

Preventing Medical Errors



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Introduction

Occupational therapy's holistic approach can expose practitioners to a variety of physical, cognitive, and mental health diagnoses. In addition, occupational therapy service delivery can differ greatly from one client to the next and even across practice settings. Providers often view this in a positive light, since it encourages critical thinking, adaptive approaches, on-the-job learning, and greater interest in job roles due to frequent variations. However, this same trait can also serve as a disadvantage for occupational therapists in the realm of medical errors. The likelihood of mistakes may increase when therapists are asked to shift gears quickly, intervene in the event of a crisis, or respond to novel situations over the course of a standard work day. When OTs utilize a client-centered approach – as they so often do – this may also lead therapists to overlook otherwise simplistic aspects of medical treatment that must be adhered to. When factoring in other aspects such as equipment, safety, and consistent team collaboration, medical errors can result. However, in keeping with the preventive lens of many OT approaches, these errors can be avoided if therapists take appropriate measures.

Section 1: Background and Prevalence

References: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

Medical errors are defined as avoidable, negative events that can occur at any point during the continuum of a person's medical care. These missteps are known to influence medical treatment plans, interventions administered, and healthcare decisions, and can have far-reaching effects. Medical errors can take place in any healthcare discipline and are a common occurrence in this industry. In fact, a study conducted by the Institute for Healthcare Improvement and the National

Patient Safety Foundation discovered 41% of American adults have experienced a medical error in their lifetime.

Medical errors can lead to a host of health complications and may even result in premature death. A dated (2016) study yielded harrowing results, stating that medical errors are the third leading cause of death in the United States with around 250,000 medical error-related deaths occurring each year. Based on these numbers, it is estimated that deaths due to medical errors account for 33% of all patients who die in the hospital.

From a global perspective, patient harm resulting from medical errors stands as the 14th leading cause of death. These statistics place medical errors resulting in death on par with the amount of worldwide deaths attributed to malaria and tuberculosis. In addition to being a glaring patient safety concern, medical errors also cost the healthcare system an exorbitant amount of money. In the United States, some sources estimate medical errors result in between \$20 and \$45 billion of insurance payouts each year.

Medical Error Terminology

As many clinicians know, there is a lot of terminology to learn in the medical field and the topic of medical errors is no exception. Therapists must differentiate between various terms in order to effectively document medical errors and similar events and work with other professionals to appropriately respond. For instance, some medical errors are classified as adverse events, but not all adverse events are considered medical errors. What sets these two terms apart is that the root cause of medical errors is preventable, while not all adverse events are able to be sidestepped. Therapists should understand the following terms:

- **Adverse event:** An instance where medical treatment of any kind leads to patient harm. The event must be attributed to the treatment itself rather than any preexisting conditions.
- **Ameliorable adverse events:** These adverse events cannot not be avoided, but their effects can be lessened if the clinician incorporates certain strategies early enough.
- **Preventable adverse events:** These events result from clinician missteps – either outright errors or from failing to follow preventive strategies. When someone discusses medical errors, this is what they are most often referring to.
- **Sentinel event:** A grave adverse event that culminates in irreversible harm, severe but temporary harm (often requiring life-sustaining intervention), or death to a patient. The term sentinel is used because such an event warrants immediate investigation and prompt preventive responses to avoid reoccurrence. Healthcare organizations are not required to report these events to the Joint Commission, but they are strongly encouraged to do so.
- **Negligence-related adverse events:** Adverse events that stem from low quality medical care; in order to be a negligent adverse event, the patient harm that results must be due to care that does not meet the generally accepted standards for that provider's discipline
- **Near miss:** A preventable situation that exposes a patient to potential harm or hazard, but does not end up as an adverse event; a near miss avoids a negative outcome because a provider implemented a strategy in due time or simply due to chance

There are a few other forms of adverse events, including adverse drug events (ADEs), adverse drug reactions, and adverse events after hospital discharge. Adverse drug events are any negative event that occurs after taking medication. As with adverse (medical) events, adverse drug events are general and do not necessarily result from medical errors. Adverse drug reactions are side effects that occur after someone takes medication as prescribed by their doctor.

Adverse events after hospital discharge are any situations that cause a patient harm in the 3 weeks after they have been released from a hospital. This category of adverse events can heavily impact rehabilitation professionals due to their association with hospital readmission. A dated study discovered around 20% of patients experience adverse events after discharge and around 66% of these events were preventable. All variations of preventable adverse events can be further broken down into several categories based on error type.

Types of Medical Errors

Surgical and Anesthesia Errors

Some of the main medical errors involving surgery include failing to remove foreign objects (such as medical tools) before closing a patient's surgical site, performing a medical procedure on the incorrect body part, using faulty medical equipment, experiencing equipment malfunctions, damaging a nerve or artery during surgery, injuring a patient through improper surgical positioning, performing a medical procedure on the wrong patient, and contributing to the development of a surgical site infection (SSI).

Medical errors involving anesthesia include improperly intubating a patient during surgery, providing anesthesia too late in the pre-operative period to be effective, neglecting to closely monitor a patient's vital signs during a procedure,

administering the wrong dose or wrong kind of anesthesia, and overlooking the presence of allergies when providing anesthesia and related surgical medications.

Causes of surgical and anesthesia errors include providers having insufficient knowledge or on-the-job experience, poor communication between members of the interprofessional team and/or surgeon and patient, poor care provided during the post-operative period, providers failing to perform a comprehensive evaluation leading them to overlook underlying health conditions, surgeon/provider neglect, and faulty medical equipment.

Diagnostic Errors

These include delaying an accurate diagnosis, misdiagnosing a patient, overlooking a diagnosis altogether, and failing to identify medical complications in a timely manner. Diagnostic errors may result from provider bias, providers having insufficient knowledge or on-the-job experience, provider neglect, or limited time spent reviewing a patient's chart, taking their medical history, and completing other parts of the evaluation.

Medication Errors

These include prescribing medication(s) that do not properly address a patient's presenting concerns, prescribing medication(s) that address a concern the patient does not have, recommending the wrong dose/frequency/duration of medication, failing to identify cognitive or temporal concerns that may prevent the patient from adhering to a given medication, and failing to recognize and inform prescription recommendations based on a patient's medication allergies.

