



**Medical Errors: Identification and Prevention**

**State of Florida Mandatory Training**

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**Answer Sheet: Medical Errors: Identification and Prevention**  
**State of Florida Mandatory Training**

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## Objectives

Upon completion of this course, the learner will be able to:

- Discuss the extent of the problem of medical errors in healthcare.
- Discuss the definition of medical errors.
- State the professional actions that most frequently result in medication errors.
- Identify patient safety organizations working on the issue of medical errors.
- Discuss disclosure of medical errors.
- Identify priority patient safety interventions promoted by the National Quality Forum that can help to minimize and/or mitigate medical errors.

## Introduction: Scope of the Problem

The safety of the patients in our care and treatment is an important goal during all healthcare encounters. Early studies in the 1960s already pointed to healthcare related errors as a problem for healthcare consumers. However, it was the startling report in 1999, from the Institute of Medicine (IOM) *To Err is Human*, that served as a wake up call for healthcare professionals, multiple public and private healthcare and healthcare-related organizations, state legislatures and the federal government. The IOM report estimated that between 44,000 and 98,000 deaths annually are a result of medical errors; more than half of the adverse medical events occurring each year are due to **preventable** medical errors, causing the death of tens of thousands. The cost associated with these errors in lost income, disability, and healthcare costs is as much as \$29 billion annually.

Healthcare is unique for a variety of reasons, including the universal vulnerability of all of us when we become patients and must rely on healthcare professionals to provide - at a minimum - competent services. The consequences of medical mistakes are often more severe than the consequences of mistakes in other industries. Imagine for a moment that the wrong tickets were provided to a patron at a concert: inconvenient and infuriating, yes; life threatening, no. Errors in healthcare can lead to death or disability rather than inconvenience on the part of consumers. This high risk underscores the need for aggressive action to resolve these errors.

Since the IOM report was issued, the issue of patient safety has been in the forefront of the healthcare literature, with multiple healthcare organizations putting significant resources into safety interventions. According to the *Third Annual Patient Safety in American Hospitals Study* (p. 4, 2006):

- “Approximately **1.24 million total patient safety incidents** occurred in almost 40 million hospitalizations in the Medicare population. These incidents were associated with **\$9.3 billion of excess cost** during 2002 through 2004. For the second year in a row, patient safety incidents have **increased**—up from 1.14 and 1.18 million reported in the *First and Second Annual Patient Safety in American Hospitals* studies, respectively.
- Of the **304,702 deaths** that occurred among patients who developed one or more patient safety incidents, **250,246** were **potentially preventable**.
- Medicare beneficiaries that developed one or more patient safety incidents had a **one-in-four chance of dying** during the hospitalization during 2002-2004. This rate remains unchanged since the first study was released July 2003.

- Wide, highly significant gaps in individual patient safety incidents and overall performance exist between the top and the bottom performing states during 2002-2004.
- Minnesota, Wisconsin, Iowa, Michigan and Kansas ranked as the top states for hospital patient safety during the period studied.
- New Jersey, New York, Nevada, Tennessee and District of Columbia, ranked last for hospital patient safety during the period studied.
- Compared to the worst state (N.J.), the best state (Minn.) had an overall almost 30-percent lower relative risk of developing one or more of the 13 patient safety incidents in its hospitals. However, performance variation between best and worst state was even more significant with individual patient safety incidents. For example, patients had an almost 92-percent lower relative risk of developing post-operative physiologic and metabolic derangements (post-operative delirium) in the top state compared to the bottom state.
- When compared to the *Second Annual Patient Safety in American Hospitals* study, the rates of six key quality improvement focus areas remained unimproved in 2004. Focus areas include metabolic derangements, post-operative respiratory failure, decubitus ulcer, post-operative pulmonary embolus or deep vein thrombosis, and hospital-acquired infections. These six areas continued to **worsen** on average by almost 12 percent or more over three years (2002 through 2004).
- **The patient safety incidents with the highest incidence rates** continued to be failure to rescue, decubitus ulcer, and post-operative sepsis. Failure to rescue improved 13 percent during the study period, while postoperative sepsis worsened by almost 25 percent.”

In July, 2006 the IOM issued another report on errors in healthcare. This report, *Preventing Medication Errors*, focused specifically on the high rates of medication errors. Most Americans have taken medication at one time or another. It's estimated that in any given week four out of every five U.S. adults will use prescription medicines, over-the-counter drugs, or dietary supplements, and nearly one-third of adults will take five or more different medications (IOM, 2006).

Some of the harm done by medications can be anticipated, as they are the potential side effects that may be caused by the medications. The potential benefit of using the medication is determined by the patient and prescriber to be worth the risk of the side effects which may be possible with the use of a particular medication. However, some adverse drug events (ADEs) occur as injuries that happened because of an error in prescribing, dispensing or administering a medication. Such errors can be prevented.

The findings of the IOM study are that medication errors are quite common-and that they are very costly to the population. At least 1.5 million preventable ADEs occur in the U. S. each year. The true number may be much higher. ***A hospitalized patient in the US can expect to be subjected to more than one medication error per day!***

### **Defining Medical Errors**

The National Patient Safety Foundation (NPSF), in 2003, defined patient safety and healthcare error (NPSF, 2005):

**Patient safety** is the prevention of healthcare errors, and the elimination or mitigation of patient injury caused by healthcare errors.

**A healthcare error** is an unintended healthcare outcome caused by a defect in the delivery of care to a patient. Healthcare errors may be errors of commission (doing the wrong thing), omission (not doing the right thing), or execution (doing the right thing incorrectly). Errors may be made by any member of the healthcare team in any healthcare setting.

There is no universal definition of medical errors. The many healthcare organizations that are currently focused on healthcare errors do not all define medical errors in the same way. Sometimes medical errors are called something other than an "error". Other terms or words used to identify a medical error include (Kirker, 2003):

- Adverse event, adverse outcome;
- Medical mishap, unintended consequences;
- Unplanned clinical occurrence; unexpected occurrence; untoward incident;
- Therapeutic misadventure; bad call;
- Peri-therapeutic accident;
- Sentinel event;
- Iatrogenic complication; iatrogenic injury;
- Hospital acquired complication.

### Classifications of Medical Errors

There are many possible ways to categorize medical errors, but no universally accepted taxonomy. Classifications have included (QuIC, 2000):

- Type of health care service provided (e.g., classification of medication errors by the National Coordinating Council for Medication Error Reporting and Prevention).
- Severity of the resulting injury (e.g., sentinel events, defined as "any unexpected occurrence involving death or serious physical or psychological injury" by the Joint Commission on Accreditation of Healthcare Organizations [JCAHO]).
- Legal definition (e.g., errors resulting from negligence).
- Type of setting (e.g., outpatient clinic, intensive care unit).
- Type of individual involved (e.g., physician, nurse, patient).

