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Contact Hours: **2**

Prevention of Medical Errors for Florida Physical Therapy

BY Judith Swan, MSN, BSN, ADN, RN; Nancy Evans, BS

LEARNING OUTCOME AND OBJECTIVES: Upon completion of this course, Florida physical therapists and physical therapist assistants will understand error reduction and patient safety measures to prevent medical errors in the practice setting. Specific learning objectives to address potential knowledge gaps include:

- Define medical errors and associated terminology.
- Discuss common causes of medical errors.
- Describe root cause analysis.
- Summarize the elements of effective communication and documentation.
- Outline contraindications and indications for physical therapy management.
- Discuss the pharmacological components of physical therapy and patient management.
- State Florida's statutory requirements for addressing medical errors.

INTRODUCTION

It would seem obvious and essential that every healthcare encounter a person has should be safe and free from harm. Unfortunately, this is not always the case. Although the vast majority of Americans are having positive experiences with the healthcare system, many report having personally experienced a "medical error." Errors occur in hospitals, clinics, surgery centers, dialysis centers, medical offices, dental offices, nursing homes, pharmacies, and even in patients' homes—anywhere patients receive care.

Medical errors are a serious public health issue, with every patient involved in the healthcare system a potential recipient of harm. Injuries and death can occur, for example, when patients

receive a wrong medication or dose of medication, experience mistakes in surgery, receive treatments meant for another patient, experience a fall in the hospital, develop a pressure injury, or are subjected to a misdiagnosis, misinterpreted medical order, or equipment failure.

Errors can occur at any point while in the healthcare system. Analyzing why medical errors happen has traditionally been focused on the human factor, concentrating on individual responsibility for making an error, and the solutions have involved training or retraining, additional supervision, or even disciplinary action. The alternative to this individual-centered approach is a system-centered approach, which assumes that humans are fallible and that systems must be designed so that humans are prevented from making errors.

Acknowledging that errors happen, learning from them, and working to prevent errors in the future are important goals and represent a major change in the culture of healthcare—a shift from blame and punishment to analysis of the root causes of errors and the creation of strategies to reduce the risk of errors. In other words, healthcare organizations must create a culture of safety that views medical errors as opportunities to improve the system. Every person on the healthcare team has a role in making healthcare safer for patients and workers (Rodziewicz et al., 2021).

DEFINING MEDICAL ERRORS

A **medical error** has been defined as the failure of a planned action to be completed as intended or the use of a wrong plan or action to achieve an aim. Errors can include problems in practice, products, procedures, and systems.

Errors are further described as **adverse events**. Important subcategories of adverse events include:

- **Preventable** adverse events can be avoided by any means currently available unless the means is not considered standard care.
- **Unpreventable** adverse events result from a complication that cannot be prevented.
- **Ameliorable** adverse events are not preventable but the severity of injury could have been substantially reduced if different actions or procedures had been performed or followed.
  (AHRQ, 2019a)

In addition to adverse events, other terms used to describe medical errors include *near misses, sentinel events,* and *never events.*

Near Misses

A near miss is any event that could have had adverse consequences but did not and was indistinguishable from fully fledged adverse events in all but outcome. In a near miss, an error

was committed, but the patient did not experience clinical harm, either through early detection or sheer luck (AHRQ, 2019a).

Sentinel Events

A sentinel event is identified by the Joint Commission Sentinel Event Policy as an event that reaches a patient and results in any of the following:

- Death
- Permanent harm
- Severe temporary harm and intervention required to sustain life
  (TJC, 2021a)

Not all sentinel events occur because of an error, and not all medical errors result in sentinel events. Sentinel events can include:

- Suicide of any patient receiving care, treatment, or services in a staffed, around-the-clock care setting or within 72 hours of discharge, including from the emergency department
- Unanticipated death of a full-term infant
- Discharge of an infant to the wrong family
- Abduction of any patient receiving care, treatment, or services
- Any elopement of a patient from a staffed, around-the-clock care setting leading to death, permanent harm, or severe temporary harm of the patient
- Rape, assault, or homicide of any patient receiving care, treatment, or services, or any staff member, licensed independent practitioner, visitor, or vendor while on site
- Surgery or other invasive procedure performed at the wrong site, on the wrong patient, or that is the wrong (unintended) procedure for the patient
- Unintended retention of a foreign object in a patient after an invasive procedure, including surgery
- Severe neonatal hyperbilirubinemia
- Prolonged fluoroscopy to a single field or any delivery of radiotherapy to the wrong body regions or delivery of the wrong radiotherapy dose
- Fire, flame, or unanticipated smoke, heat, or flashes occurring during direct patient care caused by equipment operated and used by the hospital (staff do not need to be present)
- Any intrapartum maternal death

- Sexual abuse/assault involving a patient and another patient, staff member, or other perpetrator while being treated or on hospital premises
  (TJC, 2021a)

Never Events

The National Quality Forum has compiled a set of 29 **serious reportable events (SREs)**, which are consequential, largely preventable. Such events are also called *never events*—events that should never happen. SREs can be grouped into seven categories, as follows:

- Surgical SREs (e.g., surgery performed on wrong body parts or the wrong patient, or wrong surgical/invasive procedure performed on a patient)
- Product/device SREs (e.g., patient death/serious injury associated with use of devices provided by the healthcare setting)
- Patient-protective SREs (e.g., patient elopement or suicide while in a healthcare setting)
- Care management SREs (e.g., patient death/serious injury associated with a fall while in a healthcare setting, medication errors)
- Environmental SREs (e.g., patient death/serious injury associated with the use of restraints while in a healthcare setting, burns, electric shock)
- Radiological SREs (e.g., patient/staff death/serious injury associated with the introduction of a metallic object into an MRI area)
- Criminal SREs (e.g., sexual abuse/assault on a patient while in a healthcare setting)
  (NQF, 2021)

Active and Latent Errors

Active errors (human errors) are those that occur at the point of contact between a human and some aspect of a large system (e.g., a machine). They are generally readily apparent (e.g., pushing an incorrect button or ignoring a warning light) and almost always involve someone at the frontline.