Medication errors may stem from a lack of interprofessional collaboration, poor training in medication mechanics, improper medication packaging, not abiding by

standards and practices surrounding medication prescription, and a facility lacking proper standards and practices for prescribing abilities.

Patient Falls

In order for a patient fall to be classified as a medical error, the fall must have been the result of a healthcare provider's negligence. This means a clinician did not take the proper steps to avoid the fall. Such incidents are falls that result from one or more of the following: lack of patient supervision, unnecessary medication side effects or improper medication dosage, incomplete fall risk assessments, failure to diagnose underlying conditions (such as vision concerns, neurological disorders, etc.), misdiagnosis of underlying conditions, failure to recommend/use mobility devices, and using improper patient transfer and repositioning techniques.

Hospital-acquired Infections (HAIs) or Other Injuries Sustained While in an Institutional Setting

Hospital-acquired infections, also called nosocomial infections, are those that develop due to provider negligence while someone is in an institutional healthcare facility. HAIs may occur in ambulatory surgery centers, surgical centers in hospitals, inpatient hospital rooms, and skilled nursing facilities. The most predominant HAIs include surgical site infections, ventilator-associated pneumonia, *Clostridioides difficile* (c. diff), catheter-associated urinary tract infections (CAUTI), central line-associated bloodstream infections (CLABSI), methicillin-resistant staphylococcus aureus (MRSA), and vancomycin-resistant enterococci (VRE). Hospital-acquired infection causes are mostly dependent on the type of HAI someone develops. For example, ventilator-associated pneumonia typically results when someone contracts the disease from bacteria that has entered the lungs through a breathing tube. Many HAI causes are due to improper

hand hygiene exercised by staff, visitors, and anyone else who enters a facility, and poor sanitization of durable medical equipment. Other risk factors for HAI include extended hospital stays – especially those that include time in the intensive care unit, having wounds of any kind (incisions from surgery, pressure ulcers, burns, superficial cuts, etc.), overuse of antibiotics (both those that are medically necessary and those that are over-prescribed), and undergoing lengthy surgical procedures.

In addition to HAI, there are other injuries someone can sustain in healthcare institutions that result from medical errors. These include accidental needle sticks, bruises/muscle sprains/muscle strains from improper transfer techniques, accidental cuts from sharp instruments, and pressure ulcers from extended bed rest (either due to patient neglect or as a result of a medical condition). Patient falls can also be included in this category if the patient was in a hospital at the time of the fall and the event occurred due to provider negligence. The greater majority of HAIs and related injuries are preventable.

Equipment Failure

This type of medical error may or may not be under the control of the healthcare providers involved. Equipment failure is caused when a device does not operate in the way it is intended to and, therefore, obviously harms the patient or simply does not produce the proper outcome. Causes of equipment failure may be attributed to standard wear and tear on devices, electrical malfunctions, mechanical failures, lack of proper inspection or maintenance, software concerns, and user error. In the most benign cases, equipment failure can cause slight delays in treatment. This may not be harmful for some patients, but in emergency medicine, this can lead a patient to die or cause their condition to worsen in an irreversible way, e.g. they lose all brain function due to oxygen loss. Equipment

failure due to electrical malfunctions may also lead to direct injuries such as electrical shock, which can cause serious patient injury or death.

Communication Errors

These errors may take the form of issues with patient-provider communication or exchanges between providers who are treating the same patient. Some examples include patient misidentification, lack of explanation regarding patient diagnostics or treatment, supervisors giving unclear instructions to providers who are providing medications or directly administering treatments, and failing to get informed consent for any medical care that was provided.

In the case of medical errors stemming from poor patient-provider communication, causes may be due to a language barrier, inaccessible translator services (or a lack altogether), mistrust between the two parties, poor cultural competency, time constraints, misalignment of communication styles, unrealistic productivity standards contributing to an overly heavy workload, incomplete or vague documentation, poor or missing patient education, use of medical jargon, and a provider's inability to build proper rapport with their patient. Medical errors due to communication lapses between providers can stem from differences in communication styles, incomplete or vague documentation (e.g. not properly utilizing universal abbreviations), time constraints, improper or rushed handoff procedures between clinicians who are shift workers, lack of proper training or real-world experience in effective provider communication, an unrealistic workload, software concerns (especially those related to an overly complex electronic health record or fragmentation between multiple systems), a lack of trust or role clarity between members of the interprofessional treatment team, and poor collaboration between various members of a healthcare organization's hierarchy.

Rehabilitation Errors and Their Impact

While all of the above medical errors have the capacity to impact the role of a rehabilitation professional, there are specific errors occupational therapists are more likely to commit due to the nature of their work. Some of the most common errors in this field include:

- Writing inaccurate or incomplete treatment plans
 - This includes setting goals that the patient cannot reasonably meet; not making a patient's plan of care person-centered and/or family-centered; neglecting the patient's preferences, priorities, and self-identified goals for therapy; and offering inappropriate or unhelpful exercises/activities based on the patient's needs at any given time.
- Misinterpreting or overlooking a patient's symptoms or functional abilities at any point in the plan of care
 - The former can prolong or impede a patient's medical diagnosis along with related medical care and may even cause a patient's symptoms to worsen – resulting in short-term or long-term complications. The latter error can lead a patient's existing abilities to decline and cause their caregiver burden to grow.
- Implementation errors
 - This can refer to not performing therapeutic exercises and therapeutic techniques correctly (which can lead to injuries from poor form or chronic overuse in both parties), improperly using physical agent modalities and assistive technology of any kind, and failing to adapt a therapeutic activity to a level that is more suitable for the patient.

- Failing to address or lower potential therapy risks
 - This may involve a therapist recommending a less suitable modality (e.g. one that may or may not be effective and comes along with several precautions that apply to your patient) instead of one that is more likely to be effective and comes with fewer risks. This also extends to overlooking contraindications that preclude a patient from receiving a certain modality.
- Not communicating at all or enough with other providers involved in a patient's care
 - This includes mandated forms of collaboration (such as coordination services listed on a student's Individualized Education Plan, or IEP) and other communication methods like planning approaches during a cotreatment.

