

MASSACHUSETTS SOCIETY OF HEALTH-CARE PHARMACEUTISTS

MSHP Annual Meeting 2016

Medication Safety & Automated Dispensing Machines For Pharmacy Technicians

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OBJECTIVES

- Identify factors within pharmacy practice that may contribute to medication errors and describe the impact medication errors have on the healthcare system
- Describe strategies for preventing medication errors from occurring and the role pharmacy technicians have in the implementation of medication safety
- Describe the advantages and disadvantages of using automated dispensing machines as it pertains to pharmacy workflow and medication safety

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EYE OPENING CASE

- Fatal dose of sodium chloride administered to 2 year old



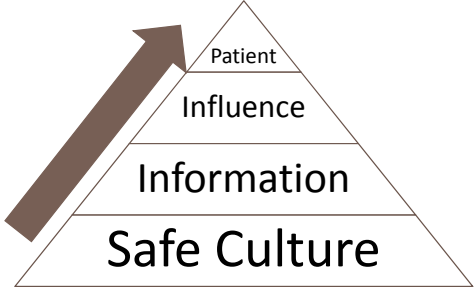
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IMPORTANCE OF MEDICATION SAFETY

- Massive increase in number and variety of available prescriptions
- More patients taking multiple medications
- Medication delivery process is shared amongst many healthcare providers
- Medication errors can be life-threatening

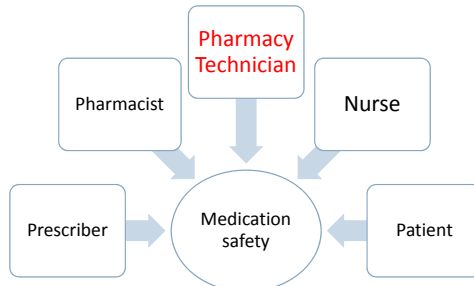
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MEDICATION SAFETY PYRAMID



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WHO IS RESPONSIBLE?



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MEDICATION ERROR

Any preventable event that may cause or lead to inappropriate medication use or harm to a patient

ASHP.org

TYPES OF MEDICATION ERRORS

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graph TD
    Errors --> Mistakes
    Errors --> SkillBased[Skill-based errors]
    Mistakes --> Knowledge[Knowledge-based]
    Mistakes --> Rule[Rule-based]
    SkillBased --> Action[Action-based]
    SkillBased --> Technical
    SkillBased --> Memory[Memory-based]
    
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J.K. Aronson. Medication errors: what are they, how they happen and how to avoid them. *O J Med* 2009; 102: 513-521

MEDICATION ERROR OUTCOMES

Aronson JK. Medication errors: definitions and classification. *BJCP* 2009; 1365-2125. FDA.gov

TECHNICIAN'S ROLE

- Implement and perform safe practice to promote medication safety
- Maintain and development of clinical knowledge
- Identify medication errors and strategies for prevention
- Report errors to appropriate personnel

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ERROR PREVENTION

Jenkins RH, Valda AJ. Simple Strategies to Avoid Medication Errors. *AAFP* 2007; 41-47.

ERROR PREVENTION

Patient information


- Double check method
- Allergies
- Height/weight

Jenkins RH, Valda AJ. Simple Strategies to Avoid Medication Errors. *AAFP* 2007; 41-47.

ERROR PREVENTION

Drug information


- ▣ Maintain drug references
- ▣ Establish guidelines
- ▣ Identify high-alert medications



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Jenkins RH, Valda AJ. Simple Strategies to Avoid Medication Errors. AAFP 2007; 41-47.

HIGH ALERT/HIGH RISK MEDICATIONS

- ▣ Insulin
- ▣ Oral hypoglycemic agents
- ▣ Narcotics/opioids
- ▣ Sedatives
- ▣ Anticoagulants
- ▣ Chemotherapeutic agents




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ERROR PREVENTION

Labeling and storage

- ▣ Separate problematic orders
- ▣ Organize work area
- ▣ Control medication access

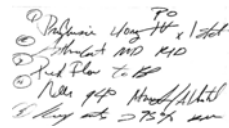


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Jenkins RH, Valda AJ. Simple Strategies to Avoid Medication Errors. AAFP 2007; 41-47.