Latent errors are accidents waiting to happen. They refer to a less apparent failure of organization or design that contributes to the occurrence of errors or allows them to cause harm to patients. They are errors in system or process design, faulty installation or maintenance of equipment, or ineffective organizational structure.

When a latent error combines with an active human error, an event occurs (AHRQ, 2019b).

COMMON MEDICAL ERRORS AND HOW TO PREVENT THEM

Medical errors are likely to occur in situations where providers are challenged to make decisions in dynamic, fast-paced, complex environments under tight time constraints. Errors stem from technical, organizational, or human factors that set off a chain reaction that could result in an adverse event (Carver et al., 2020).

The ten **most common causes of medical error** include:

1. Altered ability to make good judgments and quick decisions (e.g., misapplying expertise)
2. Ineffective communication (the most common cause)
3. Deficiencies in education, training, orientation, and experience
4. Inadequate methods of identifying patients, incomplete assessment on admission, failing to obtain consent, and failing to provide education to patients
5. Inadequate policies to guide healthcare workers
6. Lack of consistency in procedures
7. Inadequate staffing and/or poor supervision
8. Technical failures associated with medical equipment
9. No audits in the system
10. No one prepared to accept responsibility or change the system
(Rodziewicz et al., 2021)

ROOT CAUSE ANALYSIS

Root cause analysis (RCA) is a structured method used to analyze serious adverse events. When an adverse event occurs, a root cause analysis identifies underlying problems that increase the likelihood of errors while avoiding focusing on mistakes made by individuals. The approach identifies both active errors and latent errors and is one of the most widely used retrospective methods for detecting safety hazards.

RCAs follow a prespecified protocol, beginning with development of a multidisciplinary team that will define and study the problem. This process includes:

- Determining what happened
- Identify contributing factors
- Measuring, collecting and assessing data
- Identifying the root cause
- Designing and implementing a corrective action plan

- Developing measures of effectiveness and ensuring their success
- Evaluating implementation of improvement efforts
- Taking additional action
- Communicating the results

The ultimate goal of RCA is to prevent future harm by eliminating the latent errors that so often underlie adverse events (AHRQ, 2020).

Surgical Errors

Wrong-site, **wrong-procedure**, and **wrong-patient** surgical errors are relatively rare. It is estimated that in the United States such errors occur in approximately 1 of 112,000 surgical procedures and are infrequent enough that an individual hospital would only experience one such incident every 5 to 10 years. However, this includes only procedures performed in an operating room. If procedures performed in other settings such as ambulatory surgery are included, the rate of error may be much higher (AHRQ, 2019d).

Retained foreign bodies (also called *retained surgical items*) and unintentionally retained foreign objects are defined as objects retained after skin closure following an invasive procedure. Most unintended retained foreign bodies are associated with failures in leadership, communication, or other human factors that should be under the control of the operating team (Pellegrini, 2019).

Anesthesia-related adverse events may include inadvertent gas flow change, premature extubation, or breathing circuit connection error (Rayan et al., 2019).

The WHO Surgical Safety Checklist was developed after extensive consultation aimed at decreasing errors and adverse events, and increasing teamwork and communication in surgery. This checklist has gone on to show significant reduction in both morbidity and mortality and is now used by a majority of surgical providers around the world (WHO, 2021).

Medication Errors

Every year in the United States, 7,000 to 9,000 people die due to a medication error. In addition, hundreds of thousands experience but often do not report an adverse reaction or other complication related to a medication. Clinicians have access to more than 10,000 prescription medications, and nearly one third of adults in the United States take five or more medications.

Each year, adverse drug events account for nearly 700,000 emergency department visits and 100,000 hospitalizations. Nearly 5% of hospitalized patients experience an adverse drug event, making them one of the most common types of inpatient errors. Ambulatory patients may experience adverse drug events at even higher rates, and transition in care is also a well-documented source of preventable harm related to medications (Tariq et al., 2021; AHRQ, 2019e).

Medication errors may be due to human errors but often result from a flawed system with inadequate backup to detect mistakes. Most medication errors occur when drugs are being prescribed and transcribed. Medication errors may occur at any step including:

- Ordering/prescribing. The clinician must select the appropriate medication, dose, frequency and duration.
- Transcribing. In a paper-based system, an intermediary must read and interpret the prescription correctly.
- Dispensing. The pharmacist must check for drug-drug interactions and allergies and release the appropriate quantity of the medication in the correct form.
- Administering. The correct medication must be supplied to the correct patient at the correct time, either by a nurse, other trained staff, patient, or caregiver.
- Monitoring. This includes laboratory tests, side effects, effectiveness of therapeutic action, and vital signs
- Documenting. The name, strength, and quantity of drug; the date and time administered; and the name of the person administering the drug must be entered in the patient's medication administration record in a timely manner.
  (Tariq et al., 2021)

COMMON ADMINISTRATION ERRORS

Because physical therapists may administer some medications within their scope of practice and their state's practice act, they play an important role in preventing medication errors. In the administration stage, errors may include:

- Failing to follow the "**five rights**" to medication administration:
  - Right patient
  - Right drug
  - Right dose
  - Right route
  - Right time
- Failing to educate the patient as to why the drug is being prescribed
- Omitting medications
- Administering an unauthorized medication
- Failing to follow facility policies and procedures
  (Hanson & Haddad, 2020)

(See also "Pharmacologic Components of Physical Therapy and Patient Management" later in this course.)

