From: [redacted]
To: Jorgenson, Debbie [IBPE]
Cc: [redacted]
Subject: RE: Request To Be Added To November Board Meeting
Date: Thursday, October 01, 2015 10:34:52 AM

Debbie,

Thank you for adding us to the November 4th Agenda. Please use the phone number 319-384-5583 for the conference call.

Thank You,
Brianne Bakken

From: Jorgenson, Debbie [IBPE] [mailto:Debbie.Jorgenson@iowa.gov]
Sent: Thursday, October 01, 2015 9:43 AM
To: Bakken, Brianne K (UI Health Care)
Cc: Funk, Andrew [IBPE]; Witkowski, Terry [IBPE]; Gerhold, Curtis [IBPE]
Subject: RE: Request To Be Added To November Board Meeting

Brianne,

I have added you to the November agenda on November 4, 2015, during the morning session. The agenda and timetable will be posted after October 22, 2015 at https://pharmacy.iowa.gov/meeting/november-3-4-2015-board-meeting.

You asked to appear by phone conference. Please let me know the best number to reach you at before October 20, 2015, and we will phone you when we reach this item on the agenda.

Debbie Jorgenson
Iowa Board of Pharmacy
https://pharmacy.iowa.gov/
Office: 515.281.6674 | **Cell:** 515.729.2463 | **Fax:** 515.281.4609 | **Email:** debbie.jorgenson@iowa.gov
The Iowa Board of Pharmacy promotes, preserves, and protects the public health, safety, and welfare through the effective regulation of the practice of pharmacy and the licensing of pharmacies, pharmacists, and others engaged in the sale, delivery, or distribution of prescription drugs and devices or other classes of drugs or devices which may be authorized. Iowa Code § 155A.2(1).

From: Bakken, Brianne K (UI Health Care) [redacted]
Sent: Wednesday, September 30, 2015 3:20 PM
To: Jorgenson, Debbie [IBPE]
Subject: Request To Be Added To November Board Meeting

Good Afternoon Debbie,

Following up from our phone conversation this morning: I am a pharmacist at The University of Iowa Hospitals and Clinics. I have been working with Curt Gerhold regarding a new piece of technology equipment we will be implementing in our pharmacy. Terry recommended that we be on the agenda for the next Board of Pharmacy Meeting in November to present an overview of our system and some of our questions/concerns before implementation. As mentioned on the phone, we would prefer to phone conference into the meeting if possible.

Overview:

The Intelliguard® Kit and Tray Management System offers an automated solution for the medication restocking and checking of emergency kits and trays. Intelliguard® Kit and Tray Management System uses passive radio frequency identification (RFID) technology to link medication information and other specific details to a small tag on each individual medication unit used within the kits and trays. The Intelliguard® system has the ability to scan over 150 drugs within seconds, allowing for shorter kit and tray replenishment times while boasting 100% accuracy of finalized trays. Implementation of Intelliguard will improve the efficiency and accuracy of the refilling and restocking of emergency drug trays, leading directly to increased patient safety.

Additionally, the Intelliguard® Kit & Tray Management System provides more efficient record keeping and medication tracking capabilities that far surpass our current manual record keeping processes. The system records all of the following: tray name, tray number, lock number, drug items, drug NDC, drug expiration date, first expiring drug item, technician, pharmacist, deployment date, deployed to, deployed location, making our medication supply chain easier to manage.

The Intelliguard® RFID Solutions process begins by placing a small RFID tag onto each medication unit. The RFID tag consists of an antenna and a chip that contains a Unique Device Identifier (UDI). The UDI chip stores product information/data such as manufacturer, medication name, NDC number, lot number and expiration date. Initially the RFID is meaningless and does not contain any information. An entire flat of medication is labeled with blank RFID tags, the medication is placed in the Intelliguard® Kit and Tray Management Workstation and is scanned by a bar code scanner and a technician manually enters the lot number and expiration date corresponding to the package. The entire flat of medications is then placed in the Intelliguard® Kit and Tray Management Workstation and the RFID tags are encoded with the information listed above. Those medications are then scanned a second time by a pharmacist to ensure the encoding, lot and expiration are correct. After the second scan and approval by a pharmacist, the medications are ready to be used in the refilling of kits and trays.

When a kit or tray is returned to the pharmacy for refilling, it is placed in the Intelliguard® Kit and Tray Management Workstation where the system reads all pre-applied RFID tags on all products and compares it against the kit/tray formulary and predetermined medication PAR levels. During the RFID scan the tray inventory is counted; any missing, expired or soon-to-expire medications are identified and a medication pick list is generated. After tray replenishment by a technician occurs, the entire tray is scanned a second time by a pharmacist, ensuring the tray contains the correct drugs, doses and quantities.

Background Information & Materials:

I have attached some background materials that may be helpful for The Board and the following video is a nice overview of the product as well: https://www.youtube.com/watch?v=7UzriBjQfyc

Questions For The Board:

- Intelligguard will be sending some of their staff on-site to insist in the implementation. They will be sending nationally certified pharmacy technicians that will aid in the tagging, encoding and filling of kits/trays. One of our pharmacists will be completing the final verification. The Intelligguard group will be on site for approximately 2 weeks. ***Will the Intelligguard technicians need to be registered with The Board? Would The Board allow us to request a waiver?***
- ***Is the Intelligguard Kit & Tray Management system considered to be an "Automated Medication Distribution System" or "AMDS"? If so, is it subject to all of the requirements in IAC 657 Chapter 9?***
- ***What kind of error rating and reporting would be required at implementation?***

Thank You,
Brianne Bakken

Brianne Bakken, PharmD
PGY1 Health-System Pharmacy Administration Resident

Pharmacy Administration | Department of Pharmaceutical Care
University of Iowa Health Care | 200 Hawkins Drive | CC101GH
Iowa City, IA 52242

Phone 319.356.2577 | Fax 319.353.8443 | Pager 6313
[redacted]

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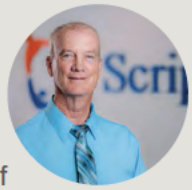
reply to the sender that you have received the message in error, then delete it. Thank you.

Executive Summary

Time and Motion Study:

The Impact of the Intelliguard® Kit and Tray Management System on Medication Kit Checking Efficiency and Accuracy

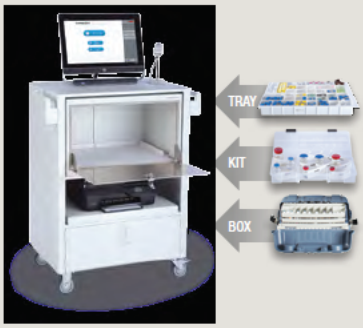
The Problem



Managing kits, trays and tackle boxes throughout the hospital is daunting. State Boards of Pharmacy and Departments of Public Health regulations mandate every medication be checked twice – once by a Technician and once by a Pharmacist – before trays are deployed for clinical use. The same staff bear the responsibility of ensuring medication kit and tray inventories are complete and accurate at replenishment.

The Solution

In November of 2013, Scripps Memorial Hospital employed the Intelliguard® Kit and Tray Management System, an automated RFID-enabled kit and tray replenishment solution. The goals were to improve reprocessing time and eliminate errors. The hospital converted 14 tray types equaling more than 100 total trays. They each held between 16 to 139 items. Cumulatively, these trays are reprocessed approximately 6,100 times annually.

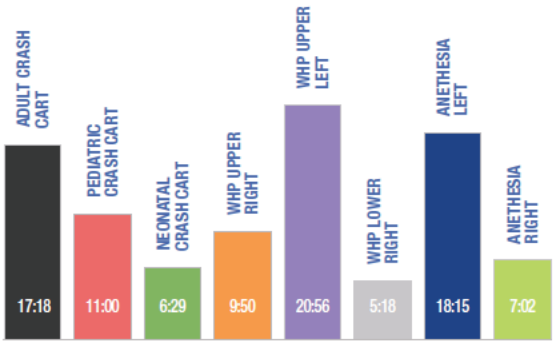


Intelliguard® Kit and Tray Management System

The Results

After 6 months in use, a Time and Motion study was conducted to validate the impact of the automated system. The purpose was to compare and record types of medication errors as well as time spent restocking and approving inventory using the current manual replenishment method versus the Intelliguard® Kit and Tray Management system.

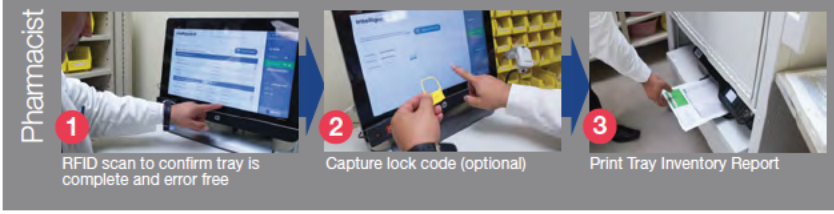
Average Time Savings in Minutes by Tray Type



Impact on Efficiency

On average, the Intelliguard® Kit and Tray Management System saved 19.5 minutes with large trays and 6.3 minutes for even the smallest trays. These figures total almost 1,500 hours of annual staff time savings by using the Intelliguard® System for processing and approving trays.

RFID-Enabled Kit and Tray Replenishment: How it Works



Confirmation

Manual kit and tray checking allows greater possibility for human error; leaving more chance for an expired, used or incorrect medication to be left in the trays and increasing the likelihood of an audit infraction or worse, a patient medication error. Plus, it takes staff 9-27 minutes to check and replenish each tray manually.

