Preventing Medication Errors:
Tips for Florida Pharmacists

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The cost for this program is $25.00.

Learning Objectives

1) Describe ways to reduce environmental factors that cause medication errors
2) Discuss root cause analysis and its role in medication error reduction
3) Discuss the process of Failure Mode and Effects Analysis (FMEA)
4) Discuss methods to appropriately use computer alerts to reduce medication errors
5) Discuss the effect of electronic prescribing on medication errors
6) Discuss the importance of medication reconciliation as a medication error reduction technique
7) Discuss other medication errors reduction strategies for pharmacists

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Pharmacists and health care professionals became more aware of the serious problem of medication errors with the release of the report by the Institute of Medication, "To Err is Human-Building a Better Health System". [1] In this report it is estimated that between 44,000 and 98,000 Americans die each year of medical errors in hospitals and as many as 40% of these could have been prevented. This results in an estimated $17 billion to $29 billion in lost wages, disability payments, additional medical care and other costs. A follow-up report by the Institute of Medicine a few years later "Preventing Medication Errors" found that medication errors harm 1.5 million people per year. [2] In addition, 400,000 preventable adverse drug events occur per year in hospitals, which equates to about one medication error per patient per day. [2] Since the release of these reports, many health care organizations and professionals have become very diligent at preventing medication errors.   Most medication errors are not made by incompetent health care professionals that have a history of multiple errors, but rather due to a breakdown in the medication use process or dispensing process. Errors related to the worksite environment issues comprise a significant portion of pharmacy errors. However, the causes of these errors can be reduced by following a few simple steps that can be implemented at virtually any pharmacy. Before environmental issues are discussed, let's look at some other more "global" error reduction strategies and analyses.

Root Cause Analysis

Every healthcare professional will be involved in some type of medication error during their professional career. It is inevitable.   When a medication does error occur, the organization and/or health care professional should conduct a root cause analysis. This type of analysis is done after a medication error has occurred. In root cause analysis, the focus should be on the processes, procedures, and systems in the medication use process to determine why an error occurred. One misconception is that this analysis should focus on individual performance issues. This is not the case. It is a process-driven analysis. When conducting a root cause analysis, the individuals involved should be very thorough in examining the process that preceded the error. It should also include special causes as well as common causes regarding the error in question. In root cause analysis, pharmacists, technicians, interns, managers, and director of pharmacy should be included and involved with this process. Before getting started, you should do a complete medical and pharmacy literature review to determine how other organizations have addressed this type of error. When beginning a root cause analysis, the focus should be on finding answers to the following questions: What happened (in detail)? Why did it happen? What occurred just before the error? At which step(s) did the medication use process breakdown or did a failure occur? What processes or systems underlie the cause of the error? What possible strategies can be implemented to help ensure the error does not occur again? Have there been any other "near-misses" or other medication errors that closely-resemble this one? What kind of evaluation and/or assessment plan will be implemented to monitor the outcomes of any error prevention technique or process change that is implemented? Once the "root cause" of the error has been determined, an action plan, follow-up, measurement strategy, evaluation, and assessment plan must be implemented to prevent future medication errors of this type. Even though root cause analysis is done after an error occurs, healthcare organizations should take a proactive approach to reducing errors and focus a large amount of time and resources on the prevention of medication errors.

Failure Mode and Effects Analysis (FMEA)

Many organizations erroneously wait until a medication error happens before they decide to see if the medication use process in their organization is broken. This may be viewed as a backwards approach to reducing medication errors. It is important to employ root cause analysis after an error occurs, but healthcare organizations should be more proactive in their approach of preventing medication errors. Failure Mode and Effects Analysis (FMEA) is one way to accomplish this and should be considered as part of a comprehensive risk-reduction strategy regarding medication safety.   The primary goal of FMEA is to systematically identify areas of potential failure in the medication use process at your institution. This proactive approach will be discussed in the context of new medications, clinical guidelines or therapies that are added to your practice site. The Institute for Safe Medication Practices (ISMP) has developed a stepwise process to use FMEA when new drugs become available and are being prescribed or are added to your inventory. The best way to illustrate this process is with a case example. Let's consider the drug Trilipix® (fenofibric acid delayed release) for hyperlipidemia.   When a pharmacy first receives this drug in their inventory, FMEA should be conducted. **Step 1:** The pharmacy staff should discuss how the product will be prescribed and what place the drug has in current patient therapy. The pharmacy staff should also consider the following questions: What clinical information is most relevant about this drug? How does it differ from other therapies used to treat the same thing? Which patients are most likely to benefit from the drug? How will it be ordered and where will it be placed on the pharmacy's shelves? What information regarding the drug should be conveyed to the patient? What potential problems might patients encounter when taking this medication? **Step 2:** What could potentially go wrong when this drug is prescribed and dispensed to a patient? The pharmacy