Implicit in the current variety of classifications is the understanding that different types of medical errors are likely to require different solutions and preventive measures. A single approach to error reduction will fail because it does not account for important differences in types of errors. For example, for the Food and Drug Administration (FDA) product risk may be a crucial dimension in shaping regulatory policy related to patient safety, but an individual healthcare provider may see product risk as a minor consideration in shaping her/his own error-control interventions and methods (QuIC, 2000).

### Medication Errors: A Category of Medical Errors

Medication errors are a category of medical errors; they are a major source of medical errors. Medication errors can occur in every step of the process: procuring the medication, prescribing, dispensing, and administering the medication, as well as during the monitoring of the impact of the medication on the patient. The IOM (2006) report, *Preventing Medication Errors*, identified that most frequently errors occur during medication prescribing and administering. This is particularly important for prescribers such as physicians, and where applicable, nurse practitioners, nurse midwives, clinical nurse specialists, nurse anesthetists, pharmacists, physician and specialist assistants, as well as those who administer medications such as registered nurses (RNs) and where applicable, licensed practical or vocational nurses (LPNs or LVNs), or medication technicians.

Medication errors are costly to everyone - patients and providers, families, employers and societies, hospitals and insurance companies. Although it is difficult to estimate the cost of medication errors, estimates are that each preventable error adds about \$8,750 to the cost of any hospital stay, making the annual cost of medication errors about \$3.5 billion! This estimate does not account for the cost of pain, suffering and lost earnings (IOM, 2006).

## **What Have We Learned Since the First IOM Report on Medical Errors**

### Patient Safety Organizations

Medical errors and patient safety have been the focus of multiple patient safety organizations. Their task is to collect data, assess it for trends, and make recommendations to hospitals and others about ways to prevent future mistakes. The US Department of Health and Human Services collates the data and is charged with disseminating best practices. Some patient safety organizations are:

- Agency for Healthcare Research and Quality

The Agency for Healthcare Research and Quality (AHRQ) is a federal agency whose mission is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans.

- National Quality Forum

The National Quality Forum (NQF) is a private, not-for-profit membership organization created to develop and implement a national strategy for healthcare quality measurement and reporting. It is a unique public-private partnership with broad participation from more than 260 organizations that represent all sectors of the health care industry, including health care providers, consumers, employers, insurers, and other stakeholders. Among its members are the AARP, AFL-CIO, the American Hospital Association, the American Medical Association, the American Nurses Association, the American Society of Health-System Pharmacists, the Ford Motor Company, and General Motors.

- [Institute of Safe Medication Practice](#)

The Institute for Safe Medication Practices (ISMP) is a nonprofit organization that works closely with healthcare practitioners and institutions, regulatory agencies, professional organizations and the pharmaceutical industry to provide education about adverse drug events and their prevention.

- [Institute of Medicine](#)

The Institute of Medicine (IOM) is a nonprofit organization of the National Academies for science-based advice on matters of biomedical science, medicine, and health.

- [Centers for Medicare and Medicaid Services](#)

The Centers for Medicare and Medicaid Services (CMS) is a government agency that administers the Medicare program and is responsible for the administrative simplification standards from the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and quality standards in health care facilities through its survey and certification activity.

- [Joint Commission on Accreditation of Healthcare Organizations](#)

The Joint Commission (JCAHO) evaluates and accredits more than 15,000 health care organizations and programs in the United States. An independent, not-for-profit organization, the Joint Commission is the nation's predominant standards-setting and accrediting body in health care.

- [Institute of Healthcare Improvement](#)

The Institute for Healthcare Improvement (IHI) is a not-for-profit organization driving the improvement of health by advancing the quality and value of health care.

### Sample Patient Safety Intervention

In December, 2004 the Institute for Healthcare Improvement launched the *100,000 Lives Campaign* (MSNBC, 2006). This campaign focused on the institution of 6 best practices that have been identified in support of patient safety. The goal was to enroll at least 2,000 US hospitals with the goal of implementing 6 safety interventions:

- **Activate a Rapid Response Team** at the first sign that a patient's condition is worsening and may lead to a more serious medical emergency.
- **Prevent patients from dying of heart attacks** by delivering evidence-based care, such as appropriate administration of aspirin and beta-blockers to prevent further heart muscle damage.
- **Prevent medication errors** by ensuring that accurate and continually updated lists of patients' medications are reviewed and reconciled during their hospital stay, particularly at transition points.
- **Prevent patients who are receiving medicines and fluids through central lines from developing infections** by following five steps, including proper hand washing and cleaning the patient's skin with chlorhexidine.
- **Prevent patients undergoing surgery from developing infections** by following a series of steps, including the timely administration of antibiotics.
- **Prevent patients on ventilators from developing pneumonia** by following four steps, including raising the head of the patient's bed between 30 and 45 degrees.

The *100,000 Lives Campaign* ended on June 14, 2006. Approximately 3,100 hospitals participated in the project, sharing mortality data and carrying out evidence based procedures that prevent infections and mistakes. It is estimated 122,300 lives were saved during that 18 month period of the Campaign.

### State and Federal Laws Regarding Patient Safety

State legislatures throughout the country as well as Congress have joined the effort to promote patient safety and reduce medical errors.

In 2005, the federal *Public Health Service Act* was amended to include the newly passed *Patient Safety and Quality Improvement Act*. It called for the establishment of a voluntary reporting system whereby healthcare practitioners or hospitals could voluntarily report mistakes to patient safety organizations (PSO). Patient safety data was designated as privileged and confidential, but the law permits certain disclosures of patient safety data, such as:

- Voluntary disclosures of non-identifiable data;

- Disclosures of data containing evidence of a wanton and criminal act to directly harm the patient;
- Disclosure necessary to carry out patient safety organization or research activities; and
- Voluntary disclosures for public health surveillance.

Despite the limited improvement on the national level regarding patient safety, some states have become champions of patient safety, while others have taken little action. There is wide variation among the states regarding patient safety laws.

The state that ranked number one in patient safety in the *Third Annual Patient Safety in American Hospitals Survey* (2006) is also the state that has the most progressive legislation regarding patient safety. Minnesota was the first state, in 2003, to legislate mandatory and public reporting of patient adverse events. This law required the use of the National Quality Forum's 27 reportable adverse events (see appendix B).

The Agency for Healthcare Research and Quality (AHRQ) (2006) has developed patient safety indicators (PSIs), a set of measures that can be used with hospital inpatient discharge data to provide a perspective on patient safety. These are the measures that the *First through Third Annual Patient Safety in American Hospitals* report used to identify the states with the best and worst patient safety data (AHRQ, 2006).

