

PREVENTING MEDICAL ERRORS

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Introduction:

During the legislative session of 2002, the Florida Legislature passed law 456.013, which mandated a two (2) hour class on medical errors for all licensees who are licensed under the department of health.

456.013 Department; general licensing provisions

(7) The boards, or the department when there is no board, shall require the completion of a 2-hour course relating to prevention of medical errors as part of the licensure and renewal process. The 2-hour course shall count towards the total number of continuing education hours required for the profession. The course shall be approved by the board or department, as appropriate, and shall include a study of root-cause analysis, error reduction and prevention, and patient safety. If the course is being offered by a facility licensed pursuant to chapter 395 for its employees, the board may approve up to 1 hour of the 2-hour course to be specifically related to error reduction and prevention methods used in that facility.

The statute above is the law that was passed during the 2001 legislative session. As you can see, anyone who is licensed under the Florida Department of Health must take this two (2) hour course *during each licensing period*. This two (2) hour course counts as a part of the total continuing education (CEU) requirements for that profession. On July 22, 2002 the Electrolysis Council made the decision to allow any Medical Errors course that was provided by any approved provider under the Department of Health, to be automatically accepted for electrolysis licensure requirements. This correspondence course *is* from an approved provider.

Goals and Objectives of this Course

In compliance with **456.013 F.S.**, the following correspondence course has been provided to meet those requirements. The goals of this course are:

- Understand why Florida health care professionals are required to take this course.
- Learn about the primary causes of medical errors and how to prevent them.
- Review the different types of medical errors.
- Learn where errors occur.
- Learn about the ways to avoid potential injuries.
- Gain an understanding of root cause analysis.
- Define sentinel events.

Why Was This Law Developed?

In 1999, the National Institute of Medicine (IOM) released a report titled **“TO ERR IS HUMAN: BUILDING A SAFER HEALTH SYSTEM”**. This report can be read in its entirety at:

<http://search.nap.edu/nap-cgi/naptitle.cgi?Search=To+Err+is+Human>

This report put a national focus on the incredible number of medical errors that were occurring in our nation’s hospitals. It was disclosed that as many as 44,000 to 98,000 people die every year in our nation’s hospitals because of medical errors! Using the lower estimate, this makes medical errors responsible for more deaths in our country than automobile accidents each year. Medication errors alone kill approximately 7,000 citizens annually – which is about 16% more deaths than the number attributed to work related injuries.

- Automobile accidents kill an average of 43,458 annually
- Breast cancer kills an average of 42,297 annually
- AIDS kills an average of 16,516 annually

The report emphasized the point that our health care *systems* needed to be improved, rather than victimize the health care workers. Effective accounting measures are required so we can learn from our mistakes, rather than placing the focus on penalizing health care workers who are trying to make a difference in an ineffective system.

President Clinton ordered the Quality Interagency Coordination Task Force to make recommendations on improving health care quality and protecting patient safety in response to the IOM report. The Report to the President on Medical Errors was issued in February 2000. For more information on medical errors, visit www.ahrq.gov/qual/errorsix.htm.

Federal agencies, states, accrediting bodies, and other organizations are collecting data that can provide important insights into medical errors, and many of these groups plan to expand their data collection systems independently. If these data collection initiatives were coordinated, they could reduce the duplication of effort and the undue burden on those who are providing information to these systems, thus encouraging the comprehensive reporting of data.

To facilitate this coordination, the Department of Health and Human Services (HHS), has established a Patient Safety Task Force to:

- Coordinate the integration of data collection on medical errors and adverse events.
- Coordinate research and analysis efforts.

- Promote collaboration on reducing the occurrence of injuries that result from medical errors.

The activities of the Patient Safety Task Force will contribute to the Nation's efforts in meeting the IOM's goal of reducing the number of medical errors by 50% by the year 2005.