staff should systematically and methodically examine where errors may occur, not just in the dispensing process, but in all steps of the medication use process. For example: When an oral prescription for Trilipix® is called in to the pharmacy, what might it be mistaken for? What drugs might it be confused with? Trilipix® may be confused with TriCor® and sounds a lot like Trileptal® or Tri-Levlen®. Will physicians and prescribers realize that Trilipix® is dosed once daily and Lopid® (which is very similar) is dosed twice daily? Do prescribers understand that this is a delayed release capsule and understand all the issues regarding delayed release dosage forms? When placed in the pharmacy's inventory, it will be located very close to TriCor® and next to Trileptal® on the shelf. What could you do to make sure the pharmacist or technician grabs the correct medication? Maybe the drug should be stored on another shelf, alerts sticker could be placed on the bottle, or a computer alert message may warn the pharmacist not to grab Trileptal® by mistake. These potential sources of medication errors must be anticipated and processes put in place to help prevent these types of errors. Anticipating these potential errors and addressing them in advance is the key. **Step 3:** The pharmacy staff needs to determine the likelihood of these types of errors occurring and what the consequences of these types of errors are. Some consequences may be more severe than others and those types of potential errors need to be addressed first and with the most definitive measures. The goal is to detect the error before it occurs and minimize the consequences. **Step 4:** What types of processes are already in place to prevent these types of errors from occurring? The pharmacy may have a very good error prevention process in place for oral prescription products with sound-alike names or computer alerts during the dispensing process. This could be applied very easily to Trilipix®. **Step 5:** Set up an evaluation and feedback system to determine if errors are still occurring with this medication. Also, the pharmacy needs to regularly evaluate how successful the counter-measures or processes implemented to prevent errors with Trilipix® have preformed.

Reducing Environmental Factors that Cause Medication Errors

It is well known that most of the published literature on pharmacy errors comes from research conducted in hospital or inpatient settings. Error rates in outpatient or community pharmacies are poorly documented and are hard to quantify. One study has estimated that the rate of medication errors found by community pharmacists was 2.6% for new prescriptions.[3] Another study estimates that prescriptions dispensed by community pharmacies have a 98.3% accuracy rate.[4] Factors in the pharmacist's work environment such as hours worked without a break, overall workload, distractions in the pharmacy, availability of support help (technicians and pharmacy interns), inventory organization, physical characteristics of the prescription department, and the amount of pharmacist interaction with the patient can all have an effect on dispensing accuracy. Typically, when pharmacists are asked to discuss the primary cause for medication errors at their worksite, high prescription volume is near the top of the list. When pharmacists are asked to dispense or "check" more prescriptions per hour than they are comfortable with, medication errors are more likely to occur. However, low levels of workload have the potential to cause just as many medication errors. In a study of 36 retail pharmacies, it was found that errors were more likely to occur when the dispensing workload was low.[5] Why is this case? Boredom, distractions, and disruptions in normal work flow can make it harder for pharmacists to focus on the task at hand (dispensing). Also, community pharmacies with slower volumes do not allow for the pharmacist to "get into a work flow rhythm" for dispensing prescriptions. Sporadic prescription volume leads to difficulty in focusing on dispensing and checking tasks. Pharmacists in slower community pharmacies or during slow times of the day should develop a work flow system that allows them to focus on the dispensing tasks at hand. This could include waiting to fill oral prescriptions phoned-in from physician offices during the same time period when other

prescriptions are being dropped-off by patients in the store. This may allow a pharmacist to stay more focused and get into a "work flow rhythm".