The *Third Annual Patient Safety in American Hospitals Survey* (2006), again identified differences regarding patient safety from state to state. They identified:

- 16 states performed statistically significantly better than expected. These states were identified as:
  - Minnesota, Wisconsin, Iowa, Michigan, Kansas, Indiana, Ohio, Pennsylvania, South Dakota, Montana, Utah, Florida, Washington, Connecticut, and Arizona.
- 10 states performed statistically significantly worse than expected. These states were identified as:
  - New Jersey, New York, Nevada, Tennessee, District of Columbia, New Mexico, Maryland, Arkansas, Hawaii, and California.
- The remaining 25 states performed as expected.

### **Medical Errors in the State of Florida**

In the *Third Annual Patient Safety in American Hospitals Survey* (2006), the state of Florida ranked 13<sup>th</sup> among the 50 states and the District of Columbia in overall patient safety. It was ranked as one of the top 15 states that performed statistically significantly better than expected.

Florida health officials have been collecting data on medical mistakes from hospitals and walk-in surgery centers since 2001. The reports do not include hospital names; they identify aggregate data only. Despite the good ranking that Florida received in the *Third Annual Patient Safety in American Hospital Survey* (2006), data collected by Florida officials indicate that more than 1,000 patients died in Florida hospitals from adverse events between January 2001 and June 2004. Additionally, nearly 400 patients have needed surgery to remove a sponge or other object left inside them in a prior operation (Gaul, Washington Post, 2005).

Several high profile cases of medical error have occurred in the State of Florida in recent years.

### **Surgeon: wrong surgery, wrong site**

In April, 2006 a Tampa hand surgeon received a \$20,000 fine and temporary suspension from practice on charges she operated on the wrong body part of a patient. This was this surgeon's third mistake of this nature in five years. The Florida Board of Medicine reported that less-severe punishment the first two times did not have the desired effect.

In the most recent case the surgeon was operating at the surgery center in September 2004. She was to repair a young woman's injured middle finger, but made the incision in her ring finger, according to state health department. When she discovered the error, the records say, she closed the incision and performed the operation on the correct finger.

In August 2000, while operating on a 77-year-old man at University Community Hospital, the surgeon mistakenly operated on his left ring finger instead of thumb, records show. The medical board fined the physician \$10,000 and ordered her to give a lecture to the hospital staff on how to avoid such errors.

In an operation on a 38-year-old man in 2001, the surgeon operated on the correct hand, but performed the wrong procedure, the records say. In December 2002, she was fined \$15,000, ordered to take a course on reducing risks, donate 25 hours of community service and write an article on the perils of wrong procedures, in addition to another lecture.

Tampa Tribune, April 8, 2006; Doctor Fined, Suspended for Errors in Surgery, by Carol Gentry

### **Pharmacy Misfills Prescriptions**

In Florida, a national drugstore misfilled a prescription for Cardura with Coumadin causing the death of a healthy man. It is unclear how the pharmacist provided the customer with a container of Coumadin erroneously labeled "Cardura." What is clear is that the customer took the wrong medication for more than two weeks before he suddenly developed an uncontrollable "bleed" that resulted in a brain hemorrhage from which he never recovered.

What is also becoming clear is that precisely the same error has occurred in the State of Florida on more than this one occasion. And, that the same national drugstore has misfilled numerous other prescriptions throughout the United States.

[www.voiceoftheinjured.com](http://www.voiceoftheinjured.com)

### **Misdiagnosis Leads to Unnecessary Surgery**

In January, 1998 J.H. had a lung removed due to lung cancer. For a year following the surgery, J.H. had multiple follow-up appointments with the surgeons and other healthcare providers. For a year he and his family continued to worry about the possibility of recurrence or spread of the cancer. One year after the surgery J.H. learned that the pathology report from a biopsy taken during his surgery indicated that he did not have cancer at all. For a year no one told him.

CNN, May 1, 2000. Retrieved April 29, 2006 from <http://archives.cnn.com/2000/HEALTH/04/28/thin.white/index.html>

## **Intervention: Preventing Medical Errors**

The goal in the United States is to deliver safe, high-quality health care to patients in all clinical settings. Despite the best intentions, however, a high rate of largely preventable adverse events and medical errors occur that cause harm to patients. Adverse events and medical errors can occur in any healthcare setting in any community in this country. One reason adverse events and medical errors occur is that evidence-based information on what works to prevent them, or reduce the harm they cause, is not available (AHRQ, 2005).

Many of the previously mentioned patient safety organizations have developed strategies to prevent errors in healthcare. While each organization has independently developed their own strategies, it is clear that there are themes that run through many of the initiatives.

### The Institute of Medicine

In addition to identifying the problem of medical errors in their seminal report in 1999 and making recommendations for reducing medical errors, the IOM also made recommendations for the reduction of medication errors in their most recent report. The 2006 recommendations to reduce medication errors encompassed wide-reaching interventions:

- Develop a professional and practice style of collaboration and partnership with patients;
- Utilize information technologies to minimize errors;
- Improved labeling and packaging of medications;
- Policy changes on the part of the federal government and regulatory agencies.

### *Provider/Patient Partnership*

Healthcare has a history of a movement away from the paternalistic, provider-centered treatment that has been the prevailing practice methods for many years, to one in which the healthcare consumer and the provider work in partnership to plan and implement the best treatment and care for that particular individual or family. While some professional disciplines and some individual professionals have been more open to this kind of interaction with patients, others struggle with such relationships.

A collaborative partnership for healthcare between patients and providers requires that the provider must make communicating with the patient a priority. Good lines of communication between patient and provider improves the healthcare relationship. Such open communication, particularly good listening skills on the part of the provider, it also facilitates education of the patient and encourages the patient to consult more actively with the provider.

Providers must fully inform patients or their representatives about the risks, side effects and contraindications for the medications that they are taking; they must make sure that patients understand what to do if they experience side effect.

A controversial intervention that the IOM recommends, is that healthcare providers must be more forthcoming when a medication error does occur and to clearly explain what consequences, if any, have resulted from the error. There are opposing viewpoints about disclosing medical errors to patients and family members. Risk managers, healthcare administrators and attorneys do not share this perspective.

### ***National Patient Safety Foundation's Statement of Principle regarding Health Care Injury***

When a health care injury occurs, the patient and the family or representatives are entitled to a prompt explanation of how the injury occurred and its short- and long-term effects. When an error contributed to the injury, the patient and the family or representative should receive

a truthful and compassionate explanation about the error and the remedies available to the patient. They should be informed that the factors involved in the injury will be investigated so that steps can be taken to reduce the likelihood of similar injury to other patients.