To achieve its mission, the Task Force will create:

- A coordinated reporting system that is easy to use for the person reporting errors and adverse events.
- A common vocabulary that enables data to be shared, compared, analyzed, and evaluated.
- A network for reporting that retains confidentiality of clinicians and patients and that allows access by each agency or organization that needs to use the reported information.
- An analysis and research function that allows the reports of errors to be evaluated, safety hazards to be identified, and safety improvements to be evaluated for their effectiveness.
- Information on the implementation of patient safety best practices within Federal programs.
- Information dissemination and technical assistance to public- and private-sector organizations that use this information to improve patient safety.
- A report that evaluates the Task Force's progress toward meeting its mission.

To ensure minimal burden, the coordinated data collection system should:

- **Be easy to use.** The system should be manageable and feature a uniform data collection method, so that those being asked to report are not frustrated by cumbersome and inconsistent formats. Frustration could lead to underreporting, and the health care system will show little gain for the expense of creating the system.
- **Provide reliable, valid information.** The system should facilitate Federal agencies, States, and private-sector organizations in fulfilling their missions. If they receive inaccurate or incomplete information, or it does not meet their needs, they may seek to develop new systems that fragment national efforts to improve patient safety.
- **Maintain confidentiality.** The confidentiality of individual patients and providers in the reported information should be paramount.

Florida's Response

The Florida legislature responded the following year with the creation of the "Florida Commission on Excellence in Health Care". Their directive was to "develop a comprehensive statewide strategy for improving the health care delivery system through meaningful reporting standards, data collection and review and quality measurement." This commission is comprised of 42 members from the following agencies:

- Secretary of the Department of Health
- Secretary of the Agency for Health Care Administration
- Representatives from various state boards
- Representatives from various hospital and medical associations
- Medical Malpractice Insurance agencies
- One laboratory director
- 5 consumer members
- 2 legislators
- 1 representative from a Florida state medical school

The Commission finished its report and presented their recommendations to the Florida House and Senate on February 1, 2001. That report can be viewed at:

www9.myflorida.com/mqa/FCHCE/FCHCEfinalrpt02-01-01.pdf

The Commission members decided that their plan needed to be "patient-centered, multidimensional, and cost effective". After meeting 7 times, they formed the following subcommittees to address the areas of:

- Regulation
- Education/Best Practices
- Quality Measurement/Data Collection and Reporting

Where Errors Occur

Hospitals are not the only place where errors occur. They occur in other health care settings, such as physicians' offices, nursing homes, pharmacies, care centers, and care delivered in the home. The IOM report indicated, however, that many errors are likely to occur outside the hospital. While there is very little data that exists on the extent of the problem outside of hospitals, this endeavor is meant to produce that data so problems can be identified and corrected. For example, in a recent investigation of pharmacists, the Massachusetts State Board of Registration in Pharmacy estimated that 2.4 million prescriptions are filled improperly each year in their state.

In 2002, only 23 states (18 of which required hospital reporting) had reporting systems to track preventable medical errors and to help providers take corrective actions.

What is a “Medical Error”?

A Medical Error is "the failure to complete a planned action as intended, or the use of a wrong plan to achieve an aim."

An Adverse Event is "an injury caused by medical *management* rather than by the underlying disease or condition of the patient."

Medical errors happen when something that was planned as a part of medical care doesn't work out, or when the wrong plan was used in the first place.

Medical errors can occur anywhere in the health care system:

- Hospitals.
- Clinics.
- Outpatient Surgery Centers.
- Doctors' Offices.
- Nursing Homes.
- Pharmacies.
- Patients' Homes.

Errors can involve:

- Medicines.
- Surgery.
- Diagnosis.
- Equipment.
- Lab reports.

They can happen during even the most routine tasks, such as when a hospital patient on a salt-free diet is given a high-salt meal. Getting the wrong medicine is a medical error.

