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Contact Hours: **2**

Prevention of Medical Errors for Florida Physical Therapy

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LEARNING OUTCOME AND OBJECTIVES: Upon completion of this course, you will understand current, evidence-based interventions 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 and root cause analysis.
- Review the most common medical errors and strategies to prevent them.
- Summarize the elements of effective communication and documentation.
- Outline contraindications and indications for physical therapy management.
- Discuss the pharmacologic components of physical therapy and patient management.
- Discuss Florida's statutory requirements for addressing medical errors.

INTRODUCTION

Healthcare providers know medical errors create a serious public health problem that poses a substantial threat to patient safety. Yet, despite providers' best efforts, medical error rates remain high, with significant disability and death. Errors can occur at any point while an individual is in the healthcare system—in hospitals, clinics, surgery centers, dialysis centers, medical offices, dental offices, nursing homes, pharmacies, and even in patients' homes—anywhere that patients receive healthcare services.

It is estimated that approximately 400,000 hospitalized patients experience some type of preventable harm each year, including surgical, diagnostic, medication, devices and equipment, system failures, infections, and falls. Most errors in outpatient healthcare are related to a missed or late diagnosis.

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. Healthcare professionals experience profound psychological effects such as anger, guilt, inadequacy, depression, and suicide due to real or perceived errors. The loss of clinical confidence and fear of punishment can make healthcare professionals reluctant to report errors.

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. The trend is for patient safety experts to focus on improving the safety of healthcare systems to reduce the probability of errors and mitigate their effects rather than focus on an individual's actions.

Errors represent an opportunity for constructive changes and improved education in healthcare delivery. 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., 2023).

DEFINING MEDICAL ERRORS

In 1999, the Institute of Medicine defined a medical error as "the failure of a planned action to be completed as intended (i.e., error of execution) or the use of a wrong plan to achieve an aim (i.e., error of planning)" (IOM, 1999). Errors can include problems in practice, products, procedures, and systems.

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

- Preventable events, in which harm may have been lessened or prevented had patient safety risk mitigation strategies been applied. Example: Performing surgery on the wrong body part.
- Negligent adverse events resulting from care that falls below the standards expected of clinicians in the community. Example: Not properly monitoring a patient under anesthesia.

- Unpreventable adverse events that result from complications that cannot be prevented given the current state of knowledge. Example: Appropriately prescribing, dispensing, and administering a drug to a patient not known to have an allergy who subsequently has an allergic reaction.
- Ameliorable events, which are not entirely preventable but may have resulted in less harm if the care had been provided differently. Example: A clinician failing to respond to a patient with medication-related symptoms.
  (Boisvert & Pellet, 2022; Rodziewicz et al., 2023)

In addition to adverse events, other terms used to describe medical errors include *near misses*, *sentinel events*, and *serious reportable events (SREs)*.

Near Misses

A near miss (also known as a *close call*) is an incident that might have resulted in harm but did not occur because of timely intervention by healthcare providers, the patient, or the patient's family. Example: A nurse recognizes a potential drug overdose in a physician's prescription and does not administer the drug but instead calls the error to the physician's attention (Performance Health Partners, 2024).

Sentinel Events

Sentinel events are those medical errors resulting in death, permanent harm, or severe temporary harm and intervention required to sustain life. Such events are called *sentinel* because they signal the need for immediate investigation and response (VA, 2023).

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

- Surgery or other invasive procedure performed on the wrong site or wrong patient
- Patient death or serious injury associated with a medication error
- Suicide during treatment or within 72 hours of discharge
- Death or serious injury to a neonate
- Discharge of an infant to the wrong family
- Patient death or serious injury associated with a fall in the healthcare setting
- Abduction of a patient/resident of any age while receiving care
- Sexual abuse/assault on a patient or staff member in the healthcare setting
- Criminal event
  (Kamakshya & De Jesus, 2023)

Serious Reportable Events (SREs)

The National Quality Forum has compiled a list of serious reportable events, which are consequential, largely preventable, harmful adverse events (also referred to as *never events,* or events that should never happen). SREs are grouped into seven categories, as follows:

- Surgical SREs (e.g., surgery/invasive procedure performed on wrong body parts or the wrong patient)
- Product/device SREs (e.g., patient death/serious injury associated with use of devices, drugs, or biologics 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)
- Radiologic 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 or staff member within or on the grounds of a healthcare setting)
  (NQF, 2024)

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 front line.