Health care professionals and institutions that accept this responsibility are acknowledging their ethical obligation to be forthcoming about health care injuries and errors. The National Patient Safety Foundation urges all health care professionals and institutions to embrace the principle of dealing honestly with patients.

*\*approved by the National Patient Safety Foundation Board of Directors on November 14, 2000*

For their part, the IOM recommends that patients must take a more active role, learning about their medications and learning to be more responsible for the monitoring for the development of both the positive effects and the adverse effects of medications (see Appendix A).

They also suggest that the healthcare system improve its education of patients. At each point of contact with a provider, if medications are involved, the patient should receive information about the medication: at the time the medication was originally prescribed, when it is administered in the hospital, when it is dispensed from the community pharmacy, etc. At each stage of healthcare contact, the patient should receive additional information about their medications. An improved information system, both in content and in delivery, was suggested by the IOM. Their recommendation is that government agencies work together to improve and standardize the medication information provided to patients at points of healthcare contact, but also have this information available to the patient on the internet or a 24-hour national telephone medication information helpline for consumers. They suggested agencies such as the Food and Drug Administration, the National Library of Medicine and others work collaboratively to develop this patient information.

#### *Increased Use of Information Technologies*

The complexity of healthcare interventions and well as the rapid pace of change in healthcare make a reliance on technology a given for healthcare providers. It is extremely difficult for prescriber's to keep up with the vast amount of information related to medications that they might prescribe.

The IOM suggests that using point-of-care reference information, such as that obtained from the internet or from personal digital assistants, offers the prescriber important current information regarding prescribing medications.

The use of electronic prescriptions will help to reduce medication errors that are due to illegible handwriting or missing information on a prescription. Such e-prescribing also allows for the automatic checking of health information for the specific patient, such as allergies or drug interactions. Electronic prescribing also offers consistency regardless of the point of healthcare service. The IOM recommended that all prescribers and pharmacies utilize e-prescriptions by the year 2010.

#### *Improved Labeling and Packaging of Medications*

Multiple errors have occurred due to the many medications with a similar sound or look to their names. The IOM recommended that the pharmaceutical industry and the appropriate federal agencies work together to improve medication nomenclature, including medication names, abbreviations and acronyms. They also suggest that the prescribing information and information sheets that accompany medications be redesigned, utilizing research that identifies the best methods for communicating information about the medications.

### *Policy Recommendations*

In order to reduce adverse drug events a concerted, coordinated effort will be needed. The IOM recommends that the multiple agencies on multiple levels address this issue. They suggest that the federal government fund and coordinate research efforts aimed at the prevention of medication errors, that regulatory agencies should encourage the adoption of practices that reduce errors, and accrediting agencies should provide training on medication-management practices. These multiple efforts will reduce errors over time.

The Florida law which requires the 2-hours of training in medical errors is an example of such a policy recommendation.

### The National Quality Forum

The National Quality Forum, with support from the Agency for Healthcare Research and Quality (AHRQ), has identified safe practices that evidence shows can work to reduce or prevent adverse events and medical errors, and reduce the risk of harm to patients. These safe practices can be categorized into several concepts:

- Promoting a culture of safety (item 1);
- Matching healthcare needs with service delivery capability (items 2-4);
- Facilitate information transfer and clear communication (6-14);
- Enhance the safety of specific processes or settings of care (items 15-26);
- Increase safe medication use (items 5, 27-30).

The following 30 **priority safe practices** relate to the concepts above:

1. *There is a need to promote a culture that overtly encourages and supports the reporting of any situation or circumstance that threatens, or potentially threatens, the safety of patients or caregivers and that views the occurrence of errors and adverse events as opportunities to make the health care system better.*

The National Patient Safety Council (NPSC) (Kizer, 2003) defines a culture of safety as an “integrated pattern of individual and organizational behavior, based upon shared beliefs and values, that continuously seeks to minimize patient harm which may result from the processes of care delivery”.

Healthcare has a long history of identifying mistakes, placing blame and disciplining the wrong-doer(s). This short-sighted resolution gave responsibility for errors to a specific person who may well have been the last person in a series of mistakes that went undetected. All of the system failures that allowed for the mistake to occur were not considered. Mistakes would often not be reported because of fear of retribution.

This new approach includes the construct that an error is often the result of multiple failures throughout the system, culminating in the medical error.

It may be easier to think about a culture of safety while identifying the 5 “C”s of safety. These 5 items, when utilized with patient safety in mind, can operationalize the concept of patient safety for providers of healthcare:

- Competence
- Communication
- Collaboration

- Coordination
- Compassion

A culture of safety includes admitting and disclosing a medical error when it occurs. Medical ethicists have maintained a long-standing consensus that harmful errors should be disclosed to patients. This does not commonly occur. Healthcare providers fear that disclosing medical errors might provoke a patient to sue. Hospital administrators, attorneys and risk managers often provide either direct policy or even subtle messages to healthcare providers that apologizing to a patient is an admission of fault. However, there exists strong evidence that patients are more likely to sue when communication is poor. Much of the current literature is supportive of disclosing medical errors to patients (Gallagher, et al., 2003; Mazor, et al., 2004; Wojcieszak, et al., 2006; Gallagher, et al., 2006), yet there is also recognition that there are many obstacles to overcome before full disclosure of medical errors is the norm in healthcare.

The medical literature indicates that when confronted with harmful medical errors, patients want disclosure of the error, information regarding why the error occurred, and how recurrences would be prevented (Gallagher, et al., 2003). Patients want the healthcare provider to apologize for the error (Gallagher, et al., 2006). Nondisclosure of harmful errors has a negative impact on patients' feelings and their level of satisfaction (Mazor, et. al, 2006).

2. *For designated high-risk, elective surgical procedures or other specified care, patients should be clearly informed of the likely reduced risk of an adverse outcome at treatment facilities that have demonstrated superior outcomes and should be referred to such facilities in accordance with the patient's stated preference.*

There has been demonstrated improved outcome with specific high volume procedures, such as (IOM, 2000, Kizer, 2003; Shahian, 2004):

- Coronary artery bypass grafts
  - Angioplasty
  - Abdominal aortic aneurysm repair
  - Pancreatectomy
  - Esophageal cancer surgery
  - Delivery of a low birth weight baby <1500 gms and/or <32 wks gestation
  - Delivery of baby with major congenital malformations.
3. *Specify an explicit protocol to be used to ensure an adequate level of nursing based on the institution's usual patient mix and the experience and training of its nursing staff.*
  4. *All patients in general intensive care units (both adult and pediatric) should be managed by physicians having specific training and certification in critical care medicine ("critical care certified").*
  5. *Pharmacists should actively participate in the medication-use process, including, at a minimum, being available for consultation with prescribers on medication ordering, interpretation and review of medication orders, preparation of medications, dispensing of medications, and administration and monitoring of medications.*
  6. *Verbal orders should be recorded whenever possible and immediately read back to the prescriber; that is, a health care provider receiving a verbal order should read or repeat back the information that the prescriber conveys in order to verify the accuracy of what was heard.*
  7. *Use only standardized abbreviations and dose designations.*

In 2004, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) issued a “Do Not Use” directive, as part of the National Patient Safety Goals. While this list is most relevant to healthcare organizations that are surveyed by JCAHO, safety of patients related to the writing of prescriptions is a concern for all prescribers.