Most errors result from problems created by today's complex health care system. But errors also happen when doctors and their patients have problems communicating. For example, a recent study supported by the Agency for Healthcare Research and Quality (AHRQ) found that doctors often do not do enough to help their patients make informed decisions. Uninvolved and uninformed patients are less likely to accept the doctor's choice of treatment and less likely to do what they need to do to make the treatment work.

Medication Errors

These are preventable mistakes in prescribing and delivering medication to patients, such as prescribing two or more drugs whose interaction is known to produce side effects or prescribing a drug to which the patient is known to be allergic.

Research by AHRQ-supported investigators is helping to characterize these errors (called preventable adverse drug events, or ADE's) and suggest how to prevent them.

- In a study of inpatient care in two tertiary care hospitals, errors in ordering and administering medicines accounted for 56% and 34%, respectively, of preventable adverse drug events.
- Findings from a second study showed that dosage errors, in particular, were primarily due to the physician's lack of knowledge about the drug or about the patient for whom it was prescribed.
- An attempt to identify risk factors for preventable adverse drug reactions among patients admitted to medical and surgical units at two large hospitals found few such factors, which suggested to the researchers that a focus on improving medication systems would prove more effective.

Surgical Errors

In contrast to ADE's, surgical adverse events (1 in 50 admissions in Colorado and Utah hospitals during 1992), accounted for two-thirds of all adverse events and 1 of 8 hospital deaths in a recent retrospective study of these institutions by an AHRQ fellow.

Diagnostic Inaccuracies

Incorrect diagnoses may lead to incorrect and ineffective treatment or unnecessary testing, which is costly and sometimes invasive. Also, inexperience with a technically difficult diagnostic procedure can affect the accuracy of the results. Here, too, AHRQ-funded researchers have made major contributions.

- One study showed that physicians who performed 100 or more colposcopies (a test used to follow up abnormal Pap smears) a year had more accurate findings than physicians who performed the procedure less often.
- Another study demonstrated that measuring blood pressure with the most commonly used type of equipment often gives incorrect readings that may lead to mismanagement of hypertension.

System Failures

Although errors in medication, surgery, and diagnosis are the easiest to detect, medical errors may result more frequently from the organization of health care delivery and the way that resources are provided to the delivery system. Research by AHRQ-supported scientists is helping to identify the systemic factors contributing to preventable adverse events.

- Investigators in a major study discovered that failures at the system level were the real culprits in over three-fourths of adverse drug events.
- Failures in disseminating pharmaceutical information, in checking drug doses and patient identities, and in making patient information available are system errors that accounted for adverse drug events in over half of the hospitals studied.
- One system-level factor, staffing levels of nurses (adjusted for hospital characteristics), was found in a study to influence the incidence of adverse events following major surgery, such as urinary tract infections, pneumonia, thrombosis, and pulmonary compromise.

This research on systemic problems leads investigators to conclude that any effort to reduce medical errors in an organization requires changes to the system design, including possible reorganization of resources by top-level management.

Costs

Medical errors carry a high financial cost. The IOM report estimates that medical errors cost the Nation approximately \$37.6 billion each year. About \$17 billion of those costs are associated with *preventable* errors. About half of the expenditures for preventable medical errors are for direct health care costs.

The serious problem of medical errors is not new, but in the past the problem has not gotten the attention it deserved. Research describing the problem of medical errors began to emerge in the early 1990s with landmark research conducted by Lucian Leape, M.D., and David Bates, M.D., and supported by the Agency for Health Care Policy and Research, now the Agency for Healthcare Research and Quality (AHRQ). In 1998 medical errors was identified as being one of the four major challenges for improving the nation's health care quality.

Preventing medical errors is a national challenge. Although the U.S. offers some of the best health care in the world, the number of medical errors is still very high.

- Medical errors are common and costly. The IOM estimates that over half of adverse medical events are due to preventable medical errors, causing up to 98,000 deaths a year and costing as much as \$29 billion annually. One study of over 30,000 patients indicated that nearly 60% of patients

suffering adverse events in a hospital stay were subjected to a preventable medical error.