ERROR PREVENTION

Communication

- ▣ Share information
- ▣ Improve handwriting
- ▣ Avoid abbreviations
- ▣ Awareness of look alike/sound alike drugs



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Jenkins RH, Valda AJ. Simple Strategies to Avoid Medication Errors. AAFP 2007; 41-47.

ERROR PRONE ABBREVIATIONS

Abbreviation	Why it's a problem	Alternative
U (unit)	Mistaken for zero, number 4, or cc	Write "unit"
IU (international unit)	Mistaken for IV or number 10	Write "international unit"
QD (daily)	Mistaken for QID	Write "daily"
QOD (every other day)	Mistaken for QID or QD	Write "every other day"
Trailing zero (X.0 mg)	Decimal point is missed	Write X mg
Lack of leading zero (.X)	Decimal point is missed	Write 0.X mg

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LOOK ALIKE/SOUND ALIKE MEDICATIONS






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ERROR PREVENTION

Medication devices

- ▣ Use appropriate syringes
- ▣ Train staff to use devices properly
- ▣ Practice sterile technique
- ▣ Dispose of waste correctly






Jenkins RH, Valda AJ. Simple Strategies to Avoid Medication Errors. AAFP 2007; 41:47.

ERROR PREVENTION

Environmental factors


- ▣ Adequately staff pharmacy
- ▣ Minimize distractions
- ▣ Reduce stress
- ▣ Troubleshoot system errors



Jenkins RH, Valda AJ. Simple Strategies to Avoid Medication Errors. AAFP 2007; 41:47.

EYE OPENING CASE

- ▣ Fatal dose of sodium chloride administered to 2 year old



Jenkins RH, Valda AJ. Simple Strategies to Avoid Medication Errors. AAFP 2007; 41:47.

AUTOMATED DISPENSING MACHINES (ADMs)

AUTOMATED DISPENSING MACHINES

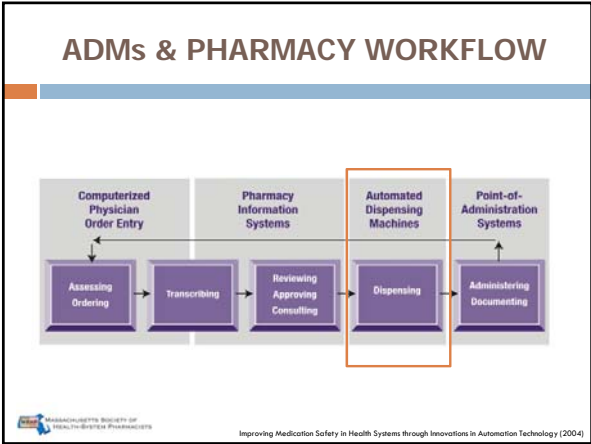
Decentralized medication distribution systems that provide computer-controlled storage, dispensing, and tracking of medications

