

Prevention of Medical Errors and Medication Errors

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By Wanda Lockwood, RN, BA, MA

Purpose

The purpose of this course is to explain issues related to medical errors and patient safety concerns, including regulations, causes of errors, root cause analysis, types of errors, and methods to avoid errors.

Goals

Upon completion of this course, one should be able to:

- Discuss goals and regulations related to medical errors.
- Explain changes to Medicare-Medicaid reimbursement for preventable errors.
- Explain 2 different types of root cause analysis.
- Explain how Failure Mode and Effects Analysis (FMEA) differs from other forms of root cause analysis.
- List and discuss 8 causes of medical errors.
- Explain the steps to identification of patients.
- Discuss issues related to handwriting.
- Explain procedures for verbal/telephone orders and reporting and hands-off communication.
- List and explain the 5 rights of medication administration.
- Explain at least 4 methods of prevent wrong-route errors.
- List at least 5 items from the do-not-use list of abbreviations.
- Explain the difference among critical tests, critical results, and subsets of critical results.
- Explain the 3 steps to prevent wrong site, wrong procedure, and wrong person surgery errors.
- Explain handwashing and alcohol rub techniques for control of nosocomial infections.

Introduction

The extent of medical error was brought to the attention of the general public in 1999 with the Institute of Medicine's (IOM's) report *To Err is Human*. The study found that over half of the adverse events at two major hospitals related to medical errors. It went on in chilling detail, describing people who had died from mistakes, had the wrong limbs amputated, or suffered serious health crises. The Joint Commission defines medical error as "An unintended act (either of omission or commission) or one that does not achieve its intended outcome." Some medical errors are caused by true accidents, but most are caused by errors, such as failing to follow a standard of care. Unfortunately, many errors are systematic and related to ineffective processes, such as a failure in communication or insufficient staffing, making it difficult to pinpoint responsibility. Further compounding the problem is that many malpractice insurance policies explicitly state that the insured should make NO admission of liability, despite this being directly counter to medical ethics. (In response to this, some states have passed legislation that explicitly states that saying "I'm sorry" is not an admission of negligence.) Medical errors can be frightening for patients, but those who commit errors may be very shaken by the experience, feeling guilty and fearful of losing their jobs, losing respect of others, and being sued.

Goals and regulations

There is a growing consensus that medical errors must and CAN be controlled and increasing regulations requiring that they be reported. The Joint Commission has issued the 2008 National Patient Safety Goals, providing strict standards to improve patient safety and reduce medical errors.

Link:

[Joint Commission 2008 National Patient Safety Goals](#)

It's important to realize that these safety goals are those that are used as part of accreditation assessment in an effort to reduce medical errors, but they do not cover all potential errors. Procedures are in place for reporting of sentinel events (unexpected events not related to a patient's condition, such as death or serious injury), and compliance with safety goals is assessed during accreditation.

The Federal Center for Medicaid and Medicare Services has issued a new rule that will take effect October 2008. Under this rule, hospitals will not be reimbursed for treatment related to preventable conditions, such as those related to medical error or improper care. Additionally, the costs cannot be conferred upon the patient, so institutions must absorb the costs related to medical errors. This provides a strong motivating force for compliance. Medicare payments have been based on diagnosis-related groups (DRGs), but institutions can apply for a higher reimbursement rate if complications occur. Thus, institutions that increased infection rates or complications received higher reimbursement and those that decreased infection rates also decreased profits—not exactly a motivation to improve care. Eight secondary conditions have been identified as no longer qualifying for additional payments because they are preventable:

Preventable complication	Incidence/ 2006
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Object left in during surgery	764
Air embolism	45
Blood incompatibility	33
Catheter-associated urinary tract infection	11,780
Pressure ulcer	322,946
Vascular-catheter-associated infection	No data
Mediastinitis after coronary artery bypass grafting	108
Fall from bed	2591

This change in reimbursement cancels the monetary advantage of providing poor care to some degree although the changes are not so clear because when costs substantially exceed the DRG, reaching a threshold amount, Medicare will still provide higher reimbursement. However, the real impetus is related to knowing that this is the beginning step in making organizations accountable, not the last step.