Tubing Misconnections

The FDA reports that medical device misconnections can occur when one type of medical device is attached in error to another type of medical device that performs a different function. Tubing misconnections can occur for several reasons, including:

- Similar design of many connectors and the widespread use of connectors with similar shapes and in similar sizes
- Human error arising from conditions such as:
    - Multiple connections for one patient
    - Poor lighting
    - Lack of training
    - Time pressure
    - Fatigue
    - High-stress environment

  (FDA, 2018)

Attempts to prevent device misconnections have included color-coding, labels, tags, and training. However, these methods alone have not effectively solved the problem, because they have not been consistently applied, nor do these methods physically prevent the misconnections.

In order to reduce the chances of tubing misconnections, non-Luer lock connections have been introduced. These include the NR-Fit connector for neuraxial and regional anesthesia catheters and the Enfit connectors for feeding tubes.

Commonly Occurring Errors in Physical Therapy Practice

Errors that can occur in all settings may include:

- Delay in care (most common)
- Falls (second most common)
- Procedural error or inadequate policy
- Wrong patient treated
- Medication errors
- Equipment failure, typically improper calculation
- Discharge errors

Error prevention steps in physical therapy practice can include:

- Developing processes to address emergency situations and prevent delayed care
- Training staff to promptly recognize "red flag" situations
- Improving documentation
- Improving equipment maintenance
- Instituting fall prevention protocols (see also "Falls" later in the course)
- Using of standardized measures when determining discharge recommendations
  (Hagley et al., 2018)

Healthcare-Associated Infections (HAIs)

HAIs are infections that occur while receiving healthcare in a hospital or other healthcare facility and that first appear 48 hours or more after admission or within 30 days after having received healthcare. HAIs are considered system failures and are often preventable (CDC, 2020a).

Types of healthcare-associated infections include:

- Catheter-associated urinary tract infections
- Surgical site infections
- Central line-associated bloodstream infections
- Peripheral IV catheter-related bloodstream infections
- *Clostridioides difficile* (*C. diff*) infections
- Multidrug-resistant organism infections

One of the most important reasons in healthcare settings for the spread of infectious bacteria, some of which are antibiotic-resistant and can prove life threatening, is the failure of physicians, nurses, and other caregivers to practice basic hand hygiene. Studies show that on average healthcare providers clean their hands less than half of the times they should, contributing to the spread of HAIs.

Prevention measures include:

- Following infection control policies and procedures
- Practicing hand hygiene measures
- Keeping environment and equipment clean
- Utilizing sterile technique when appropriate
- Using antibiotics when appropriate
  (CDC, 2020b)

Errors Related to Medical Devices and Equipment

Technology is believed to improve healthcare efficiency, increase quality of care, promote safety, and lower cost. This same technology, however, may result in errors and adverse events. Since there are approximately 5,000 types of medical devices used by millions of healthcare providers around the world, device-related errors are inescapable.

Physical therapists may use various types of electrical equipment in their clinical practice, such as mechanical traction, exercise equipment (such as treadmills), or various other modalities (i.e., hydrocollator, ultrasound, or electrotherapy) that could be hazardous, resulting in harm to patients if improperly used or maintained. For example, water and electricity mixed may result in shock hazard and harm to both patient and therapist.

Therapists and therapy departments must ensure patient safety by establishing protocols to routinely monitor the condition of any electrical equipment and address work practices, which should include:

- Visual inspection of cords
- Visual inspection of equipment before using
- Ensuring all electrical service near sources of water is properly grounded
- Ensuring proper technique and body mechanics when using devices/equipment, in order to minimize risk of injury (both acute and chronic) to therapist and/or patient (OSHA, 2021)

Each year the FDA receives several hundred thousand reports of suspected device-associated deaths, serious injuries, and malfunctions. Mandatory reporting of such events must be done by manufacturers, importers, and device user facilities. Healthcare professionals, patients, caregivers, and consumers are also encouraged to voluntarily report adverse events to MedWatch, the FDA's safety information and adverse event reporting program.

User facilities **must report suspected medical device-related deaths** to both the FDA and the manufacturer. A user facility is not required to report a device malfunction but can voluntarily advise the FDA of such product problems. The FDA uses the reported information to monitor device performance, detect potential device-related safety issues, and contribute to benefit-risk assessments of these products (FDA, 2020).

(See also "Adverse Incident Reporting Requirements" later in this course.)

Falls

Falls are the most common type of accidents in people 65 years of age and older. Falls in institutional settings occur more frequently and are associated with greater morbidity than falls that occur in the community. Approximately 50% of individuals in the long-term care setting fall yearly (Appeadu & Bordoni, 2020; Kiel, 2020).