ISMP.org

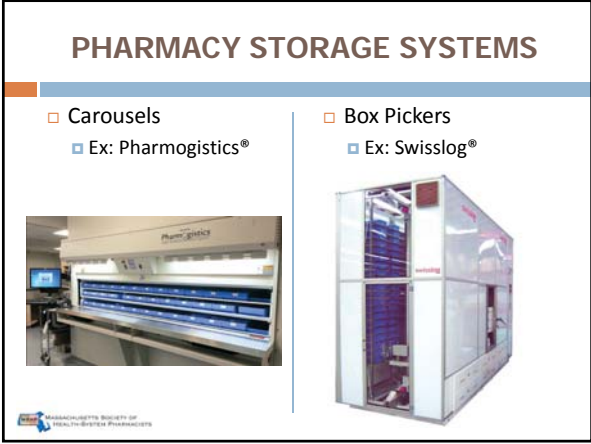
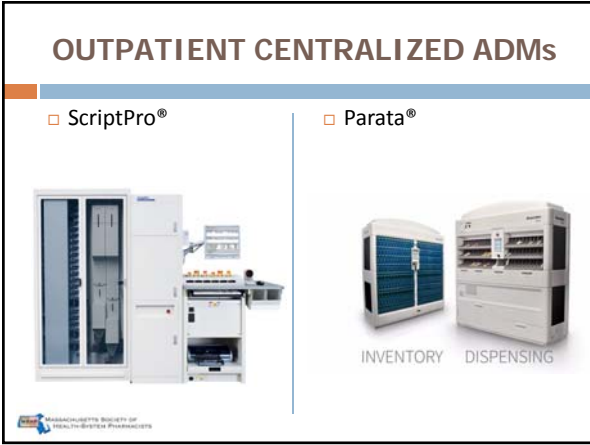
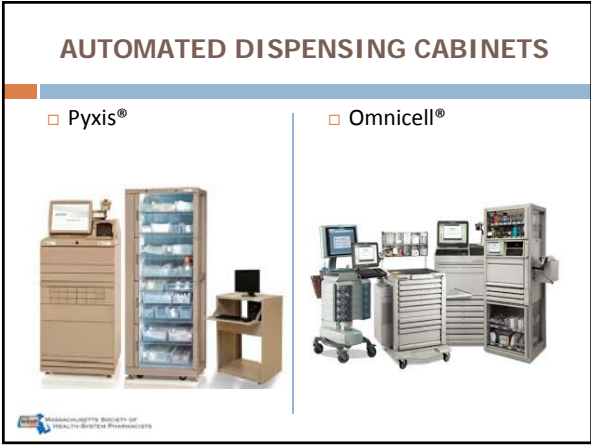
HISTORY OF ADMs

- ▣ Introduced in the 1980s – began replacing patient-specific cassettes of unit-dose medications on nursing units
- ▣ By 1999, only about 50% of hospitals were utilizing ADMs however by 2009, the prevalence has increased to greater than 80%
- ▣ Since their development, the structure and safety features of ADMs have changed drastically in order to improve patient safety and decrease medication & dispensing errors

Murray MD. Am J Health Syst Pharm 2000;57:565-571. ISMP.org



TYPES OF ADMs




What are **advantages** to using automated dispensing machines?


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ADVANTAGES OF ADMs

- Improve the efficiency of medication distribution
- Facilitate timely administration of medications
 - Enhance first dose availability for critically ill patients
- Secure medication storage on patient units
- Track & monitor drug usage patterns proactively
- Track narcotic and controlled substances electronically




What are **disadvantages** to using automated dispensing machines?



DISADVANTAGES OF ADMs

- Cost and installation
- Coordination of pharmacy technology and systems
- System failures
- Extensive multi-disciplinary staff education



ISMP GUIDANCE FOR SAFE USE OF ADMs


1. Provide ideal environmental conditions for the use of ADMs

Location of ADMs:

- Secure, easily accessible area with minimal distraction
- Close proximity to IV tubing, supplies, and refrigerated medications
- Adequately ventilated, temperature controlled, and well lit

Number of ADMs:

- Appropriate number of ADMs, towers, and computer consoles to efficiently service hospital or other type of institution




ISMP Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets (2008)

ISMP GUIDANCE FOR SAFE USE OF ADMs

2. Ensure security of ADMs

- Username and password/fingerprint protection
- Auto log-off
- Security clearance & user privileges
- System updates
- Remote locking of refrigerated items
- System in place for documentation of medication destruction and waste



ISMP Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets (2008)


ISMP GUIDANCE FOR SAFE USE OF ADMs

3. Utilization of Pharmacy-profiled ADMs

- Pharmacy-profiling functionality

4. Identify information that should appear on ADM screen

- Patient information and demographics
- Use of various types of icons (i.e. system failures, new orders)



ISMP Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets (2008)