While awaiting federal action, some states have enacted their own regulations to improve safety, and some now require reporting of hospital-acquired infections and/or reporting of MRSA infections, and 25 states currently require mandatory reporting of medical errors. Adverse event reporting rules and statutes for all states that include some type of mandatory reporting are available at the National Academy for State Health Policy. There is an alphabetical listing of states with links to rules and statutes:

[National Academy for State Health Policy, state links](#)

Florida is a good example of government and public concerns spurring legislation, sometimes at odds with each other. In 2004, the Florida Legislature passed cutting-edge legislation requiring that information about patient outcomes, such as mortality rates and infection rates, be made public and that patients be notified when they were involved in an adverse event. It also mandated patient safety education for healthcare providers. Florida set up the Florida Patient Safety Corporation, which established a voluntary reporting system for “near-misses,” assuring anonymity, which most authorities believe is essential to honest reporting.

However, in 2004, voters approved two amendments backed by the Florida Trial Attorneys:

- Patient’s Right to Know about Adverse Medical Incidents Act (Amendment 7), which allows patients access to all records about their care (including previously protected peer review findings).
- Three Strikes and You Are Out Act (Amendment 8), which provides for revocation of license to practice for physicians with 3 adjudicated malpractice suits.

While the legislature has made some modifications trying to align the different regulations, the result has been an increase in out-of-court settlements because physicians fear losing a judgment and endangering their licenses, and a marked decrease in reporting of medical errors because anonymity is not protected. Currently, medical errors must be reported (Code 15 report) to the state within 15

days. Monthly and annual reports of adverse events (deaths, injury) are available online. Link:

[Florida Risk Management Data](#)

Florida's Amendment 7 is also at odds with the federal Patient Safety and Quality Improvement Act (2005), which established a national database for reporting of voluntary information about medical errors in order to develop more effective safety measures. This act ensures confidentiality. The need for clear national policy is evident.

Root cause analysis

Root cause analysis (RCA) is a method used to determine the cause of an adverse event, such as a sentinel event (unexpected death, clustered adverse events). RCA is an integral part of reducing medical error. Because RCA is retrospective, it requires interviews with those involved, questionnaires, observations of processes and procedures, and medical record review. Every step in a process or procedure may be traced, focusing on why and how things are done rather than on the individuals who are carrying out the processes. Usually RCA includes a review of literature and study of best practices to determine the best solutions to the problems discovered through the RCA when developing an action plan. An action plan to solve a problem without RCA may be ineffective. If, for example, contaminated airflow has caused surgical infections, altering the method of disinfecting the surgical suite will not decrease infections. There are a variety of alternative methods that may be used to conduct RCA:

- **5 Whys:** This method, originally used by Toyota in Japan, utilizes a team with knowledge of the process to be analyzed. The team asks a series of at least 5 "Why?" questions to reach consensus as to why a problem arose. It begins with a complete detailed outline of a procedure or process and then questions about each separate step:
 - Why did the patient take an overdose of medication? Because she didn't understand the directions.
 - Why didn't she understand the directions? Because she couldn't read English.
 - And so on.....
- **Is – Is not:** This method attempts to identify root cause by evaluating a problem in terms of what it is and is not. A 2-column table with the problem listed at the top is created. One column heading is "Is" and the other column heading is "Is not."
 - **Is:** A detailed description of the problem is identified through the asking of information questions about the process.
 - **Is not:** This identified all those factors/event that MIGHT have caused the same problem but did not.
 - The two lists are then examined to determine what differentiates them in order to determine root cause.

- Failure mode and effects analysis (FMEA):** This RCA is different from the others because it is done prospectively instead of retrospectively. That is, when a new process or procedure is proposed, the FMEA is done to determine all possible problems/failures that may arise and to correct processes in advance. This is a form of risk assessment that involves creating a very detailed flow chart of a process/procedure and then brainstorming every step and sub-step for potential problems, asking “What could go wrong?” All potential adverse events must be identified and ranked according to severity, with causes and effects identified through RCA, 5-Whys or other methods. Performance measures are identified as part of the analysis.

