



Stocking Policies and Procedures for Automated Dispensing Cabinets

Given the recent and much-publicized medication errors involving heparin overdoses, as well as the release of the Institute for Safe Medication Practices' "Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets," hospitals across the country are taking an even harder look at ways to build medication safety into their dispensing processes. Automated dispensing cabinets (ADCs) present a significant number of patient safety benefits to the hospitals that employ them. However, this technology alone cannot prevent medication errors from reaching your patients. It is also vital to establish sound ADC stocking policies and procedures to protect your patients from adverse drug events.

Safety Starts in the Pharmacy

Pharmacy can employ several methods to verify the accuracy of ADC stock before it makes its journey to the nursing unit. The use of automated drug storage and retrieval devices, such as robots and carousels, can certainly improve the accuracy and efficiency of ADC stocking, but pharmacies without these advanced technologies still have opportunities to make the process safer.

First, in the pharmacy picking area, segregate the medications dispensed from ADCs from those not routinely available in your cabinets to lower the risk of stocking errors. Second, give your technicians and pharmacists plenty of room to pick, organize, and verify inventory in a distraction- and interaction-free zone within the pharmacy. Third, organize the inventory being sent to the floor by placing it into clearly labeled, cabinet- or drawer-specific bags. In addition, require your staff to pick and verify ADC inventory sequentially, according to the order on the fill list. Doing so will reduce the risk of missing

medications and will maintain organization during picking and verification.

It can also be valuable to incorporate bar code verification into your process. By scanning bar codes printed on your pull list against the bar codes on each item being sent to the nursing floor, you can easily identify discrepancies and provide a higher level of safety. It is imperative to implement a double check for high-alert medications, such as anticoagulants and paralytics, before



Photo courtesy of McKesson Automation

Stocking non-medication items in ADCs promotes a casual use of the override function, which can have a negative impact on medication safety.

they are released to the nursing units. This is a particularly important step for pharmacies without bar coding capabilities.

Safety at the Cabinet

Maintaining the organization of your inventory is the first key to safe stocking practices. As mentioned earlier, medications should be transported in cabinet- or drawer-specific pouches to avoid confusion upon stocking.

Bar code technology can also improve the accuracy of restocking activities. Some ADCs are outfitted with technology that will automatically open the cor-



rect locked-lidded drawer as soon as a medication's bar code is scanned. Organizations can also bar code the pockets in an ADC's matrix drawers to increase stocking accuracy. The technician can scan the bar codes on both the pocket and medication to verify the ADC is being stocked correctly. This kind of technology encourages technicians to stock only one medication at a time. That said, even without bar coding capabilities, technicians should not restock an entire drawer and then enter information in the ADC's computer system afterwards.

Also consider implementing a double check for high-alert medications. For instance, ask a nurse to verify and document that the technician has stocked a paralytic in the correct drawer or pocket. To cut down on distractions and remain focused on the task at hand, your technicians should also avoid multitasking while stocking ADCs.

Care Area-Specific ADC Inventory

Individualized ADC inventory has its benefits. Not all cabinets should be created equal, just as the care areas they serve are not created equal. For example, the medications routinely needed on an oncology unit will be different from those needed on a surgical floor or on a pediatric unit. To develop individualized ADC inventory lists for each unit, first consider the patient population you are serving, as it will likely have fairly distinct medication needs. For instance, paralytics are seldom used on a med-surg unit, so stock these high-risk drugs only in ICU and operating suite ADCs.

Also consider how unit-based ADCs will be used: Do they dispense first doses and PRNs only, or are they the primary means of medication distribution? In addition, an administrative group, such as a P&T or medication safety committee, should be responsible for approving and overseeing the changes to each unit's ADC inventories, as no adjustment should be made without a sound thought process behind it.

One-Day Par Levels

By establishing one-day par levels for your ADCs, you can significantly reduce the potential for multi-fold overdoses. For instance, a misplaced decimal point in the prescribed dose for an initial fosphenytoin bolus may lead a nurse to reach for 10 vials to administer to a patient. If one-day par levels were established for the ADC, it is unlikely 10 vials would even be available. Once the nurse calls the pharmacy for the additional vials, the pharmacist verifying the order could catch the miscalculation and avoid a serious medication error. Decreasing the amount of available ADC inventory is particularly important in pediatric care areas, where these small patients are at an even higher risk for multifold overdosing. In addition, although one-day par levels can be difficult to maintain in remote locations, it is also important to establish tighter par levels and prevent the



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Whenever possible, avoid stocking multi-dose vials in your ADCs; instead, dispense only ready-to-administer doses.

stocking of excessive drug quantities in ADCs located at off-site clinics.

Nurses may balk at the concept of one-day ADC par levels, as they prefer to be assured that the medications they need are always on hand. In addition, pharmacy technicians may feel this policy will create more work for them in restocking the machines. Establishing this policy takes a lot of monitoring and proactive thinking; you must emphasize to both pharmacy and nursing that this practice pays out in patient safety.