Preventing falls involves assessing patients for fall risk, developing a personalized plan of care, and utilizing consistent preventive interventions.

RISK ASSESSMENT

Falls risk can be categorized as either intrinsic or extrinsic. **Intrinsic factors** include issues that are unique to the individual and concern medical, psychological, and physical issues such as advanced age, inner ear disorders, and lower extremity weakness (Appeadu & Bordoni, 2020). **Extrinsic factors** generally can be changed and address environmental risks that patients encounter, such as use of restraints, dim lighting or glare, ill-fitting or inappropriate footwear (AHRQ, 2017).

Older patients are not the only population at risk. Any patient who has had excessive blood loss may experience postural hypotension, increasing the risk of falling. Maternity patients or other patients who have epidural anesthesia are at risk for falls due to decreased lower-body sensation (AHRQ, 2017).

While some institutions have created their own fall risk **assessment tools**, tools that have been extensively studied and recommended include:

- Morse Fall Scale
- STRATIFY Scale
- Schmid Fall Risk Assessment Tool
- Berg Balance Scale

Tailored **prevention interventions** may include:

- Physical therapy evaluation/treatment for gait instability or other risk factors
- Toileting schedule for incontinence
- Continuous virtual monitoring for agitation, confusion, or impaired judgment
- Pharmacy consults for medication side effects
  (Dykes et al., 2018)

STEADI (STOP ELDERLY ACCIDENTS, DEATHS AND INJURIES)

The Centers for Disease Control and Prevention's STEADI initiative is a coordinated approach for the implementation of practice guidelines for fall prevention in community-dwelling adults. Recommendations include:

- Screening for fall risk annually, or any time the patient presents with an acute fall
- Assessing those who are found to be at risk
- Intervening to reduce identified risk factors
  (CDC, 2020c)

EVALUATION AND TREATMENT

For patients who are found to be at fall risk, a physical therapist will perform a thorough **evaluation**, including:

- Review of medical history
- Review of medications
- Simple vision test
- Balance, strength, range of motion, and walking ability
- Home safety assessment
- Simple test of cognitive abilities
- Assessment of orthostatic blood pressures
- Assessment of feet and footwear

Based upon the findings, the physical therapist designs a **treatment plan** tailored to the patient's needs, which may include:

- Balance training
- Prescribed exercise program that includes walking and/or gait training
- Dual-task training program
- Strength training
- Endurance training
- Pain management
- Education on nutrition, sleep, choosing appropriate footwear
- Fear management
- Referral to community programs
- Home safety guidance
  (APTA, 2018a)

CULTURE OF SAFETY

Among their efforts to reduce medical errors, healthcare facilities must consider changes in organizational culture. One such strategy involves creating a "culture of safety," which encompasses the following key features:

- Acknowledging the high-risk nature of an organization's activities and the determination to achieve consistently safe operations

- Fostering a blame-free environment where individuals are able to report errors or near misses without fear of reprimand or punishment
- Encouraging collaboration across ranks and disciplines to seek solutions to patient safety problems
- Committing organizational resources to address safety concerns
(AHRQ, 2019c)

EFFECTIVE DOCUMENTATION AND COMMUNICATION

It is clear that good communication lies at the heart of good practice and thus promotes patient safety. Many errors have been demonstrated to arise from the lack of adequate or accurate communication. There is a great deal of support for the development of effective documentation and communication in the provision of safe patient care.

Documenting to Prevent Errors

Documentation is a tool for the planning and provision of patient care; communication among providers; and demonstration of compliance with federal, state, and local law, third-party payer, facility policy and procedures, as well as other regulations. Documentation should be consistent with the treatment plan(s) and meet all applicable professional and ethical guidelines. Documentation should also reflect established coding and billing procedures.

Guidelines for documenting include:

- Document in the correct chart. Check to make sure that key patient identifiers are accurate, including the spelling of the person's name and date of birth, to ensure effective linking of patient healthcare information records within and across systems.
- Date and sign all entries.
- Document legibly.
- After making an observation or providing care, document actions for more detailed notes. Waiting to the end of the work shift can result in forgetting to include significant information.
- Be accurate, objective, and complete. Document what is seen, heard, and done. Include data relating to all aspects of patient care.
- Track test results and consultation reports to ensure that findings are properly communicated and acknowledged, and document these actions in the patient's medical record.

- Use approved abbreviations. Unfamiliar or seldom-used abbreviations can confuse other providers and lead to potential patient injuries. Consult the facility's list of approved abbreviations and use them consistently.

- Include patient communication. Document patient education regarding treatment and any educational materials, resources, or references provided to the patient.

- Document patient complaints, questions, and other concerns as well as steps taken to resolve concerns.

- Record instances of nonadherence. This may include missed and canceled appointments, refusal to provide information, and rejection of treatment recommendations.

- Document delegated tasks. Include verification that delegated patient care-related tasks are completed by those under one's direction and/or supervision.

- Document discharge planning throughout episodes of care.

- Demonstrate skilled care and medical necessity.

- Correct errors promptly. Correct charting errors in accordance with the facility's policies and procedures, ensuring they are clearly marked as late entries.

- When using documentation software for electronic entry of data, ensure that programs comply with appropriate provisions for security and confidentiality.
  (Reiner, 2021; Sullivan et al., 2019)

Communication Tools to Prevent Errors

Research indicates that poor communication is a root cause of the great majority of all sentinel events.