Largely speaking, the causes of medical errors in therapy fields include time constraints; lack of training; inadequate knowledge; the cognitive impact of stress, fatigue, emotional exhaustion, and other burnout symptoms; and a lack of appropriate coping strategies to help manage work-related stressors. Research has shed some light on the most common causes, and there appear to be some patterns.

One dated study on the topic found that most OT medical errors are attributed to insufficient communication, poor judgment, lack of knowledge, improper preparation, and inexperience. A similar dated study in the American Journal of Occupational Therapy mirrored these results, showing misjudgment, lack of preparation, and lack of experience as the top three causes of OT medical errors.

Medical errors can impact many aspects of treatment, but some research has shown they are more prevalent in certain areas. In particular, Hunter & Rhodus

(2022) looked at the health concerns most influenced by OT medical errors in postacute settings. Results found they spanned the following areas: pressure ulcers, falls, discharge management, dysphagia, diabetes management, and infection control. This lends support to the long-lasting and wide-reaching impact many medical errors have.

A dated study conducted by the Office of the Inspector General looked into the occurrence of adverse events in rehabilitation hospitals that served Medicare members. Results showed that 29% of all patients experienced an adverse event during their admission. This prevalence was nearly identical to that of patients in skilled nursing facilities and acute care hospitals. Almost 50% of the adverse events in rehabilitation hospitals were attributed to delirium, medication errors, and pressure ulcers, which are largely known to be preventable.

Kinoshita et al. (2022) looked at the frequency of adverse events occurring during physical rehabilitation with patients in an acute care hospital. After conducting a retrospective review of the previous year, results showed a total of 113 adverse events, 93.8% of which were minor and did not require patients to receive new treatment. Of these, the most common occurrences were patient falls, decreased consciousness, low affect secondary to hypotension, and peripheral intravenous tube removal. The study also found no significant link between the frequency of adverse events and years of experience each clinician had. In addition, Eggmann et al. (2024) looked at rehabilitation-related adverse events that affected patients receiving critical care. Researchers found oxygen desaturation and hemodynamic changes (such as variations in blood pressure, respiration rate, and cardiac output) were the most frequently reported adverse events, though these are just as likely to occur during routine care or rehabilitation with another population. These specific concerns also posed a significant safety risk when they occurred following particularly intensive rehabilitation.

As you can see, medical errors take many forms, and each type has its own set of causes, risks, and possible outcomes. While there are several medical errors that may occur as a direct result of OT intervention and related duties, any medical error stands to impact the treatment OTs provide. Therefore, it's important for therapists to diligently utilize prevention strategies to avoid adverse events and employ relevant methodologies to mitigate patient harm in the event they do occur. We will discuss more about each of those in the coming sections.

Section 1 Personal Reflection

There are several levels of prevention that medical approaches may be categorized as. What tier(s) might preventive strategies aimed at avoiding medical errors fall under?

Section 2: Root Cause Analysis for Identifying Medical Errors

References: 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26

Before a therapist takes any steps to address a medical error, they must first determine what caused (or is causing) the error. The go-to process for medical error identification is a Root Cause Analysis. A Root Cause Analysis, or RCA, is a structured approach to discovering the underlying cause of a problem. While RCA has applications across many fields, it is especially effective when used to investigate medical errors. By using an RCA, therapists can learn why a medical error occurred, explore what factors contributed to the error, and craft solution-focused strategies to appropriately address the problem. This approach helps therapists manage an existing concern while simultaneously understanding how

to prevent the issue from recurring. There are several key steps involved in conducting an RCA:

- Identifying the problem by defining specifically what the error is
- Collecting data and other factual evidence that pertains to the error
- Locating root causes using one of several methods to trace the problem back to its main source
 - These methods include but are not limited to the 5 Whys Technique, Change Analysis, Fishbone/Ishikawa Diagram (also known as a Cause and Effect Diagram), Pareto chart, Fault Tree Analysis, Failure Mode and Effects Analysis, PROACT RCA Method, Affinity Diagram, Circle map, Diagnostic Tree, Forcefield Analysis, and Is-Is Not Exercise. Depending on the complexity of the error and how much detail they need to uncover, therapists may also be able to use scatter plot diagrams during this step.
- Suggesting and implementing solutions with two aims: (1) addressing the root cause of the existing problem and (2) preventing future errors from occurring
- Following up by monitoring the efficacy of the plan and making ongoing adjustments as needed
- Closing the loop in a way that ensures the strategies continue to be effective in avoiding future errors of the same kind

Corrective Action Plans

After performing a root cause analysis to identify medical errors, the next step is for therapists to create a corrective action plan (sometimes referred to as

corrective and preventive actions, or CAPAs). In a general sense, corrective action plans (CAPs) are used for the purpose of quality management. For example, business owners may develop a CAP to address liability concerns or fill service gaps in their companies. Their application in the world of medical errors is not all that different. In the healthcare industry, corrective action plans are necessary tools used to ideate solution-focused steps for the remediation of medical errors. Therapists also use CAPs to put these steps into practice and work toward preventing future errors of the same kind. Interventions recommended via a medical error corrective action plan may include healthcare staff education, equipment reviews, modifications to organizational policies or procedures, and workshops focused on identifying systemic issues that may cause future errors. Depending on the medical error they address, some corrective action plans may also consist of targeted interventions such as more thorough practice in using a medical device before treating patients with it.

In order to be effective, CAPs must also incorporate plan evaluation and monitoring. All CAPs should outline the resources needed to address the medical error, an estimated timeline for the plan's implementation, and specific goals that will be met once complete. Therapists can utilize SMART goals to assist in this process. Just as with patient treatment plans, a corrective action plan should be periodically reassessed and adjusted, as needed. Therapists should also detail progress monitoring tools and techniques that will be used.

