

Medical Errors

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Purpose: The purpose of this course is to provide an overview of medical errors in today's health care system and what can be done to prevent medical errors.

Objectives

1. Discuss the impact of medical errors
2. Discuss different types of medical errors
3. List three steps to reduce medication errors in the hospital
4. List three steps to reduce errors in prescribing medications in an outpatient setting
5. Discuss the health consumers role in the reduction of medical errors

The World Health Organization reports that the United States has the 37th best health care system in the world (1). Medical errors are one fact that contributes to the dire state of our health care system. Over a two-year period 238,337 potentially preventable deaths were attributed to medical errors (2).

Medical errors are typically not related to one person – but they can be. More commonly errors occur because of the complex system that makes up American health care. Errors are not a result of bad people, but a bad system.

To understand the implication of medical errors it is important to understand the difference between a few common terms. A drug reaction is any adverse event associated with medications regardless of cause. Medical errors occur when something that was planned does not work out or the incorrect course of action was used.

Errors can be acts of commission, omission or near-misses. Errors of commission are a situation when the wrong action was taken. For example, prescribing an antibiotic that the patient is known to be allergic to. Errors of omission are a failure to take the correct action. For example, forgetting to order a cholesterol panel on a patient with diabetes is an example of an omission error. Near-misses are a situation where an error is just avoided. For example, a nurse is about to administer an antibiotic into a patient, but just before she opens the tubing she notices that it is the antibiotic for the patient in the next room.

Adverse drug reactions are situations that occur as the result of a medication. They are not necessarily errors. Many side effects or complications of therapy are known and may occur. Typically, the prescriber is aware of these reactions and decides that the risk of the adverse event is worth the benefit of the medication. It is estimated that 1.5 million people are admitted to the hospital and 100,000 deaths occur every year because of adverse drug reactions (3).

Errors occur in a variety of settings. They can occur in the hospital, doctor's office, surgery center, nursing home and pharmacy, just to name a few. One of the most common types of errors is medication errors. A medication error is a preventable occurrence that may cause or lead to improper use of medications or patient injury by a medication. More than 7000 deaths occur each year related to medications (3).

Medication errors occur at many different places along the medical continuum. The error could occur at the level of the prescriber: did he/she prescribe the drug correctly? If the medication is called in to the pharmacy: did the person who

called it in, call it in correctly? If a written script is turned in to the pharmacy: was it legible and interpreted properly by the pharmacy? Was it filled correctly at the pharmacy? Did the patient take it correctly?

As you can see there are many places that medication errors can occur. This article will outline multiple strategies to help reduce the risk of errors. In addition, efforts taken by different organizations – to improve the system and hopefully reduce errors – will be discussed.

While errors can occur in any health care setting, errors in the hospital are the best studied. Misdiagnosis is a common type of medical error. Again there are multiple places that this can go wrong. Did the doctor and nurse get an accurate history, perform an appropriate physical exam? Was testing ordered correctly? Was testing performed correctly? Did the patient accurately report his condition? Some patients lie or tell half-truths during the history part of the exam, leading to an increased chance of a missed diagnosis.

Cost

The total cost of medical errors is an estimated 17 to 29 billion dollars per year (3, 6). The cost comes from multiple areas. Costs of hospitalizing the patient, outpatient follow up care, diagnostic tests, medications to treat the error and health care provider's time all contribute to the financial impact of medical errors.

In a study of Medicare patients over three years, 1.1 million errors occurred and cost the Medicare program 8.8 billion dollars (2). Medical error rate was found to be 3 percent of all Medicare patients (2).

In addition to the monetary cost of errors, there are physical and psychological costs. Errors have the potential to leave a patient with a permanent physical ailment. It may lead to distrust of the health care system and drive some away from visiting doctors leading to poor utilization of the health care system and consequently worse health care.

Etiology

Many factors contribute to the medical errors. Fragmentation - the use of multiple medical specialists or medical systems to care for one individual – is a large contributor to errors. Information does not always follow patients – there is no one place that knows all about one patient's health. Fragmented health services are largely responsible for health care information not being centralized. One doctor caring for all of a patient's medical needs is not the norm in today's health care setting. Fragmentation leads to duplicate medications and services, which is not only costly, but increases the risk of medical error.