Latent errors are accidents waiting to happen. They refer to a less apparent failure in system or process design, faulty installation or maintenance of equipment, or ineffective organizational structure that contributes to the occurrence of errors, allowing them to cause harm to patients (Sameera et al., 2021).

COMMON MEDICAL ERRORS AND HOW TO PREVENT THEM

Medical errors usually occur in stressful, fast-paced environments such as emergency departments, intensive care units, and operating rooms. Errors often occur when staffing is inadequate and necessary personnel are not available when needed (Carver et al., 2023).

The 10 **most common causes of medical error** include:

1. Ineffective communication (the most common cause)
2. Changes in clinician's ability to make good judgments and quick decisions
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 patient education
5. Inadequate policies and procedures 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., 2023)

ROOT CAUSE ANALYSIS (RCA)

Root cause analysis has been adopted widely as a method for investigating serious adverse events. The Joint Commission has mandated use of RCA to analyze sentinel events since 1997.

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. The ultimate goal of RCA is to prevent future harm by eliminating the latent errors that often underlie adverse events.

RCAs follow a prespecified protocol, beginning with data collection and reconstruction of the events through record review and participant interviews. A multidisciplinary team then analyzes the sequence of events leading to the error, with goals of identifying how the event occurred (by identifying active errors) and why the event occurred (by systematic identification and analysis of latent errors). The steps in this process include:

- Verifying the incident and defining the problem
- Commissioning the root cause analysis investigation
- Mapping a timeline (event and causal factor chart)
- Identifying critical events
- Analyzing the critical events (cause and effect chart)
- Identifying root causes

- Supporting each root cause with evidence
- Identifying and selecting the best ways of addressing the problem
- Developing recommendations
- Writing and presenting the report
(VDH, 2021)

Medication Errors

Medication errors are the **most common** errors in both outpatient and inpatient settings. Each year in the United States, over 7 million people are affected, and 7,000 to 9,000 people die due to a medication error. In addition, many other patients experience but often do not report an adverse reaction or other complications related to medication. The total cost of caring for patients with medication-associated errors exceeds $40 billion each year (Tariq et al., 2023).

Causes of medication errors include:

- Expired product, usually related to improper storage
- Administering medication for a shorter or longer duration than prescribed
- Incorrect preparation before final administration
- Incorrect strength
- Incorrect rate, most commonly with IV push or infusions
- Incorrect timing, which may lead to under- or overdosing
- Incorrect dose, including overdose, underdose, and extra dose
- Incorrect route, often resulting in significant morbidity and mortality
- Incorrect dosage form, such as immediate release instead of extended release
- Incorrect patient action correctible only with patient education
- Known allergen
- Known contraindication

Medication errors may be due to human errors but often result from **system failures**, such as:

- Inaccurate order transcription
- Failure to disseminate drug knowledge
- Failing to obtain allergy history
- Incomplete order checking
- Mistakes in tracking of medication orders

- Poor professional communication
- Unavailable or inaccurate patient information
(Tariq et al., 2023)

Medication errors are **most common** during the ordering or prescribing stage, although errors may occur at any step in the process.

- Ordering/prescribing. The clinician must select the appropriate medication, dose, frequency, and duration.
- 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, by either 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., 2023, MacDowell et al., 2021)

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 enter the administration of a medication in the patient's medical record
- Failing to confirm why patients are being given a medication, and that it is an appropriate treatment for their condition
- Failing to ensure the correct form of administration within a given route (e.g., tablet, powder, liquid, suppository, etc.)
- Failing to monitor the person's response to the medication and ensure it's having the desired effect
(AHRQ, 2021)

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

Surgical Errors

At least 4,000 surgical errors occur in the United States each year. Surgical errors include retained foreign bodies, mislabeled surgical specimens, and wrong-site errors, wrong-procedure errors, and wrong-patient errors (WSPEs). Errors can occur at various stages in the surgical process.

Some **causes** of surgical errors include:

- Lack of adequate surgeon training and education
- Absence of standardized rules and regulations
- Major gap in communication between surgeon, anesthesiologist, and other ancillary staff
- Gap in communication between the surgeon and the patient
- Use of unreliable systems or protocols
- Rushing to complete cases
- Human factors
  (Santos & Jones, 2023; Rodziewicz et al., 2023)

Instances of **retained surgical items** are known to occur approximately 40 times per week in the United States, and the most common are surgical sponges or laparotomy pads, which then become gossypibomas, or masses within the body comprised of a cotton matrix surrounded by a foreign body reaction. These gossypibomas account for 48% to 69% of retained foreign bodies (Steris Healthcare, 2024). Clamps and retractors are the most common types of retained instruments. The second most common category is catheters and drains. Needles and blades are the third most common category, a majority of which are suture needles.