There are various templates that can assist in the creation of a corrective action plan. Many healthcare organizations have their own workflow to follow after any medical errors that occur in their facility. Most corrective action plans follow the 4 Ws and the 2Hs, as this structure offers sufficient detail for those carrying out the plan and anyone else who reads about it. This template includes:

1. A brief description of the medical error or other problem that will be addressed
2. A summary of what the plan will do, including a general description and specific action steps that will be taken
3. Explanation as to why these steps must be taken, which serves as clinical and legal justification for the plan and its contents
4. A description of the location(s) where the plan will be carried out
5. An outline of when the plan will be carried out, including deadlines and specific times/dates
6. A list of who will be responsible for carrying out the plan. If the plan is broken up into several sections and each is tasked by different people, this section should describe who is responsible for what part.
7. A discussion of the methods and processes followed during each part of the plan
8. An itemized list of costs associated with each part of the plan

Therapists may need to recruit help for certain aspects of the CAP, such as determining what vendors the organization is partnered with and researching item costs from that vendor. However, it is well within a therapist's abilities to complete the greater majority of the plan on their own.

Evidence Surrounding Root Cause Analysis for Medical Errors

Research supports the benefits of using RCAs in the medical field. Al Mardawi & Rajendram (2021) found that, while they are costly to implement, RCAs can improve patient safety by decreasing the recurrence of medication errors. The

costs of RCA are also known to be relatively low in comparison to those associated with medical errors themselves, lending further support to their utility.

A study from Martin-Delgado et al. (2020) also found benefit in using RCA to look into adverse events. However, this systematic review found RCA to be more helpful in identifying various causes for safety incidents and less so for implementing measures to avoid the errors in the future. Therefore, these results suggest RCA should be paired with another tool to help with the action component of medical error remediation and prevention.

Willis et al. (2023) looked into provider experiences after RCA to address medical errors, and found that clinicians overwhelmingly considered the process valuable in helping with significant adverse events. Providers did report some concerns relative to their workload and a lack of time to thoroughly complete an RCA. Interestingly enough, providers also viewed legislation-related disclosure policies as both a hindrance and support for its use.

RCA in Action

Let's walk through an example together and detail what exactly an RCA and associated CAP might look like when performed by an occupational therapist.

For this scenario, we'll follow an occupational therapist working in an outpatient clinic. This therapist has been working for 2 years and this is her first and only OT position since graduating. She is scheduled to complete an evaluation on a 34-year-old female patient. The reason for referral is custom orthoses to address a right hand contracture, which developed after a stroke that occurred one year ago.

The therapist has had some experience and education in hand diagnoses and orthoses fabrication, as her current supervisor (who also served as her mentor

during her early working days) is a certified hand therapist. The OT briefly discussed the case with her supervisor before taking it on. The therapist reviews this patient's medical records beforehand to prepare for the evaluation and learns the patient also has moderate intellectual disability, hypertension, and type 2 diabetes mellitus. The patient's 60-year-old mother is her caregiver and healthcare proxy, and has served in these capacities for many years due to her intellectual disability. The patient's mother reports significant changes since her stroke – namely, the patient now has very little speech and struggles with many functional tasks due to deficits in right upper body strength and motion. Doctor's notes state the patient did not appear to sustain lasting cognitive changes as a result of the stroke. The patient's mother is present for the entire evaluation.

During the evaluation, the therapist directs most questions to the patient's caregiver and asks the patient mostly yes-no questions such as, "Does anything hurt?" and "Can you show me how you'd pick this object up?" The therapist uses the Wong-Baker FACES Pain Rating Scale to determine the patient's pain levels, which are determined to be 2/10 (hurts a little). The patient made many vocalizations throughout the evaluation, and her mother reported this and other non-verbal communication appeared to be typical for her. The therapist completed the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire with the help of the patient's mother. She rated most items as a 4 (severe difficulty) or a 3 (moderate difficulty). Her total disability score was 57.5%.

At rest, the patient's right hand was contracted into a fist. The therapist attempted passive range of motion with the patient and was able to achieve 10° of MCP extension, 5° of PIP extension, and 0° of DIP extension. The patient appeared to be in pain during passive range of motion, so the therapist was gentle and slow during goniometry. The patient had only slight active motion in the digits. The therapist determined the patient would benefit from a resting hand orthosis and took measurements to begin the process. She fabricated the orthosis, placed it on

the patient, and made adjustments before letting the finished product set. The therapist told the patient's mother that the patient should wear the orthosis for 2-3 hours each day until her next appointment. The OT also gave the mother a print-out with the information she verbally noted during the session, and offered some education about maintenance and care for the orthosis. The OT asked the patient's mother to make an appointment one month later to follow up and make any other adjustments that were needed. She also offered some education about signs that might warrant a call to the clinic to make an earlier appointment. The mother verbalized that she understood and stopped at the front desk to make her daughter's next appointment before they left.

One week later, the clinic receives a call from this patient's mother. She mentions that her daughter has been excessively vocal and increasingly agitated over the past several days, which is unlike her. The mother reports being unsure if the orthosis has something to do with these behaviors. She said her daughter has been wearing the orthosis all day, each day since their last appointment, reporting that this is what the OT said to do. The OT called the patient's mother back and told her to remove the patient's orthosis and come to the clinic as soon as she could with her daughter. She also mentioned it was important to bring the orthosis and the associated paperwork she gave them.

The patient's mother came in later that day and they both met with the OT. The OT explained that she'd need to remove the orthosis and take a look at the patient's hand, but the patient recoiled and held her arm close to her body when the OT attempted to do so. After some encouragement, she let the OT take a look. The therapist observed several red spots on the knuckles, excess moisture in the palm of the hand, and a foul odor coming from the hand. Upon further assessment, all skin was intact. The OT looked at the paper she gave the family during the evaluation and noticed that she forgot to adjust the wording to reflect

her recommendation for a 2-3 hour wearing schedule each day. The paper notes that the patient is to wear her orthosis 24 hours a day.

A root cause analysis for this scenario might look as follows:

1. Identifying the problem by defining specifically what the error is

In this situation, the chief problem is that the patient was given the incorrect orthosis wearing schedule.

2. Collecting data and other factual evidence that pertains to the error

Data that shows this error occurred includes:

- The patient's mother stating the patient has been wearing the orthosis 24/7 since her evaluation
- Reports from the patient's mother of her daughter's abnormal behavior, e.g. vocalizations that are more frequent than usual for her
- The patient recoiling when the OT attempted to remove the orthosis
- The OT smelling a foul odor and observing redness, excess moisture on the hand once she removed the orthosis

3. Locating root causes using one of several methods to trace the problem back to its main source

For this example, we will use the 5 Whys Technique to determine the main cause of the problem. This goes as follows:

- The patient presents with pain, redness, moisture, and a foul odor when her orthosis was removed.
- "Why?"