One of the most critical areas that community pharmacies should focus their resources to reduce medication errors is the dispensing area and how the prescriptions flow through this area (work flow). A well-designed work area with a properly planned system to move the prescriptions through the dispensing process can go a long way in preventing medication errors. The dispensing area should facilitate a smooth transition from one step to the next throughout the dispensing process. Pharmacists should check and verify prescriptions before dispensing in a distraction free environment. In fact the Institute for Safe Medication Practices (ISMP) has even suggested that pharmacies should adopt a similar model that is used by the airline industry. The Sterile Cockpit Rule is an FAA regulation requiring pilots to refrain from non-essential activities during critical phases of flight including taxing, takeoff, landing, and other flight operations conducted below 10,000 feet. The FAA imposed the rule in 1981 after reviewing a series of accidents that were caused by flight crews who were distracted from their flying duties by engaging in non-essential conversations and activities during critical parts of the flight. The idea of a "sterile cockpit" for pharmacies would involves polices and procedure that minimize or eliminate unnecessary distractions and interruptions during critical steps of the prescription dispensing and final verification process. One recently published study looked at implementing a sterile cockpit during the dispensing process and its effect on medication errors. The study found that after the sterile cockpit was implemented in the pharmacy, the number of errors decreased from 12 errors in the two months prior to implementation to only three errors after implementation.[6] There was also a general consensus among the pharmacy staff that workload decreased, even though actual workload data showed the prescription volume had increased. Even though this was a small study at one worksite, it provides some evidence that this theory may be beneficial in reducing medication errors.

Listed below are other ways to potentially reduce medication errors caused by work area and work flow issues:

1) The work area should be kept free from clutter.
2) Area for final verification should be kept away from high traffic areas in the prescription department.
3) Drug bottles that are no longer used should be discarded or returned to the shelves.
4) Telephones should be located in an area where they cannot be a distraction to a pharmacist verifying prescriptions before dispensing.
5) Pharmacists should only fill one prescription at a time before switching containers or drugs.
6) Complete the entire process for each prescription (counting, checking, labeling, verifying) before moving on to the next one.
7) Make sure the dispensing area has adequate space to perform all activities.
8) Train technicians and interns to be the ones who answer the phone.
9) Interruptions when pharmacists are entering prescriptions into the computer and/or verifying prescriptions will absolutely not be tolerated. Train technicians and interns to never interrupt a pharmacist while he/she is in the process of the final verification before dispensing.
10) If you are interrupted while verifying a prescription, start the entire verification process over.
11) Use the same verification process with every prescription dispensed.
12) Keep the fax machine is an area away from the final verification area.
13) Make sure all areas of the pharmacy are well-lit. Some studies have suggested that light levels need to be increased for workers over the age of 45. Also, clean lighting fixture on a regular basis. Lighting levels can be decreased by as much as 25% in fixtures that have not been cleaned for two years.

14) Create "break-periods" where pharmacists can step away from the dispensing process for a short time to avoid fatigue. It is better to make a patient wait a few minutes then have a pharmacist make a mistake due to eye-strain.

15) Make sure everyone in the pharmacy is properly trained on the system of how a prescription flows through the work flow system.

16) Technicians and interns should conform to the pharmacist's work flow and habits, not the reverse.

17) Educate your technicians and interns to become "filters" for the pharmacists, but don't let them overstep their boundaries and risk patient safety.

18) Always read the label, prescription, and drug container at least three times. This is called **Verification**[3].

19) Keep the final verification area away from the cash register, waiting area, and counseling window.

20) Have monthly meetings to discuss how work flow could be improved to reduce congestion, distractions, and improve patient safety.

21) Provide magnifying lens to aid in the reading of labels with very small print.

22) Make sure all lighting in the pharmacy is not casting a glare on computer screens used for data entry.

23) Store medication stock bottles in an organized and uncluttered area with at least one inch between bottles sitting side-by-side on the shelf.

24) Empower all pharmacy employees to make dispensing accuracy their responsibility, not just the pharmacists.

Computer Alerts

     As the number of prescriptions dispensed continues to increase, pharmacists are relying on pharmacy technicians to do more and more. First, patient safety should never be comprised by allowing pharmacy technicians to do "professional" functions or patient education. Technicians play an important role in the prescription department, but the pharmacist is ultimately responsible for everything that goes on in that pharmacy. Many pharmacists are allowing technicians to do the data entry work when filling a prescription. This allows the pharmacist to spend more time counseling and talking to the patient, but may create a potentially hazardous situation where medication errors can occur. This occurs when a technician encounters a computer alert (drug interaction, duplicate therapy, drug-disease state interaction, drug allergy, excessive dose, sub-therapeutic dose, refill too soon, etc.) that he/she overrides and continues data entry of the prescription information. Technicians are not in the position to make these types of clinical decisions. In addition, it is the responsibility of the pharmacist to do prospective DUR at the time the prescription is dispensed. Many times the only opportunity to do this is during the data entry phase of the dispensing process. There are a couple of problems with these types of computer alerts. The first one was just discussed, technicians and data entry personnel bypassing alerts and the pharmacist never sees them. The second is too many false alarms. This means that the pharmacist and technicians become complacent to these alerts because many are not clinically significant and become a "nuisance". This leads to bypassing all alerts, even those that are clinically significant and need to be acted on. Here are some suggestions provided by The Institute for Safe Medication Practices to deal with this issue:

1) One potential way to deal with false alarms is to control the sensitivity of the alerts within the system. Some systems will allow the user to control the "level" or "seriousness" of the alert for different drug interactions. Pharmacists can set some alerts with a higher priority message than

others. The downside to this is that some alerts may be missed by the pharmacist due to their downgraded status.