ISMP GUIDANCE FOR SAFE USE OF ADMs

5. Maintain adequate drug inventory

- P&T committee overview & approval
- Establish criteria for inventory (i.e. hazardous medications)
- Analyze reports to determine low usage medications
- Establish par levels



ISMP Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets (2008)

ISMP GUIDANCE FOR SAFE USE OF ADMs

6. Select Appropriate ADM Configuration

- Individual compartment storage preferred
- In open drawers, limit similar medication types and “look-a-like”/“sound-a-like” medications
- Do not use open drawers for high risk agents, reversal agents, or medications prone to diversion



ISMP Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets (2008)

ISMP GUIDANCE FOR SAFE USE OF ADMs

7. Define safe ADM restocking process

- Standardize restocking
- Select one medication at a time when restocking ADM
- Utilize barcode scanning
- Avoid multitasking
- Plan delivery times in conjunction with the workflow of the patient care area
- Use “blind counts” for narcotics



ISMP Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets (2008)

ISMP GUIDANCE FOR SAFE USE OF ADMs

8. Develop procedures to ensure accurate withdrawal of medications from ADM

- Configure ADM to
 - Indicate location of the medication to be removed
 - Allow practitioner to remove medications for one patient at a time
 - Promptly report any discrepancies discovered



ISMP Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets (2008)

ISMP GUIDANCE FOR SAFE USE OF ADMs

9. Establish Criteria for ADM System Overrides

- Establish list of medications that may be removed in emergent situations only
- Use process where the drug and dose are checked against patient’s allergies and other medical conditions
- Establish procedure for documentation of medication override and rationale



ISMP Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets (2008)

ISMP GUIDANCE FOR SAFE USE OF ADMs

10. Standardize Process for Transporting Medications from the ADM to patient’s bedside

11. Eliminate process for returning medications directly to their original ADM location

- Utilization of return bins


12. Provide staff education and competency validation




ISMP Guidance on the Interdisciplinary Safe Use of Automated Dispensing Cabinets (2008)

ERROR DETECTION

- Chart review
- Claims data
- Incident reporting (sentinel events)
- Voluntary reporting
- Administrative data examination
- Computer monitoring
- Direct care observation
- Patient reported


Montesi G, Lechi A. Prevention of medication errors: detection and audit. *BJCP* 2009; 1365-2125.

WHERE TO REPORT?



Reported a Medication or Vaccine Error on Hazard to ISMP?
 Thank you for your willingness to report a medication or vaccine error or hazard to ISMP.
 If you are a **CONSUMER**, please click on the orange button below if you are ready to report an error or hazard.

**FOR CONSUMERS:
Report a
Medication Error**

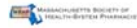
If you are a **HEALTHCARE PRACTITIONER**, you can report the error or hazard to ISMP using one of two secure methods:
1) Report to the ISMP National Medication Errors Reporting Program (NMERP) or the ISMP National Vaccine Errors Reporting Program (NVERP)

These are confidential, voluntary reporting programs operated by ISMP to learn about the causes of medication and vaccine errors. After you submit a report, ISMP staff will follow up with you to ask additional questions to clarify what went wrong and to identify the devices and factors that contributed to the reported event. The report will also be forwarded in confidence to the US Food and Drug Administration (FDA) and, when applicable, to product vendors to inform them about pharmaceutical labeling, packaging, and nomenclature issues that may cause errors by their design. **Your name, contact information, and location will NOT be submitted to FDA or product vendors without your permission, and identifiable information will NOT be disclosed outside of ISMP.**

Click on the appropriate button below if you are ready to report an error or hazard to the ISMP NMERP or ISMP NVERP.


Report a Medication Error

Report a Vaccine Error




WHERE TO REPORT?







KEY TAKEAWAYS


- Pharmacy technicians play a vital role in medication safety and numerous opportunities exist for technicians to prevent medication errors
- While ADMs may reduce the risk of medication errors, there is still potential for them to occur and several measures can be taken in order to prevent them
- Detection and reporting of medication errors is an important process to determine areas for improvement



QUESTIONS?







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Thank You!

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