- The patient wore her orthosis for 6 full days.
- “Why?”
- Her mother didn’t recall the wearing schedule the OT verbally gave her during their evaluation (2-3 hours per day), so she referred to the typewritten handout, which incorrectly stated the orthosis was to be worn 24/7.
- “Why?”
- The OT didn’t revise, add to, or proofread the pre-made orthosis aftercare handout before giving it to the patient.
- “Why?”
- The OT felt excess pressure while treating this patient and it led her to overlook several important areas during the evaluation.
- “Why?”
- The OT lacked experience in the patient’s diagnoses, treatment recommendations and also experienced time constraints.

4. Suggesting and implementing solutions with two aims: (1) addressing the root cause of the existing problem and (2) preventing future errors from occurring

There are several courses of action that can assist in addressing this error in the here and now. These include: (1) Writing up a new aftercare handout that details the proper wearing schedule for the patient; (2) Providing therapeutic modalities that address the direct effects the patient experienced due to the error, e.g. gentle tissue massage to alleviate redness and improve circulation, gentle passive range of motion to decrease

stiffness, etc.; (3) Recommending to the patient's mother that she leave the orthosis off for 4-5 days to allow the hand to return to its baseline state; and (4) Making another appointment with the patient one week from now to assess the hand and determine a new wearing schedule or another relevant course of action.

In the realm of preventing future errors from occurring, there are several options. These include: (1) The therapist working with their mentor to improve time management and related skills (e.g. organization, planning, and preparation for sessions and evaluations alike) to alleviate any pressure that impacts treatment; (2) The clinic offering 1:1 and widespread provider training regarding using the software program that generates patient education handouts; (3) The clinic creating a mandatory workflow that requires all providers to proofread their patient education handouts before printing them off and giving them to patients; (4) The therapist's supervisor offering continuing education resources on the fabrication and customization of hand orthoses and working with patients who have intellectual disabilities and/or stroke to improve the OT's knowledge in these areas; (5) The therapist's supervisor allowing shadowing opportunities for the OT to observe other therapists treating patients similar to this one (as well as other diagnoses/modalities the therapist has not seen before).

5. Following up by monitoring the efficacy of the plan and making ongoing adjustments as needed

After implementing the aforementioned plan, the therapist's supervisor should use SMART goals to create realistic objectives that guide the therapist's learning. The supervisor should meet with the therapist on a weekly basis afterwards to offer support and keep track of the therapist's

progress. From there, they can collaboratively make adjustments to the corrective action plan based on new scenarios that arise in practice or otherwise.

6. Closing the loop in a way that ensures the strategies continue to be effective in avoiding future errors of the same kind

Once the initial plan is complete, the therapist and her supervisor should meet on a monthly basis to ensure the corrective action plan was effective in its intent (e.g. avoiding errors and deepening the therapist's learning in the area of orthoses and hand rehabilitation). Discussions should also cover the possibility of adding more objectives to further the therapist's learning. If this is deemed unnecessary, the therapist's supervisor may want to recommend resources to help the therapist self-direct her learning from that point forward.

Section 2 Personal Reflection

What resources might a therapist's supervisor provide to support their learning while executing a corrective action plan?

Section 2 Key Words

Corrective action plan - A plan that outlines specifically how to remediate errors after they occur and prevent others from happening in the future; for maximal benefit, corrective action plans are paired with root cause analyses

Root cause analysis - A structured approach used to discover the underlying cause of a problem; in the healthcare industry, RCAs assist with identifying cause(s) of medical errors

Section 3: Error Reduction and Prevention

References: 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37

There are many evidence-based approaches therapists can use to assist with preventing medical errors. One dated study cites the importance of educational approaches in reducing OT errors as well as those that occur in other medical professions. This same study found that many therapists used some of the same strategies to help reduce the impact of medical errors. The most commonly used techniques included stopping errors from interfering with other job duties, willingly choosing to spend more time with patients affected by a medical error, focusing on exercising good judgment to determine their next step(s), and making/adhering to a corrective action plan that addresses the error. Results from this study showed the efficacy of each strategy was highly dependent on whether or not patients were made aware of the error committed. In a broader sense and for this study's cohort, error disclosure was correlated with positive outcomes.

Research also explored the responses of physical rehabilitation therapists after committing practice-related errors. Results from a dated study indicated several common themes: having a strong emotional response after an error occurred, feeling compelled to be transparent with the patient after an incident, taking initiative to properly manage errors themselves, changing approaches to prevent errors from occurring again, and understanding the stark contrast between medical errors and the standards the therapist typically holds themselves to. Assertiveness training in the form of advocacy was identified as a large asset in remedying medical errors with an organizational cause. In addition, education with a strong focus on clinical reasoning training proved beneficial in generating appropriate and thorough responses to medical errors.

A dated study in the American Journal of Occupational Therapy (AJOT) looked at approaches that reduced the frequency of OT errors. The most efficacious

approaches included: strengthening mentoring and orientation for all new therapists (specifically in the realm of mandated reporting and assertive communication training), performing competency checks on all therapists to ensure high working standards, bolstering safety procedures or creating new ones altogether, and advocating for systemic changes to assist in the credibility and efficacy of OT's role. This review also outlined some exercise-based programming that can prevent medical errors at the organizational level, with most targeting patients who are at a higher risk of adverse events due to health conditions or fragility. These included multicomponent falls prevention programs, depression interventions in home health settings to decrease readmission rates, multidisciplinary rehab for swallow strengthening, and pressure ulcer prevention programs.

Some newer studies have explored the direct impact of root cause analysis on error reduction and prevention. Specifically, Wolf et al. (2022) looked at how root cause analysis helped with the creation and implementation of human factor-centered interventions in a large, multi-facility health system over a 4-year period. Results showed the interventions effectively addressed adverse events, made interventions more resilient to human error, and increased provider satisfaction. In total, this process resulted in more adverse events being linked to subsequently “strong” interventions, with numbers rising from 43% to 69%.