2) Use the medical and pharmacy literature to identify high-priority or clinical significant alerts and keep a list of them. Keep this list at the site where final verification of the prescription occurs and where data entry is done. Train technicians to notify pharmacists when one of the prescriptions on the list is being entered into the computer, so the pharmacist can be alerted that this drug may have the potential for some sort of drug interaction or contraindication. An example of this is Coumadin. Every Coumadin prescription should be carefully screened and evaluated by the pharmacist against the patient profile before dispensing. Lithium, cyclosporine, SSRIs, MAO inhibitors, and cardiac drugs also fall into this category.

3) Encourage pharmacy personal to report alerts that keep occurring and are not clinically significantly so changes can be made in the system.

4) Have the technicians notify the pharmacist as soon as possible when an alert pops-up on the computer system. Also, a written documentation system detailing the alert could be placed with the prescription as it proceeds through the pharmacy's work flow system to alert the pharmacist before the final verification. Some computer systems have the ability to print an "alert label" along with the prescription label that the pharmacist can review before dispensing the drug.

5) Require that pharmacists must review and authorize high-priority or high-significance alerts before data entry can proceed. There should be safeguards in place that will not allow interns and technicians to bypass these alerts. They must be viewed, acted on, and released by a pharmacist before data processing can continue. If the pharmacist bypasses the alert, documentation should be made in the computer system or on the prescription as to the reason why this was done.

6) Many computer systems will allow you to print a daily report of bypassed alerts. This will allow the pharmacist to retrospectively look at the most commonly bypassed alerts and take appropriate action. This may include education of the staff not to bypass certain types of alerts or the pharmacist can change the sensitivity of individual alerts within the system.

7) Even though these computer alerts can be distracting and annoying, never completely disable the alert system. You may miss that one clinically significant alert that could save a patient's life.

8) Make sure your alert system is up-to-date. Studies have shown that many pharmacies' alert systems are out of date. Keep up with the current medical literature as new interactions and contraindications are discovered and add them to your system.

9) Education is the key. Spend time with the pharmacy staff educating them why these alerts are important and when a pharmacist is needed to review the alert and intervene. When in doubt, have the staff ask the pharmacist what to do with an alert message.

Electronic Prescribing

Electronic prescribing or e-prescribing is being touted as a significant advance towards preventing medication errors. E-prescribing can accomplish this by effectively dealing with many potential medication errors such as bad handwriting, ambiguous prescriptions, omitted information, and improper terminology. Some e-prescribing systems come equipped with clinical-decision support systems that are linked to comprehensive drug databases that aid in appropriate prescribing. Some of the most sophisticated systems can: a) help prescribers stay up to date on formulary changes and insurance coverage issues, b) alert prescribers to the most appropriate treatment options based on evidence based medicine, current clinical guidelines and best practices, c) facilitate data exchange between health care providers, d) maintain up-to-date, accurate and unbiased drug databases for drug therapy selection, e) provide prescribers with computer screen alerts and prompts to be careful of look-alike drugs and dosages that exceed clinical guidelines, f) provide prescriber with patient specific allergy and drug interaction alerts to

help avoid potential adverse drug reactions, g) flag pre-existing conditions that would preclude the use of certain therapeutic options, and h) expedite refill requests from both patients and pharmacists.   There is no doubt that electronic prescribing can be very beneficial in preventing many types of medication errors. However, this new technology will only breed a new generation of medication errors that pharmacists and practitioners must become aware. Some of these include:

1) If a prescriber misspells the patient's name, the system may bring up the wrong patient. This can result in the prescriber ordering a prescription for the wrong patient.

2) A physician may forget to close one patient's record on the system before e-prescribing medications for the next patient. This could result in the first patient receiving prescriptions intended for the second patient.