ERRORS	Manual	Automated
Adult Crash Cart	3	
Pediatric Crash Cart	2	
Neonatal Crash Cart	1	
WHP Upper Right	0	
WHP Upper Left	0	
WHP Lower Right	0	
Anesthesia Left	1	
Anesthesia Right	2	

Using the Intelliguard® Kit and Tray Management System is proven to save staff time and assures each required task is performed with 100% accuracy.

Time and Motion Study:

The Impact of the Intelliguard® Kit and Tray Management System on Medication Kit Checking Efficiency and Accuracy

Scripps Memorial Hospital Encinitas
and MEPS Real-Time, Inc.

Abstract

As hospitals grow in physical size, patient volume and patient complexity, there is increasing demand for a higher quantity and greater variety of medications to be kept readily accessible outside of an automated dispensing cabinet (ADC).

Medication management and oversight by the pharmacy plays a crucial role in supporting patient safety.

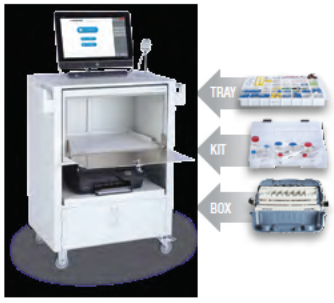
A common way to achieve this is with the use of kits and trays that can serve many different conditions and situations, some of which can be critical. Management of floor stock medications is defined and regulated by state and federal regulations.

The task of managing kits, trays and tackle boxes throughout the hospital is daunting. Regulatory standards demand accuracy which in turn mandates facility policies which include every medication be checked twice – once by a Technician and once by a Pharmacist – before trays are deployed for clinical use.

Pharmacy Technicians and Pharmacists bear the responsibility of ensuring medication kit and tray inventories are complete and accurate at replenishment – to ensure proper PAR level quantities, medication types/dosage, refrigerated medication re-dating, ancillary labeling, removal of recalled/expired medication and paperwork. This task is done for hundreds of kits – multiple times each day – which adds up to substantial time. Plus, there is a significant risk of human error.

Objectives

Scripps Memorial Hospital Encinitas and MEPS Real-Time, Inc. conducted a Time and Motion study to assess the impact of staff reprocessing time and tray errors by automating this process using the Intelliguard® Kit and Tray Management System. The purpose of this study was to compare and record types of medication errors as well as time spent restocking and approving inventory using the manual replenishment method and again using the Intelliguard® Kit and Tray Management system.



Intelliguard® Kit and Tray Management System

Hospital Demographics

Scripps Memorial Hospital Encinitas is a general community medical and surgical hospital based in Encinitas, California. It has an average bed census of 112 and performs approximately 4,800 inpatient and outpatient surgeries annually. The facility is licensed for 192 inpatient beds.

- Inpatient daily census of 112
- Monthly births of 180
- Monthly ED visits of 3,529
- Monthly Adjusted Patient Days of 4,973

Design

The study was designed to collect two types of data – *time and accuracy*.

Time measurements included time required for both individuals performing the tasks (Pharmacy Technician and Pharmacist) and cumulative time for the entire workflow.

Inventory accuracy was measured at completion of both Pharmacy Technician and Pharmacist workflows.

Two Pharmacy Technicians and two Pharmacists were included in the study. Errors were embedded in the trays which needed to be replenished and study subjects were informed that errors were specifically included.

Pharmacy Technicians and Pharmacists bear the responsibility of ensuring kit and tray inventories are complete and accurate at replenishment.

Tray Types Utilized:

Tray Categories	Tray Name	Annual Tray Cycles
Small (1-15)	Neonatal Crash Cart	56
Medium (16-50)	Pediatric Crash Cart	64
	WHP Lower Right	524
	Anesthesia Right	1,492
Large (51-75)	Adult Crash Cart	480
	WHP Upper Right	608
	WHP Upper Left	124
	Anesthesia Left	1504
Total	8	6,136

Trays were stocked with the following errors

Data Collection Key	Description	Quantity
EX	Expired Med	11
MI	Missing Med	30
OP	Open/Used Med	9
OV	Overage	4
SALAD	Look/Sound Alike	1
SUB	Substitution	2

Adult Code	Pediatric Code	Neonatal Code	WHP Upper Right
EX: EPINEPHrine 1:10,000	EX: calcium chloride 10%	EX: atropine PFS	OP: sodium chloride 0.9%
EX: magnesium sulfate 2mL	MI: adenosine 2mL	EX: sodium chloride 0.9% Flush	MI: lidocaine 2% AMP
MI: phenytoin 5mL	MI: amiodarone 3mL	MI: adenosine 2mL	MI: chloroprocaine 3%
MI: magnesium sulfate 2mL	MI: naloxone 1mL	MI: sodium bicarb 4.2%	MI: chloroprocaine 3%
OV: amiodarone 3mL	MI: sodium bicarb 8.4% 10mL		MI: lidocaine 2% AMP
OP: flumazenil	SALAD: DOBUTamine		
OP: vasopressin 1mL	EX: EPINEPHrine 1:10,000 PFS		
MI: diphenhydrAMINE	OP: phenytoin 5mL		
	OV: phenytoin 5mL		

WHP Upper Left	WHP Lower Right	Anesthesia Left	Anesthesia Right
EX: flumazenil	EX: phenylephrine PFS	OP: flumazenil	OV: propofol
OP: amiodarone 3mL	EX: lidocaine PFS 2%	MI: nalbuphine (out of stock)	MI: lidocaine 2% PF
MI: ondansetron 2mL	MI: phenylephrine PFS	MI: metoclopramide	MI: lidocaine 2% PF
MI: ceFAZolin 1gm	MI: phenylephrine PFS	MI: ondansetron 2mL	MI: lidocaine 2% Jelly
MI: ceFAZolin 1gm	MI: phenylephrine PFS	MI: ceFAZolin	EX: ePHEDrine PFS
MI: sodium chloride 0.9%	OP: lidocaine 2%	MI: sodium chloride 0.9%	OP: succinycholine
SUB: nalbuphine amp		OV: vasopressin	EX: succinycholine
OP: vasopressin			
SUB: atropine			
MI: oxytocin 1mL			
MI: oxytocin 1mL			

Manual Replenishment Workflow

Pharmacy Technician

Pharmacy Technician #1 restocked each tray using the standard manual process. This process was repeated for all 8 trays. Times and errors were recorded by a MEPS® employee after each tray was complete.

Manual Replenishment Workflow Steps:

- Visual check for used/open meds
- Check medications against tray formulary
- Check for tray errors
- Replenish tray
- Check replenished tray inventory
- Indicate tray ready for Pharmacist

Pharmacist

Pharmacist #1 used the standard manual process to approve each tray. This process was repeated for all 8 trays. Time and errors were recorded by a MEPS® employee after each tray was complete.

Manual Replenishment Workflow Steps:

- Visual check for used/open meds
- Check medications against tray formulary
- Check for tray errors
- Verify tray inventory
- Indicate tray ready to leave Pharmacy

After the manual replenishment and approval process was complete, MEPS® reset all of the tray errors. Then, the same individuals restocked and approved each tray using the Intelliguard® Kit and Tray Management System.

Manually checking trays is a slow and tedious process. Even for the most diligent staff, it is not done accurately every time which can create quality and patient safety issues.

Intelliguard® Kit and Tray Management System Workflow

Pharmacy Technician

- Visual check for used/open meds
- Scan to automatically compare medications against tray formulary
- Replenish tray based on medication pick list generated
- Rescan to auto-check for errors
- Log out to indicate tray is ready for Pharmacist approval

Pharmacist

- Visual check for used/open meds
- Scan restocked tray
- Approve
- Log out to indicate tray is ready to leave the Pharmacy

Touchscreen user interface scans hundreds of medications in seconds.

Data Findings – Restocking Time

Time: Average Manual Workflow

The tables below list actual recorded times by tray type for each test subject using the manual workflow:

Technicians: Manual Workflow

	Adult Code	Pediatric Code	Neonatal Code	WHP Upper Right	WHP Upper Left	WHP Lower Right	Anesthesia Left	Anesthesia Right
Pharmacy Tech 1	0:14:02	0:11:43	0:05:08	0:07:17	0:09:14	0:04:09	0:14:36	0:04:47
Pharmacy Tech 2	0:12:02	0:10:01	0:05:17	0:10:05	0:17:38	0:05:54	0:14:15	0:07:05
Average Time	0:13:02	0:10:52	0:05:13	0:08:41	0:13:26	0:05:01	0:14:25	0:05:56

*Recorded times are listed as hh:mm:ss

Pharmacists: Manual Workflow

	Adult Code	Pediatric Code	Neonatal Code	WHP Upper Right	WHP Upper Left	WHP Lower Right	Anesthesia Left	Anesthesia Right
Pharmacist 1	0:12:03	0:10:03	0:04:32	0:06:45	0:13:06	0:04:21	0:11:45	0:04:28
Pharmacist 2	0:09:57	0:08:23	0:06:38	0:08:03	0:14:57	0:04:29	0:14:14	0:04:11
AverageTime	0:11:00	0:09:13	0:05:35	0:07:24	0:14:01	0:04:25	0:12:59	0:04:20

*Recorded times are listed as hh:mm:ss

Data Findings

Time Savings: Manual vs. Intelliguard Workflows

The tables below list recorded time savings by tray type for each test subject using the Intelliguard® Kit and Tray Management System