An individual with diabetes, heart failure, prostate cancer and depression could be seeing six different doctors including an endocrinologist, cardiologist, urologist, oncologist, psychiatrist and a primary care doctor. With this many doctors treating the patient there is risk for duplication of services – such as two different doctors doing the same test or two different doctors prescribing similar or duplicate medications – and too few tests being run (because one doctor assumes the other is running the test). Poor communication between the specialists is commonplace and one specialist often has no idea what the other specialist is doing (3).

While specialists are great resources, caution must be instituted when patients are noted to be seeing more than one or two doctors. It is typically the responsibility of the primary care doctor to coordinate services, but this often does not occur. Primary doctors are busy and may not know all of what is going on with each of their patients.

The use of a hospitalist is another piece of the health care system that leads to fragmentation. The hospitalist is a doctor specializing in the care of the patient who is admitted to the hospital. These groups of physicians are experts in care of hospitalized patients and provide excellent care.

The hospital is a time when the body is in a broken down state and care needs to be maintained or dire consequences will ensue. While hospitalists do a good job at caring for hospitalized patients they are typically not familiar with their patient's medical history.

It is critical to convey an accurate report of the medical history to the hospitalists. The hospitalist is not the primary care doctor and may not have access to all medical records. If the patient does not convey accurate information, disaster may ensue.

Fragmentation goes beyond just seeing different doctors. It includes the use of different pharmacies and hospitals. When a patient goes to get a medication filled at a pharmacy, it is important for the pharmacist to know what other medications the patient is on so interactions can be monitored for.

Table : Example of Fragmentation

Joan is a 56 year-old female who goes to a local hospital's urgent clinic when she came down with a urinary tract infection. The doctor at the urgent clinic prescribed trimethoprim-sulfamethoxazole (Bactrim DS) for 7 days. While this is a reasonable treatment; she died six days after starting the antibiotic.

She got the prescription filled at the hospital pharmacy, which was not her regular pharmacy. She went to a doctor who was not her regular doctor. She did a poor job at conveying her medical history. She forgot to mention that she was on warfarin (Coumadin). A strong interaction occurred between her warfarin and the Bactrim – leading to an extreme elevation in her international ratio (INR) causing a massive cerebral hemorrhage.

Was this a medical error? Yes. But, whose fault was it? Hard to say with this limited information, but likely a combination of four factors: the doctor not taking a good history, the pharmacy not taking a good history, the patient not conveying a good history, and the decentralized health care system.

Speed

Health care takes place at a rapid rate. Doctors are seeing a large volume of patients each day, pharmacists are filling a large number of prescriptions each day, and nurses are often caring for more patients than they should. Many health care providers are overworked. They need to work fast to meet the demands of administrators, patients and the financial bottom line. Unfortunately, when working at high rates of speed the risk of errors is increased.

Poor communication

Sometimes because health care providers are moving too fast, or have other things on their mind, listening to their patients is neglected. Good listening requires that the health care provider listen fully and hear their patient. In addition to listening, health care providers need to communicate information accurately and simply.

Table : Health care provider tips for good communication

- Do not use leading questions
- Do not have a preconceived notion
- Be aware of your time constraints
- Make sure you understand what the patient is saying, by repeating it back to him/her

Beyond communication with patients it is important to communicate well with other health care providers. Communication is critical to quality health care. When doctor's offices call pharmacies, radiology centers, other doctor's offices they need to convey accurate information in order to reduce errors.

Lack of knowledge

It is impossible to know everything in health care. Everyday health care providers are faced with situations where they do not know the answer. Sometimes decisions are made, without knowing for sure if the answer is correct.

Also, health care providers do not always follow recommended guidelines for screening. Not providing recommendations to patients regarding these

screenings results in morbidity and mortality - error of omission. For example, most diabetics should be on an aspirin. The doctor not recommending this to a diabetic who is a candidate for therapy is considered an error or omission. Whether it is from lack of knowledge or just forgetting to recommend it; it is an error.

It is almost impossible to be aware of every medication interaction; but, medication interactions are a common source of errors. The use of an electronic medical record, hand-held device or computerized physician ordering system may help identify potential drug interactions.

In addition, the pharmacy should alert the physician about potential drug interactions. Unfortunately, this is challenging for the pharmacy. When the patient has reached the pharmacy and gives the prescription to the pharmacist they expect to have their medication filled and be out the door in 15 minutes. If the pharmacist detects an interaction, he or she will need to call the doctor, get the doctor on the phone and discuss the findings. When calling the doctor's office, many times the doctor is preoccupied with another patient or another task. The way the system is set up is inconvenient to the doctor's office, the doctor, the pharmacist and most importantly, the patient.