**Table 1. The JCAHO Official “Do Not Use” List**

<b>Do Not Use</b>	<b>Potential Problem</b>	<b>Use Instead</b>
U (unit)	Mistaken for “0” (zero), the number “4” (four) or “cc”	Write “Unit”
IU (International Unit)	Mistaken for IV (intravenous) or the number 10 (ten)	Write “International Unit”
Q.D., QD, q.d., qd (daily) Q.O.D., QOD, q.o.d., qod (every other day)	Mistaken for each other Period after the Q mistaken for “I” and the “O” mistaken for “I”	Write “daily” Write “every other day”
Trailing zero (X.0 mg)* Lack of leading zeros (.X mg)	Decimal point is missed	Write “X mg” Write “0.X mg”
MS  MSO4 and MgSO4	Can mean morphine sulfate or Magnesium sulfate Confused for one another	Write “Morphine sulfate”  Write “Magnesium sulfate”

<sup>1</sup>Applies to all orders and all medication related documentation that is handwritten (including free text computer entry) or on pre-printed forms.

\*EXCEPTION: A “trailing zero” may be used only where required to demonstrate the level of precision of the value being reported, such as for laboratory results, imaging studies that report size of lesions, or catheter/tube sizes. It may not be used in medication orders or medication related documentation.

JCAHO also issued a list of abbreviations, acronyms and symbols that are often problematic in handwritten documentation. In 2005, JCAHO affirmed this list; they continue to identify the items in Table 2 as having a high potential for documentation error. They have not been added to the official “Do Not Use” list (as of November, 2005) (JCAHO, 2005).

According to JCAHO (2000) up to 7,000 deaths can be attributed to mistakes made in prescribing or dispensing medications. The costs of medical errors, of which medication errors are a part, are estimated to be between \$17 and \$29 billion nationally in lost income, disability and healthcare expenses.

**Table 2. The JCAHO Additional Abbreviations, Acronyms and Symbols (for possible inclusion in the Official “Do Not Use” list in the future)**

<b>Do Not Use</b>	<b>Potential Problem</b>	<b>Use Instead</b>
> (greater than) < (less than)	Misinterpreted as the number “7” (seven) or the letter “L” Confused for one another	Write “greater than” Write “less than”
Abbreviations for drug names	Misinterpreted due to similar abbreviations for multiple drugs	Write drug names in full
Apothecary units	Unfamiliar to many practitioners Confused with metric units	Use metric units
@	Mistaken for the number “2” (two)	Write “at”
cc	Mistaken for “U” (units) when poorly written	Write “ml” or “milliliters”
µg	Mistaken for “mg” (milligrams) resulting in one thousand-fold overdose	Write “mcg” or “micrograms”

*8. Patient care summaries or other similar records should not be prepared from memory.*

*9. Ensure that care information, especially changes in orders and new diagnostic information, is transmitted in a timely and clearly understandable form to all of the patient's current health care providers who need that information to provide care.*

The Joint Commission on Accreditation of Healthcare Organization's (JCAHO) 2006 Patient Safety Goals (JCAHO, 2006) recommend that a healthcare organization needs to identify between "Critical tests", that is those test that will always require rapid communication of the results, even when the results are normal, often considered to be "stat" exams and "critical results", that is those findings, even from routine tests, which will always require rapid communication of results.

*10. Ask each patient or legal surrogate to recount what he or she has been told during the informed consent discussion.*

Merely asking the patient or surrogates if they understand what has been discussed, is not adequate. A more specific method of assessing knowledge and understanding of patients is to ask them to repeat what they believe to be the outcome of the discussion. This method of discussion provides opportunities to clarify and reiterate important points. It helps the patient avoid agreeing with the provider, even when they really do not understand.

*11. Ensure that written documentation of the patient's preference for life-sustaining treatments is prominently displayed in his or her chart.*

Advance Directives should be addressed with every person admitted to a hospital. Promoting the use of advance directives in any care setting helps to insure that the patient's wishes will be known and followed. Pursuing advance directives prior to when they will be needed will eliminate the need for suffering for the patient and the family, as was seen in the high profile Shiuvo case, that ultimately included intervention from very branch of the US government.

*12. Implement a computerized prescriber-order entry system.*

The 2006 IOM report on medication errors also recommends this intervention, as part of their recommendation that healthcare providers and healthcare organizations improve the information technology they use related to patient care and treatment.

Computerized prescribing or ordering eliminates a significant cause of medication errors: poor handwriting/illegible handwriting. This would also eliminate the problem of ambiguous symbols, abbreviations and acronyms.

*13. Implement a standardized protocol to prevent the mislabeling of radiographs.*

*14. Implement standardized protocols to prevent the occurrence of wrong-site or wrong-patient procedures.*

The Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) issued recommendations for avoiding wrong-site surgery after review of 43 cases reported through its Sentinel Event Policy over a 3 year period. These recommendations include:

- Mark the operative site and involve the patient in this process.

- Require oral verification of the correct site in the operating room by each member of the surgical team.
- Follow a verification checklist that includes all documents and medical records referencing the intended operative procedure and site.
- Directly involve the operating surgeon in the informed consent process.
- Engage in ongoing monitoring to ensure verification procedures are followed.