3) Physicians may design their own "short-cuts" and enter them into the system to speed-up e-prescribing. For example: When prescribing amoxicillin 500mg, the physician only has to enter "Amox" and the system automatically brings up amoxicillin 500mg. Errors occur when the physician types Amox… and the system brings up the 500mg strength when actually the physician wanted the 250mg strength.

4) Physicians design their own "short-codes" for medication directions to speed-up prescribing. For example: The physician creates a short-code in the system called "CTID". Whenever this is typed into the system, the directions for the medication automatically inserts are "Take one capsule by mouth three times a day". Errors can occur when the wrong short-codes are chosen or misspelled.

5) Physicians setting "defaults" within the system. For example: A physician knows that 90% of his patients started on an ACE inhibitor are given enalapril 5mg, QD. This is set in the system as the default and automatically comes up on the prescribing screen. An error occurs when a patient is supposed to get a different strength of enalapril.

6) Like some pharmacists, prescribers turn-off some safety features of the system, such as drug interaction alerts or they get in the habit of just "entering" past them because many are clinically insignificant. This is sometimes referred to as "work-arounds".

7) A physician may inadvertently order laboratory tests instead of medications when options on the screen look like drug names.

8) The system is not kept properly updated with new clinical information as new clinical guidelines are introduced, new ADRs are discovered, and new drugs become available.

9) Individual prescribers can access the system's programming and can create overrides within the system. For example: A prescriber gets into the system and can override maximum dosage alert messages or delete them altogether.

As a rule, commercially available e-prescribing systems from large, reputable companies are better than "locally developed" or "in-house" systems by small companies. These locally developed systems allow for too many customized changes to be made by the user and may have not gone through the rigorous testing that systems from larger, more established companies have. Many Boards of Pharmacy require approval of e-prescribing systems before they can be used. This is done to eliminate potentially serious problems before they are used in practice. When a practitioner chooses an e-prescribing system they should ask several questions including: the number of prescribers/organizations that are using the system, what type of testing was done with the system, ability of the system to interface with pharmacy computers, can the system be customized for institution specific alerts, and what types of fail-safe procedures, alerts, and error messages are available with the system, just to name a few.   Pharmacists must be aware that e-prescribing will reduce many types of medication errors, but may lead to others we have not even dreamed of yet.

Medication Reconciliation

One of the biggest potential sources of medication errors is when patients transition from one point of care to another. The Institute for Healthcare Improvement estimates that bad communication or lack thereof could be responsible for as many as 50% of all medication errors and up to 19% of adverse drug reactions in hospitals. These transitions may include home care to hospital care, nursing home care to hospital care, hospital care to at home care, and at home to nursing home care are just a few examples of transitions in care where medication errors can occur. For example, a patient is stable on two medications for their hypertension: hydrochlorothiazide 12.5mg once daily and enalapril 5mg once daily. The patient enters the hospital for a routine procedure, such as gall bladder surgery, and experiences some type of hypertensive crisis while hospitalized. The patient is given a series of medications to control the problem. When discharged, the patient is sent home on medications for a problem that may have only been a one-time occurrence or acute problem during the hospitalization. The patient goes home on two new medications for their hypertension and continues therapy with hydrochlorothiazide and enalapril as before. This is a problem with medication reconciliation. In the same patient case, the patient may be switched to the hospital's ACE Inhibitor of choice, such as lisinopril, while the patient is in the hospital. The discharge doctor does not realize this and gives the patient a new prescription for lisinopril. The patient is now taking two ACE Inhibitors because proper medication reconciliation did not occur before discharge.

A study by the Mayo Clinic found that many patients know little about the medications they are prescribed when they leave the hospital.[7] In fact, 15% of patients did not know their physicians had even prescribed a new medication to take when going home and 33% of patients could not name their new medication(s). In addition, only 22% could name a serious side effect of the new medication and most patients stated that side effects were not even discussed with them before they left the hospital. Finally, more than one-third of patients did not even know the basics of these new discharge medications such as dose, how to take it, or what it was for. These are very alarming statistics and illustrate the need for medication reconciliation. Most health care practitioners agree that medication reconciliation is a problem, but are not sure how to properly implement strategies to deal with it. Even Joint Commission on Accreditation of Healthcare Organizations (Joint Commission) is having difficulty in dealing with it. In 2005, Joint Commission introduced medication reconciliation as one of its National Patient Safety Goals. In fact, National Patient Safety Goal 8 states healthcare organizations should "accurately and completely reconcile medications across the continuum of care". However, many healthcare organizations have struggled to meet this goal. This has led to Joint Commission to consider revising its requirements. In fact, Joint Commission's surveyor findings on National Patient Safety Goal 8 will not contribute to an organization's accreditation decision and will not appear on an organization's accreditation report. However, Joint Commission will continue to evaluate compliance with Goal 8 in order to provide data, refine requirements and contribute to process improvements. From these evaluations and meetings Joint Commission plans to have with health care providers and practitioners, Joint Commission hopes to release an improvement to Goal 8 that supports both the quality and safety of care. The implementation of the "new" Goal 8 should be in place sometime in 2011.

