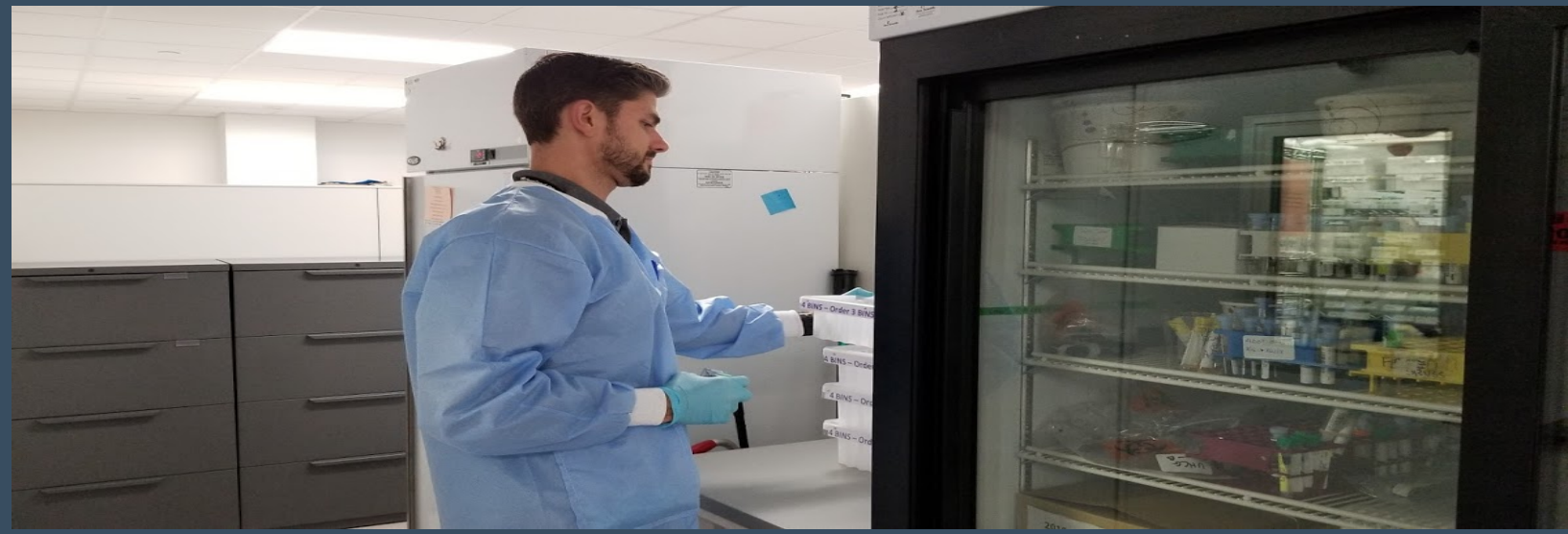
Organization Is A Plus!

How Do the Techs Feel…

- The concept was socialized with the Techs as their huddle meetings
- They were excited to error proof the process
- They found it much easier to check inventory and monitor items that frequently expire such as calibrators and controls
- Inventory Coordinators and Techs feel this is a real moral booster