RISK FACTORS FOR POOR COMMUNICATION

Verbal communication is a common source of medical error. Risk factors for such errors include:

- Disruptive behavior, rudeness, or verbal abuse
- Environmental noise issues
- Cultural differences between patients and providers
- Hierarchy issues
- Providers acting as autonomous agents
- Personality differences
- Language barriers

- Failure to work as a team
- Multiple conversations occurring at the same time
- Education and literacy
  (HIPAA Journal, 2021)

TOOLS FOR EFFECTIVE COMMUNICATION

Communication among healthcare providers using a standard framework and proven tools for reporting and sharing information can enable more effective communication. Examples of such tools include:

- SBAR (see below)

- BATHE protocol (**B**ackground, **A**ffect, **T**rouble, **H**andling, and **E**mpathy) is an interviewing process utilized in outpatient settings to connect with patients, screen for mental health problems, and empower patients to handle identified issues more constructively.

- Ticket-to-Ride for handoffs is a short, in-house document ensuring that transporters and providers unfamiliar with the patient will have important information readily available if problems arise or the patient is away from the unit longer than expected.

- Hourly rounding to each patient's room or bedside is an intervention that helps to proactively anticipate and address each patient's needs.

- Patient teach-back is a technique for healthcare providers to ensure that medical information has been explained clearly so that patients and families understand the information given to them.

- I-PASS is a clinical handoff verbal and written protocol for patient in-house transfer that includes **P**atient summary, **A**ction to-do list, **S**ituation awareness and contingency plan, and **S**ynthesis or **S**ummary of the information by the receiver.

- Technological communication tools:
  - Bedside tablets for patients instead of call lights
  - HIPAA-compliant text messaging platforms for communicating among members of the care team

  (HIPAA Journal, 2021)

SBAR

SBAR is one of the most common communication tools used for structured communication to ensure that information is transferred accurately between two clinicians, such as during a shift transfer. *SBAR* stands for Situation (S), Background (B),

Assessment (A), and Recommendation (R). It uses prompt questions in four areas to guide a conversation to ensure efficient transfer of concise information (IHI, 2021).

S	Situation	What is happening right now?
B	Background	What are the circumstances that led up to this situation?
A	Assessment	What do I think the problem is with this patient?
R	Recommendation	What should be done to correct the situation?
(IHI, 2021)		

Speak Up

Well-informed patients are better able to avoid serious medical errors. Clinicians should follow protocols that guide care, health education, and communication to help in both their own and their patients' decision-making about appropriate healthcare.

The Joint Commission encourages patient participation through their Speak Up initiative that encourages hospitals to inform patients about the importance of their contributions to the care they receive, making them active participants in avoiding medical errors (Rodziewicz et al., 2021).

S	Speak up if you have questions or concerns.
P	Pay attention to badges worn by healthcare staff and remind staff to wash their hands.
E	Educate yourself about your illness, medical tests, and treatment plan.
A	Ask a trusted family member or friend to be your advocate.
K	Know what medicines you take and why you take them.
U	Use a hospital, clinic, surgery center, or other facility that meets standards of care.
P	Participate in all decisions about your treatment; you are the center of the healthcare team.
(TJC, 2021b)	

CONTRAINDICATIONS AND INDICATIONS FOR PHYSICAL THERAPY MANAGEMENT

Florida is a "direct access with provisions" state, which means an individual may go directly to a physical therapist for evaluation without a physician's referral first and may receive treatment for 30 days. After 30 days, the therapist must obtain a treatment plan signed by an approved healthcare provider (FPTA, 2021).

Florida Statute 486.021 and Florida Senate Bill CS/HB467 outline modalities used by physical therapists, which include:

- Assessments to include the endocrine, nervous, cardiovascular, pulmonary, integumentary, and musculoskeletal systems
- Treatment for or prevention of any disability, injury, disease, or other health condition
- Rehabilitation by the use of:
    - Exercise and physical modalities
    - Chemical modalities
    - Properties of air (air-fluidized therapy)
    - Electricity
    - Massage
    - Radiant energy, including ultraviolet, visible, and infrared rays
    - Ultrasound
    - Water
    - Acupuncture, including dry needling
- Performance of tests of neuromuscular functions or electromyography as an aid to diagnosis
- Referral or consultation with a practitioner of record if the patient's condition is found to be outside the physical therapist's scope of practice
  (FBPTA, 2021; Florida Legislature, 2020)

Therapists must be aware of both the indications and contraindications for each modality in order to prevent the occurrence of adverse events.

Heat

A thermogenic agent induces an increase in temperature and subsequent physiological changes to the superficial layer(s) of skin, fat, tissues, blood vessels, muscles, nerves, tendons, ligaments, and joints. These include hot packs, heating pads, paraffin bath, infrared, ultrasound, and fluidotherapy.

SUPERFICIAL HEAT

Indications for use of superficial heat in subacute to chronic conditions include reducing pain and muscle spasms, relaxing skeletal muscles, and decreasing stiffness.

Superficial heat is **contraindicated** for patients with:

- Peripheral vascular disease
- Bleeding disorders
- Local malignancy
- Acute inflammation or trauma
- Edema
- Infection
- Open wounds
- Over large scars
- Impaired sensation
- Impaired communication or cognition

DEEP HEAT

Deep heat modalities include ultrasound, shortwave diathermy (SWD), and microwave diathermy (MWD), the latter two which convert electromagnetic energy to thermal energy. **Indications** for use of deep heat include treatment of various soft tissue disorders, including bursitis, tendonitis, degenerative arthritis, musculoskeletal pain, and contractures, and promotion of wound healing.