As health care professionals continue to struggle with this issue, what can pharmacists due to help implement a process that helps reduce medication errors. It is short-sighted to only include prescription medications in this process. Pharmacists should ask patients if they are taking any OTCs, vitamins, herbals, nutriceuticals, and home remedies. The process should begin with the pharmacist asking the patient for a current list of medications they are taking. Suggest to your patients that they should carry a current list of all medications with them at all times and give this

list to close family members and friends in case the patient is unable to communicate with healthcare providers.   Pharmacists should always update patient profile information in the computer on a regular basis and anytime the patient has transitioned from one care setting to another. Pharmacists should also use the medication reconciliation process to help identify transcription errors, omissions from the patient's chart or profile, and clarify misunderstandings regarding continuation of therapy after transitioning to another level of care.   Here is a simple stepwise process in developing a very basic medication reconciliation process at your pharmacy or institution.

Step 1: Have the patient provide a current list of all medications, including OTCs, herbal products, and vitamins that the patient takes on a regular basis. This may be difficult for some patients to provide. One option is to have them or a caregiver bring a bag with all the patient's medications to the pharmacy. Pharmacists sometimes call this a "brown bag program". **Step 2:** Have the physician responsible for the patient's care review and act on every medication on the patient's list. This will help reduce duplication of therapy and errors of omission**. Step 3:** Generate a list of new medications the prescriber wishes to begin in treating the patient. This should also include any OTC and "as needed" medications as well. **Step 4:** Review the two lists with prescriber to identify any discrepancies**. Step 5:** Repeat the same process any time the patient transitions from one level of care to another, always making sure the list is reconciled, updated and reviewed with the patient and caregiver.   **Step 6:** Communicate to the patient the importance of knowing what medications they are taking, how they are to be used, and what they are treating. Stress to the patient to keep an up-to-date list of medications and include any and all changes at the time they occur. **Step 7:** Offer assistance to the patient in helping them keep their medication list as current as possible. Healthcare professionals must realize that medication reconciliation is everyone's responsibility. The entire healthcare team, physicians, pharmacists, nurses, dieticians, etc, should all be involved in this process.

Other Error Reduction Strategies

1) ***The Independent Double Check*** - All pharmacists have been in the situation at one time or another where their "gut- feeling" was something was just not right. Pharmacists should always heed the warnings signals these feelings may be sending. One way to help deal with this is an independent double check. This is a system in which a high-risk or high-alert medication order or prescription is verified separately by two different pharmacists. This verification (dosage, calculation, prescription interpretation, directions, use, etc) is done alone and apart from each other. Each pharmacist comes up with their own results/conclusions and then they are shared with one other.   Pharmacies should develop a list of medications or processes (example: calculation of dosage adjustments) that should involve the independent double check system. It is often easy for an institutional pharmacist to find another pharmacist for a double check, but what about in a community pharmacy? This could be accomplished by having the double check done when another pharmacist comes into work later that day or by calling a reliable, "friend" pharmacist at another store.

2) ***Create a List of High-Alert Medications*** - High alert medications are those with the greatest potential to cause serious harm to the patient in the event of a medication error. Even though many of these medications are not commonly used, the potential for harm is significant. Through extensive research, The Institute for Safe Medication Practices has compiled a list of high-alert medications. These include: adrenergic agonists, adrenergic antagonists, anesthetics, antiarrhythmics, anticoagulants, chemotherapy drugs, hypoglycemics, inotropic drugs, sedatives and hypnotics, narcotic pain relievers, TPN solutions, and neuromuscular blockers just to name a

few.   Your pharmacy can create a list with other drugs on it as well.   These drugs should be well marked as high-alert drugs that require special attention. You may also use special labeling, markings, color-coding, and computer alerts to make all health care personnel aware the potential for serious harm when dispensing these medications to patients. Education and safety nets in the medication use process are the keys to prevention of medication errors with these drugs.