Anesthesia-related adverse events are fairly uncommon, although not rare. The American Society of Anesthesiologists reports that approximately 1 in every 200,000 patients experiences an anesthesia-related complication leading to mortality. **Common anesthesia errors** include, but are not limited to:

- Dosage errors (overdosing and underdosing)
- Delayed delivery of anesthesia
- Improper intubation
- Improper monitoring
- Failure to respond to a patient's vital signs
- Equipment malfunction

- Failure to complete a thorough patient history to identify allergies or drug interactions
- Poor communication
(Shaked, 2024)

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. The **most common** reason is that many types of tubing lines for different medical devices incorporate common Luer lock connectors, which consist of a male taper with an associated threaded "skirt" and a female taper having flanges to engage the threads (FDA, 2023).

EXAMPLES OF TUBING MISCONNECTIONS

- Enteral feeding tube connected to an IV
- Enteral feeding tube connected to ventilator in-line suction catheter
- Blood pressure cuff tubing connected to an IV port
- IV tubing connected to tracheostomy cuff
- IV tubing connected to nebulizer
- Oxygen tubing connected to a needleless IV port
- IV tubing connected to nasal cannula
- Syringe connected to tracheostomy cuff
- Epidural solution connected to a peripheral or central IV catheter
- Epidural line connected to an IV infusion
- Bladder irrigation solution utilizing primary IV tubing connected to a peripheral or central IV catheter
- Foley catheter connected to NG tube
- IV infusion connected to an indwelling urinary catheter
- IV infusion connected to an enteral feeding tube
- Primary IV tube connected to a blood product meant for transfusion
(FDA, 2023)

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.

These connectors are designed to be incompatible with Luer adaptors, which are commonly used in IV applications. The connectors look and secure very similarly to a Luer threaded lock system, although the design is larger and, therefore, incompatible with connectors for unrelated delivery systems such as tracheostomy tubes, IV lines, and catheters (Rodziewicz et al., 2023).

Errors in Physical Therapy Practice

Common errors include:

- Poor or improper technique
- Lack of communication
- Overly aggressive force
- Improper application of ice or heat
- Overextending limbs/joints
- Improper training in equipment usage or technique
- Inappropriate use of unapproved equipment
- Broken/faulty equipment

Though rare, some of the most severe potential consequences of negligence in physical therapy practice may include lower back injuries, spinal cord issues, and strokes. It is of the utmost importance that individuals providing physical therapy are vigilant of the potential harm that can be done during therapy sessions.

Error prevention steps in physical therapy practice can include:

- Establishing and enforcing proper documentation protocol
- Following proper care protocols
- Routinely testing equipment (see below)
- Closely supervising patients during treatments
  (Chenoweth, 2024; Niemi, 2024)

Physical therapists use different types of **electrical treatment equipment**, such as hydrocollators, electrical stimulation, and ultrasound devices, that could be hazardous if:

- Water and electrical energies mix, resulting in a possible shock hazard
- Equipment is used improperly due to carelessness or lack of proper training and/or supervision
- Electrical cords are frayed or damaged, resulting in potential electrical exposure

Prevention controls and work practices include maintaining machines in good working order, including:

- Routinely monitoring the condition of equipment
- Training employees to correctly and safely use and clean equipment
- Maintaining adequate working space and access to equipment
- Visually inspecting equipment before using
- Not using equipment if cords are frayed or damaged
- Not using the machine and calling for assistance if anything else does not look right (OSHA, 2023)

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. As many as 1 in 31 hospitalized patients and 1 in 43 nursing home residents contract at least one HAI in association with their healthcare (CDC, 2023a).

HAIs AND HAND HYGIENE

One of the most important reasons in healthcare settings for the spread of bacteria resulting in HAIs, 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 some healthcare providers practice hand hygiene on fewer than half the occasions they should. Providers might need to clean hands as many as 100 times per 12-hour shift, depending on the number of patients and intensity of care (CDC, 2023b).

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

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, 2023a)

Risk for Falls

Falls are the most common type of accidents in people 65 years of age and older, with over 30% of such individuals falling every year. In approximately one half of these cases, the falls are recurrent. These percentages increase to around 40% in individuals 85 years and older.