Causes of medical errors

The US Senate directed the Agency for Healthcare Research and Quality (AHRQ) to lead a national effort to improve patient safety and prevent medical errors. A number of projects were funded. The interim report (2003) to the Senate identified 8 common root causes of medical errors. These identified causes have served as guides in efforts to eliminate errors:

Eight common causes of medical errors	
1. Communication problems	These are the most common problems and cause the widest variety of errors at all levels of patient care.
2. Inadequate information flow	This includes problems that prevent timely availability of information, such as laboratory findings, and coordination of medication orders.
3. Human problems	These include lack of knowledge, failure to follow procedures or standards of care, and sub-optimal documentation/labeling.
4. Patient-related problems	These include improper patient identification, failure to obtain informed consent, and inadequate patient education.
5. Organizational transfer of knowledge	This includes inadequacy in training or education for those providing care, including procedures in place for an institution or unit.
6. Staffing pattern/work flow	This includes inadequate staffing and supervision.
7. Technical failure	This includes equipment failure, poor equipment design, and inadequate instruction in use of equipment.
8. Inadequate policies and procedures	These include failure in processes of care as well as poorly documented, non-existing, or inadequate procedures.

Identification

The first goal that the Joint Commission outlines is a patient-related problem: “Improve the accuracy of patient identification.” The guideline requires 2 patient

identifiers. Identifying the patient seems central to providing care, but failing to properly identify patients is the cause of many errors, sometimes resulting in the wrong patients having operations or receiving treatments or tests intended for someone else. One in-depth study used root-cause analysis to determine why the wrong patient, Joan Morris, underwent an invasive cardiac procedure intended for Jane Morrison. The study identified not one error, but 17 different and distinct errors, beginning with an original confusion in identification. Once this error had been made, the assumption, from one department to another, was that the woman was the correct patient—despite a different name, different diagnosis, the patient’s statement that she knew nothing about the procedure and didn’t want the procedure, and no signed consent form. In fact, she was convinced to sign a consent form—although clearly without “informed” consent because the test was totally unrelated to her condition. Repeatedly, Morris was referred to as “the patient” or “my patient” rather than by name. Even when staff noticed disparities, such as the difference in names or Morris’s name missing from the laboratory schedule, they assumed there was an explanation.

There are a number of steps that staff must take in order to assure that patients are correctly identified. It is not sufficient to just glance at a wristband as one can look without actually seeing when procedures become routine.

Correctly identifying a patient

Always use two patient identifiers—usually name and birthdate.

Ask the patient when possible, “What is your name?” and “What is your birth date?”

Always check the wristband or another form of identification to verify identification, and read the name out loud.

Never assume that “knowing” a patient ensures proper identification or that it’s all right to ignore identification procedures.

Never trust other people to have correctly identified a patient.

Use names to identify patients, not “my patient” or “room 86.” Verify identity if others do this, “Do you mean Mrs. Smith in room 86?”

Verify identification every single time for every single treatment or procedure.

Conduct a “time-out” before any invasive procedure—a final verification to confirm the right patient, the right treatment/procedure, the right site—using active communication techniques.

Handwriting

The medical community has for generations tolerated poor handwriting, a human problem, on the part of physicians and staff, joking about people “writing like a doctor.” However, there’s nothing funny about illegible prescriptions and notes, and there’s no excuse for tolerating it. While some studies have shown that doctors have handwriting that is worse than other professionals, other studies have shown otherwise. It doesn’t matter whose handwriting is worse. A scribbled note to Aunt Jessie doesn’t have the same impact as an illegible order for a cardiac medication or an illegible nurse progress note. The problem lies with nurses and other staff as well as physicians. If notes cannot be understood, important information may be overlooked. Newer computer programs have built-

in safeguards to check medication dosages and sound alarms if ordering or administering dosage is incorrect, but still errors occur because handwritten orders and notes remain common:

Ensuring legible handwriting

Require all staff to write legible notes, preferably with block printing.

Verify ALL orders that are not written clearly, every single time: "I'm sorry, but I can't read your writing, so I need to verify your orders."

Tell people directly that their handwriting is illegible: "I can't read your writing."

Tell administrators or supervisors if someone's handwriting is illegible: "I can't read John Brown's handwriting."

Never guess what something says and act on that. NEVER.