Contraindications for deep heat include those for superficial heat above and:

- Over the eyes
- Over a pregnant uterus
- Over a malignant area
- Near the heart, brain, spine, laminectomy sites, or epiphyseal plates of children
- In patients with:
    - Pacemakers
    - Metal plates
    - Screws, pins, and external fixators
    - Joint replacement components

(Seidel et al., 2021)

Ultrasound

Ultrasound uses high-frequency sound waves to provide deep heating to muscles, tendons, joints, and ligaments. The waves produce transfer energy to the surface of the body and can target

deeper soft tissues. It is **indicated** for use in the treatment of a variety of musculoskeletal pathologies such as osteoarthritis, tendon injuries, and or any other soft tissue injury.

Ultrasound is **contraindicated** for use:

- Over open wound, acute inflammation, or acute infection
- Over malignancies or metastatic lesions
- Over areas with decreased sensation
- Over active epiphyses in children
- On parts of the body with metal implants, e.g., joint replacement
- Near or over a pacemaker
- In pregnant patients
- Around eyes, breasts, or gonads
- Over fractures
- Near or over any implanted electrical stimulation device
- In patients with thrombophlebitis
  (Matthews & Stretanski, 2020)

Phonophoresis

Phonophoresis refers to use of ultrasound for delivering therapeutic medications to subcutaneous tissues. It is used in physical therapy to enhance the absorption of topically applied analgesics and anti-inflammatory agents. Phonophoresis is **indicated** for and may be useful in the treatment of inflammatory conditions including tendonitis, arthritis, and bursitis. **Contraindications** are identical with those for use of ultrasound (see above).

Electrotherapy

Electrotherapy uses electromagnetic radiation to stimulate nerve or muscle.
Common types include:

- Transcutaneous nerve stimulation (TENS)
- Interferential therapy (IFT)
- Neuromuscular electrical stimulation (NMES)
- Iontophoresis for delivery of medications to deep tissues

Indications for use include:

- Acute and chronic pain

- Neuromuscular disease
- Joint effusion and edema
- Disuse muscle atrophy
- Wound and bone healing

Electrotherapy treatment is **contraindicated**:

- Over carotid sinus, heart, or pregnant uterus
- Over pacemakers and automatic implantable cardioverter defibrillators
- Over battery-operated implant devices such as drug delivery pumps, neurostimulators, and cochlear implants
- Over major skin defects/wounds that cannot be covered with Vaseline
- In patients with an IUD containing metal
- In patients with seizure disorder, active hemorrhage, malignancy, circulatory impairments, and arterial or venous thrombosis
  (Seidel et al., 2021)

Iontophoresis

Iontophoresis is the process of using an electric current to deliver a therapeutic agent transdermally to reach deeper tissues. **Indications** for use may involve local, regional, or systemic delivery. Localized agents include anesthetics for pain management, corticosteroids, and antiperspirants. Regional delivery includes anti-inflammatory agents. Systemic delivery includes fentanyl for analgesia (Seidel et al., 2021).

Contraindications for iontophoresis include those noted above and hypersensitivity or adverse reactions associated with the drug to be administered. Patients with prior medical histories of cardiac arrythmias or hypercoagulability should not receive the procedure near a cardiac pacemaker or superficial blood vessels (Sheikh & Anterpreet, 2020).

Light Therapy (Phototherapy)

Light therapies include ultraviolet light and low-level laser therapy and are **indicated** for acute and chronic pain and inflammation, stimulation of collagen metabolism, and promotion of wound healing.

Light therapies are **contraindicated** for treatment:

- Over eyes
- Over skin cancers

- In patients with organ disease, systemic lupus erythematosus, fevers, or acute inflammation
- In patients with irradiation of the neck region, seizures, epilepsy, and hyperhidrosis (Seidel et al., 2021)

Dry Needling

Dry needling is an invasive intervention that uses a thin, solid filiform needle to penetrate the skin and stimulate underlying myofascial trigger points and muscular and connective tissue for the management of neuro-musculoskeletal pain and movement impairment. Dry needling can be carried out at a superficial or deep tissue level.

Indications for use of dry needling include:

- Minimum criteria is met for diagnosis of myofascial trigger points, including:
    - Spot tenderness in a palpable band of skeletal muscle
    - Subject recognition of pain with palpation
- A "jump and shout" sign on palpation

There are both absolute and relative contraindications for the use of dry needling. **Absolute contraindications** include:

- In a patient with needle phobia
- In a patient who is unwilling (e.g., fear, patient beliefs)
- In a patient unable to give consent due to age-related, communication, or cognitive issues
- In a medical emergency or in acute medical conditions
- Over an area or limb with lymphedema
- Into a muscle or area in patients on anticoagulant therapy or with thrombocytopenia

Relative contraindications are those that should be used with caution, including patients with or who are:

- Abnormal bleeding tendency
- Compromised immune system
- Vascular disease
- Diabetes
- Epilepsy
- Pregnant

- Children
- Frail
  (Physiopedia, 2021)

PHARMACOLOGIC COMPONENTS OF PHYSICAL THERAPY AND PATIENT MANAGEMENT

In Florida, state law gives physical therapists the right to administer topical medications. Pursuant to a physician's prescription for the patient, a physical therapist may retain custody of that patient's nonscheduled legend topical medications and administer those medications to that patient. All prescription medications used in physical therapy treatment shall be properly dispensed by a Florida licensed pharmacist and administered only to the patient for whom the prescription was authorized (FLBPT, 2021).