Phase One – Time Savings

	Adult Code	Pediatric Code	Neonatal Code	WHP Upper Right	WHP Upper Left	WHP Lower Right	Anesthesia Left	Anesthesia Right
Pharmacy Tech: Time Savings	0:08:13	0:04:07	0:01:25	0:01:15	0:03:40	0:00:13	0:05:29	0:01:54
Pharmacist: Time Savings	0:10:29	0:06:30	0:03:37	0:04:20	0:12:17	0:03:41	0:10:59	0:03:50
Total: Time Savings	**0:18:42**	**0:10:37**	**0:05:02**	**0:05:35**	**0:15:57**	**0:03:54**	**0:16:28**	**0:05:44**

*Recorded times are listed as hh:mm:ss

Phase Two – Time Savings

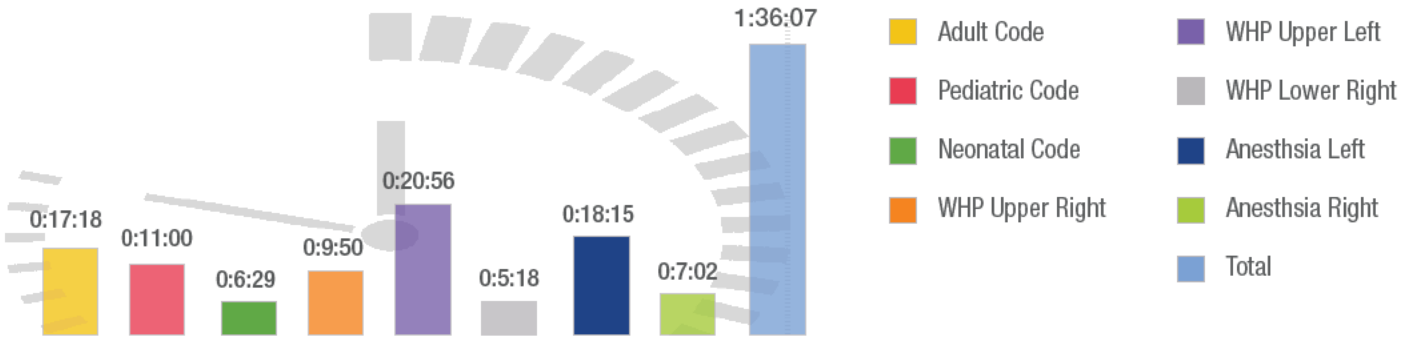
	Adult Code	Pediatric Code	Neonatal Code	WHP Upper Right	WHP Upper Left	WHP Lower Right	Anesthesia Left	Anesthesia Right
Pharmacy Tech: Time Savings	0:07:03	0:04:42	0:02:10	0:06:37	0:11:35	0:02:46	0:06:15	0:04:47
Pharmacist: Time Savings	0:08:51	0:06:41	0:05:47	0:07:27	0:14:19	0:03:56	0:13:46	0:03:33
Total: Time Savings	**0:15:54**	**0:11:23**	**0:07:57**	**0:14:04**	**0:25:54**	**0:06:42**	**0:20:01**	**0:08:20**

*Recorded times are listed as hh:mm:ss

In all cases, time savings was observed when using the Intelliguard® Kit and Tray Management System. Average time savings per tray processed ranged from just over 5 minutes to nearly 21 minutes depending on tray type. The cumulative average time savings for processing the 8 trays tested was **1:36 hours**: (Figure 1)

"This system ensures that management sees that I've not only done my job, but it was done accurately and completely."
– Pharmacy Tech II, Scripps Health

1 | Average Annual Time Savings (per tray type / in hours)



Data
Findings

RFID Smart Tag Encoding and Smart Batch™ Pharmacist Approval

To account for the task of tagging and encoding medications with an RFID Smart Tag, the study timed each test subject performing this function. The table below shows recorded time for the technicians to process 10 and 25 medications respectively. The pharmacist was timed using the Multi-Batch™ approval process to approve all 35 medications at once. The table below lists recorded time spent by each test subject to perform RFID Smart Tag encoding.

	10 Meds	25 Meds
Pharmacy Tech 1	0:03:05	0:07:00
Pharmacy Tech 2	0:02:01	0:03:40
Average Time	0:02:33	0:05:20

	35 Meds
Pharmacist 1	0:01:12
Pharmacist 2	0:01:40
Average Time	0:01:26

*Recorded times are listed as hh:mm:ss

Based on the data collected, it takes a Technician approximately 14 seconds to tag and encode one unit of medication and a Pharmacist approximately 2 seconds to approve one unit of medication.

Data
Findings – Accuracy

Specific Errors: Manual Workflow

As described, errors were embedded in the trays which needed to be replenished and study subjects were informed that errors were specifically included. The table below indicates errors still remaining in the trays after using the manual replenishment and approval process:

	Adult Code	Pediatric Code	Neonatal Code	WHP Upper Right	WHP Upper Left	WHP Lower Right	Anesthesia Left	Anesthesia Right
Total Errors	8	9	4	6	11	6	7	7
Tech 1	MI: phenytoin 5mL MI: magnesium sulfate 2mL	SALAD: DOBUTamine						EX: succinycho-line
RPh 1	MI: phenytoin 5mL	SALAD: DOBUTamine Incorrectly recorded expiration, which was originally correct						EX: succinycho-line
Total 1	1 (87%)	2 (78%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	1 (86%)
Tech 2			EX: sodium chloride 0.9% Flush MI: sodium bicarb 4.2%				MI: ondansetron 2mL	
RPh 2								
Total 2	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)

Data Findings

Errors By Percentage

	Adult Code	Pediatric Code	Neonatal Code	WHP Upper Right	WHP Upper Left	WHP Lower Right	Anesthesia Left	Anesthesia Right
Total Errors	8	9	4	6	11	6	7	7
Tech 1	2 (75%)	1 (89%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	1 (86%)
RPh 1	1 (87%)	2 (78%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	1 (86%)
Total 1	1 (87%)	2 (78%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	1 (86%)
Tech 2	0 (100%)	0 (100%)	2 (50%)	0 (100%)	0 (100%)	0 (100%)	1 (86%)	0 (100%)
RPh 2	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)
Total 2	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)	0 (100%)

Error Rates

Using the manual method, errors remained in trays after replenishment and approval, including missing, look alike/sound alike and expired medications.

Results

Error Elimination: Intelliguard® Kit and Tray Workflow

After the manual replenishment and approval process was complete, all trays were reset with the same errors. Then, the same individuals restocked and approved each tray using the Intelliguard® Kit and Tray Management System.

Using the Intelliguard® Kit and Tray Management System errors were completely eliminated:

	Adult Code	Pediatric Code	Neonatal Code	WHP Upper Right	WHP Upper Left	WHP Lower Right	Anesthesia Left	Anesthesia Right
Total Errors	8	9	4	6	11	6	7	7
Tech 1	100%	100%	100%	100%	100%	100%	100%	100%
RPh 1	100%	100%	100%	100%	100%	100%	100%	100%
Total 1	100%	100%	100%	100%	100%	100%	100%	100%
Tech 2	100%	100%	100%	100%	100%	100%	100%	100%
RPh 2	100%	100%	100%	100%	100%	100%	100%	100%
Total 2	100%	100%	100%	100%	100%	100%	100%	100%

Using the Intelliguard® Kit and Tray Management System replenishment and approval process, errors were completely eliminated

Results

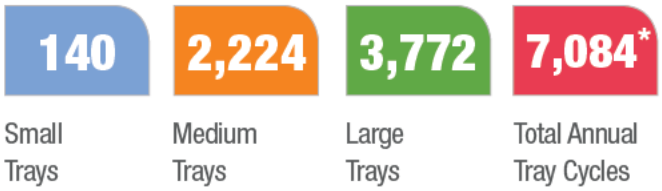
Time Savings

To calculate total expected time savings, the study considered all trays converted to the Intelliguard® Kit and Tray Management System. Each tray was divided into either a small, medium or large category based on the number of items located in the tray. The expected annual tray cycles are noted, extrapolated from actual tray cycles processed for 3 months. Trays which were not tested – but are still processed with the Intelliguard® Kit and Tray System – are highlighted in blue.

Tray Categories	Tray Name	Annual Tray Cycles
Small (1-15)	Neonatal Crash Cart	56
	Cardiopulmonary Tray	84
Medium (16-50)	Pediatric Crash Cart	64
	WHP Lower Right	524
	Anesthesia Right	1,492
	Pharmacist Code Box	140
	Regional Anesthesia Tray	40
Large (51-75)	Adult Crash Cart	480
	WHP Upper Right	608
	WHP Upper Left	124
	Anesthesia Left	1,504
	IAU-IR-Cath Right Tray	456
	IAU-IR-Cath Left Tray	228
Total	13	7,084

Based on the number of trays cycling through hospital pharmacy, the annual total number of tray cycles are projected at 7,084 or approximately 20 trays per day. Of these, the largest trays (containing between 51-75 items) are cycled through the system the most (Figure 2).

2 | Projected Annual Tray Cycles

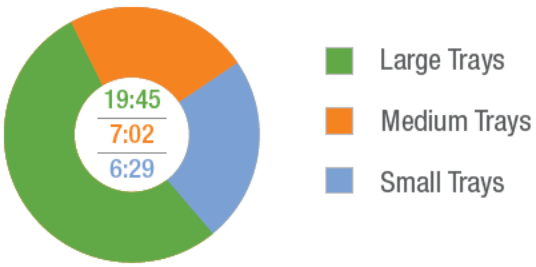


The average time savings per tray varied based upon the size of the tray. As expected, the larger the tray, the longer it took the Pharmacist and Pharmacy Technician to replenish and approve their trays.