*15. Evaluate each patient undergoing elective surgery for risk of an acute ischemic cardiac event during surgery, and provide prophylactic treatment for high-risk patients with beta blockers.*

*16. Evaluate each patient upon admission, and regularly thereafter, for the risk of developing pressure ulcers. This evaluation should be repeated at regular intervals during care. Clinically appropriate preventive methods should be implemented consequent to the evaluation.*

*17. Evaluate each patient upon admission, and regularly thereafter, for the risk of developing deep vein thrombosis/venous thromboembolism. Utilize clinically appropriate methods to prevent both.*

*18. Utilize dedicated anti-thrombotic (anti-coagulation) services that facilitate coordinated care management.*

*19. Upon admission, and regularly thereafter, evaluate each patient for the risk of aspiration.*

*20. Adhere to effective methods of preventing central venous catheter-associated bloodstream infections.*

*21. Evaluate each pre-operative patient in light of his or her planned surgical procedure for the risk of surgical site infection, and implement appropriate antibiotic prophylaxis and other preventive measures based on that evaluation.*

*22. Utilize validated protocols to evaluate patients who are at risk for contrast media-induced renal failure, and utilize a clinically appropriate method for reducing risk of renal injury based on the patient's kidney function evaluation.*

*23. Evaluate each patient upon admission, and regularly thereafter, for risk of malnutrition. Employ clinically appropriate strategies to prevent malnutrition.*

*24. Whenever a pneumatic tourniquet is used, evaluate the patient for the risk of an ischemic and/or thrombotic complication, and utilize appropriate prophylactic measures.*

*25. Decontaminate hands with either a hygienic hand rub or by washing with a disinfectant soap prior to, and after, direct contact with the patient or objects immediately around the patient.*

In 2002 the recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force published new hand hygiene guidelines (Boyce, et. al, 2002).

These guidelines include the following indications for **handwashing** and **hand antisepsis** (Boyce et. al., 2002):

- When hands are visibly dirty or contaminated with proteinaceous material or are visibly soiled with blood or other body fluids, wash hands with either a non-antimicrobial soap and water or an antimicrobial soap and water.

- If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands in clinical situations. Alternatively, wash hands with an antimicrobial soap and water in clinical situations.
- Decontaminate hands before having direct contact with patients.
- Decontaminate hands before donning sterile gloves when inserting a central intravascular catheter.
- Decontaminate hands before inserting indwelling urinary catheters, peripheral vascular catheters, or other invasive devices that do not require a surgical procedure.
- Decontaminate hands after contact with a patient's intact skin (e.g., when taking a pulse or blood pressure, and lifting a patient).
- Decontaminate hands after contact with body fluids or excretions, mucous membranes, nonintact skin, and wound dressings if hands are not visibly soiled.
- Decontaminate hands if moving from a contaminated-body site to a clean-body site during patient care.
- Decontaminate hands after contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient.
- Decontaminate hands after removing gloves.
- Before eating and after using a restroom, wash hands with a non-antimicrobial soap and water or with an antimicrobial soap and water.
- Antimicrobial-impregnated wipes (i.e., towelettes) may be considered as an alternative to washing hands with non-antimicrobial soap and water. Because they are not as effective as alcohol-based hand rubs or washing hands with an antimicrobial soap and water for reducing bacterial counts on the hands of healthcare workers, they are not a substitute for using an alcohol-based hand rub or antimicrobial soap.
- Wash hands with non-antimicrobial soap and water or with antimicrobial soap and water if exposure to *Bacillus anthracis* is suspected or proven. The physical action of washing and rinsing hands under such circumstances is recommended because alcohols, chlorhexidine, iodophors, and other antiseptic agents have poor activity against spores.
- No recommendations were made regarding the routine use of nonalcohol-based hand rubs for hand hygiene in healthcare settings; this remains an unresolved issue.

**Hand-hygiene technique** recommendations of the guidelines include:

- When decontaminating hands with an alcohol-based hand rub, apply product to palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry. Follow the manufacturer's recommendations regarding the volume of product to use.
- When washing hands with soap and water, wet hands first with water, apply an amount of product recommended by the manufacturer to hands, and rub hands together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers. Rinse hands with water and dry thoroughly with a disposable towel. Use towel to turn off the faucet. Avoid using hot water, because repeated exposure to hot water may increase the risk of dermatitis.
- Liquid, bar, leaflet or powdered forms of plain soap are acceptable when washing hands with a non-antimicrobial soap and water. When bar soap is used, soap racks that facilitate drainage and small bars of soap should be used.
- Multiple-use cloth towels of the hanging or roll type are not recommended for use in healthcare settings.

*26. Vaccinate health care workers against influenza to protect both them and patients.*

Influenza infects an average of 5-20% of the US population each year. On average, over 200,000 people are hospitalized and 36,000 people die of influenza or its complications each year (CDC, 2005).

Influenza vaccination is the best way to reduce the healthcare worker's chances of getting ill from influenza and from giving influenza to patients, co-workers and family. There are two types of influenza vaccine:

- 1) inactivated influenza vaccine (flu shot), and
- 2) live, attenuated influenza vaccine (LAIV) (nasal spray).

LAIV is an option for all healthy individuals 5-49 years of age. The inactivated influenza vaccine is preferred for healthcare personnel who work with patients with severely weakened immune systems (i.e., patients who have recently had a bone marrow transplant and require a protected environment) because of a theoretical risk that LAIV could be transmitted to severely immunocompromised persons. Healthcare personnel who are vaccinated with LAIV (nasal spray) should not care for patients with severely weakened immune systems for the 7 days after receiving the vaccine. Another important way to prevent the spread of influenza is to follow infection control recommendations including hand hygiene and Standard and Droplet Precautions (CDC, 2005).

The CDC (2005) recommends that all healthcare personnel should get vaccinated to protect themselves from getting influenza and to prevent transmission of influenza to their patients, coworkers, family members, and close contacts. Vaccination can also prevent persons at highest risk of complications from developing severe influenza-related illness and death.

*27. Keep workspaces where medications are prepared clean, orderly, well lit, and free of clutter, distraction, and noise.*

*28. Standardize the methods for labeling, packaging, and storing medications.*

*29. Identify all "high alert" drugs (for example, intravenous adrenergic agonists and antagonists, chemotherapy agents, anti-coagulants and anti-thrombotics, concentrated parenteral electrolytes, general anesthetics, neuromuscular blockers, insulin and oral hypoglycemics, narcotics, and opiates).*

*30. Dispense medications in unit-dose or, when appropriate, unit-of-use form, whenever possible.*

## **Conclusion**

Medical errors have long been recognized as a problem in healthcare. However, it has only been in the last decade that the focus has been on patient safety. Despite medical errors being the 6th leading cause of death in the US, and the current focus on patient safety, the rate of healthcare errors continues to climb. Although certainly some errors will continue because it is human nature to be imperfect, the high rate of medical errors requires that patient safety is a constant, ongoing, and continuous goal.

Multiple healthcare organizations have focused on patient safety; many recommendations have been made and specific interventions have been identified. It is the responsibility of each healthcare provider and every healthcare organization, to recognize that errors are a major problem and to utilize strategies to reduce the likelihood of harmful medical errors.