Verbal/telephone orders and reporting

As part of improving communication, the Joint Commission has established clear guidelines for verbal or telephone orders or reporting of critical laboratory results, requiring "read-back" at the end of the communication. Read-back is required of all medical personnel, including physicians, so all staff must be trained not only to provide read-back but also to ask for it if the person receiving information fails to follow the correct procedure. This requirement precludes leaving messages for orders or critical test results on voice mail. The receiver MUST transcribe the order and call back to complete a read-back before acting on the orders or information. There is not yet a Joint Commission requirement that read-back be documented, but some institutions have chosen to require this, "Read-back completed," and this is a very good method to ensure better compliance. The responsibility for avoiding do-not-use terms lies with the person giving the communication, not the transcriber, but the transcriber can prompt and clarify and often avoid do-not-use terms, especially if the order is not clear. An effective method is to include both "repeat-back" and "read-back."

Repeat-back and read-back.

Repeat-back Repeat-back each item of an order or a report to provide an opportunity to clarify while recording. If the person giving the communication uses abbreviations, repeat-back with the correct terminology and ask questions to clarify information that is unclear:

Physician: "ASA 81mg qd."

Nurse: "Aspirin 81 mg daily."

Physician: "Diet ad lib."

Nurse: "Do you mean aregular non-restricted diet?"

Physician: "Yes."

Repeat-back does NOT, however, take the place of read-back.

Read-back Read-back when the order or report is completed and written down. The read-back must receive an affirmation.
Nurse: "Let me read-back your order to make sure I have written it correctly:
Aspirin 81 mg daily.
Regular non-restricted diet.
Is that correct."

Doctor: "Yes, that's correct."

Note that in emergency situations, such as a code for a cardiac arrest in the emergency department when the doctor calls out an order, repeat-back is acceptable as it's not practical in this case to take the time to write out the order and do read-back.

Hands-off communications

Hands-off communication occurs when a patient is being transferred from one caregiver to another. Communication problems are the primary cause of sentinel events, and hands-off communication is a common cause of error. It's not unusual for patients to be cared for by many different units during a hospital stay: presurgical unit, surgery, recovery room, critical care, medical-surgical department, and so forth. Additionally, hands-off communication occurs at the change of every shift and when patients transfer to other facilities. Guidelines require that hands-off communications must include interactive questions and answers. Taped end-of-shift reports are not acceptable unless they include an interactive question and answer period after the oncoming staff person listens to the tape. Leaving a telephone number so that the person can call to ask questions is NOT sufficient.

Since this policy applies to physicians who are handing-off care of a patient, there must be some type of standardized procedure in place for physicians as well as other staff. Simply writing in a chart that another physician is taking over care of a patient is not considered adequate, as there must be interaction that allows for questions and answers. The Joint Commission recommends a number of strategies to improve communication and ensure that valuable information is communicated.

Improving hands-off communication

Use clear language. Avoid abbreviations, jargon, and generalizations, such as "She's doing well" or "He's deteriorating." Give specific information: "His blood pressure dropped to 80/60 and oxygen saturation to 84%."

Use effective communication techniques. Limit interruptions and allow time for questioning and feedback to ensure communication is effective.

Standardize shift-change and unit-change/reporting. Devise a standard method of hands-off reporting that is followed by all staff members. It may include a summary of history, orders, problems, laboratory tests, and other information, depending upon the type of facility.

Plan for smooth discharge to other facilities by beginning the process at admission and using a standardized approach that includes adequate documentation, a current list of medications and treatment, and any follow-up information, such as appointments.

Utilize technology, such as electronic medical records that can be accessed by all units or departments as needed.

Medication errors

One primary goal of the Joint Commission is to improve the safety of using medications. A 2001 study of prescriptions written by 23 physicians (total 37,821 prescribed items) over a 2-month period showed that 10.2% of handwritten prescriptions and 7.9% of computer-generated prescriptions contained errors. A more recent study of ambulatory care prescriptions found that 21% contained errors. Not only are there errors in prescribing, but also many errors occur with filling of prescriptions and administration of medications. According to a 2007 report of the Institute of Medicine (IOM), medication errors are responsible for 1.5 million preventable adverse drug events each year in the United States.