Other Sources of Errors

Work schedules contribute to errors. Overworked attending physicians, residents and interns contribute to the problem. Nursing shortages often necessitate nurses picking up extra shifts or working a double shift. When health care providers are tired and fatigued, they are more prone to make mistakes.

In addition, traveling nurses may cause errors. Traveling nurses are not given a complete orientation to the hospital that they are in and consequently may not be as prepared to care for patients. These nurses spend more time trying to figure out mundane details; such as where do they keep the intravenous tubing, what is the attending physician's phone number, and how to order a meal for their patient – which leaves less time for patient care. This time crunch may contribute to medical errors.

Errors and Kids

Medication errors are much more common in children and are more likely to be harmful. The risk of adverse drug events in children in the hospital is about three times as high as hospitalized adult patients (4). Like the elderly, children are physiologically less able to tolerate a medication error.

What makes kids more prone to errors? Most medications were developed for adults; children may need specialized adjustment in the medication dose which increases the risk of an error. Health care settings are built around the needs of adults and not kids (5). In addition, some health care providers are not as familiar with pediatric protocols.

Communication is also a concern. Many pediatric patients are unable to tell the health care team they are experiencing an adverse event (5).

What types of errors occur in kids? The most common type of error is an improper dose, followed by omission errors, incorrect medication, prescribing error, improper administration technique, incorrect time, improper preparation, incorrect dose and wrong route (5).

The underlying causes of the errors are variable. The most prevalent underlying cause was performance deficit, followed by knowledge deficit, not following protocol, miscommunication, calculation error, computer entry error, improper monitoring and documentation errors (5).

The Hospital

The Institute of Medicine estimates that 44,000 to 98,000 Americans die each year by mistakes in the hospital (6). The error rate may be significantly different depending on the hospital. Top-performing hospitals were 43 percent less likely to make a medical error than the lowest rated hospital (2). In addition to death, other complications and increased health care costs contribute to the dire state of the American hospital system. Complications, including errors, cost the American health care system billions of dollars each year.

The hospital is a dangerous place. The risks of hospitalization can be subdivided into complications of hospitalizations, errors and iatrogenic disease (3). Complications are additional medical problem that results from some aspect of medical care.

Errors – a type of complication - are mistakes that doctors, nurses or other staff members commit. The line between errors and complications are sometimes blurred. When a known complication to a medication occurs, but it may not have been monitored for appropriately, it is typically written off as a simple complication, but it more accurately should be labeled as an error (see Table 3). Iatrogenic disease, defined as disease produced by doctors or other health care workers, runs rampant in the hospital and is often related to errors.

Improper hand washing, improper technique on a sterile procedure or lack of monitoring can all be forms of iatrogenic disease.

Table : Example of a Complication/Error

Scenario #1

Mary is a 72 year-old nursing home resident, who is admitted to the hospital for pneumonia. She is treated with azithromycin and ceftriaxone and responds well to therapy. Her pneumonia clears, but on day five of the hospitalization her white blood cell count spikes and the next day she develops diarrhea. The stool is positive of *Clostridium difficile*.

This is not a medication error, but it is a complication that arose from a medication.

Scenario #2

Mary develops the diarrhea on day five of antibiotic treatment for pneumonia, but since her pneumonia is clinically improved she is discharged back to the nursing home with an order for Imodium and a repeat lab draw for a complete blood cell count in one week.

Her diarrhea is somewhat controlled on admission to the nursing home, but she needs the Imodium at least three times a day. No one questions this as abnormal.

After her blood count shows a significant leukocytosis (after one week), her stool is checked for *Clostridium difficile*. The sample is positive and she is treated.

In scenario #2, there is both a complication and an error. It is labeled as an

error because the symptom of diarrhea was not managed properly.

Medications

Complications from medicine can be broken down into errors, side effects and adverse events. Side effects are reactions that result from a medication or treatment. Many times side effects are expected but the doctor decides that the risk of the side effect is worth the benefit of the treatment. All medicines have side effects, but some are much more dangerous than others. In order to prevent errors as a consequence of side effects, it is important to understand what common side effects of medications are and which side effects need to be watched for closely. Some common medicines used require special attention. Below are listed some common side effects, that if not monitored properly can lead to adverse events that may be deemed medical errors.