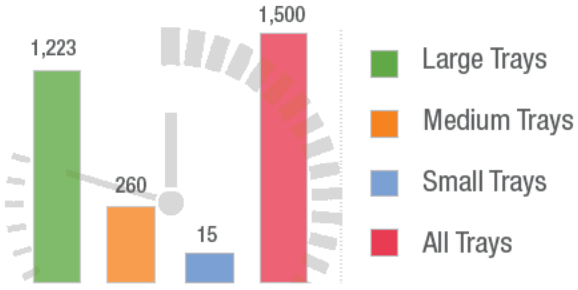
*Approximately 20 trays per day

On average, the Intelliguard® Kit and Tray Management System saved 19.5 minutes with large trays and 6.3 minutes for even the smallest trays (Figure 3). These figures total almost 1,500 hours of annual time savings by solely using the Intelliguard® System for processing and approving trays (Figure 4).

3 | Average Time Savings/Tray Type



4 | Expected Annual Time Savings (in hours)



*Even more time savings is anticipated when using the system for monthly inventory checks for expired and soon-to-expire medications as well as recalled medication events.

Analysis

As confirmed in this study, using the manual checking method allows greater possibility for human error; leaving more chance for an expired, used or incorrect medication left in these trays and increasing the likelihood of an audit infraction or worse, a patient medication error. Plus, it takes between 9-27 minutes for each team to check and replenish each tray.

Using the Intelliguard® Kit and Tray Management System is proven to save staff time and provides assurance that each task is performed with 100% accuracy. Automation eliminates human error, distraction and exhaustion that goes along with manually checking these trays – and the Intelliguard® System does not permit steps in the process to be missed or skipped.

Additional Benefits

Another advantage of automating the kit and tray management process is the ability to track where medications are located in the event of a recall. A simple report within the Intelliguard® System allows users to review the specific trays in which recalled medication is located. In the absence of an automated kit and tray management solution, a recall requires staff to open every single tray that includes the recalled medication to see whether that specific lot number is on the recall list. This process alone can take days.

Detailed reports within the Intelliguard® System also give management the ability to track medication usage to justify decreasing or eliminating medications which are infrequently or never used, or increasing PAR levels for medications which are used more frequently. Inventory reports allow for quicker and more accurate monthly inventory checks when looking for expired or soon-to-expire medication as the Intelliguard® System automatically tracks medication expiration dates. Every time a kit or tray is returned to the pharmacy for reprocesing, the Intelliguard® System instantly indicates expired and soon-to-expire medications.

From staff's perspective, the Intelliguard® workstations are ergonomically designed to maximize productivity by reducing fatigue and discomfort, and the user interface is intuitive and easy-to-use. Even new staff can navigate through the process with minimal training.

Additionally, with the Intelliguard® Virtual Logbook – management has visibility to the specific dispensed location of kits and trays once they leave the pharmacy. This function is particularly helpful during monthly inventory checks or recall events. Management simply views the Virtual Logbook report to determine which trays contain expired, expiring or recalled meds – and the specific deployed location of the tray(s). This process alone can save the hospital countless man hours by targeting staff to only those kits and trays that need attention.

"RFID systems for medication inventory, such as those from MEPS Real-Time®, have demonstrated that hospital pharmacies can achieve higher levels of efficiency while also improving patient safety."

Conclusion

Increased efficiency by eliminating the tedious manual process of kit and tray replenishment allows repurposing of over-worked staff. More importantly, serious medication errors can occur if the correct medication is not available for patient care.

The Intelliguard® Kit and Tray Management System provides an efficient, more accurate way for Pharmacy staff to manage tray restocking while providing clinicians access critical medications quickly – when and where they need them.

The Virtual Logbook provides visibility to know the who, what, where and when of each kit and tray – throughout the hospital at any given time.

About MEPS Real-Time, Inc.

Founded in 2006 and headquartered in Carlsbad, CA, MEPS Real-Time, Inc. is a leading innovator of Radio Frequency Identification (RFID) solutions for pharmacy automation and inventory management. Our suite of Intelliguard® RFID Solutions offers unprecedented real-time visibility of high-value, critical-dose drug inventory to reduce costs through inventory management and monitoring of expiration dates, NDCs, lot numbers and temperature; increase staff efficiency by eliminating manual counting and item-level scanning through automation; improve patient safety through medication error prevention; and enhance diversion prevention with embedded security features. Intelliguard® RFID Solutions include Kit and Tray Management, Inventory Management and Vendor Managed Inventory Systems.

Today, our suite of Intelliguard® RFID Solutions are used in major medical centers in the U.S. and Canada with a focus on RFID as an enabling technology for pharmacy workflow automation and inventory management systems.

For more information, call (760) 448-9500 or visit www.mepsrealtime.com.

Please note that in California a new law has passed, SB 1039, in 2014 which will allow technicians and intern pharmacists under the supervision of a licensed pharmacist in a healthcare facility to package emergency supplies, seal emergency containers and perform monthly checks of drug supplies. Unfortunately, this law currently conflicts with Ca DPH Title XXII which mandates a pharmacist perform these functions. As of Dec. 16, 2014 a California All Facilities Letter, ALF 14-34, addressed this problem. It will allow facilities interested in implementing the SB 1039, do so by developing policies and procedures, then submitting them to the Ca DPH via a program flexibility request form. This in combination with the California Tech check Tech regulations could free up significant pharmacist time to support the clinical pharmacist duties.

Phone 760-448-9500
Email sales@mepsrealtime.com
Web www.mepsrealtime.com

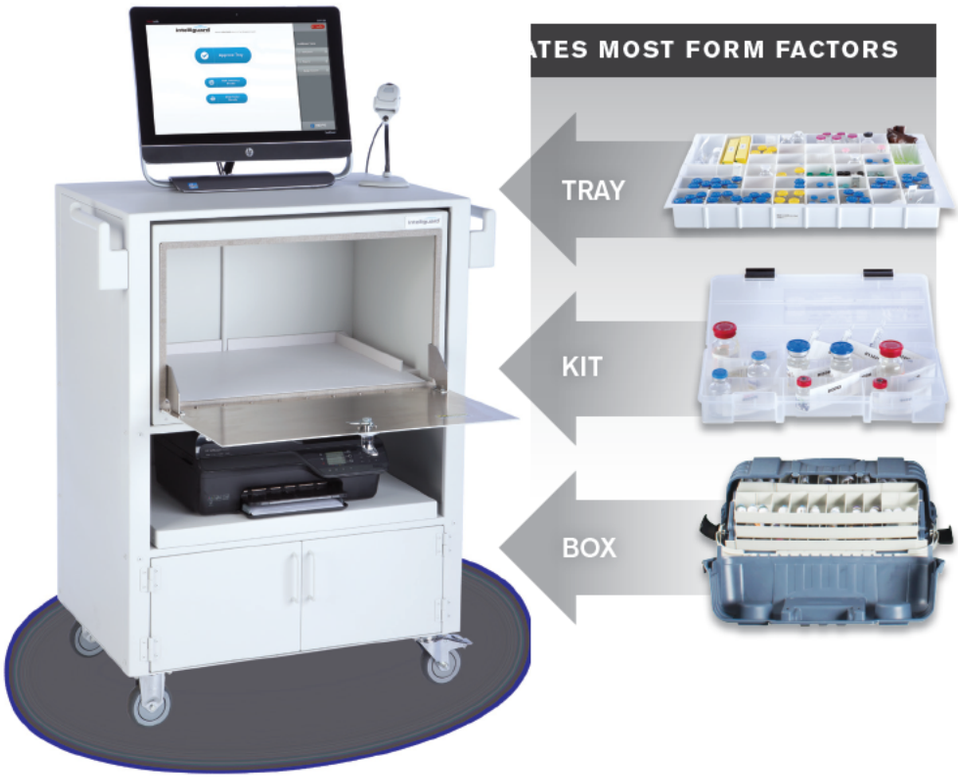
MEPS® REAL-TIME, INC.

intelliguard® | RFID Solutions for Critical Inventory™

Intelliguard® Kit and Tray Management System

The Intelliguard® Kit and Tray Management System uses advanced RFID technology to automate medication inventory management and replenishment. With the ability to read high-density trays, multi-layer tackle boxes and overlapping kit labels, this revolutionary system can scan more than 150 medications in a matter of seconds.

- A standalone accessory – no IT needed
- Touchscreen user interfac
- Increases accuracy of identifying expired, soon-to-expire and recalled medications
- Reduces the cost of held inventory
- Improves patient safety
- Provides printable reports that highlight critical information for each kit an help prepare for audits mc quickly and accurately



intelliguard®

RFID Solutions for Critical Inventory™

Intelliguard® Kit and Tray Management System

Replenishing medications, checking expiration dates and filling out paperwork for multiple medication kits – *multiple times each day* – adds up to a lot of time… and it is no one's favorite job. Plus, there's a significant risk for human error.

That's why the innovators at MEPS Real-Time® developed the smarter, automated kit checking solution. Using patented and exclusive RFID technology, our Intelliguard® Kit and Tray Management System saves you time and ensures medication kit inventories are always complete and accurate.

Smaller stations. Smaller tags.

We understand hospital pharmacies: space is limited! MEPS Real-Time® is the only company that gives you the choice of three space-saving, ergonomic solutions for your main pharmacy, satellite pharmacies and surgery centers.