It is within the physical therapists' professional scope of practice to administer and store medication to facilitate outcomes of physical therapy patient management. Physical therapists use medications for treatment of musculoskeletal conditions such as plantar fasciitis, tendonitis/bursitis, rheumatoid arthritis, and enthesopathic conditions. The specific medication used depends on the treatment goals. Goals that may benefit from the concomitant use of medications include, but are not limited to:

- Reducing pain
- Reducing inflammation
- Promoting integumentary repair and/or protection
- Facilitating airway clearance and/or ventilation respiration
- Facilitating functional movement
  (APTA, 2018b)

Administering Iontophoresis Medications

The most common drug administered by iontophoresis in physical therapy is dexamethasone, an anti-inflammatory medication used to treat localized inflammation occurring in conditions such as tendonitis or bursitis. Other common iontophoresis medications include:

- Acetic acid, which decreases calcium deposits in musculoskeletal tissue and is indicated for conditions such as adhesive capsulitis (frozen shoulder), calcific tendonitis, or myositis ossificans
- Chlorine, a negatively charged ion used to treat scar tissue and keloid scars
- Calcium chloride, which helps decrease muscle spasm that may accompany a home exercise program to maintain muscle function

- Iodine, which improves local blood flow to tissues and may be used to treat sclerotic conditions such as frozen shoulder
- Magnesium sulfate, used to treat muscle spasm
- Hyaluronidase, used to treat soft tissue edema or swelling following surgery or injury to help manage edema in the acute or chronic stages of healing
- Tap water, using either positive or negative electrode, during hand or foot immersion bath to treat hyperhidrosis

(Sears, 2020)

Medication Management

Physical therapists must keep their skills and knowledge current to ensure patient safety. This includes knowledge of and ability to monitor for intended effects, side effects, and adverse drug reactions related to a patient's medication regimen.

Physical therapists may serve as the first provider for patients and as the first provider following discharge. Addressing medications in a drug regimen review and medication reconciliation are an integral part of physical therapy practice to help ensure appropriate patient care is delivered and optimal clinical outcomes are obtained.

Changes made in medication regimens may impact functional status and/or ability. An important concern is functional decline associated with diminished ability to perform instrumental activities of daily living and decreased physical functioning. Physical therapy practitioners are well positioned to help monitor, identify, and communicate associated findings related to medications to appropriate providers (Adamski et al., 2019).

Like other clinicians, the physical therapist should be familiar with the list of high-risk/high-alert medications for the facility where employed and should be watchful for potential injury, especially when a patient is receiving an anticoagulant such as warfarin or heparin. Physical therapists must recognize that medication absorption can be affected by modalities such as exercise or hot and cold applications.

FLORIDA STATUTORY REQUIREMENTS

Florida's Comprehensive Medical Malpractice Reform Act of 1985 mandates that each licensed facility implement a risk-management program and that healthcare professionals are obligated to report adverse events to the facility leadership. State oversight is provided by the Florida Agency for Health Care Administration (AHCA). Each licensed facility is required to hire an F.S. 395-10974 licensed risk manager who is responsible for implementation and oversight of the risk management program.

Internal Risk Management Program Requirement

Florida Statutes (F.S., 2019) require every facility licensed under F.S. 395-1097 to establish an internal risk management program that must include the following:

- The investigation and analysis of the frequency and causes of adverse incidents
- The development of appropriate measures to minimize risk, including:
    - Education and training of all non-physician personnel as part of initial orientation and at least one hour of such education and training annually for all personnel working in clinical areas and providing patient care, except for licensed healthcare practitioners who are required to complete continuing education coursework pursuant to chapter 456 or their respective practice act
- The analysis of patient grievances related to patient care
- A system for informing a patient or designee pursuant to state law that the patient was the subject of an adverse event
- Prohibition against a single staff person attending patients in recovery room unless there is live observation, electronic observation, or any other reasonable measure to ensure patient protection and privacy
- Prohibition against any unlicensed person from assisting or participating in any surgical procedure unless authorized to do so
- An incident reporting system to report adverse incidents to the risk manager or designee within three business days after their occurrence

Adverse Incident Requirements

F.S. 395-0197 mandates internal reporting within three business days of any adverse incident (event) over which healthcare personnel could exercise control and that is associated in whole or in part with medical intervention rather than the condition for which such intervention occurred. These include:

1. Adverse events resulting in one of the following injuries:
    - Death
    - Brain or spinal damage
    - Permanent disfigurement
    - Fracture or dislocation of bones or joints
    - Limitation of neurologic, physical, or sensory function which continues after discharge from the facility

- Any condition that required specialized medical attention or surgical intervention resulting from nonemergency medical intervention, other than an emergency medical condition, to which the patient has not given his or her informed consent

- Any condition that required the transfer of the patient, within or outside the facility, to a unit providing a more acute level of care due to the adverse incident rather than the patient's condition prior to the adverse incident

2. The performance of a surgical procedure on the wrong patient, a wrong surgical procedure, a wrong-site surgical procedure, or a surgical procedure otherwise unrelated to the patient's diagnosis or medical condition

3. Surgical repair of damage resulting to a patient from a planned surgical procedure, where the damage was not a recognized specific risk, as disclosed to the patient and documented through the informed-consent process

4. A procedure required to remove unplanned foreign objects remaining from a surgical procedure

Licensed facilities in Florida are required to submit two types of reports to AHCA:

An **adverse incident report** must be submitted to the AHCA by mail or by using the online Adverse Incident Reporting System (AIRS) within 15 calendar days after its occurrence, whether occurring in the licensed facility or arising from healthcare prior to admission to the licensed facility.