- Some antibiotics have the potential to cause diarrhea, but diarrhea can be a sign of a complication – *Clostridium difficile*. If diarrhea is let to go on for a while without checking for *Clostridium difficile* and it is present, an error has occurred.
- The aminoglycoside antibiotics gentamicin or tobramycin can cause kidney damage or hearing loss. If not monitored for appropriately than an error has occurred.
- Antihypertensive medications need to be monitored closely for side effects including low blood pressure, falls, dehydration and with some antihypertensive medications electrolyte disturbances.

- Non-steroidal anti-inflammatory medicine can lead to a gastrointestinal bleed or kidney failure.
- Narcotic pain medicines can cause confusion, dizziness and falls. An error would be if the nurse assess that the patient is becoming increasingly confused after treatment with narcotic medications and does not report this to the prescriber and then an adverse event occurs, such as a fall.
- Prednisone can thin bones, raise blood sugar or cause weight gain. An error would be if a patient has been on long-term steroids and has not been treated for or monitored for osteoporosis/osteopenia and then the patient falls and breaks a hip.

Admission errors

Admission to the hospital is a common place where medication errors occur. Patients are often admitted to the hospital by a physician who is unfamiliar with his or her past medical history. Therefore, the admitting doctor often relies solely on the patient's report of medications when prescribing medications that the patient will take in the hospital. If the patient does not provide an accurate list of medications then he or she will not get all of the medications necessary to keep their body in balance. Patients who are admitted to the hospital are in a weakened state due to their underlying illness and usually need most of the medications that they are on at home to keep their body balanced. At times one of the medications from home may be contributing to the problem and unless the admitting clinician is aware of all of the patient's medications, appropriate assessment and treatment will not be possible.

Health care providers need to be diligent about getting an accurate history from the patient. In addition the patient needs to take responsibility to give an accurate medical and medication history – this should include a written list of all medication currently taken by the patient.

Nursing errors

Patients getting the wrong medications are another form of error common in hospitalized patients. In the hospital, nurses are very busy and care for multiple patients who they are often unfamiliar with. Patients getting the wrong medicine are an occurrence that can be prevented.

In the hospital errors often result from lack of attention rather than lack of knowledge. The nursing staff is often overworked and may make an error in administering medicine.

Nursing home patients are prone to errors. The rate of adverse drug reactions is 9.8 per 100 resident-months with almost half of these being preventable (7). The most common area of errors occurs during ordering and monitoring medication use. Certain drugs are more risky and special caution should be used when patients are noted to be on them. They include: anticoagulants, diuretics, antiepileptic, and antipsychotics (7).

Another study looked at 18 nursing homes, which showed 546 medication related injuries. One death, 31 life-threatening events, and 208 serious injuries occurred. In addition, there were 80 near misses (15).

Multiple strategies are recommended to reduce medication errors in the nursing home. Improved surveillance and monitoring will help detect errors and

improve strategies to reduce future errors. Improved education among nursing home staff in the form of continuing education is another strategy. Improvements in the system will help reduce the number of errors.

Discharge

Errors on discharge are common. When being discharged from the hospital the patient receives discharge instructions including a list of medications. It is important to assure that this list is complete and accurate. Oversights and omissions occur even with the best-intentioned health care providers (3).

Follow up appointments can get missed after discharge. Discharge instructions should include a scheduled appointment with the health care provider or a number to call to set up that appointment. This point needs to be reinforced. This can mean the difference between life and death. New medications are often started in the hospital and require outpatient monitoring to assure they are not only effective but also not causing any life threatening complications (See Table 4).

Table : Example of an error on discharge

<p>Lucy, a fifty-six year old female, is being discharged from the hospital after a myocardial infarction. While in the hospital it was determined that her heart attack led to systolic heart failure. She was placed on a number of new medications including: lisinopril 20 mg once a day, metoprolol XL 50 mg once a day, and spironolactone 50 mg once a day. Two weeks after hospital discharge, her husband could not wake her up. The cause of death was cardiac arrest secondary to hyperkalemia.</p>
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She was supposed to have a follow up appointment with her cardiologist one week after discharge which she did not know about. The nurse who discharged her from the hospital did not highlight this point on the discharge sheet, even though it was written.

If she had this appointment it is likely that she would have had hyperkalemia diagnosed and her medications adjusted so the level would not have risen so high as to cause cardiac arrest.

In addition, it would have likely been noted that the dose of spironolactone that the physician prescribed was only 25 mg once a day. The combination of the incorrect dose of spironolactone, with lisinopril and not having proper follow-up led to the hyperkalemia and subsequent death.