We also know space is limited in your trays. Feedback from hospital anesthesiology and clinicians was unanimous. Our Intelliguard® RFID Smart Tag, the smallest in the industry, makes medications easier to handle and eliminates the potential for medications to become stuck in anesthesia cart drawers.

With its ability to read high-density trays, multi-layer tackle boxes and overlapping tags, our Intelliguard® System can inventory more than 150 medications in seconds with 100% accuracy of identifying missing, expired, soon-to-expire and recalled medications.

Contact us to set up a webinar and see how we fit your pharmacy.

Our on-site implementation and training team will have your trays fully converted and your staff replenishing faster and more accurately in days.

The smarter kit checking solution!

Three Solutions

All-in-One

Free-standing, all inclusive cart for use with multi-layer tackle boxes

Countertop

Space-saving counter-top unit for kits and trays

Under Counter

Under-counter mount option

Phone 760-448-9500
Email sales@mepsrealtime.com
Web www.mepsrealtime.com

MEPS® REAL-TIME, INC.

900-0060, rev A

Countertop for installation in Pharmacy and OR Satellites

Countertop

Space-saving counter-top unit fits kits and trays

How it Works

Encoding Intelligard® RFID Smart Tags

Smart Batch™ Encoding of RFID Smart Tags

1

Open sealed case or flat and apply blank tags

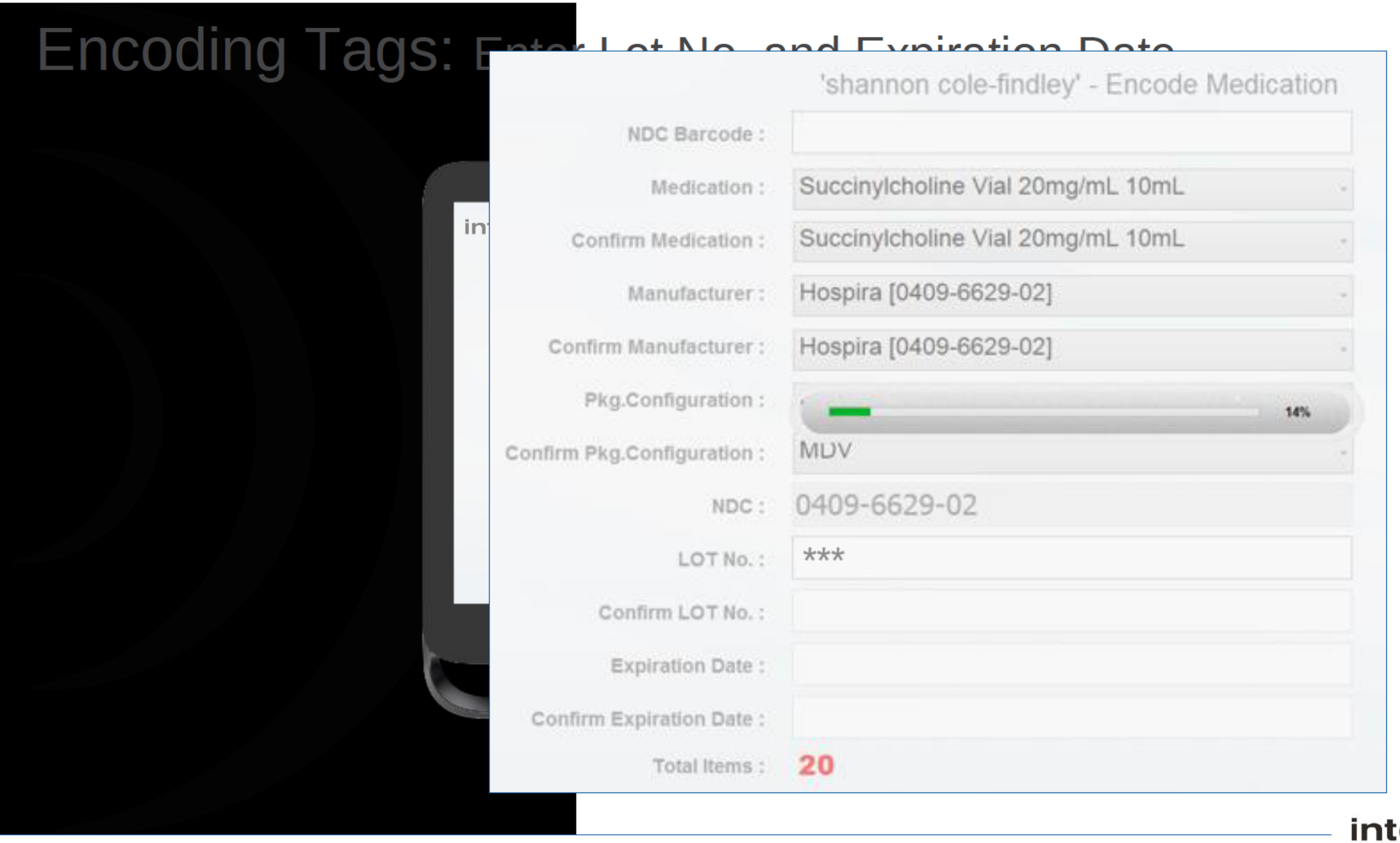
2

Place entire medication lot into workstation

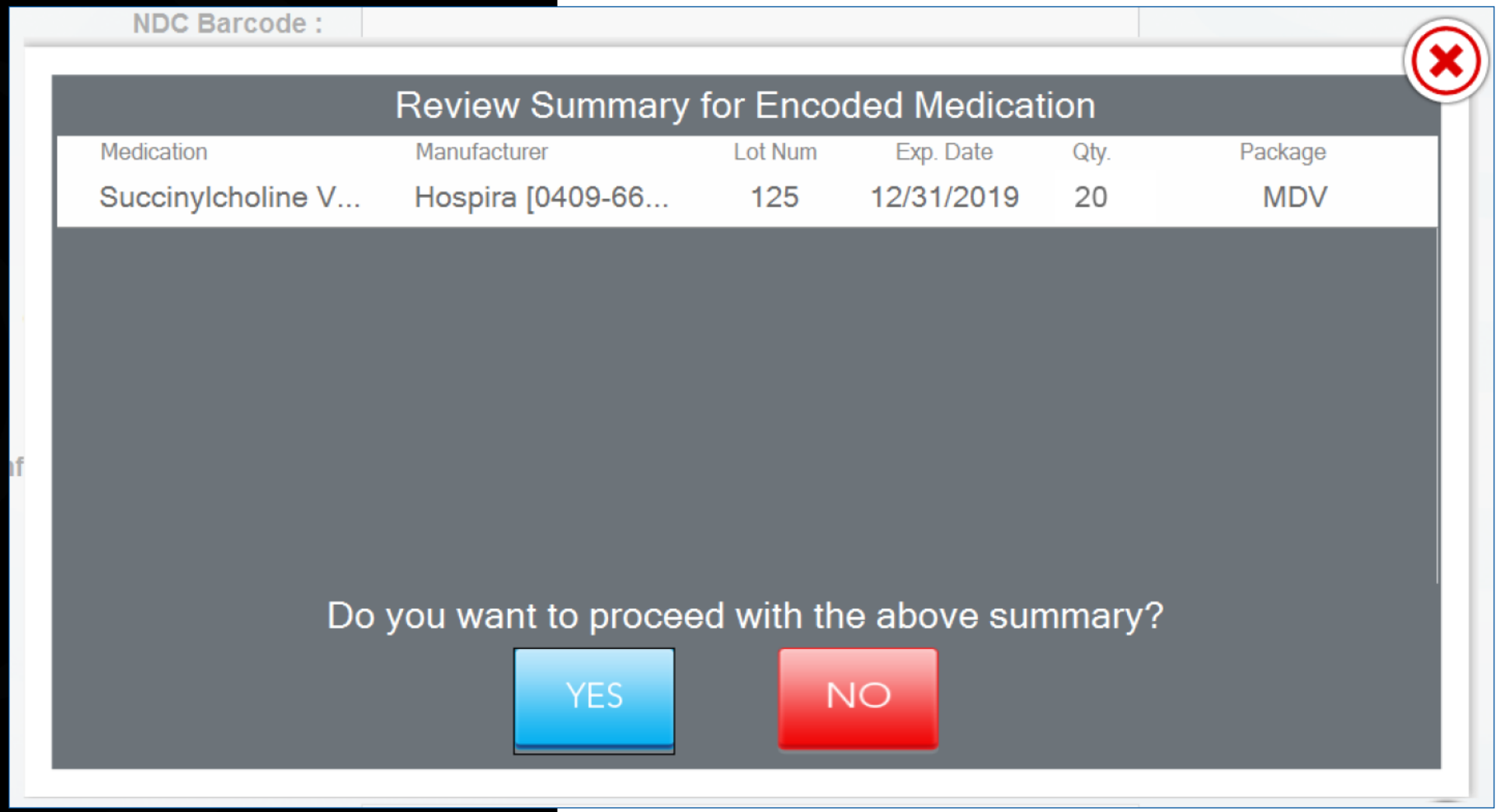
3

Scan one barcode then enter Expiration and Lot Number.