The annual report summarizes the incident reports that have been filed in the facility for that year and includes:

- The total number of adverse incidents
- Types of adverse events listed by category and number of incidents occurring within each category
- Code numbers of each professional and individual directly involved and number of incidents each has been directly involved in
- Description of all malpractice claims filed against the facility, including number of pending and closed claims, the status and disposition of each claim

CASE

David, a physical therapist employed by a Florida skilled nursing facility, was training two certified nursing assistants (CNAs) in the use of a Hoyer lift to transfer a patient from her wheelchair back to her bed. David hadn't gotten much sleep the night before and was very tired. Due to his fatigue, he failed to notice when one of the aides incorrectly attached the transfer sling to the lift prior to moving the patient. In the middle of the transfer, the patient slipped out of the improperly attached sling and fell to the floor. David and the CNAs managed to lift the patient, who was shaken but seemed uninjured, into her bed.

David reported the near-fall to his rehab director, who stated that it was lucky that nobody had been hurt but warned David to be more vigilant next time. The incident was reported internally to the nursing director and facility administration, but no further action was taken at that time.

Two days later, the patient began complaining of worsening hip pain. Finally, the pain grew so bad that she was taken to the local hospital for an X-ray, which revealed a femur fracture. The facility determined that the injury had resulted from the fall out of the Hoyer lift sling, however, no external report was made to the Florida Agency for Health Care Administration (AHCA). The site administrator and risk manager knew that they were legally obligated to make an adverse incident report within 15 calendar days of the adverse event but decided to keep the incident quiet, as they had already had several adverse incident reports in the past few months.

However, three weeks after the incident, David felt overcome with guilt at what had happened. He used the AHCA's online Adverse Incident Reporting System (AIRS) to file a report about the incident. When an investigator was sent to follow-up on the incident, the facility was cited for failing to report the incident within the legally required timeframe.

CONCLUSION

Everyone has a stake in the safety of the healthcare system—healthcare workers as well as the general public. All healthcare workers are being actively educated about their roles in the prevention of avoidable negative outcomes for all patients. It is essential that all clinicians understand the journey every patient makes through the system, recognizing how the system can fail, and take action to prevent those failures.

To counter errors and safeguard patients, changes must continue to be made in how the workforce is deployed; in how work processes are designed; and in the leadership, management, and the culture of healthcare organizations. Because communication issues are so commonly involved in medical errors, it is crucial that physicians, nurses, therapists, and other healthcare personnel work together as a team, respecting each other's contributions to the well-being of the patients in their care. Collaborative teamwork is essential for optimizing quality and safety in healthcare.

RESOURCES

Florida Agency for Health Care Administration, Division of Health Quality Assurance
http://ahca.myflorida.com/MCHQ/index.shtml#1

Hospital Safety Grade
http://www.hospitalsafetygrade.org
Institute for Healthcare Improvement
http://www.ihi.org

National Quality Forum
http://www.qualityforum.org

Patient Safety Network
http://psnet.ahrq.gov

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1. A medical error is best defined as:

a. A problem with a procedure or a system.
b. An unplanned action due to negligence.
c. Failure of a planned action to be completed as intended.
d. An unplanned event that can always be prevented.

2. The rehab department of a long-term care facility has no established maintenance and repair protocol for their wheelchairs. One day, a therapist is assisting a patient into a wheelchair, not realizing that one of the brakes is broken and does not fully lock. Though the therapist uses the appropriate safety techniques, the wheelchair slips during the transfer and the patient falls to the floor. This is an example of a(an):

a. Sentinel event.
b. Latent error.
c. Active error.
d. Near miss.

3. The most common cause of medical errors is:

a. Inadequate staff or supervision.
b. Technical failure or equipment.
c. Ineffective communication.
d. Deficiency in education and training.

4. The ultimate goal of a root cause analysis is to:

a. Determine who was at fault.
b. Prevent future harm by eliminating latent errors.
c. Re-educate the person who made the error.
d. Determine the impact of the error on the patient.

5. An outpatient physical therapist is preparing to contact a referring provider about a newly observed patient symptom. Which statement does the physical therapist make when communicating their "assessment" using the SBAR technique?

a. "The patient's incision is red and appears inflamed."
b. "The patient had hip replacement surgery 3 days ago."
c. "The patient's presentation and symptoms lead me to suspect a possible infection."
d. "Would you like me to pause rehab until the patient can be seen for a medical follow-up?"

6. The use of electrotherapy is **contraindicated** for patients with:

a. Neuromuscular disease.
b. Disuse muscle atrophy.
c. An IUD in place that contains metal.
d. Joint edema.

7. Acetic acid delivered via iontophoresis is indicated for all the following conditions, **except**:

a. Calcific tendonitis.
b. Adhesive capsulitis.
c. Muscle spasms.
d. Myositis ossificans.

8. Florida statutes require adverse incident reports to be submitted within what time period after occurrence?

a. 48 hours
b. 3 days
c. 7 business days
d. 15 calendar days