In 2004, the United States alone, there were over 33,000 trademarked medications and 8000 non-proprietary medications. Even though drug companies have begun to assess new drug names for similarities to existing drugs, look-alike, sound-alike (LASA) drugs continue to be marketed—and with so many drugs, it's almost inevitable. In addition, some prescriptions are written with brand names and others with generic names, and generic names may be similar to the brand names of other drugs. Two different drugs may have the same name in different countries, and with the increase in international travel, this poses a potential risk. There are a number of recommendations that involve storage of medications and labeling (using both generic and brand names) by pharmacies, as well as limiting the formulary, and these are outside of nursing responsibility, but nursing staff must be aware of the potential for error.

The Institute for Safe Medication Practices maintains a list of LASA drugs that have been involved in patient medication errors. Link: [Institute for Safe Medication Practices list of confused drug names](#)

Another area of concern for medical errors is administering intravenous drugs, especially when adding drugs to intravenous solutions as many drugs and IV fluids are incompatible. Drug/IV fluid incompatibility can result in crystallization of the medication, causing clogging of the lines or embolus. Additionally, if more than one drug is administered intravenously, there may be incompatibilities between drugs. Tissue damage from drugs can occur if IV lines have infiltrated, so patency of the line should be assured before injecting medications into the line. Procedures for flushing IVs before and after administration of drugs must be followed carefully. Charts with IV fluid/drug compatibilities must be available for nursing staff.

The Joint Commission is particularly concerned with increasing safety of anticoagulation therapy because of its potential for adverse effects. Standardized practices that include patient involvement are to be developed with full implementation by January 1, 2009.

Follow the 5 rights of medication administration:

- Right patient
- Right drug
- Right dose
- Right time
- Right route

Utilize correct procedures for telephone/verbal orders, such as read-back.

Question/clarify any order that raises concerns.

Follow correct patient identification procedures every time giving medications/ intravenous fluids.

Verify pediatric doses of medications.

Check intravenous fluid/medication compatibility charts when administering intravenous medications.

Check required infusion rates for intravenous medications.

Read the label every time a medication is accessed and prior to administration.

Use single-dose packaging whenever possible.

Check the purpose of the medication before administration and compare with the diagnoses.

Always verify blood type before administering blood products.

Check all medication delivery devices and equipment, such as PCAs, to ensure they are set and functioning correctly.

Wrong-route

Tubings, catheters, and syringes all lend themselves to wrong-route errors in administration. In the United States, 9 cases of tubing misconnections (7 adults, 2 infants) have been reported to the Joint Commission Sentinel Event Database (launched in 1996), resulting in 8 deaths and permanent loss of function in the remaining victim. Additional reports have been made to other agencies, indicating that this is not an isolated problem, and less serious errors may go unreported. This problem arises because people often have multiple access devices (enteral feeding lines, central lines, peripheral IV lines, Foley catheters, NG tubes, epidurals and peritoneal dialysis catheters) and these devices often connect to each. There are a number of factors that contribute to the problem:

- Luer connections are often used to link various types of medical devices.
- Dissimilar tubes may be positioned close to each other (such as an enteral feeding tube and intravenous line).
- Routine use of devices for unintended purposes, such as using a syringe to administer oral medications or using intravenous extension tubing on epidurals.
- Patient hands-off without providing adequate information.
- Carelessness, fatigue, and stress.

In some cases, such as administering an IM medication subcutaneously, there may be local irritation or problems with absorption, and while usually not life-threatening, these are still serious errors. Some other specific examples of wrong-route errors include:

- Connecting an enteric feeding into an IV catheter.
- Connecting a blood pressure insufflator tube to an IV catheter.
- Injection of intravenous fluid into a tracheostomy cuff inflate tube.
- Injection of oral medication (drawn up in a syringe) into an intravenous line.
- Injection of epidural medications into an intravenous line.
- Injection of intravenous medications into an epidural line.

Because of concerns, manufacturers are producing devices with built-in barriers, such as enteral feeding tubing that is incompatible with other types of tubing or attachments and oral administration syringes that cannot attach to intravenous or other tubing. These should be used universally, but this is not yet the case, partially because of costs involved. A cost-benefit analysis may not indicate return on the investment—small comfort to patients or families who are victims of error. Additionally, there may be lack of awareness of the potential problems. However, there are a number of steps that can be taken to reduce wrong-route errors:

Preventing wrong-route errors

Advise patients and families to never connect or disconnect devices, but to always call for assistance. Educate patients and families about the different devices.