Appendix A

20 Tips to Help Prevent Medical Errors: Patient Fact Sheet

What You Can Do

1.	<b>Be Involved in Your Health Care</b>	<b>The single most important way you can help to prevent errors is to be an active member of your health care team.</b>	That means taking part in every decision about your health care. Research shows that patients who are more involved with their care tend to get better results. Some specific tips, based on the latest scientific evidence about what works best, follow.
2.	<b>Medicines</b>	<b>Make sure that all of your doctors know about everything you are taking. This includes prescription and over-the-counter medicines, and dietary supplements such as vitamins and herbs.</b>	At least once a year, bring all of your medicines and supplements with you to your doctor. "Brown bagging" your medicines can help you and your doctor talk about them and find out if there are any problems. It can also help your doctor keep your records up to date, which can help you get better quality care.
3.		<b>Make sure your doctor knows about any allergies and adverse reactions you have had to medicines.</b>	This can help you avoid getting a medicine that can harm you.
4.		<b>When your doctor writes you a prescription, make sure you can read it.</b>	If you can't read your doctor's handwriting, your pharmacist might not be able to either.
5.		<b>Ask for information about your medicines in terms you can understand—both when your medicines are prescribed and when you receive them.</b>	What is the medicine for?  How am I supposed to take it, and for how long?  What side effects are likely? What do I do if they occur?  Is this medicine safe to take with other medicines or dietary supplements I am taking?  What food, drink, or activities should I avoid while taking this medicine?
6.		<b>When you pick up your medicine from the pharmacy, ask: Is this the medicine that my doctor prescribed?</b>	A study by the Massachusetts College of Pharmacy and Allied Health Sciences found that 88 percent of medicine errors involved the wrong drug or the wrong dose.
7.		<b>If you have any questions about the directions on your medicine labels, ask.</b>	Medicine labels can be hard to understand. For example, ask if "four doses daily" means taking a dose every 6 hours around the clock or just during regular waking hours.

8.		<b>Ask your pharmacist for the best device to measure your liquid medicine. Also, ask questions if you're not sure how to use it.</b>	Research shows that many people do not understand the right way to measure liquid medicines. For example, many use household teaspoons, which often do not hold a true teaspoon of liquid. Special devices, like marked syringes, help people to measure the right dose. Being told how to use the devices helps even more.
9.		<b>Ask for written information about the side effects your medicine could cause.</b>	If you know what might happen, you will be better prepared if it does—or, if something unexpected happens instead. That way, you can report the problem right away and get help before it gets worse. A study found that written information about medicines can help patients recognize problem side effects and then give that information to their doctor or pharmacist.
10.	<b>Hospital Stays</b>	<b>If you have a choice, choose a hospital at which many patients have the procedure or surgery you need.</b>	Research shows that patients tend to have better results when they are treated in hospitals that have a great deal of experience with their condition.
11.		<b>If you are in a hospital, consider asking all health care workers who have direct contact with you whether they have washed their hands.</b>	Handwashing is an important way to prevent the spread of infections in hospitals. Yet, it is not done regularly or thoroughly enough. A recent study found that when patients checked whether health care workers washed their hands, the workers washed their hands more often and used more soap.
12.		<b>When you are being discharged from the hospital, ask your doctor to explain the treatment plan you will use at home.</b>	This includes learning about your medicines and finding out when you can get back to your regular activities. Research shows that at discharge time, doctors think their patients understand more than they really do about what they should or should not do when they return home.
13.	<b>Surgery</b>	<b>If you are having surgery, make sure that you, your doctor, and your surgeon all agree and are clear on exactly what will be done.</b>	Doing surgery at the wrong site (for example, operating on the left knee instead of the right) is rare. But even once is too often. The good news is that wrong-site surgery is 100 percent preventable. The American Academy of Orthopaedic Surgeons urges its members to sign their initials directly on the site to be operated on before the surgery.
14.	<b>Other Steps You Can Take</b>	<b>Speak up if you have questions or concerns.</b>	You have a right to question anyone who is involved with your care.

15.		<b>Make sure that someone, such as your personal doctor, is in charge of your care.</b>	This is especially important if you have many health problems or are in a hospital.
16.		<b>Make sure that all health professionals involved in your care have important health information about you.</b>	Do not assume that everyone knows everything they need to.
17.		<b>Ask a family member or friend to be there with you and to be your advocate (someone who can help get things done and speak up for you if you can't).</b>	Even if you think you don't need help now, you might need it later.
18.		<b>Know that "more" is not always better.</b>	It is a good idea to find out why a test or treatment is needed and how it can help you. You could be better off without it.
19.		<b>If you have a test, don't assume that no news is good news.</b>	Ask about the results.
20.		<b>Learn about your condition and treatments by asking your doctor and nurse and by using other reliable sources.</b>	For example, treatment recommendations based on the latest scientific evidence are available from the National Guidelines Clearinghouse™ at <a href="http://www.guideline.gov">http://www.guideline.gov</a> . Ask your healthcare provider if your treatment is based on the latest evidence.

Agency for Healthcare Research and Quality (AHRQ). (2000). *20 Tips to Help Prevent Medical Errors*. Patient Fact Sheet. AHRQ Publication No. 00-PO38, Agency for Healthcare Research and Quality, Rockville, MD. Retrieved May, 2006 at <http://www.ahrq.gov/consumer/20tips.htm>.

## Appendix B

### National Quality Forum's Serious Reportable Events (Kaiser & Steegan, 2002)

Event	Additional specifications
<b>1. Surgical events</b>	
<b>A. Surgery performed on the wrong body part</b>	Defined as any surgery performed on a body part that is not consistent with the documented informed consent for that patient.  Excludes emergent situations that occur in the course of surgery and/or whose exigency precludes obtaining informed consent.
<b>B. Surgery performed on the wrong patient</b>	Defined as any surgery on a patient that is not consistent with the documented informed consent for that patient.
<b>C. Wrong surgical procedure performed on a patient</b>	Defined as any procedure performed on a patient that is not consistent with the documented informed consent for that patient.  Excludes emergent situations that occur in the course of surgery and/or whose exigency precludes obtaining informed consent.  Surgery includes endoscopies and other invasive procedures.
<b>D. Retention of a foreign object in a patient after surgery or other procedure</b>	Excludes objects intentionally implanted as part of a planned intervention and objects present prior to surgery that were intentionally retained.
<b>E. Intraoperative or immediately post-operative death in an ASA Class I patient</b>	Includes all ASA Class I patient deaths in situations where anesthesia was administered; the planned surgical procedure may or may not have been carried out. Immediately post-operative means within 24 hours after induction of anesthesia (if surgery not completed), surgery, or other invasive procedure was completed.
<b>2. Product or device events</b>	
<b>A. Patient death or serious disability associated with the use of contaminated drugs, devices, or biologics provided by the health care facility</b>	Includes generally detectable contaminants in drugs, devices, or biologics regardless of the source of contamination and/or product.
<b>B. Patient death or serious disability associated with the use or function of a device in patient care, in which the device is used for functions other than as</b>	Includes, but is not limited to, catheters, drains and other specialized tubes, infusion pumps, and ventilators.