Some RCA research focuses more on the targeted prevention of medical errors with the help of widely renowned methods. For example, Driesen et al. (2021) conducted a systematic review on the use of root cause analysis to prevent and recover from medical errors. This review found benefits when using the Prevention and Recovery Information System for Monitoring and Analysis (PRISMA) Method to assist in root cause analysis and the development of relevant recommendations. This is one of the most commonly used RCA methods worldwide due to its generalizability. This method entails: (1) completing a root

cause analysis; (2) classifying the error causes as either organizational, technical, or human; and (3) exploring possible solutions to address the problem at its source. Since the PRISMA Method looks at contributing factors across all three categories, it allows therapists to better target their solutions to positively affect change in the future. It is recommended that this method be researched and implemented more in the United States due to its efficacy in healthcare systems in other parts of the world.

Another piece of research looked at the ways in which root cause analysis helped reduce falls in inpatient facilities. In this study, Lakbala et al. (2024) discovered the two most common strategies implemented in response to falls were physical protection paired with environmental modifications and presenting the causes of risks to improve awareness about someone's propensity for falls. Other frequently used approaches were increased supervision and monitoring; education and culturalization; and incorporating fall risk assessment tools into more care protocols. Lakbala et al. also highlighted how important it is to be mindful of each organization's unique characteristics, since this can impact intervention efficacy and may even aid in strategy development.

In the same vein, therapists and administrators should assess their facility for any potential organizational barriers that may impede the reporting of adverse events. This helps improve the success of RCA and related efforts in preventing medical errors. Research by Aljabari & Kadhim (2021) emphasized this point via a systematic review that determined what hindered the ability of healthcare clinicians to report errors. This study only involved research that surveyed nurses and doctors; however, results showed that fear of consequences was the most predominant concern followed by a confrontational work culture and lack of feedback from superiors regarding how to respond to medical errors and similar issues. This review also showed quite a bit of variation in the barriers present at

various organizations, making it important to pinpoint those that affect you before addressing them.

In addition to organizational factors, there are many ethical considerations that intersect with medical error occurrence and responses. Some dated research looked specifically at the ethics of adverse events when they occur in rehabilitation (namely, physical therapy and occupational therapy). This study explored how adverse events have several moral dimensions that affect the therapist's response in any given situation. Authors suggest using professional codes of ethics, bioethical theories, and other (sometimes more general) ethical principles to assist in discerning the situation and critically thinking to develop solutions. Therapists surveyed in this research mostly brought up solutions that were safety-focused and aimed to prevent future errors, which is of note since patient well-being is paramount.

A unique, clinically-focused study by Laurino et al. (2024) looked at the efficacy of assessing vital signs to help predict and prevent adverse events during exercise portions of cardiac rehabilitation. This study found that errors occurred at a rate of 2.5 events per hour of exercise, which is quite high. Factors that were most effective in preventing adverse events included heart rate variability, functional capacity, pulmonary function, and adiposity. These were also considered beneficial for organizations with minimal resources. These findings can be carried over in settings that require a high degree of clinician autonomy and offer limited oversight, such as home health.

In summary, research supports human factor interventions targeted at reducing errors caused by therapist concerns, education-based approaches, tactful and solutions-focused error disclosure with patients, and appropriate therapist responses to remediate medical errors. Other research suggests safety strategies are crucial and bioethical principles should be used alongside root cause analysis.

Several pieces of research found a connection between how error disclosure is handled and positive outcomes. Therefore, communication techniques – namely, assertiveness training – have been identified as advantageous in this process.

Section 3 Personal Reflection

In what ways can assertiveness training help with advocacy for organizational change to prevent medical errors? How might it assist with disclosing medical errors to patients who have been affected?

Section 4: Contraindications, Medication Side Effects, & Error Prevention

References: 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57

A thorough assessment is very beneficial in preventing medical errors, chiefly those in the OT field. This is due in large part to the potential risks of OT modalities, such as physical agent modalities and certain forms of therapeutic exercise. Therapists should be fully trained in the use of all therapy modalities before implementing them with any patient. This training must include proper administration of the modality and an understanding of the mechanism of action, risks, benefits, and potential side effects. Therapists should be aware of the following contraindications, precautions, and risks associated with certain OT interventions:

Biofeedback

Contraindications

- Communication limitations, especially those that are receptive and prevent someone from following directions
- Neurosis
- Pregnancy
- Presence of an internal electronic device, such as a pacemaker, defibrillator, drug delivery system, loop recorder, or neurostimulator
- Psychosis
- Severe cognitive deficits
- Uncontrolled epilepsy

Precautions

- Limited engagement in or motivation for therapy and change in general
- Open wounds, infections, and other skin abnormalities (when applied locally)
- Poorly managed cardiovascular conditions
- Recent injury or surgery that has resulted in significant physical limitations

Risks

- Anxiety
- Decreased efficacy with some medical conditions

- Decreased performance after biofeedback is discontinued
- Muscle strains or other soft tissue injuries
- Skin irritation from electrodes or gel

Cryotherapy

Contraindications

- Bleeding disorders
- Burns
- Circulatory problems, such as deep vein thrombosis
- Cold intolerance
- Hypertension
- Ischemic heart disease
- Open wounds (when applied locally)
- Other vascular impairments
- Peripheral vascular disease
- Raynaud's phenomenon
- Regenerating peripheral nerve (when applied locally)
- Sensory deficits, whether long-term due to a condition or short-term due to the application of topical analgesics
- Skin conditions, such as urticaria

Precautions

- Avoid placement over superficial nerves, the sides of the fingers
- Closely monitor use in people with skin infections or slow wound healing
- Always wrap cold packs in a towel or other fabric before applying to the skin
- Check the skin often when using cold therapy, especially with someone who has never used it before
- Discontinue use in the event the patient temporarily loses feeling in the skin
- Use for 5-10 minutes to start

Risks

- Bleeding
- Cold urticaria
- Excessive dilation of the blood vessels
- Frostbite
- Muscle cramping
- Nerve damage
- Skin changes, such as swelling, redness, blistering, and scarring (mostly in people with darker skin tones)
- Temporary numbness

Electrical stimulation, Iontophoresis, Neuromuscular Electrical Stimulation (NMES), & Transcutaneous Electrical Nerve Stimulation (TENS)

