

IV Room Workflow Technology- Safety, Benefits, and Lessons Learned

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Learning Objectives for Pharmacists and Technicians

- Describe IV room workflows and available technology.
- Identify billing implications related to IV room workflow.
- State the differences in safety between traditional IV room workflow and newer workflows which incorporate technology.
- Discuss implementation plans and lessons learned.



Common IV Room Workflows

- IV Robotics
 - Able to compound syringes and/or bags
 - Faster Rate than by hand :
 - approximately 600 doses per hour (small volume syringes)
 - approximately 50-60 doses per hour (IV bags)
 - Gravimetric or volumetric measurement with barcode verification
- IV Workflow systems
 - Allows for grouping and prioritizing of doses
 - Pharmacist able to verify remotely
 - Gravimetric or volumetric measurement with barcode verification
- Traditional Method of IV Compounding



Test your knowledge question

True or False

According to ISMP medication Errors Reporting program the syringe pullback method of verifying CSPs is very reliable.

Syringe Pullback- The technician injects a volume of medication into a volume of diluent either in a syringe or a bag and pulls back the syringe or plunger to mark the amount added for the pharmacist to verify.



Available IV Room Technologies

- DoseEdge Pharmacy Workflow Manager from Baxter
- Dispense Prep/Dispense Queue/Compounding and Repackaging from EPIC
- IVX workflow from Omnicell
- Diana from ICU Medical
- Pyxis IV Prep(formerly BD Cato) from BD
- Pharmacy Keeper/Phocus Rx from Grifols USA
- Automated IV Workflow Technology (Drugcam) from Eureka



DoseEdge Pharmacy Workflow Manager from Baxter

- Interfaces the hospital pharmacy information system to automate the process of routing, preparing, inspecting, tracking, and reporting on IV and oral liquid doses.
- Stationary camera along with a barcode scanner and printer
 - Option for gravimetric verification
- Dose Queue
 - Orders are automatically removed from the queue as they are discontinued or if the patient is discharged
- Reporting Functions
- Reduces Waste
 - Allows for re-use of previously prepared doses
 - Tracking the volume remaining in multi-dose vials
- Use HL-7 interface
 - Capture exact NDC use and waste



Dispense Prep/Dispense Queue

- Integrated within the EPIC EHR
 - Minimal informatics build effort
- Dispense Prep
 - Pharmacy tech manually selects the order to print the label for compounding
 - EHR validates the scanned barcode and matches the order
 - Camera to capture images
- Dispense Check
 - Electronic documentation of person who prepared the compound and person who checked it
 - Reporting capability on potential medication errors
- Reduces Waste
 - Orders are automatically removed from the queue as they are discontinued or if the patient is discharged



Dispense Prep Waste

- Must document waste when compounding high cost medications
 - MAB
 - Chemotherapy
 - Alteplase
- Entire vial capture for 340B / GPO accumulation
- Dispense prep programmed to allow technician documentation of waste



Epic Compounding and Repackaging (CNR)

- Method to batch compound high volume medications
- Preparation recipe is provided
- Barcode scanning to ensure accuracy of compounded product
- Customize checking process based on workflow
- Lot numbers and expiration dates recorded
 - Allows for product capture during recall
 - Automatically places correct expiration date on compounded product
- Charge captured based on NDC used to compound
- Improved in accuracy and reduced waste



Implementation of Compounding and Repackaging

- Workflow walkthrough
 - Non sterile compounding vs sterile compounding
 - Adult vs pediatric
- Equipment
 - Laptop, printer, scanner
- Epic build
 - Identifying exact NDC used
 - Recipe clean up
- Testing
 - Scanned all the raw ingredients
 - Identified different compounding processes
- Training
 - Super user
- Go-live
 - Started with non-sterile compounded products
 - Better reporting and record keeping



Test your knowledge question

Implementation of an automatized IV workflow system can assist with all of the following except

- A. Documentation of the compounding record including procedure and products used
- B. Elimination of pharmacist oversight for final product dispensing
- C. Barcode verification for products used in compounding CSPs
- D. Decreasing waste from compounding products that are no longer for a specific patient due to discharge



Test your knowledge question

Some Key components of a successful implementation include

- A. Last minute testing and cross your fingers on go-live date
- B. Collaboration with pharmacy staff, management team, and pharmacy informatics team
- C. Underestimate your equipment needs to save money
- D. No training needed, your staff members will figure it out