- Medication errors account for a significant portion of preventable adverse events. The IOM estimates the number of lives lost to preventable medication errors account for over 7,000 deaths annually in hospitals alone and tens of thousands more in outpatient facilities nationwide. These errors increase hospital costs by an estimated \$2 billion, and nursing homes costs by over \$3 billion. A study of hospitals in New York State indicated that drug complications represent 19% of all adverse events, and that 45% of these adverse events were caused by medical errors. In this study, 30% of individuals with drug-related injuries died.

Public Fears

While there has been no unified effort to address the problem of medical errors and patient safety, awareness of the issue has been growing. Americans have a very real fear of medical errors. According to a national poll conducted by the National Patient Safety Foundation:

- Forty-two percent of respondents had been affected by a medical error, either personally or through a friend or relative.
- Thirty-two percent of the respondents indicated that the error had a permanent negative effect on the patient's health.

Another survey, conducted by the American Society of Health-System Pharmacists, found that Americans are "very concerned" about:

- Being given the wrong medicine (61%).
- Being given two or more medicines that interact in a negative way (58%).
- Complications from a medical procedure (56%).

Most people believe that medical errors are the result of the failures of individual providers. When asked in a survey about possible solutions to medical errors:

- 75% of respondents thought it would be most effective to "keep health professionals with bad track records from providing care."
- 69% thought the problem could be solved through "better training of health professionals."

This fear of medical errors was borne out by the interest and attention that the IOM report generated. According to a survey by the Kaiser Family Foundation, 51% of Americans followed closely the release of the IOM report on medical errors.

It's a Systems Problem

The IOM emphasized that most of the medical errors are systems related and not attributable to individual negligence or misconduct. The key to reducing medical errors is to focus on improving the systems of delivering care and not to blame individuals. Health care professionals are simply human and, like everyone else, they make mistakes. But research has shown that system improvements can reduce the error rates and improve the quality of health care:

- A 1999 study indicated that including a pharmacist on medical rounds reduced the errors related to medication ordering by 66%, from 10.4 per 1,000 patient days to 3.5 per 1,000 patient days.
- The specialty of anesthesia has reduced its error rate by nearly sevenfold, from 25 to 50 per million to 5.4 per million, by using standardized guidelines and protocols, standardizing equipment, etc.
- One hospital in the Department of Veterans Affairs uses hand-held, wireless computer technology and bar-coding, which has cut overall hospital medication error rates by 70%. This system is soon to be implemented in all VA hospitals.

Types of Errors

The IOM defines medical error as "the failure to complete a planned action as intended or the use of a wrong plan to achieve an aim." An adverse event is defined as "an injury caused by medical management rather than by the underlying disease or condition of the patient." Some adverse events are not preventable and they reflect the risk associated with treatment, such as a life-threatening allergic reaction to a drug when the patient had no known allergies to it. However, the patient who receives an antibiotic to which he or she is known to be allergic, goes into anaphylactic shock, and dies, represents a preventable adverse event.

Most people believe that medical errors usually involve drugs, such as a patient getting the wrong prescription or dosage, or mishandled surgeries, such as amputation of the wrong limb. However, there are many other types of medical errors, including:

- Diagnostic error, such as misdiagnosis leading to an incorrect choice of therapy, failure to use an indicated diagnostic test, misinterpretation of test results, and failure to act on abnormal results.
- Equipment failure, such as defibrillators with dead batteries or intravenous pumps whose valves are easily dislodged or bumped, causing increased doses of medication over too short a period.
- Infections, such as nosocomial and post-surgical wound infections.
- Blood transfusion-related injuries, such as giving a patient the blood of the incorrect type.

- Misinterpretation of other medical orders, such as failing to give a patient a salt-free meal, as ordered by a physician.

Preventing Errors

Research clearly shows that the majority of medical errors can be prevented.