Errors in Other Settings

The causes of medication errors are varied and vary by health care setting. In the outpatient setting a common error is the pharmacist filling the wrong prescription due to inability to read the physician's handwriting. Patients not understanding the instructions to take the medicine are another common cause of error. Effective communication between the prescriber, pharmacist and patient can reduce errors in the outpatient setting.

Certain medications are more likely to cause adverse events in outpatient setting and require more diligent monitoring. These errors can be serious resulting in hospitalization and even death. Medications that need to be watched closely include: cardiovascular agents, analgesics, and hypoglycemics (8). Common effects that can occur are overdiuresis with diuretics, hypoglycemia with

diabetic medications and gastrointestinal bleeding with non-steroidal anti-inflammatory medications. Common problems include prescribing the wrong medication and not monitoring the patient carefully.

Prescribers and patients need to communicate well. Poor communication is a major source of medication errors in the outpatient setting. Patients should be encouraged to ask questions (Table 5) and take notes on any new drug prescribed by the doctor. The more informed the consumer is the less likely an error will occur.

Table : Questions for patients to ask prescribers about newly prescribed medications (3)

- What is this medicine for?
- Does my age affect the dose needed to treat me properly?
- Are there any restrictions with this drug? For example, could this make me drowsy so I should not drive after taking the drug?
- How will it help me? How will I know if it is working?
- When should I take the medicine? In the morning, at night etc.
- Should I take the medicine with food or on an empty stomach?
- What are the common side effects with this medicine? Are the benefits of this drug worth the side effects and drug interaction?
- Are there any necessary follow-ups either by exam or laboratory evaluation for monitoring this medicine?
- How long will I need to take this medicine? Will I be on this drug for life? Will we be able to discontinue it at some time?

- How much does it cost? Are there any cheaper alternatives to this medicine? Is there a generic version that has equal effectiveness?
- Can this medicine interact with any of my other medicines?
- How long has this medicine been on the market?
- Are there any severe risks with this medicine?
- What should I do if I miss a dose of the medicine?
- Can I drink alcohol while on this medicine?

What can be done about medical errors?

Reducing the number of medical errors is an important part of improving the American health care system. There is a three tier approach to reducing the number of errors. The first is an overall improvement in the health care system. Currently, there is a national focus with health care leaders working to collect data, enhance knowledge to reduce the number of medical errors. The second is an effort on each individual health care provider to provide safe and effective care. Lastly, each patient needs to be an active consumer of health care.

Improvements can be made; hospitals and clinicians need to adopt a culture of change. A recent study on hospital errors showed that if the worst performing hospitals performed as well as the best performing hospitals then 220,106 incidences could have been prevented and 37,214 deaths could have been prevented. This would have saved the health care system approximately 2 billion dollars (2).

In order to hold hospitals accountable to maintaining good quality care the Center for Medicare and Medicaid Services will cease reimbursing hospitals for the treatment of certain errors such as leaving objects in the body after surgery.

Health care leaders are aware of the problem and are taking steps to correct it. In 2000, the United States Department of Human Services along with other agencies put together a task force with the main goal of reducing medical errors (9). One of the agencies on this panel is the Food and Drug Administration (FDA). Placing bar codes on all drugs in the hospital to help assure that each patient receives the right drug is one intervention that is being implemented. This rule took effect in 2004. Also, the FDA reviews drug names carefully and avoids similar sounding medications (9).

The task force also improved drug labeling. There is now improved labeling on over the counter medications in an effort to help consumers choose over the counter medications more wisely (9).

The task force is also tracking medication error reports. The FDA reviews approximately 300 medication error reports every month. This information is used to improve labeling and provide education (9).

Although not universal, there is an increased use of electronic prescribing and typed prescription. This will reduce the chance that the pharmacy will misread the prescription.

The Leapfrog group is one organization that represents health care purchasers. They are working to implement computerized order systems and helping consumers find the best hospitals by making rating information public

knowledge (www.leapfroggroup.org). In addition, they are working to get hospitals staffed appropriately. For example, getting doctors specifically trained in intensive care to work in intensive care units instead of general physicians (13).

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) are encouraging physicians to follow standards for major diagnoses such as heart attack, heart failure and pneumonia (10).

What can the individual health care provider do? A lot. The first step is to be diligent and careful when administering medications, treatments, diagnostic tests or any intervention.

Awareness is another key factor. Be aware of common orders that may lead to errors. Similar sounding and appearing medication (See table 6), the use of abbreviations, medication interactions, poor handwriting, confusing drug labels, lack of knowledge are all potential causes of errors.