intended	
C. <b>Patient death or serious disability associated with intravascular air embolism that occurs while being cared for in a health care facility</b>	Excludes deaths associated with neurosurgical procedures known to be a high risk of intravascular air embolism.
<b>3. Patient protection events</b>	
A. <b>Infant discharged to the wrong person</b>	
B. <b>Patient death or serious disability associated with patient elopement (disappearance) for more than four hours</b>	Excludes events involving competent adults.
C. <b>Patient suicide, or attempted suicide resulting in serious disability, while being cared for in a health care facility</b>	Defined as events that result from patient actions after admission to a health care facility.  Excludes deaths resulting from self-inflicted injuries that were the reason for admission to the health care facility.
<b>4. Care management events</b>	
A. <b>Patient death or serious disability associated with a medication error (e.g., errors involving the wrong drug, wrong dose, wrong patient, wrong time, wrong rate, wrong preparation, or wrong route of administration)</b>	Excludes reasonable differences in clinical judgment on drug selection and dose.
B. <b>Patient death or serious disability associated with a hemolytic reaction due to the administration of ABO-incompatible blood or blood products</b>	
C. <b>Maternal death or serious disability associated with labor or delivery in a low-risk pregnancy while being cared for in a health care facility</b>	Includes events that occur within 42 days post-delivery.  Excludes deaths from pulmonary or amniotic fluid embolism, acute fatty liver of pregnancy or cardiomyopathy.
D. <b>Patient death or serious disability associated with hypoglycemia, the onset of which occurs while the patient is being cared for in a health care</b>	

facility	
E. <b>Death or serious disability (kernicterus) associated with failure to identify and treat hyperbilirubinemia in neonates</b>	Hyperbilirubinemia is defined as bilirubin levels >30 mg/dl.  Neonates refers to the first 28 days of life.
F. <b>Stage 3 or 4 pressure ulcers acquired after admission to a health care facility</b>	Excludes progression from Stage 2 to Stage 3 if Stage 2 was recognized upon admission.
G. <b>Patient death or serious disability due to spinal manipulative therapy</b>	
<b>5. Environmental events</b>	
A. <b>Patient death or serious disability associated with an electric shock while being cared for in a health care facility</b>	Excludes <b>events</b> involving planned treatments such as electric countershock.
B. <b>Any incident in which a line designated for oxygen or other gas to be delivered to a patient contains the wrong gas or is contaminated by toxic substances</b>	
C. <b>Patient death or serious disability associated with a burn incurred from any source while being cared for in a health care facility</b>	
D. <b>Patient death associated with a fall while being cared for in a health care facility</b>	
E. <b>Patient death or serious disability associated with the use of restraints or bedrails while being cared for in a health care facility</b>	
<b>6. Criminal events</b>	
A. <b>Any instance of care ordered by or provided by someone impersonating a physician, nurse, pharmacist, or other licensed health care provider</b>	

B. <b>Abduction of a patient of any age</b>	
C. <b>Sexual assault on a patient within or on the grounds of the health care facility</b>	
D. <b>Death or significant injury of a patient or staff member resulting from a physical assault (i.e., battery) that occurs within or on the grounds of the health care facility</b>	

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**Medical Errors: Identification and Prevention  
State of Florida Mandatory Training  
Test**

1. Medical errors are the 6<sup>th</sup> leading cause of death in the US.
    - A. True.
    - B. False.
  
  2. The National Patient Safety Foundation has defined medical errors as:
    - A. An unintended healthcare outcome caused by a defect in the delivery of care to a patient.
    - B. They may be errors of commission (doing the wrong thing), omission (not doing the right thing), or execution (doing the right thing incorrectly).
    - C. Errors may be made by any member of the healthcare team in any healthcare setting.
    - D. All of the above.
  
  3. There is no universal definition for medical errors. Terminology for medical errors is creative and varies widely. Among terms used for medical errors are:
    - Adverse event, adverse outcome;
    - Medical mishap, unintended consequences;
    - Unplanned clinical occurrence; unexpected occurrence; untoward incident;
    - Therapeutic misadventure; bad call;
    - Peri-therapeutic accident;
    - Sentinel event;
    - Iatrogenic complication; iatrogenic injury;
    - Hospital acquired complication.
    - A. True.
    - B. False.
  
  4. According to the 2006 Institute of Medicine report on medication errors, medication errors occur most frequently during:
    - A. Prescribing.
    - B. Administering.
    - C. Both A and B.
    - D. Neither A or B.
  
  5. A collaborative healthcare partnership between providers and patients should be developed, according to the Institute of Medicine's 2006 report on medication errors. Among their recommendations are:
    - A. Making good, open communication between providers and patients a priority.
    - B. Improved listening skills on the part of the provider helps to facilitate the patient's collaboration with the provider.
    - C. Full disclosure of risks and benefits of all medications and insuring that the patient or the patient's representative understands the risks and benefits.
    - D. All of the above.
-

6. In order to prevent an error from occurring while prescribing medications, prescribers should:
  - A. Utilize technology to maximize safety, such as electronic prescriptions and electronic point-of-care references such as personal digital assistants.
  - B. Avoid using any of the high risk abbreviations, symbols and acronyms identified by the Joint Commission on Accreditation of Healthcare Organizations.
  - C. Insist that prescribing information and information sheets that accompany medications be redesigned, utilizing research that identifies the best methods for communicating information about the medications.
  - D. All of the above.
  
7. Medical ethicists agree that errors should never be disclosed to patients.
  - A. True.
  - B. False.
  
8. Generally, when a medical error occurs, the literature indicates that patients want:
  - A. Disclosure of the error and information as to why the error occurred.
  - B. Information about how the error can be prevented.
  - C. Healthcare providers to apologize for the error.
  - D. All of the above.
  
9. Pharmacists should actively participate in the medication-use process, including, at a minimum, being available for consultation with prescribers on medication ordering, interpretation and review of medication orders, preparation of medications, dispensing of medications, and administration and monitoring of medications.
  - A. True.
  - B. False.
  
10. Because 5-20% of the US population acquires influenza each year and 36,000 people die from it each year, the CDC and the National Quality Forum recommends that all healthcare personnel should get vaccinated to protect themselves from getting influenza and to prevent transmission of influenza to their patients, coworkers, family members, and close contacts. Vaccination can also prevent persons at highest risk of complications from developing severe influenza-related illness and death.
  - A. True.
  - B. False.