- One of the landmark studies on medical errors indicated 70% of adverse events found in a review of 1,133 medical records were preventable; 6% were potentially preventable; and 24% were not preventable.
- A study released last year, based on a chart review of 15,000 medical records in Colorado and Utah, found that 54% of surgical errors were preventable.

Other potential system improvements include:

- Use of information technology, such as hand-held bedside computers, to eliminate reliance on handwriting for ordering medications and other treatment needs.
- Avoidance of similar-sounding and look-alike names and packages of medication.
- Standardization of treatment policies and protocols to avoid confusion and reliance on memory, which is known to be fallible and responsible for many errors.

The following “tips” have been taken from *AHRQ Publication No. 00-PO38*

What Can You Do? Be Involved in Your Health Care

1. The single most important way you can help to prevent errors is to be an active member of your health care team.

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.

Medicines

2. 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.

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. Make sure your doctor knows about any allergies and adverse reactions you have had to medicines.

This can help you avoid getting a medicine that can harm you.

4. When your doctor writes you a prescription, make sure you can read it.

If you can't read your doctor's handwriting, your pharmacist might not be able to either.

5. Ask for information about your medicines in terms you can understand—both when your medicines are prescribed and when you receive them.

- 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. When you pick up your medicine from the pharmacy, ask: Is this the medicine that my doctor prescribed?

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. If you have any questions about the directions on your medicine labels, ask.

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. Ask your pharmacist for the best device to measure your liquid medicine. Also, ask questions if you're not sure how to use it.

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. Ask for written information about the side effects your medicine could cause.

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.

Hospital Stays

10. If you have a choice, choose a hospital at which many patients have the procedure or surgery you need.

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. If you are in a hospital, consider asking all health care workers who have direct contact with you whether they have washed their hands.

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. When you are being discharged from the hospital, ask your doctor to explain the treatment plan you will use at home.

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.

Surgery

13. 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.

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.

Other Steps You Can Take

14. Speak up if you have questions or concerns.

You have a right to question anyone who is involved with your care.

15. Make sure that someone, such as your personal doctor, is in charge of your care.

This is especially important if you have many health problems or are in a hospital.

16. Make sure that all health professionals involved in your care have important health information about you.

Do not assume that everyone knows everything they need to.

17. 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).

Even if you think you don't need help now, you might need it later.

18. Know that "more" is not always better.

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. If you have a test, don't assume that no news is good news.

Ask about the results.

20. Learn about your condition and treatments by asking your doctor and nurse and by using other reliable sources.

For example, treatment recommendations based on the latest scientific evidence are available from the National Guidelines Clearinghouse at <http://www.guideline.gov>. Ask your doctor if your treatment is based on the latest evidence.

More Information

A Federal report on medical errors can be accessed online, and a print copy (Publication No. OM 00-0004) is available from the AHRQ Publications Clearinghouse: phone, 1-800-358-9295 (outside the United States, call 410-381-3150) or E-mail: ahrqpubs@ahrq.gov.

The following fact sheet was developed by Federal agencies in the Quality Interagency Coordination (QuIC) Task Force, in partnership with other health care purchasers and providers.

1. Speak up if you have questions or concerns. Choose a doctor who you feel comfortable talking to about your health and treatment. Take a relative or friend with you if this will help you ask questions and understand the answers. It's okay to ask questions and to expect answers you can understand.

2. Keep a list of all the medicines you take. Tell your doctor and pharmacist about the medicines that you take, including over-the-counter medicines such as aspirin, ibuprofen, and dietary supplements like vitamins and herbals. Tell them about any drug allergies you have.

Ask the pharmacist about side effects and what foods or other things to avoid while taking the medicine. When you get your medicine, read the label, including warnings. Make sure it is what your doctor ordered, and you know how to use it. If the medicine looks different than you expected, ask the pharmacist about it.

3. Make sure you get the results of any test or procedure. Ask your doctor or nurse when and how you will get the results of tests or procedures. If you do not get them when expected—in person, on the phone, or in the mail—don't assume the results are fine. Call your doctor and ask for them. Ask what the results mean for your care.