Compounding and Repackaging Billing

- Requires extensive configuration and editing
- NDC must be manually updated as new generic manufacturers stocked
- Pharmacy technician and pharmacist must electronically sign off CNR batches
 - Allows charge to post on patient record
 - Allows nurse to bar code administer medication



Compounding and Repackaging Billing

- Example:
- **OPI (Ortho Peri-articular Injection)**
 - Ropivacaine 0.5% 250mg/50ml
 - Epinephrine 0.5mg
 - Ketoralac 30mg
 - Clnidine 100mcg
 - NS 7.5ml -----> Total volume 60ml
- Barcode scanning on the MAR works well with CNR. When CNR label scanned on administration, the system read the batch number and all NDC's are captured for NDC billing and 340B / GPO accumulation



However OPI Administration in OR....

- ONE Step Procedure with anesthesia in surgery
- Procedural areas do not use barcode scanning. Use “one step” One step is designed to record administration and charge medications all in one step.
- It is completed by clicking on a computer screen. No barcoding performed!
- Had to create option to send OPI as “patient-specific mixture” and electronically split into components behind the scene.
- Until we figured out, had multiple billing errors and missed charges which required manual billing.



Test Your Knowledge Question

What improves accurate CNR Billing:

- A. One Step Procedure
- B. Multiple NDC's (ingredients)
- C. Barcode Medication Administration
- D. Barcode Compounding



Practice Change

- **Labor Epidurals** - contain 3 ingredients
- Like OPI, some administrations were scanned on the MAR
- Some administered in One Step
- Resultant billing failures and 340B accumulation issues

- Practice Change → LDR nurses required to barcode scan all epidurals on EMR. Fully utilizes CNR advantages
- Accurate NDC, expiration date, electronic billing



Drug Shortages

- No escaping drug shortages
- CNR – Neonatal Dopamine Infusion Dilutions
 - DOPamine 1,000 mcg/ml in D5W IV INFUSION – using 10ml vials
 - DOPamine 1,000 mcg/ml in D5W IV INFUSION - using 5 ml vials
 - DOPamine 1,000 mcg/ml in D5W IB INFUSION – using bag
- If keep one entry must swap out with each shortage update. Kept all three as open option



Safety Concerns

- Adverse Events
 - Manual compounding process
 - Choosing incorrect products
 - Human Error
- Regulatory Compliance
 - Compounding Record
 - Documentation of cleaning and other procedures
- Contamination
 - Cleaning process added to the directions
 - Robotics limit manipulation



Safety Concerns

- Traditional IV workflow uses manual error collection reporting
- Technology assisted workflow prevents error through bar code compounding, checking and administration
- Traditional IV workflow relies on visual capture of compounding errors or “pull back process”
- Technology assisted workflow electronically captures correct medication and dose and improves efficiency
- BCMA allows Right patient – Right Medication



Safety Improvements

- Barcode Scanning
 - Each item used for compounding is scanned prior to compounding being performed
- Gravimetric Technique
 - Specific gravity of the medication to compare to the ordered dose volume
 - Accurate reconstitution
 - Acceptable margin of error
- Image Capture and Remote Verification
 - Accurate product selection verified by pharmacist
 - Real-time images of compounding process
 - Record of process that can be used to verify



Benefits

- Reduced errors
- Accurate preparation and verifying compounded sterile product
- Creates electronic record for all compounded medications
- Electronic tracking prevents waste
- BCMA captures accurate administration time and missed doses
- Electronically calculates quantity required for dose preparation
- Improves turn around time for drug delivery



Test your Knowledge Question:

IV Room Technology Workflow benefit:

- A. Improves charge capture
- B. Electronic Compounding Record
- C. Close access for pharmacist bar code verification
- D. Large variety of technology



Test your knowledge question

In 2016 ISMP issued updated guidelines for an increased use of technology/automation in sterile compounding. Which of the following were listed as ways to achieve this in their release?

- A. Barcode Scanning
- B. Gravimetrics
- C. Image recognition
- D. Independent double check of all products
- E. All of the Above



What Are Your Thoughts?

What do you feel is the biggest safety improvement achieved by implementing an automated, or technological IV Workflow system?



What Are Your Thoughts?

What do you think are some of the biggest challenges that you might come across when deciding to implement an automated IV Workflow system?



Questions?