Ready-to-Administer Doses

Whenever possible, avoid stocking multi-dose vials in your ADCs; instead, dispense only ready-to-administer doses. By speaking to your nurses, you will get a good idea of how often they have to perform manipulations to medications once they are dispensed from the ADC. Any drug that requires dilution or manipulation should be considered for removal from the ADC. For instance, magnesium 50% can never be administered without dilution, and as such, the appropriate patient dose should be dispensed directly from the pharmacy. It is also advisable to stock only unit dose medications in your ADCs, to reduce the risk of overdosing. Currently, adult unit dose medications are easier to source from manufacturers than pediatric unit doses, and as such, you may need to package a significant majority of your pediatric unit doses in the pharmacy.

Limited Concentrations and Dose Forms

Hopefully, all institutions are attempting to limit the number of concentrations available for any drug – not just in their ADCs, but also throughout the hospital – particularly high-alert medications, such as heparin and other anticoagulants. In that vein, also limit the number of dose forms available in your ADCs. For instance, if both morphine drops and an oral morphine product are available, consider eliminating either one from the ADC inventory. Furthermore, certain drugs, such as chemotherapy agents, should be eliminated from ADC stock altogether. In addition, the Joint

Commission may cite you for dispensing concentrated potassium vials from your ADCs, as they require dilution and added precautions prior to administration. Such items should be dispensed directly from the pharmacy in their ready-to-use form.

Drawer Configurations

Appropriate drawer configurations can do much to improve patient safety. For institutions with the resources to purchase new cabinets, locked-lidded drawers issue considerable patient safety dividends. However, when limited by either financial resources or the space within your ADCs, there are meth-

ods you can employ to improve safety within matrix drawers. First, consider using matrix drawers only for non-high-alert medications like antacids, ibuprofen, and acetaminophen. Second, avoid stocking look-alike, sound-alike medications and different concentrations of a drug in the same matrix drawer. Third, stock high-alert medications, such as heparin, paralytics, and reversal agents, in their own individual drawers, in order to decrease the potential for serious medication errors.

Special Considerations for Anticoagulants

In order to increase the safety of your anticoagulant dispensing practices, first, identify all of the anticoagulant therapies currently on your formulary and then determine in which unit-based ADCs each drug should be made available. Anticoagulants should be segregated within the ADC, in their own pocket or locked-lidded drawer. Furthermore, all injectable anticoagulants should be made available in their ready-to-infuse form. For example, at Primary Children's Medical Center, we dispense 10 units per mL heparin flushes in pre-filled syringes, which decreases the risk of nurses administering multifold overdoses of this high-risk drug. To differentiate our heparin products and avoid identification errors, we dispense 100 units per mL heparin in vials, as opposed to pre-filled syringes. You may also find it helpful to segregate pediatric inventory from adult doses of heparin within your ADCs or go so far as to install a pediatrics-only ADC on certain units.



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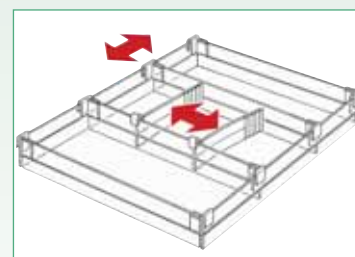
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Organizations can bar code the pockets in an ADC's matrix drawers to increase stocking accuracy.

In addition, nurses should not return unused heparin doses to the ADCs themselves. Rather, they should place these doses in a secured box controlled by pharmacy.

Refrigerated Medications

Hospitals should consider implementing a remote locking mechanism for their medication refrigerators, through which refrigerated medications can only be accessed via a nearby ADC. While you may be tempted to stock high-alert medications, such as paralytics and insulin, in your refrigerators in order to achieve extended beyond-use dating for those items, remember that, in doing so, you will lose the patient safety benefits associated with an ADC's locked-lidded or medication-specific drawer configurations. The cost benefits of avoiding drug wastage are not likely to outweigh the decrease in medication safety and security.

Non-Medication Items

Non-medication items should not be kept in ADCs used to dispense medications. While it may be convenient for nurses, this arrangement has several drawbacks. First, because non-medication items are typically accessed on override, stocking them in ADCs promotes a casual use of the override function, which can have a negative impact on medication safety. Second, it decreases the space available for medications.

Conclusion

In addition to the stocking policies and procedures outlined in this article, there are a number of other tools avail-

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able to improve the safety of your facility's automated dispensing technology. For example, the use of pharmacy profiling functionality, versus open inventory, is paramount in preventing dispensing errors. This and other recommendations for improving medication safety are clearly outlined in the aforementioned ISMP guidelines. I urge readers to download this valuable document (available at www.ismp.org/Tools/guidelines/ADC_Guidelines_Final.pdf) and refer to it as you establish your institution's policies and procedures surrounding ADC use. ■



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