Contraindications

- An electronic device, such as a pacemaker
- Cardiovascular conditions
- Cognitive impairments
- Deep vein thrombosis
- Epilepsy
- Heart failure (when applied locally)
- Hemorrhagic conditions
- Infections (when applied locally)
- Limited communication skills
- Malignant tumors (when applied locally)
- Metal implants, such as internal fixators or intrauterine devices (IUDs)
- Open, damaged, scarred, recently grafted, or otherwise at-risk skin (when applied locally)
- Pregnancy
- Regenerating nerves
- Sensation deficits (when applied locally)
- Tissue that recently received radiation (when applied locally)

- Tuberculosis (when applied locally)
- Use across the orbital or temporal region of the skull

Precautions

- Active epiphysis
- Application over the chest, especially the heart
- Circulatory problems
- Skin disease(s)

Risks

- Pain
- Skin irritation, such as redness, peeling, dryness, blistering, and itchiness
- Surge or shock
- Tingling

Extracorporeal Shockwave Therapy (ESWT)

Contraindications

- Abdominal aortic aneurysm
- Active or untreated infection
- An electronic device, such as a pacemaker
- A recent history of corticosteroid injections (within the last 6 weeks)
- Bleeding disorders

- Malignant tumors (when applied locally)
- Open wounds (when applied locally)
- Organs or other areas filled with, including the lungs and gastrointestinal tract (when applied locally)
- Pregnancy
- Uncontrolled arrhythmia
- Untreated or poorly managed hypertension

Precautions

- Ask patients to refrain from taking NSAIDs prior to treatment
- Educate patients to refrain from high-impact sports, vigorous exercise, and strenuous activities for 24-48 hours after receiving this modality
- Inform the patient to consult with their doctor about taking NSAIDs to assist with discomfort after receiving ESWT
- Morbid obesity
- Offer ice packs if needed after ESWT, as long as there are no relevant contraindications for that modality

Risks

- Bruising near the area where the modality was applied
- Dizziness
- Nausea
- Numbness

- Skin redness
- Slight pain or discomfort
- Soft tissue damage
- Swelling
- Tingling and other minor sensation changes
- Vomiting

Paraffin

Contraindications

- Confusion or otherwise altered cognitive status
- Diabetes
- Difficulty regulating temperature (either in the face of extreme cold or extreme heat)
- Impaired sensation (when applied locally)
- Inflammatory skin conditions (psoriasis, eczema, rashes, etc.)
- Open wounds
- Pregnancy
- Sensitivities to chemicals
- Newly healed scars

Precautions

- Do not overheat the wax, as it may catch fire
- Do not pour wax directly on any tissue
- Ensure the skin is dry

Risks

- Minor swelling
- Shortness of breath (if someone is allergic to the wax or dyes it may contain)
- Skin changes, such as heat rash or breakouts
- Swelling in the tongue and throat (if someone is allergic to the wax or dyes it may contain)
- Wheezing (if someone is allergic to the wax or dyes it may contain)

Soft Tissue Mobilization

Contraindications

- Cancer (for deep tissue massage)
- Complex regional pain syndrome
- Congestive heart failure (for deep tissue massage)
- Deep vein thrombosis
- Existing bruises
- Hemophilia

- Infectious diseases, including viral or bacterial infections of any kind, osteomyelitis
- Inflammatory disorders
- Joint instability
- Myositis ossificans, a type of heterotrophic ossification
- Open wounds
- Osteoporosis (for deep tissue massage)
- Pain intolerance
- Peripheral vascular disease
- Recent heart surgery
- Rheumatoid arthritis
- Skin infections
- Tactile hypersensitivity
- Thrombophlebitis
- Uncontrolled or poorly managed hypertension
- Uncontrolled diabetes
- Unhealed fractures
- Unstable angina

Precautions

- Avoid soft tissue massage of any kind near the lymph nodes after someone has undergone surgery or radiation for cancer
- Pregnancy

Risks

- Aggravation of acute injuries, especially those that are not accounted for
- Bruising
- Discomfort, especially in areas with superficial nerves
- Tenderness

Therapeutic Exercise

- Exercises such as back stretches, chest presses, abdominal crunches, and anything that requires a twisting motion (yoga poses, exercises, etc.) are contraindicated for people with osteoporosis
- Exercises of any kind that involve vigorous isometric muscle contractions, heavy weight lifting, holding your breath, prolonged muscle contractions of any kind, and body weight exercises (planks, push-ups, etc.) are contraindicated for people with cardiovascular conditions
- General contraindications for rehabilitation as a whole include:
 - Active infections (especially those with open wounds or sores)
 - Acute or unhealed fractures, unless indicated by a doctor's protocol
 - Acute pain

- Aortic stenosis
- Deep vein thrombosis
- Fever or another acute illness
- Recent myocardial infarction
- Recent stroke with unstable cognitive status
- Severe cognitive impairments
- Severe joint inflammation
- Severe or poorly managed hypertension
- Uncontrolled bleeding
- Uncontrolled seizures
- Unstable angina
- Unstable vital signs

Thermotherapy (Fluidotherapy, Hot Packs, Whirlpool, Contrast Baths, & Diathermy)

Contraindications

- Acute musculoskeletal injuries, such as sprains, fractures, and bruises, especially those that are actively inflamed (when applied locally)
- Bleeding disorders
- Burns
- Chronic heart failure

- Cognitive impairments
- Deep vein thrombosis
- Dermatitis
- Eczema
- Fever
- Malignant tumors (when applied locally)
- Multiple sclerosis
- Open wounds (when applied locally)
- Pediatric patients
- Recent history of hemorrhage or open and untreated wounds (when applied locally)
- Sensation impairments
- Severe pain accompanied by swelling (when applied locally)

Precautions

- Always wrap heating pads in a towel or other fabric before applying to the skin
- Avoid applying heat to the abdomen or lower back in women who are pregnant
- Closely monitor use in anyone with cardiac insufficiency who receives thermotherapy