Encoding Tags: Enter Lot No. and Expiration Date



Encoding Tags:

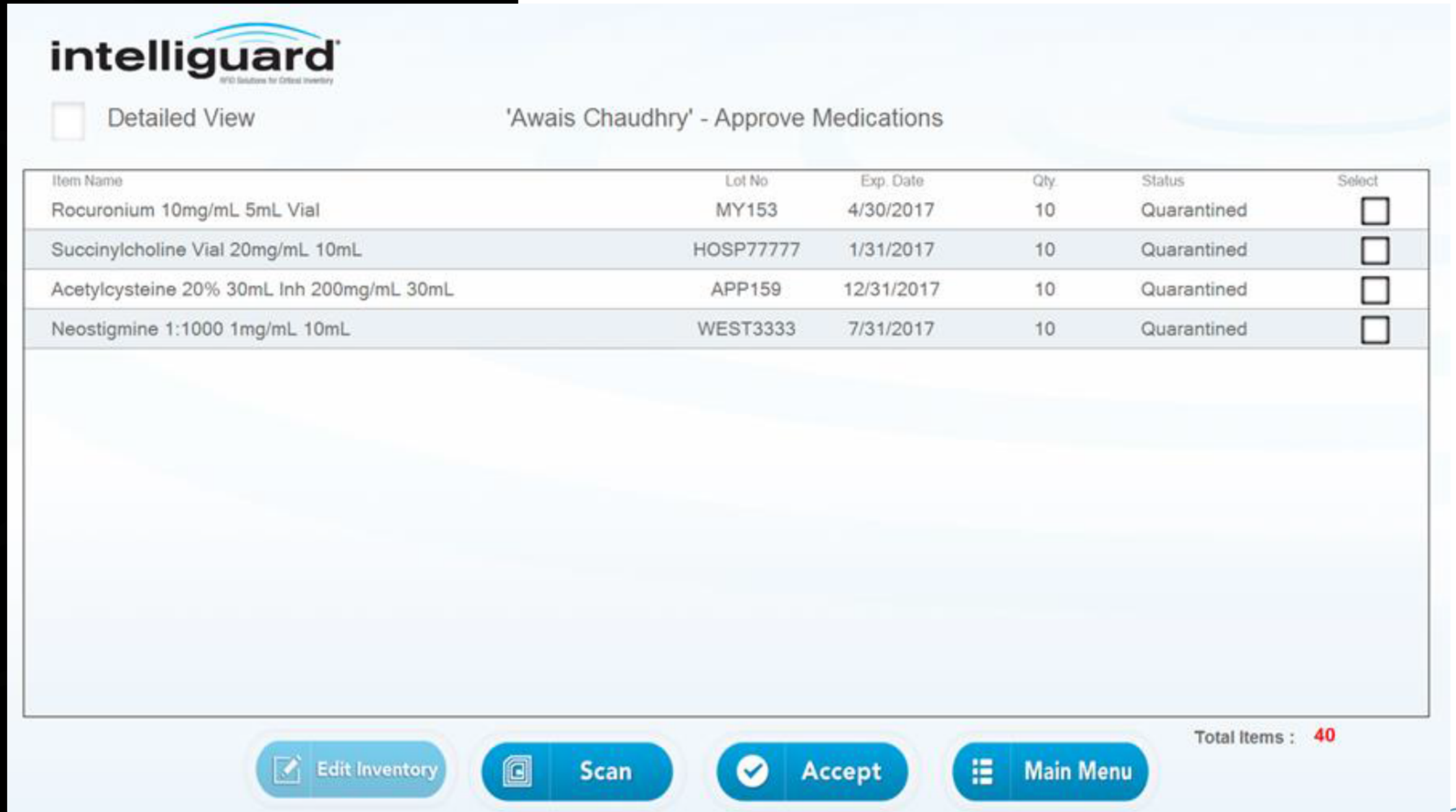


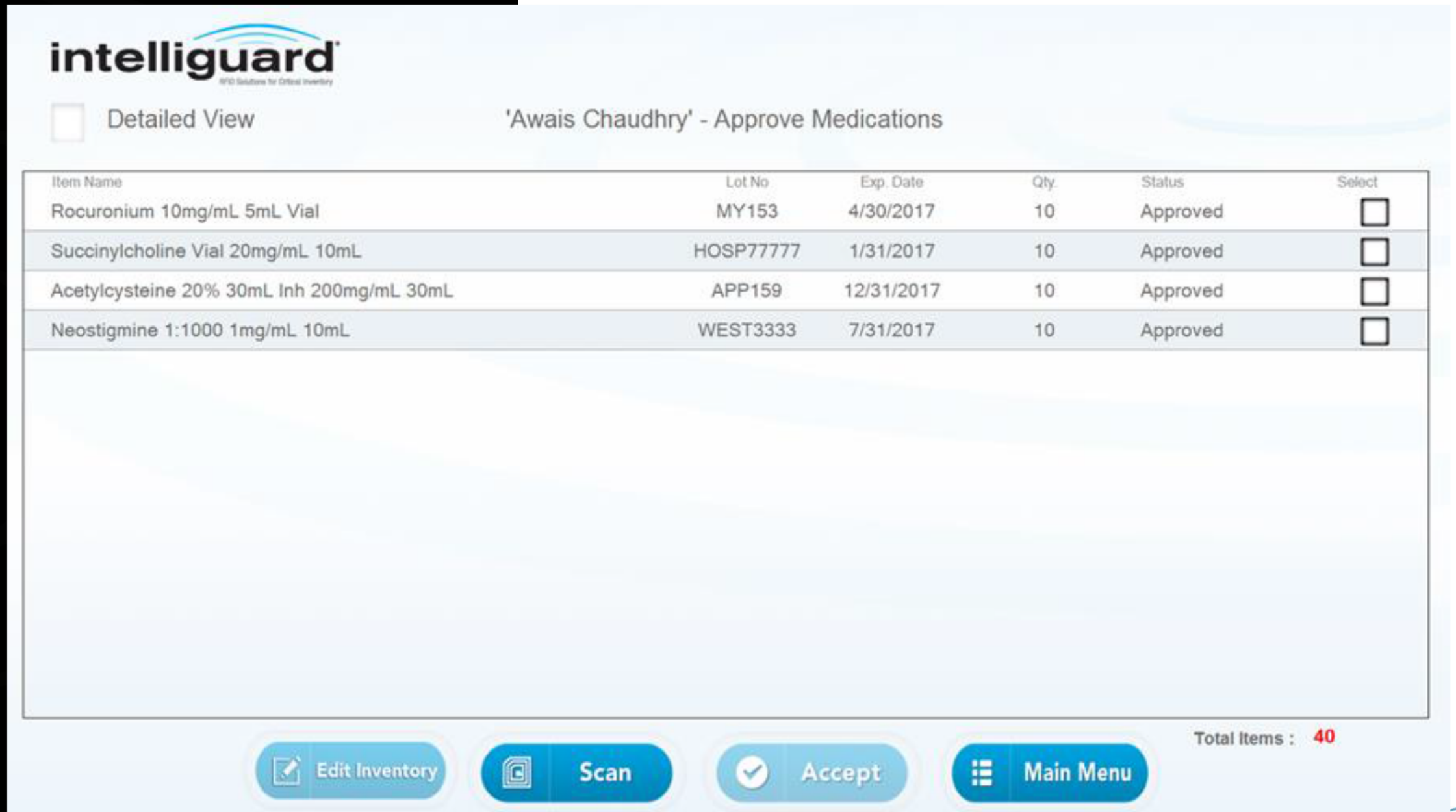
Encoded Medications: Concurrent Multi-Batch™ Pharmacist Approval

Smart Multi-Batch Approval™

- Place multiple batches of medication in enclosure
- Scan to approve
- Inventory ready for use

Averages Less than 2 Minutes to Encode (Per Case/Flat)


intelligguard
Detailed View
'Awais Chaudhry' - Approve Medications
Item Name
Lot No
Exp. Date
Qty
Status
Select
Rocuronium 10mg/mL 5mL Vial
MY153
4/30/2017
10
Quarantined
Succinylcholine Vial 20mg/mL 10mL
HOSP77777
1/31/2017
10
Quarantined
Acetylcysteine 20% 30mL Inh 200mg/mL 30mL
APP159
12/31/2017
10
Quarantined
Neostigmine 1:1000 1mg/mL 10mL
WEST3333
7/31/2017
10
Quarantined
Total Items : 40
Edit Inventory
Scan
Accept
Main Menu


intelligguard
Detailed View
'Awais Chaudhry' - Approve Medications
Item Name
Lot No
Exp. Date
Qty
Status
Select
Rocuronium 10mg/mL 5mL Vial
MY153
4/30/2017
10
Approved
Succinylcholine Vial 20mg/mL 10mL
HOSP77777
1/31/2017
10
Approved
Acetylcysteine 20% 30mL Inh 200mg/mL 30mL
APP159
12/31/2017
10
Approved
Neostigmine 1:1000 1mg/mL 10mL
WEST3333
7/31/2017
10
Approved
Total Items : 40
Edit Inventory
Scan
Accept
Main Menu

Tray Replenishment: 3 Process Flows to Fit Your Needs

Standard Technician-Pharmacist Workflow
(Pharmacist Checker)

Technician-Technician Workflow
(Technician Checker)