Color-code and/or clearly LABEL all high-risk catheters (arterial, epidural, intrathecal) and avoid catheters with injection ports for these applications.

Always trace all lines from the origin to the connection port prior to making connection or reconnections or administering medications, solutions, or other products.

Include tracing of all lines when doing the standard line reconciliation process as part of hands-off communication.

NEVER use Luer-connection syringes/devices for oral administration.

Abbreviations

The use of abbreviations is a special area of concern because many errors have been attributed to the improper use or understanding of abbreviations. In response, the Joint Commission discourages the use of abbreviations and has established a list of “Do not use” abbreviations and an additional list of terms that may be included on the “do not use” list in the future. Most institutions have established lists of approved abbreviations, but the reality is that most lists are quite long and contain many abbreviations that are not commonly used. A better approach is to use the current list without definitions as a test to determine which terms are most useful and understandable. All staff members or a selected number from different departments can be asked to define the terms on the approved list, and then a new and more usable list can be created from those with the highest recognition factor. Problems are often encountered with use of periods, as some people write them carelessly as slash marks when writing quickly, and these can be misinterpreted as letters or numbers.

Problems can arise if prescribing physicians refuse to comply with the do-not-use restrictions. The nurse is not responsible for monitoring the behavior of prescribers or for correcting them, but nurses should report failure to comply to nursing administration, which in turn can take the issue to medical staff leadership because compliance is part of Joint Commission accreditation. It helps if an institution has do-not-use guidelines prominently posted at nursing stations and other areas of the facility:

Do not use	Problem	Substitute/write
U (unit)	May be read as 0, 4, or cc	Unit
IU (international unit)	May be read as IV or 10	International unit
Q.D., QD, q.d., qd (daily) Q.O.D, QOD, q.o.d., qod (every other day)	Daily and every other day may be confused. Periods may be read as letter i, so q.d may be read as qid.	Daily Every other day.
X.0 mg (trailing zero) .X mg (no leading zero)	Decimal points are often missed or misread, so only use if necessary to show less than a whole number.	X mg 0.X mg Never use trailing zeros for medications, but they may be used for laboratory reports, imaging studies (to indicate precise size) and catheter tube sizes. Always use leading zeros.
MS MSO ₄ & MgSO ₄	Can mean morphine sulfate or magnesium's sulfate and may be confused.	Morphine sulfate Magnesium sulfate
> (greater than) < (less than)	Read as 7 Read as L	Greater than Less than
Drug names (MS, TCN, etc)	Many drugs may have similar abbreviations.	Full name of drug
Apothecary units	May be confused with metric units or may be unfamiliar to many.	Metric units
@ (at)	Read as 2	at
cc (cubic centimeters)	Read as U (units)	ml or milliliter
µg (microgram)	Read as mg(1000-fold overdose)	mcg or microgram

Critical test results and values

One area identified by the Joint Commission, related to poor communication, is the need to improve the timeliness of the reporting of critical test results and values. In some cases, delay may relate to problems outside of nursing control, such as inefficient or understaffed laboratories, resulting in slow test turnover. Physicians are, understandably, resistant to receiving calls every time a lab test result is received, so the institution must define the following:

- **Critical tests:** Tests that ALWAYS require rapid reporting, even if results are normal.
- **Critical results:** A range of results for any test (even routine) that triggers rapid reporting.

Critical tests include laboratory tests, imaging studies, and other diagnostic tests. There are subsets of critical results:

- Results that are necessary to determine a course of treatment.
- Results that would be critical for some but are normal for those with a chronic disease.
- Results that were reported initially and subsequent retesting results show improvement.

Unless an institution has specifically developed a protocol for the various subsets, they are handled the same as critical results with immediate reporting. Critical results must be transmitted immediately upon receiving them. The institution must establish acceptable time lines for critical tests, such as when a physician orders a test to be done "stat."