4. Talk with your doctor and health care team about your options if you need hospital care. If you have more than one hospital to choose from, ask your doctor which one has the best care and results for your condition. Hospitals do a

good job of treating a wide range of problems. However, for some procedures (such as heart bypass surgery), research shows results often are better at hospitals doing a lot of these procedures. Also, before you leave the hospital, be sure to ask about follow-up care, and be sure you understand the instructions.

5. Make sure you understand what will happen if you need surgery. Ask your doctor and surgeon:

- Who will take charge of my care while I'm in the hospital?
- Exactly what will you be doing?
- How long will it take?
- What will happen after the surgery?
- How can I expect to feel during recovery?

Tell the surgeon, anesthesiologist, and nurses if you have allergies or have ever had a bad reaction to anesthesia. Make sure you, your doctor, and your surgeon all agree on exactly what will be done during the operation.

Boring Facts

Death from Medical Errors

- 44,000 – 98,000 = medical errors
- 43,458 = motor vehicle accidents
- 42,297 = breast cancer
- 16,516 = AIDS

Medical errors are the 8th leading cause of death in the United States!

Errors in health care have been estimated to cost more than \$5 million per year in a large teaching hospital. According to a recent report by the Institute of Medicine (IOM), preventable health care-related injuries cost the economy from \$17 to \$29 billion annually, of which half are health care costs.

The IOM report estimates that 44,000 to 98,000 people each year die from medical errors. Even the lower estimate is higher than the annual mortality from motor vehicle accidents (43,458), breast cancer (42,297), or AIDS (16,516), thus making medical errors the eighth leading cause of death in the United States.

These and other findings of the IOM report are based on research sponsored by a variety of organizations, including the Agency for Healthcare Research and Quality (AHRQ).

For example, a study by AHRQ found that just one type of error—preventable adverse drug events—caused one out of five injuries or deaths per year to patients in the hospitals that were studied.

Adverse Effects

One study of over 30,000 patients indicated that nearly 60% of patients suffering adverse events in a hospital stay were subjected to a *preventable* medical error.

Root Cause Analysis

Root cause analysis is a set of processes by which the underlying causes of adverse outcomes may be identified, keeping in mind that the goal is to prevent the reoccurrence of such events. Experts in risk management both within and without the health care industry emphasize system failures and system-driven errors over direct human error, and the philosophy guiding the process of root cause analysis, be it manual or automated, should reflect this emphasis.

Fears of criminal prosecution within the medical community are not without foundation. For example, in California, there are a handful of physicians facing second degree murder charges. "We need to make sure we find a way to prevent criminal prosecution of doctors from becoming a trend" says a California emergency physician who was acquitted of murder charges and the possibility of 15 years to life in prison stemming from clinical decisions. Another doctor is standing trial for the death of a patient whose uterus he perforated during an abortion. (Prager, 1998). These are extreme examples of how a sentinel event with a tragically poor outcome can affect physicians. These are also examples of how the health care provider can be crushed by a system that points to human error without regard for considering systems and process deficiencies which can likely be identified and corrected with a thorough and credible root cause analysis.

Most physicians and other health-care professionals realize that medical errors remain an ever-present threat to patients' well-being. To successfully reduce and prevent errors, however, we must learn to view and deal with errors differently. When a patient receives the wrong medication, we know that an error has occurred, but we must recognize that other, less-obvious incidents constitute medical errors as well.

It is all too easy for us to dismiss an error as an isolated event that won't happen again. We rationalize that it was a single individual's mistake that occurred because of an unusual confluence of circumstances. Meanwhile, we never believe it could happen to us.

When we view medical errors in isolation, however, we miss the opportunity to really understand the nature of the problem and we overlook important themes that could help patients and health-care professionals in the future. The process

of "root-cause analysis" is the mechanism by which we strive to learn from each event in the name of patient safety.