Tray Replenishment in 3 Easy Steps - Technician

1

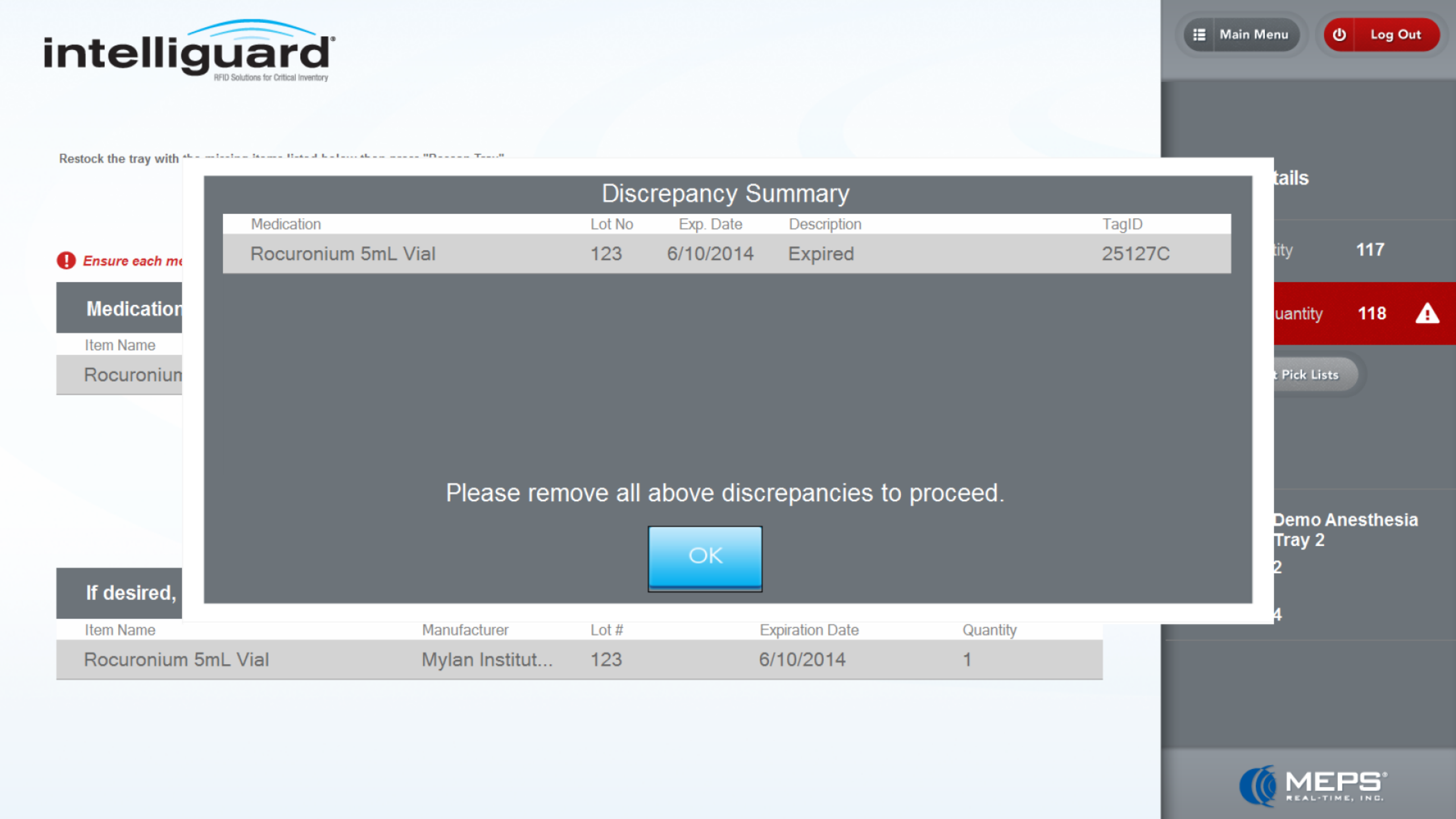
Visual inspection and RFID scan

2

Replace missing and expiring medication as shown on pick list

3

Final inspection for refrigerated meds & ancillary labeling



Main Menu
Log Out
Restock the tray with
Ensure each me
Medicatior
Item Name
Rocuroniun
If desired,
Discrepancy Summary
Medication
Lot No
Exp. Date
Description
TagID
Rocuronium 5mL Vial
123
6/10/2014
Expired
25127C
Please remove all above discrepancies to proceed.
OK
tails
ity 117
uantity 118
Pick Lists
Demo Anesthesia Tray 2
Item Name
Manufacturer
Lot #
Expiration Date
Quantity
Rocuronium 5mL Vial
Mylan Institut...
123
6/10/2014
1

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Main Menu | Log Out

Restock the tray with the missing items listed below then press "Rescan Tray".

Rescan Tray

Ensure each medication is in appropriate pocket within the tray.

Medication Pick List

Item Name	Needed
Succinylcholine Vial	1
Propofol 1% 20mL	1
Cisatracurium	1

If desired, replace items expiring within 30 EDIT days

Item Name	Manufacturer	Lot #	Expiration Date	Quantity
Atropine 0.4mg/1mL	American Re...	AT33	9/30/2014	1
Vecuronium	Sun	YOU1	4/30/2015	1
Pancuronium	TEVA	123	10/8/2014	4

Tray Details

Par Quantity 117

Current Quantity 114

Print Pick Lists

Tray Demo Anesthesia Tray 2

Tray # 2

Cycle # 4

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Tray Replenishment in 3 Easy Steps - Technician

1

Visual inspection and scan

2

Replace missing and expiring medication as instructed

3

Final inspection for refrigerated meds & ancillary labeling

Tray Replenishment in 3 Easy Steps - Technician

1

Visual inspection and scan

2

Replace missing and expiring medication as instructed

3

Final inspection for refrigerated meds & ancillary labeling

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RFID Solutions for Critical Inventory

Welcome **shannon cole-findley** to the Kit & Tray Management System

Main Menu | Log Out

Please confirm new expiration date(s) on the new refrigerated medication(s), multidose medication(s) and verify all ancillary label(s) are attached to the medication(s) listed below.

Save & Proceed

Refrigerated Medication Expiration Date

Item Name	Lot #	Original Expiration Date	New Expiration Date	Tag ID
Succinylcholine Vial	125	12/31/2019	08/19/2015	25B6ED

Multidose Medication Expiration Date

Item Name	Lot #	Original Expiration Date	New Expiration Date	Tag ID	Used ?
Nalbuphine 10mL MDV	123	12/31/2017	09/16/2014	250FE5	☐
Nalbuphine 10mL MDV	123	12/31/2017	09/16/2014	2511CA	☐

Please be sure to add an updated expiration date label to the medication below before proceeding.

Ancillary Labels

Item Name	
Rocuronium 5mL Vial	WARNING: Paralyzing Agent
Succinylcholine Vial	WARNING: Paralyzing Agent

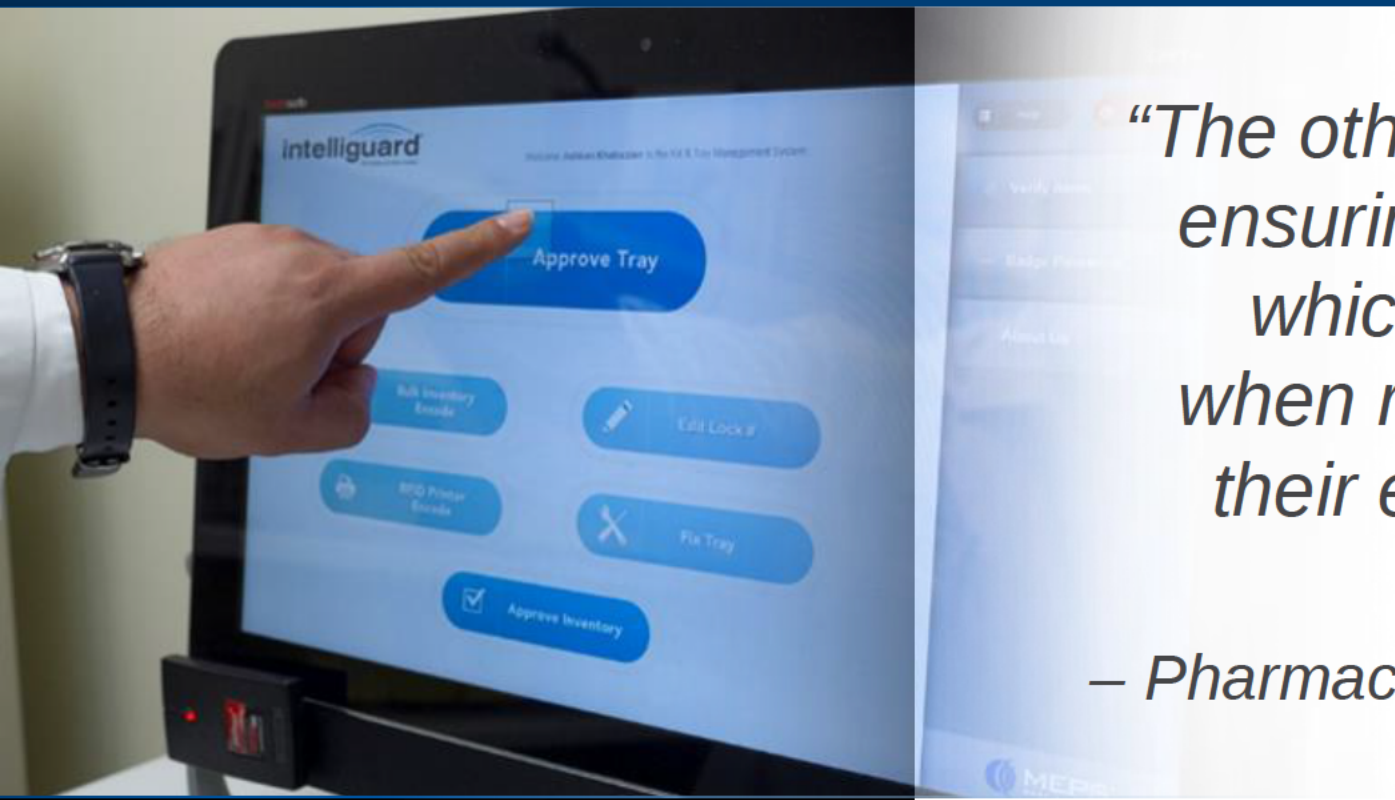
Tray Details

Par Quantity	117
Current Quantity	117
Tray	Demo Anesthesia Tray 2
Tray #	2
Cycle #	4

MEPS REAL-TIME, INC.