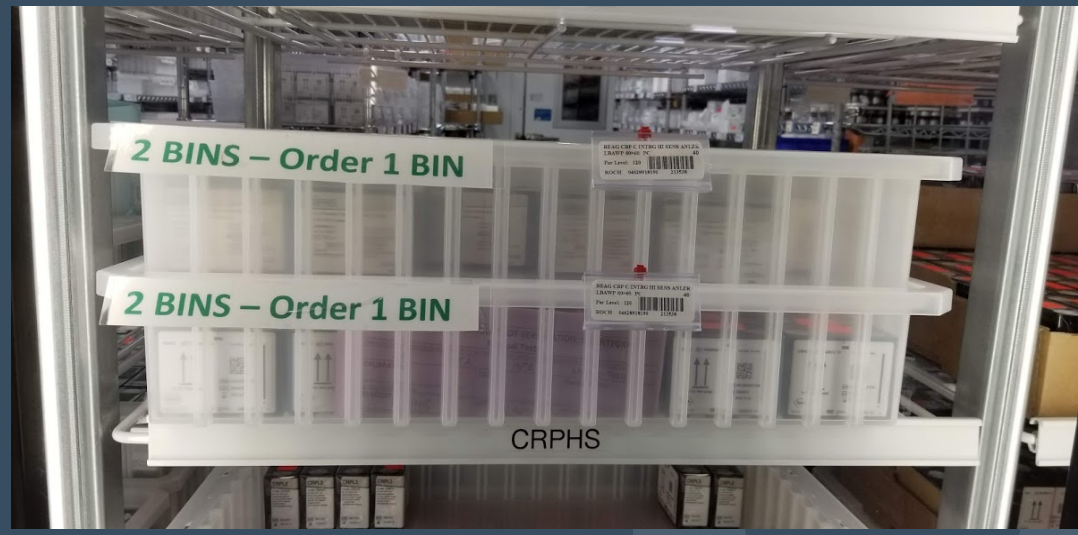
Tech View


4 BINS – Order 3 BINS
4 BINS – Order 3 BINS
CO2
4 BINS – Order 3 BINS
4 BINS – Order 3 BINS
CREP2
2 BINS – Order 1 BIN
2 BINS – Order 1 BIN
CRPHS
3 BINS – Order 2 BINS
3 BINS – Order 2 BINS
3 BINS – Order 2 BINS
3 BINS – Order 2 BINS



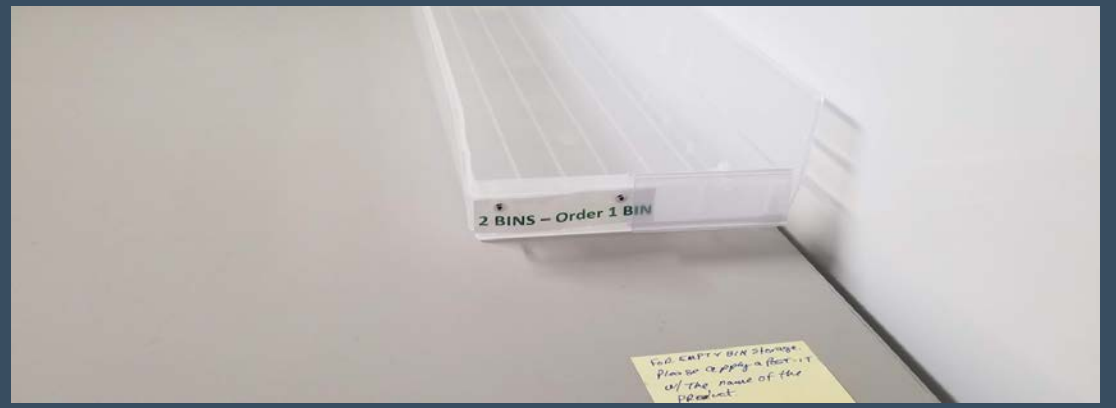

EXIT
4 BINS – Order 3 BINS
4 BINS – Order 3 BINS
4 BINS – Order 3 BINS
4 BINS – Order 3 BINS

Note the Label, Bin # and Bar Code



Empty Bins


Please Place
Empty Plastic
Roche
Reagent Bins
Here!
Thank You!


2 BINS – Order 1 BIN


Please Place
Empty Plastic
Roche
Reagent Bins
Here!
Thank You!

Restocking the Lab

Financial Expectations

- Reduced rush/emergency orders
  - Previously there were at least one a day
  - Now there is less than one a week
  - Expectation is near zero
- Cost over the course a year is $100K in savings (excluding labor)
- Labor savings is expected to be around $5K
- Reduced labor in inventory and replenishment $8K
- Total annual savings $113K
- ROI less than 1 month

Keys to Success

- Focus on best practice for the patient; the rest will follow
- Involve other areas not just Supply Chain and Clinical Labs
  - The Sign Shop suggested making the red and green reversible lids
    - The idea of a reversible lid came from their director
    - Adding a finger hole to easily remove the lid also is his idea
  - The Prototype shop is modifying existing Roche cartridge holders to accommodate smaller volumes where a bin is too big
  - If they can’t modify it they will develop something that will work!
- The Sign Shop is developing supply cart signage in both Supply Chain jargon and Lab jargon
- Staff has had input into the process to ensure that it works for them and that they understand it
- DAILY huddle meetings are used for education/input

Next Steps

- Monitor Rush Orders and shipping costs to quantify the effects
  - We expect a minimum of a $50k savings on overnight delivery cost reduction
  - After 2 weeks we are already seeing a Rush Order reduction!
- Roll out the plan to other areas on the Cleveland Clinic Main Campus
- Copy the plan and roll it out for all other hospitals in the system
- Set up semi-annual review of the inventory turns, stock outs, and costs to further refine the system
- Look for applications of the system beyond Lab Medicine such as Pharmacy, Radiology, Respiratory Therapy etc.
- Proceed in small easy to manage projects; don’t bite off more than you can chew!

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