Rather than view the error as an isolated incident occurring at a single point in time, root-cause analysis expands the timeline and requires us to look further upstream from the event. This approach allows us to identify system problems that individually are not problematic but which, in combination, allow for the "unusual confluence of circumstances" that lead to medical errors.

A root-cause analysis is typically conducted by an interdisciplinary team of the individuals who witnessed or were otherwise involved in the incident. The focus of the analysis is to learn what we can do better next time. Root-cause analyses demonstrate that certain actions, behaviors and attitudes can contribute to catastrophic results under certain conditions. Viewing the problem in this "process flow" manner can reveal a pattern of error that would otherwise be attributed to unconnected events. Such insight can lead to valuable changes in policies and procedures so that no future patients are harmed.

In a case recently cited in the *Annals of Internal Medicine*, for example, a 67-year-old woman was admitted for cerebral angiography and mistakenly underwent an invasive cardiac electrophysiology study. Through a root-cause analysis, the team identified 17 distinct errors that led to the mix-up. No single error could have caused the event, but in combination with system weaknesses, the wrong patient was taken to the EP lab. The contributing errors included absent or misused protocols for patient identification and informed consent; faulty exchange of information among caregivers; and poorly functioning teams.

Performing a root-cause analysis can also be very beneficial in response to a "near-miss." No error occurred because one of the checks and balances intervened before a critical step. Although we applaud the vigilance that catches such errors in time, this vigilance should be the last level of security because a near-miss indicates that the overall system is not designed optimally. Reducing the number of near-misses is a key goal of root-cause analyses, and physicians and staff should be encouraged to report near-misses as well as actual errors. Ultimately, each event provides an opportunity to learn and to improve safety for our patients.

So, the goal of root cause analysis is to identify:

- What happened
- Why did it happen
- What can you do to prevent it from happening again

A root cause analysis is performed when a *sentinel event* occurs.

Sentinel Event

A sentinel event is an unexpected occurrence involving

- Death
- Serious physical injury
 - This includes loss of limb or function
- Psychological injury

Sentinel Event in Hair Removal

While a sentinel event in hair removal is very hard to imagine, there have been a few! The following is an article that appeared in the Washington Post on January 31, 2001. This is by far the worst incident that we have heard of to date.

Man's Death After Visit To Clinic Spurs Suit

Virginia Family Says Doctor Failed to Give Son CPR

By Tom Jackman

Washington Post Staff Writer

Wednesday, January 31, 2001; Page B01

As a teenager, Jonathan Briese had first-aid training, both as an Eagle Scout and a volunteer Fairfax County firefighter. His father is a paramedic and author of textbooks on emergency response. His brother is a firefighter and paramedic.

But when Briese suffered an allergic reaction in a McLean doctor's office last year, he didn't get the basic lifesaving help he needed until paramedics arrived, his family said. Within an hour, the promising 20-year-old cadet at the U.S. Coast Guard Academy was dead.

It was supposed to be a simple procedure -- outpatient laser hair removal. He'd undergone one treatment. His father had checked out the clinic. "It was a no-brainer," said Garry Briese, Jonathan's father. But when he was given a combination of a pain reliever, a relaxant and an anesthetic cream, something went wrong.

Even worse, the Brieses claim, only one doctor -- and no nurses or other support staff -- was around to help in a moment of crisis. Late last week, the Brieses filed a lawsuit against the clinic's owners, plastic surgeons Csaba L. Magassy and B. Scott Teunis, and the doctor who was to perform the removal, James J. Donohue IV. The suit alleges wrongful death, negligent hiring and supervision of Donohue, and false advertising in the clinic's claims that Magassy would supervise and direct the procedure.

Magassy and Donohue yesterday expressed regret over Briese's death. Teunis did not return a phone message seeking comment.

"I did the best I could and called 911 when it happened," Donohue said. "I guess I'll just explain that in court. I never had anything like this happen."

Magassy said he was out of the country when the incident occurred, but that "full resuscitation equipment was available in the office. . . . I wish I would have been there to help the kid."