3) ***Textbook Errata*** - Pharmacists and physicians rely on textbooks and drug references to answer crucial drug information questions when they arise in practice. Incorrect information in some textbooks and/or outdated information have the potential to cause serious medication errors. The decisions health care professionals make are only as good as the source of the information. References should be reviewed on an annual basis for accuracy, whether they are outdated, and replaced accordingly. The Institute for Safe Medication Practice maintains a database of reports on drug reference errors at www.ismp.org/Errata/default.asp. Finally, many pharmacies have gone to on-line references as the sole source of drug information. If this is the case, all pharmacists should be very familiar with how to use these on-line systems before "hardcopy" references are totally eliminated from the pharmacy.

4) ***Labeling suggestions*** - The Institute for Safe Medication Practices has issued some guidance for medication labels to reduce errors. Some of their suggestions include: a) the minimum font size for patient name, drug name, and dose should be 12 point font and not to use italic, oblique, narrow, or condensed font to "fit all the directions on the label", b) use typographic cues (bolding and highlighting) for patient content only, c) maximize the amount of white space on the label to improve readability of the information on the label, d) use horizontal text only, e) use a white background for all labels, f) avoid awkward terms such as "twice"; instead use "two" or "2", and g) use simplified language and avoid medical jargon. Example: If the directions are: 1 tablet SL, type the directions as "Place one tablet under the tongue".

5) ***www.ConsumerMedSafety.org*** - The Institute for Safe Medication Practices has a brand-new website designed specifically for consumers. It is designed to help consumers take control of medication error reduction and prevention strategies. The website is a valuable resource to any consumer taking multiple medications and/or who wants to take an interest in their own healthcare. There are several pieces of the website that are worth mentioning. The website has a search feature where patients can enter the name of a prescription drug they are taking and the site searches for safety information and features of that drug. The Drug Alert section provides up-to-date information and alerts regarding safety issues with specific medications, newly identified problems, and issues with prescription and non-prescription drugs. The Safe Medicines section has great information about accidental poisonings and what to do in a poison emergency. Finally, the website has several other tools and resources for consumers, including mechanisms for consumers to confidentiality report medication errors and the ability for the consumer to received customized safety alerts on their own medications.

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> *The views contained in this program are not intended as legal advice. Pharmacists should always consult their own attorney or the Florida Board of Pharmacy when questions or issues regarding the practice of pharmacy arise.*

Continuing Education Test Questions Using the Test Answer sheet on the last page, please circle the correct response for each question. A passing grade of 70% must be obtained to receive continuing education credit. CE statements of credit will be mailed within 2 weeks of receiving your answer sheet.

1) Most medication errors are made by incompetent health care practitioners with a history of making multiple errors.

a) true   b) false

2) Once the root cause of an error has been determined, which of the following must be implemented to prevent future medication errors of this type?

a) an action plan
b) measurement strategy
c) assessment plan
d) a and b only
e) a, b, and c

3) Failure Mode and Effects Analysis (FMEA) occurs after an error has occurred and is very similar to root cause analysis.

a) true   b) false

4) Which of the following are true?

a) The primary goal of FMEA is to identify areas of potential failure in the medication use process.
b) Root cause analysis should focus on individual performance issues.
c) In FMEA, regular evaluation of counter-measures and processes implemented to prevent future errors should be conducted.
d) a and c are true
e) a, b, and c are true

5) Which of the following are true?

a) The fax machine in the pharmacy should be kept away from the final verification area.
b) Pharmacies should have monthly meetings to discuss how workflow could be improved.
c) ISMP has suggested that pharmacies should adopt a model similar to the Sterile Cockpit Rule by the FAA when checking and verifying prescriptions.
d) a and c are true
e) a, b, and c are true

6) Which of the following are potential causes for medication errors when pharmacist workload is low?

a) Boredom can make it harder for pharmacists to focus on the task at hand.
b) Sporadic prescription volume leads to difficulty in focusing on dispensing.
c) Slower prescription volumes do not allow pharmacists to get into a work flow rhythm.
d) a and c only
e) a, b, and c

7) Which of the following are ways to reduce medication errors caused by work area and work flow issues?

a) Prescriptions should be verified and checked in high traffic areas of the prescription department.
b) Drug bottles no longer in use should be returned to the shelf or discarded.
c) If you are interrupted while verifying a prescription, start the entire verification process over.
d) b and c only
e) a, b, and c

8) Which of the following are ways to reduce medication errors caused by work area and work flow issues?