Approximately 10% of falls result in serious injuries, including fracture of the hip, other fractures, traumatic brain injury, or subdural hematoma. They are the major cause of hospitalization related to injury in those 65 years and older and are associated with increased mortality.

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, 2023; Kiel, 2023).

Fall risks 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. Extrinsic factors generally can be changed and address environmental risks that patients encounter (Appeadu & Bordoni, 2023).

A fall **risk assessment** is done on admission, and reassessment is done whenever there is a change in a patient's condition or when a patient is being transferred to another unit. A reliable, standardized, and validated assessment scale should be used that includes a history of falls, mobility problems, use of assistive devices, medications, and mental status.

There are many fall assessment tools. The following tools have been extensively studied and recommended:

- Morse Fall Scale

- STRATIFY Scale
- Schmid Fall Risk Assessment Tool

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

- Review of medical history
- Review of medications
- Checking heart rate and blood pressure measurements at rest and while changing positions
- Simple vision test
- Balance, strength, range of motion, and walking ability assessments
- Home safety assessment
- Simple test of cognitive abilities
- Feet and footwear assessment

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 moving
- Dual-task training program
- Strength training
- Pain management
- Education on nutrition, sleep, choosing appropriate footwear
- Fear management
- Referral to community programs
- Home safety guidance

(APTA, 2023)

PATIENT SAFETY CULTURE

Patient safety culture describes the extent to which an organization's culture supports and promotes patient safety and refers to the values, beliefs, and norms shared by practitioners and other staff throughout the organization that influence their behaviors and actions. **Key features** of a safety culture include:

- Strong support from organizational leadership
- Acknowledgement of the high-risk nature of an organization's activities
- Determination to achieve consistently safe operations
- Responsibility by everyone for safety, implementing and reporting unsafe conditions
- A blame-free environment for individual reporting of errors or near misses without fear of reprimand or punishment
- Encouragement of collaboration about decision-making across all staff levels and disciplines to seek solutions to worker and patient safety problems
- Organizational commitment of resources to address safety concerns
(CDC, 2023c)

EFFECTIVE DOCUMENTATION AND COMMUNICATION

Physical therapy documentation systems can take various forms, such as handwritten notes, electronic medical records (EMRs), or specialized physical therapy practice management software. Documentation should be comprehensive and objective, and should adhere to professional guidelines and standards. Guidelines for documenting include:

- Document in the correct chart.
- Ensure 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.
- Ensure documentation includes patient demographics, medical and physical therapy evaluation and treatment history, medical diagnosis, treatment plans, medication history, interventions, patient education, and outcomes/response to treatment.
- Include patient consent.
- Chart promptly.
- Be accurate, objective, and complete.
- Avoid repetitive copying and pasting.
- Use approved abbreviations.
- Include patient communication.
- Record instances of a patient's nonadherence.
- Document delegated tasks.
- Correct errors in charting promptly.
- Update records at every visit to reflect current treatment, progress, and changes in plan of care.

- When treating minors, include:
    - Written parental consent for treatment
    - Specific details of the parent/guardian present during the session
    - Modifications made to treatment plans or assessments due to age or development
- If a patient has cognitive impairments, include:
    - Description of the patient's understanding of their condition and treatment plan
    - Details of any communication modifications used (e.g., visual aids, simplified language)
    - Presence and involvement of a caregiver, if applicable

(PTEverywhere, 2023; Reiner, 2023)

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

(Rodziewicz et al., 2023)

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.
- Technologic 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 is one of the most commonly used communication tools 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)		

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, 2024).

Florida Statute 486.021 outlines modalities used by physical therapists, which include:

- Performance of physical therapy assessments
- Treatment for or prevention of any disability, injury, disease, or other health condition
- Rehabilitation by the use of:
    - Therapeutic exercise
    - Functional movement training in self-management and in-home, community, or work integration or reintegration
    - Manual therapy
    - Massage
    - Airway clearance techniques
    - Maintaining and restoring the integumentary system and wound care
    - Physical agent or modality
    - Mechanical or electrotherapeutic modality
    - Dry needling
    - Patient-related instruction
    - The use of apparatus and equipment in the application of such treatment, prevention, or rehabilitation
    - The performance of tests of neuromuscular functions as an aid to the diagnosis or treatment of any human conditions
    - Performance of electromyography as an aid to the diagnosis of any human condition only upon compliance with the criteria set forth by the Board of Medicine
- 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
(FLBPT, 2021; Florida Legislature, 2023)

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.