How it Works

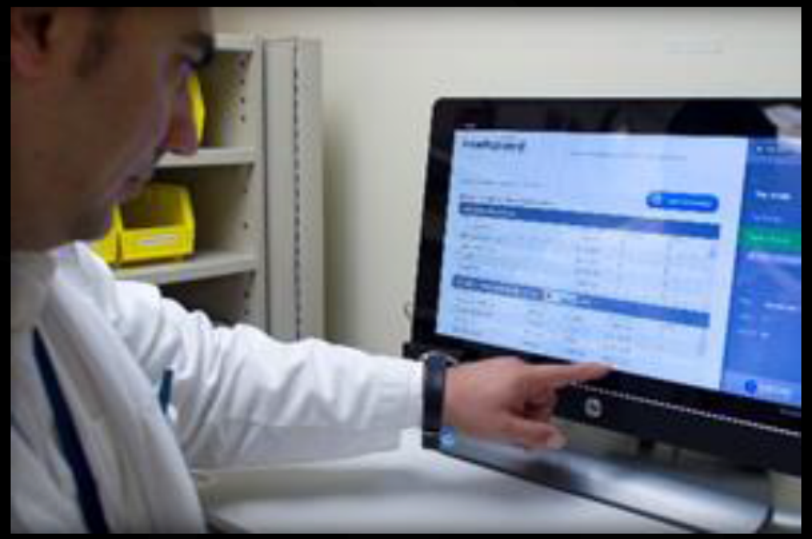
Approving the Tray– Secondary Workflow



*"The other concern was a **safety issue**: ensuring that situations never arose in which medications were unavailable when required, and that drugs nearing their expiration dates could **easily be identified and removed.**"*

– Pharmacist-in-Chief, Rady Children's Hospital

Tray Approval in 3 Easy Steps

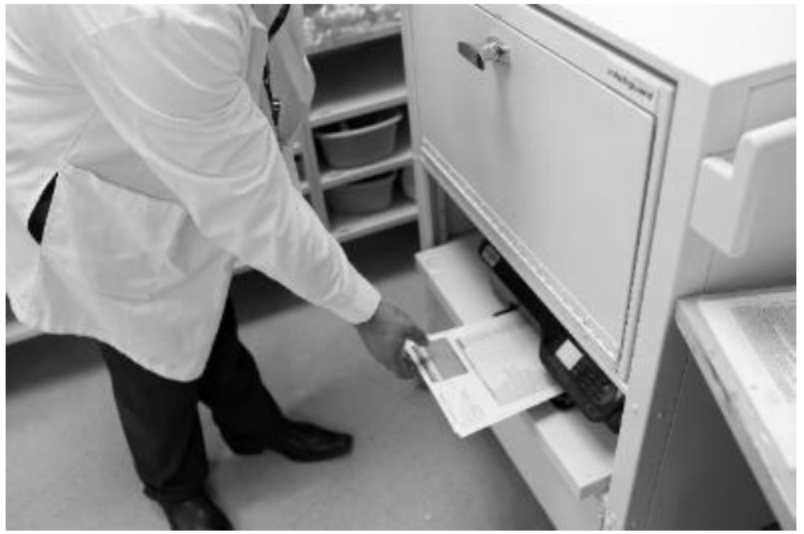


1

RFID scan to confirm tray is complete and error free

2

Capture lock number (optional)



3

Print tray inventory report

Tray Approval in 3 Easy Steps

1

Scan and confirm tray is complete and error free

2

Capture lock number (optional)

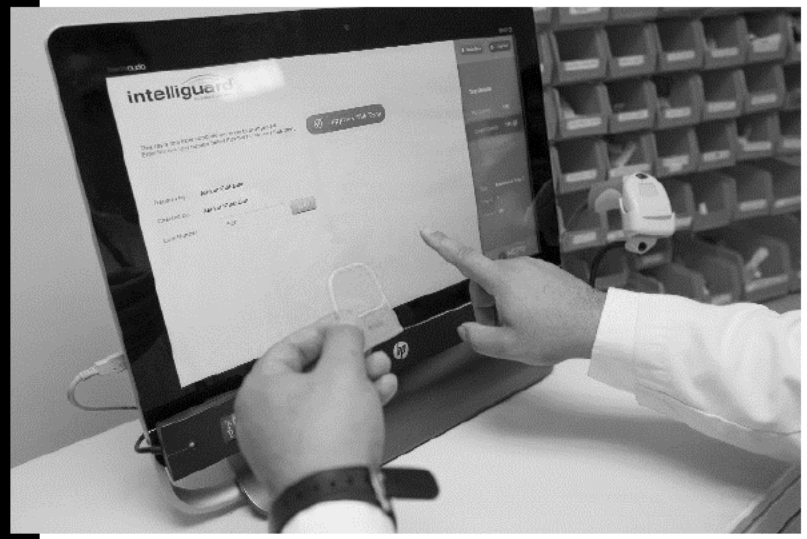
3

Print tray inventory report

Tray Approval in 3 Easy Steps

1

Scan and confirm tray is complete and error free



2

Capture lock number (optional)

3

Print tray inventory report

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Welcome **shannon cole-findley** to the Kit & Tray Management System

Main Menu | Log Out

Tray has been saved & successfully approved.
Print the report and place with the tray.

Print Tray Report

Anesthesia Tray 2 Detail Report

Tray Number	**2**
Cycle Number	**4**
Report Date	**08/19/14**
Report Time	**02:32 PM**
Prepared By	**shannon cole-findley**
Approved By	**Roy Jones**

Ensure that the earliest expiring medication is correct.

Earliest Item(s) to Expire

Nalbuphine 10mL MDV **09/16/2014**

IF EXPIRED, CALL PHARMACY @867-5309

View Completed Item List

Item Name	Expiration Date	Quantity
Etomidate 10mL	12/31/2016	2
Rocuronium 5mL Vial	08/12/2015	3
Succinylcholine Vial	08/12/2015	2
Esmolol	12/31/2015	2

Tray Details

Par Quantity 117

Current Quantity 117

MEPS REAL-TIME, INC.

Virtual Logbook

Visibility to Kit and Tray Deployment Enterprise-Wide

ed location of drug kits and
y were released

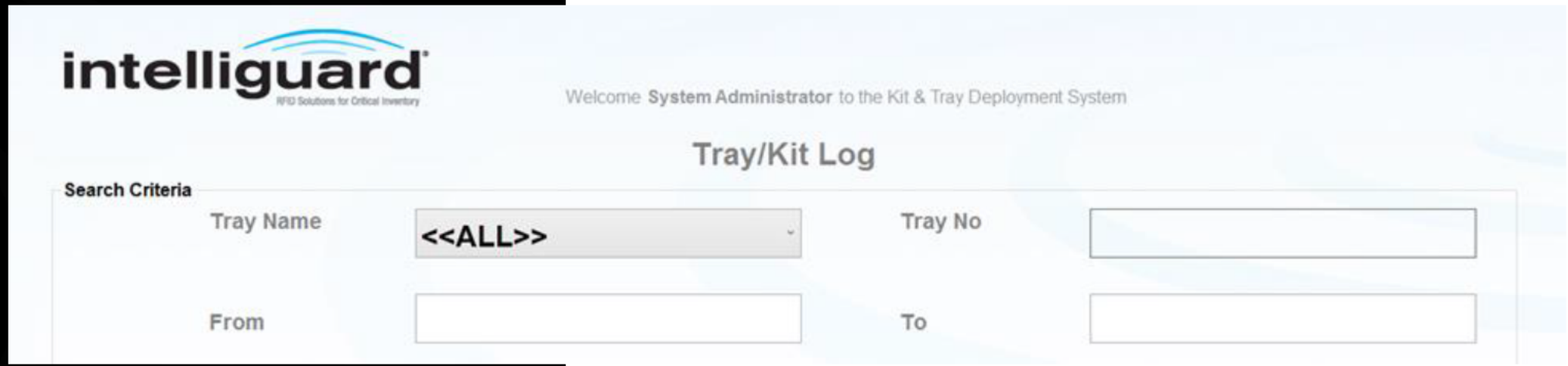
e Intelligguard® Kit and Tray

user interface, tray
sily recorded, including:

- Approving Pharmacist
- Deployment Date
- Technician Name
- Deployed Location
- Deployed to (Name)

Save staff countless hours by no longer having to search and manually check each tray to seize recalled, expiring or expired items

Virtual Logbook



Tray Name	Tray No	Cart No	Stock Date	First Exp Med	Exp Date	Approved Pharmacist	Deploy Date	Tech Name	Deployed Location	Deployed To Name
Code Tray	11	5	10/4/2014	Epinephrine 1 mg…	12/5/2014	Victor Tran	10/7/2014	Jill Hansen	Cardiology	Danielle Taber