a) Pharmacists should conform to the technician's work flow and habits.
b) Medication bottles should be stored with at least one inch between bottles sitting side-by-side on a shelf.
c) Always read the label, prescription, and drug container at least twice before dispensing.
d) a and b
e) a, b, and c

9) It is the responsibility of the pharmacist to do _____ at the time a prescription is dispensed.

a) prospective DUR
b) retrospective DUR
c) both

10) Which of the following are problems with computer alerts?

a) Technicians doing data entry bypass alerts and the pharmacist never sees them.
b) There are too many false alarms.
c) Computer alerts slow down the dispensing process, which causes more medication errors.
d) a and c
e) a and b

11) Which of the following are true regarding computer alerts?

a) Never completely disable a computer alert system, no matter how distracting it is.
b) Make sure your alert system is up-to-date.
c) Require pharmacists to review and authorize high-significance alerts before data entry can proceed.
d) a and c are true
e) a, b, and c are true

12) Even though electronic prescribing is being described as a significant advance in preventing medication errors, it will breed a new generation of medication errors.

a) true   b) false

13) Electronic prescribing can potentially eliminate which of the following types of medication errors?

a) Errors from bad handwriting
b) Prescriptions with improper terminology
c) Information that is omitted from prescriptions
d) a and b
e) a, b, and c

14) Which of the following are errors that e-prescribing systems have the potential to cause?

a) Errors when e-prescribing systems are not kept up-to-date.
b) Errors when physicians use short-codes for medication directions.
c) Errors when the prescriber forgets to close one patient's record on the system before e-prescribing for the next patient.
d) b and c
e) a, b, and c

15) In general, locally developed or "in-house" e-prescribing systems are better than those from large companies.

a) true   b) false

16) Medication reconciliation should take place anytime the patient transitions from one point of care to another.

a) true   b) false

17) Which of the following are true regarding medication reconciliation?

a) Joint Commission should have a new "Goal" regarding medication reconciliation sometime in 2012.
b) Only prescription medications should be included in the medication reconciliation process.
c) Most medical professionals agree medication reconciliation is a problem, but are not sure how to fix it.
d) b and c are true
e) a, b, and c are true

18) When the Independent Double Check is done correctly, each pharmacist does the verification alone and apart from the other pharmacist.

a) true   b) false

19) Which of the following may reduce medication errors on prescription labels?

a) The minimum font size for patient name and drug name should be 10 point font.
b) A colored background, such as yellow, should be used for all medication labels.
c) Use simplified language and not medical jargon.
d) a and c
e) a, b, and c

20) Which of the following are true?

a) Outdated textbooks, known as Textbook Errata, have the potential to cause serious medication errors.
b) The website www.ConsumerMedSafety.org has a feature where patients can search for safety information and features on their own prescription drugs.
c) Special labeling, markings, and/or computer alerts may help in reducing medication errors in high-alert medications.
d) b and c are true
e) a, b, and c are true

Continuing Education Test Answer Sheet

"Preventing Medication Errors:
Tips for Florida Pharmacists"
Florida Course #: 20-252063
C.E.U.s: 0.2
Contact Hours: 2 hours
Release date: 01/12/2010
Expiration date: 01/12/2013

1)   A   B   C   D   E

2)   A   B   C   D   E

3)   A   B   C   D   E

4)   A   B   C   D   E

5)   A   B   C   D   E

6)   A   B   C   D   E

7)   A   B   C   D   E

8)   A   B   C   D   E

9)   A   B   C   D   E

10) A   B   C   D   E

11) A   B   C   D   E

12) A   B   C   D   E

13) A   B   C   D   E

14) A   B   C   D   E

15) A   B   C   D   E

16) A   B   C   D   E

17) A   B   C   D   E

18) A   B   C   D   E

19) A   B   C   D   E

20) A   B   C   D   E

Questions? Contact us by email at
pharmacyeducationunlimited@yahoo.com
or by phone at # 937-309-5066.

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Email: _____

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Florida Pharmacist License #
_____

Program Evaluation:
Please use the following scale to answer the
following questions
        1 – Strongly Disagree
        2 – Moderately Disagree
        3 – Slightly Disagree
        4 – Slightly Agree
        5 – Moderately Agree
        6 – Strongly Agree

_____This program met learning objective 1.
_____This program met learning objective 2.
_____This program met learning objective 3.
_____This program met learning objective 4.
_____This program met learning objective 5.
_____This program met learning objective 6.
_____This program met learning objective 7.
_____ I learned a lot from this program.
_____ The information in this program is
        applicable to my practice setting.

Any other comments about this program:

_____

_____

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