Critical test results can be reported to an "agent" of the prescribing physician if the institution can demonstrate that the information can be transmitted immediately to the physician. For example, a report may be given to an office staff person if the physician is at an office. In some cases, results are sent in computerized form directly from the laboratory, and protocol must be established delineating responsibilities in that case. All staff should be aware of reporting requirements, and information about reporting should be prominently.

Ensuring timely reporting of critical test results and values

Check all lab reports when received and verify those that require immediate reporting.

Report verbally or by telephone immediately to the physician or physician's agent, requesting read-back (especially if giving results to an agent and not directly to the physician).

Chart date and time that test results were reported.

Wrong site, wrong procedure, wrong person surgery

The Joint Commission has developed a universal protocol to prevent wrong site, wrong procedure, wrong person surgery. These types of errors, such as removing the wrong leg or operating on the wrong patient, can have devastating

effects and almost always relate to poor communication. Patients undergoing surgery are often concerned about mistakes being made. Some resort to writing “wrong side” on their bodies—a practice that should be discouraged as it can be confused with correct surgical marking.

Preventing wrong site, wrong person, wrong procedure surgery

Complete pre-operative verification: This step involves insuring that all relevant information and documentation are available, have been reviewed, and are consistent with each other. There is no missing information or discrepancies.

Mark the operative site: The operative site is marked with permanent ink to indicate the right/left distinction or multiple sites, following the protocol established by the institution. The marking must be visible after the patient is prepped and draped, so the marking is on the operative side, (not a warning on the opposite side).

Conduct a time out immediately before starting the procedure: This should be initiated by a designated team member, allowing last minute verification.

Nosocomial infections

Nosocomial infection according to the National Nosocomial Infections Surveillance (NNIS) is a hospital-acquired infection, either localized or systemic, caused by a pathogen or toxin that was not present (or incubating) in the patient at the time he/she was initially hospitalized. In some cases, infections occur within 24-48 hours, but other infections may not become evident until after discharge from the hospital because incubation times and resistance varies. An infection that occurs after discharge but is hospital-acquired is still considered nosocomial

Nosocomial infections are a grave cause of concern, especially with the marked increased in methicillin-resistant *staphylococcus aureus* (MRSA) infections. Hospital-acquired infections are frequently related to surgical sites, invasive devices, such as urinary and central line catheters and mechanical ventilators. Studies indicate that proper handwashing techniques and consistent handwashing before and after caring for each patient can effectively reduce infection rates.

Preventing nosocomial infections

Follow protocols for use of mechanical ventilators.

Avoid or limit the use of urinary Foley catheters.

Examine all central and peripheral lines for indications of infection at least every 8 hours and follow all protocols for safety.

Examine surgical sites for indications of infection at least every 8 hours, using aseptic technique for all wound care.

Utilize proper hand washing technique under running water if there is any debris on the hands:

- Wash hands under running water with plain soap rather than antimicrobial soap because of issues related to resistance.
- Lather hands thoroughly, covering all areas of the hands and

- wrists with soap, and then rinsed.
- Avoid contacting surfaces that might serve as vectors, such as faucet handles and doorknobs, after washing hands
 - Turn the faucet off by using the elbow or upper forearm or holding a piece of paper towel as a barrier.
 - Dry the hands with disposable towels.

Utilize alcohol based rubs, such as Purell®, to kill bacteria on the hands if they are not contaminated or do not contain debris:

- Rub alcohol cleaner on hands, coating all hand surfaces, including between the fingers, the wrists, and under the nails, and then continuing rubbing the hands together until the solution evaporates, at least 15 second
- Do not rinse hands.

Summary

There is a growing consensus that medical errors must be eliminated, and the federal government, accreditation agencies, and state legislatures are passing regulations to spur improvement in patient safety. The 8 primary causes of medical error are communication problems, inadequate information flow, human problems, patient-related problems, organizational transfer of knowledge, staffing pattern/work flow; technical failure; and inadequate policies. There are a number of areas of concern in decreasing medical errors: identification; handwriting; verbal/telephone orders and reporting; hands-off communications; medication errors; wrong route errors; abbreviations; critical test results and values; wrong site, wrong procedure, wrong person surgery; and nosocomial infections. Nurses must be proactive in efforts to reduce medical error.

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