When prescribing medications health care providers can reduce the risk of errors. Writing legibly or using a computer generated prescription is helpful. Writing the reason for the medication will serve a double check to assure that the patient is getting the correct medication.

Table : Similar Sounding or Appearing Medications

Celebrex (celecoxib)	Celexa (citalopram)
Zantac (ranitidine)	Zyrtec (cetirizine), Zyprexa (olanzapine)
Lamictal (lamotrigine)	Lamsil (terbinafine)
Avandia (rosiglitazone)	Coumadin (warfrin)
Diovan (valsartan)	Darvon (propoxyphene)
Flomax (tamsulosin)	Fosamax (alendronate)
Tegretol XR (carbamazepine)	Toprol XL (metoprolol succinate)

Awareness of which medications are prone to error will help the clinician. When one of these medications is seen the health care provider should use extra caution. The most common harmful medication errors include: diltiazem, warfarin, potassium chloride, heparin, insulin, morphine, fentanyl, hydromorphone, vancomycin and enoxaparin (11).

Other strategies to reduce the number of errors include double checking one's work. Having another health care provider checking it will help assure accuracy.

In addition, the use of abbreviations should be avoided. Instead write out all instruction. Do not use "qd"; instead write out "everyday".

It is important for health care providers to not hide from their errors but learn from them. Tracking errors and having discussion about them will help staff develop a system that will teach providers how to be better workers and improve the system to help assure that it is as safe as possible (9).

Medication orders should almost always be written by the prescriber. Verbal/telephone errors are a large source of errors within the health care system. In an emergency situation the use of a verbal order is appropriate. In this situation the nurse taking the order should read back the order to the prescriber.

Another common source of error is when medications are called into pharmacies. When calls go directly to the voice mail system it eliminates the possibility for the read back. When calling in medications on the voice mail system it is essential to speak clearly and state the purpose of the medication to limit the number of errors.

Caution is important when writing medications as well. The best strategy is to use electronic prescribing or computer generated prescriptions. If not using these systems than print clearly; do not use cursive. Write both brand and generic names. Do not use abbreviations. Write out the full directions on how to take the medication. Record the reason for the medication. Lastly, include the dosage of the medication.

The use of computers can greatly reduce the risk of prescription errors. When entering new prescription some computerized physician ordering systems will cross check with other medications to see if there are any interactions.

Prescribers, nurses and pharmacists should spend time teaching patients about their medications. If the patient is aware of what he/she is taking and why, he or she will be more compliant. Moreover, an informed consumer will act as another safety net if there is an error in filling the prescription. Encourage the

patient to write this information down. This will not only help the patient retain the information, but will act as a back-up if there is a mix up at the pharmacy.

The Agency for Healthcare Research and Quality lists 20 tips to help prevent medical errors (12). The first step that they recommend is that each health care consumer becomes an active member of his/her health care team. This is partly done by making sure that health care consumers maintain a personal medical record including a listing of all medical diagnoses, medications taken and surgeries (3).

In addition the patient should understand each medication that they are on, how to take it and any side effects. When in the hospital –choose one that is safe and experienced at the condition the patient is there for. Patients have the responsibility to (12):

- Make sure all caregivers wash their hands when caring for them
- Communicate well with providers and maintain a list of questions and concerns
- Review discharge medications with the prescriber

In an outpatient setting the patient has a large responsibility in reducing medication errors. The first step is that they need to be educated that medication errors may occur. Patients need to know the name of the medication, the dose, the reason for taking it, and how to take it. The medication should be looked at when it is received in the pharmacy for accuracy. Any concerns should be addressed right there. Insist that the pharmacist review the medication with the patient.

Pediatric Interventions

As discussed earlier pediatric patients have special concern when it comes to errors, especially medication errors. Training of staff is critical if they are going to take care of pediatric patients. This is an especially important intervention for those health care providers working in a general hospital. Those health care providers who generally take care of adults, who get floated to care for pediatrics patients, are at increased risk for making an error.

Some strategies to reduce errors in the pediatric population include:

- Limiting the number of dosages and concentrations of medications
- Make sure all pediatric patients are weighed
- Make sure a pediatric pharmacist is available at all times
- Have a pediatric clinical expert available, such as a pediatric clinical nurse specialist

Conclusion

Medical errors are a major problem in health care. Typically the problem is a system problem and not necessarily the result of one individual. The system needs to be fixed and the government and other organizations are working to improve the system. None the less, each individual health care provider needs to be aware of common errors and be aware of steps to prevent them.

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