High-power ultrasound is **indicated** for lithotripsy and high-intensity focused ultrasound (HIFU) to heat or destroy tissue. Low-power ultrasound is indicated for bone healing, sonophoresis, and diathermy.

Ultrasound **contraindications** include:

- Extracorporeal shock wave lithotripsy (ESWL), in cases of infection, stone burden greater than 2.5 cm, coagulopathies, untreated hypertension, pregnancy
- Magnetic resonance-guided focused ultrasound surgery (MRgFUS) in the presence of cardiac pacemaker or other implantable devices
- Ultrasound diathermy in cases of bone fracture; malignancy; arteriosclerosis; application to eye, spine, active infection, or ischemic tissues
  (Matthews & Stretanski, 2023)

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, or 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 (Seidel et al., 2021).

Contraindications for iontophoresis include:

- History of hypersensitivity or adverse reactions to the drug to be administered
- Prior medical history of cardiac arrhythmias or hypercoagulability
- Near pacemakers and superficial blood vessels
- Near embedded wires, staples, orthopedic implants, and areas of skin with lesions and impaired sensation
- During pregnancy, or used with extreme caution
  (Sheikh & Dua, 2023)

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

- 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. Most states, including Florida, allow dry needling as part of physical therapy scope of practice, and physical therapists must undergo specialized additional training in order to legally perform dry needling interventions.

Indications for use of dry needling include:

- Myofascial pain and presence of trigger points
- Chronic pain
- Low back pain
- Strains
- Osteoarthritis
- Fibromyalgia
- Tendinopathies

Absolute contraindications include:

- Unwilling or unable to give consent due to fear, beliefs, communication, cognitive age-related factors
- Medical emergency or acute medical condition
- Local infection
- Over an area or limb with lymphedema
- Inappropriate for any other reasons

Relative contraindications include:

- Abnormal bleeding tendency
- Compromised immune system
- Vascular disease
- Diabetes
- Pregnancy
- Children
- Frail patients
- Patients with epilepsy
- Psychological status
- Patient allergies
- Patient medication
- Unsuitable patient for any reason

(Physiopedia, 2024)

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 therapist's' 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, 2018)

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 and 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 (sweaty palms or feet)
(Sears, 2022)

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 is 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 their employing facility 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 therapeutic exercise or hot and cold applications.

FLORIDA STATUTORY REQUIREMENTS

The 2023 Florida Statutes require every licensed facility to establish an internal risk management program and develop and implement an incident reporting system. It is the duty of all healthcare providers and all agents and employees to report adverse incidents to the risk manager or their designee within 3 business days after their occurrence.

Internal Risk Management Program Requirement

The Florida Statutes 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 nonphysician 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 rooms 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 Reporting 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 the Agency for Health Care Administration (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 the adverse incident's occurrence, whether occurring in the licensed facility or arising from healthcare prior to admission to the licensed facility.

- An **annual report** summarizing the incident reports that have been filed in the facility for that year, including:

    - 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 and the status and disposition of each claim

(Florida Legislature, 2024)

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 incident 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. In the past, patient safety was not a traditional part of the education of most healthcare workers, but today this is no longer true. 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, recognize 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
https://ahca.myflorida.com/health-care-policy-and-oversight#1

Hospital Safety Grade
https://www.hospitalsafetygrade.org

Institute for Healthcare Improvement
https://www.ihi.org

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

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

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TEST

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1. Which statement **best** defines a "medical error"?

a. An event that is not entirely preventable
b. A provider failure to make a correct diagnosis
c. An occurrence that is always preventable
d. An unintended healthcare outcome

2. Which term is used by the Joint Commission to refer to a patient safety event that results in death, permanent harm, or severe temporary harm and intervention required to sustain life?

a. Sentinel event
b. Medical error
c. Near miss
d. Adverse event

3. Which cause is the most common **reason** for medical errors?

a. Impulsive behavior by a clinician
b. Dangerous actions by a particular practitioner
c. Inaction undertaken purposefully by an individual
d. Communication issues

4. Which outcome is the ultimate goal of a root cause analysis?

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

5. During which stage do more medication errors occur?

a. Ordering
b. Transcribing
c. Dispensing
d. Administering

6. 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?"

7. Which patient condition is a **contraindication** for the use of electrotherapy?

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

8. For which condition is acetic acid delivered via iontophoresis **not** indicated?

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

9. Within which time period after an adverse incident do Florida statutes require a report to be submitted to the Agency for Health Care Administration?

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