Jonathan Briese and his older brother, Oren, grew up around public servants. Their father was a firefighter in Florida, and the family moved to Fairfax County in 1985 when Garry Briese was hired as executive director of the International Association of Fire Chiefs. Garry Briese has written and lectured about emergency medical care, and in one of his textbooks, "First Responder," Briese served as a model in photographs depicting how to perform cardiopulmonary resuscitation.

Briese also liked to do things his own way, whether it was applying to colleges or looking into hair removal. Friends who swam and played lacrosse with Briese teased him about his hairy back, and he was self-conscious about it, his parents said. When he learned of laser hair removal, which requires only the burning of hair follicles, Briese researched it, then began visiting doctor's offices.

In December 1999, he visited the McLean offices of Plastic Surgery Associates, Magassy and Teunis's firm. The firm had advertised in various publications, and his mother had given him a list of questions to ask the doctors.

"If we're willing to let him risk his life in the Coast Guard," his mother said, "we should let him choose his own doctor."

After spending about 40 minutes at Plastic Surgery Associates, he called home and said it looked good. He was planning to have his first treatment later that afternoon.

Briese wasn't given any drugs on his first visit, his father said. When he came home, "he was ecstatic. He had a clear back." He made another appointment for February 2000, on a weekend when he'd be home from the academy.

After having lunch with his father on Feb. 19, he went back to Plastic Surgery Associates. The lawsuit alleges that Donohue was the only doctor present and that he sent the only other staffer -- a nurse -- home. The doctor's notes say that he gave Briese Xanax, a relaxant, and Lortab, a pain reliever, the lawsuit claims.

While Donohue was applying an anesthetic cream, he noticed Briese lower his head and begin to snore before losing consciousness. The lawsuit alleges that Briese's breathing slowed, that he vomited and that Donohue tried to clear his airway before leaving the room to call 911. The Brieses claim no CPR or other lifesaving treatment was administered by the doctor.

Paramedics arrived within minutes and began CPR, intravenous and cardiac treatment, and then rushed Briese to Inova Fairfax Hospital. Twelve minutes after he arrived there, he was dead.

The medical examiner ruled that Briese had died of anaphylaxis, or an allergic reaction. "Anaphylaxis is usually manageable if it's caught," Garry Briese said. "The bigger question is, once he got into difficulty, what was the response? What happened between when he walked in the office and when 911 was called? From my perspective, it's unexplainable. It really is."

Magassy, a board-certified plastic surgeon, said that his office had not had a death in 28 years, but that "this really wasn't us." He said Donohue was renting space from his firm.

"I don't blame the parents for suing," Magassy said. "I'd sue, too."

The case of Jonathan Breise is a sentinel event because there was a death involved. If an electrologist had been involved, there probably would not have been an adverse event. We all know that hair removal is not so painful that powerful prescription medications have to be used. We also know that topical anesthetics should be used for smaller areas of the body. Since the liver has to process all of the medications present in our topical agents, an entire back probably should not be covered by a topical such as EMLA. The combination of Xanax, Lortab, and (probably) EMLA was too much for his system and he unfortunately died before the procedure could even begin. In reality, this is not a hair removal problem, but rather an issue of poorly implemented medications.

The root cause analysis would most likely reveal that these powerful prescription medications were used inappropriately.

Florida has been one of the states in the lead for developing patient safety programs. One of the first national centers was created as a part of the Veterans Administration. Teamed with the University of South Florida this VA center was designated as a "National Center for Patient Safety Research" by the federal agency for Healthcare Research and Quality. It is responsible for working with other locations in the state to assemble data for their research.

There are 32 health care occupations that are licensed in Florida, and all of those professions are now required to take this two (2) hour course on "Prevention of Medical Errors". It is designed to make us all take a good hard look at how the health care system works and how it can be improved in Florida. Only time will tell if this requirement will improve health care in Florida.

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