- Closely monitor use in anyone with diabetes, as thermotherapy can lead to hypoglycemia, especially with prolonged exposure
- Closely monitor use in anyone with severe peripheral vascular disease
- Closely monitor use in anyone with rheumatoid arthritis, especially when someone is currently experiencing a flare-up
- Closely monitor use in anyone with hypotension or hypertension
- Closely monitor use in anyone with a spinal cord injury, especially when applied below the level of their injury/lesion
- Refrain from sleeping while any form of thermotherapy is applied
- When using electric heating devices, monitor cords and wires to ensure they are in good working order
- Start on the lowest heat setting or with the smallest heat pack and gradually increase based on patient tolerance and response
- Use for 5-10 minutes to start

Risks

- Bleeding
- Decreased blood pressure
- Fainting
- Hypoglycemia
- Increased heart rate
- Increased inflammation

- Infection (from unsanitary conditions in whirlpool and other forms of hydrotherapy)
- Nerve and tissue damage
- Skin irritation, such as rash, redness, or blistering

Ultrasound & Phonophoresis

Contraindications

- Areas with excessive bone growth, such as over epiphyseal growth plates
- Areas that are actively bleeding (when applied locally)
- Areas that are actively infected (when applied locally)
- Arteriosclerosis
- Clotting disorders
- Deep vein thrombosis
- Diabetes mellitus
- Malignant tumors (when applied locally)
- Metal, silicone, or saline implants such as pacemakers, internal fixators, and breast implants
- Open wounds (when applied locally)
- Osteoporosis
- Pregnancy
- Pulmonary embolism

- Reduced sensation or circulation impairments (when applied locally)
- Unstable fractures (when applied locally)
- Use over the eyes, spinal column, testicles, or ischemic tissues

Precautions

- Do not use the ultrasound wand continuously over the same small area, as this can cause burns

Risks

- Allergic reactions
- Burns
- Damaged cells
- Internal bleeding
- Minor discomfort

Medication Side Effects

Whether available via prescription or over-the-counter, drugs of any kind come along with a wide range of side effects. However, certain adverse reactions are more likely to impact the therapy process than others. Therapists should take extra precautions when treating patients who are taking some of the following medications. Relevant side effects of these drug classes include:

- **Angiotensin-Converting Enzyme (ACE) Inhibitors:** dizziness
- **Antibiotics:** dizziness, balance changes

- **Antidepressants:** dizziness, dry mouth, drowsiness, balance changes
- **Antiemetics:** drowsiness
- **Antihistamines:** drowsiness, balance changes
- **Antihypertensives:** dizziness, lightheadedness, orthostatic hypotension, balance changes
- **Antimalarial drugs:** muscle weakness
- **Antipsychotics:** drowsiness, incoordination
- **Antiseizure drugs:** dizziness, drowsiness, incoordination, fatigue
- **Benzodiazepines:** drowsiness, fatigue, balance changes
- **Beta-blockers:** dizziness, drowsiness, long-term fatigue
- **Blood thinners:** increased bleeding risk, bruising
- **Chemotherapy agents:** muscle weakness, incoordination
- **Corticosteroids:** mood swings, muscle weakness, fluid retention, increased appetite, changes in blood pressure
- **Diuretics:** dizziness
- **Hormonal birth control:** changes in blood pressure
- **Migraine medications:** changes in blood pressure
- **Muscle relaxers:** muscle weakness, fatigue, impaired coordination, drowsiness
- **Non-steroidal Anti-Inflammatory Drugs (NSAIDs):** bleeding, dizziness, decreased platelet function (leading to impaired immunity), nausea, and changes in blood pressure

- **Opioids:** constipation, nausea, dizziness, trouble breathing, drowsiness, fatigue, balance changes
- **Statins:** dizziness, muscle weakness, fatigue

Rehabilitation & Surgical Protocols

Concussion (non-surgical)

Phase I (0-3 days after injury)

- Participation in household and community activities as tolerated

Phase II (3-10 days after injury)

- Limit head movements and distraction of the cervical spine
- Maintain a neutral neck position at all times
- Avoid the Valsalva maneuver
- Avoid contact sports

Phase III (10+ days after injury)

- Avoid the Valsalva maneuver
- Avoid contact sports

Frozen Shoulder

Phase I (Freezing phase)

- Avoid painful activities of any kind, including stretching and active range of motion with the affected shoulder

Phase II (Frozen phase)

- Gentle stretching is encouraged
- Active use of the shoulder is encouraged

Phase III (Thawing phase)

- Increase gentle passive stretching
- Start with pendulum exercises, tabletop slides, and supine neutral external rotation stretches
 - After 7 to 10 days of those exercises, add a new exercise every 5-6 days, which may include internal rotation behind the back, supine external rotation with abduction, horizontal adduction stretches, and wall climbing/supine passive forward flexion
- Avoid any stretching and motion that worsens pain

Hip Arthroplasty

Precautions after hip arthroplasty using a posterior approach

- No hip flexion past 90°
- No hip adduction or internal rotation that places the hip out of a neutral position

Precautions after hip arthroplasty using an anterior approach

- No pelvic bridging or prone lying
- Keep the hip in at least 30° of flexion when laying in supine, either using a pillow under the knees or by raising the head of the bed
- No hip extension or external rotation that places the hip out of a neutral position

Precautions after hip arthroplasty using a direct anterior approach

- No full pelvic bridging

Precautions after hip arthroplasty using a lateral approach

- No hip abduction that places the hip out of a neutral position

Precautions after a trochanteric osteotomy

- No active hip abduction exercises
- Hip abduction in PROM only
- Use of a leg lifter may be indicated to help with ADLs and functional mobility

*If medical documentation lists global precautions after a hip arthroplasty, this means a combination of anterior and posterior precautions. Global precautions may be ordered after a hip resurfacing or revision surgery for patients who have a history of hip dislocation. Most surgical precautions are lifted between 3 and 6 weeks after surgery, but you must receive surgeon clearance for this.

Knee Arthroplasty

Phase I (0-3 days after surgery)

- No exercises with resistance or weights
- Weight bearing as tolerated with the use of an assistive device (in some cases, the surgeon will not recommend an assistive device)
- Slowly progress to full weight bearing in this phase
- No twisting forces or torque of any kind across the knee, especially when bearing weight on the affected limb

Lateral Epicondylitis (non-surgical)

- Avoid exercises that cause significant pain or extreme wrist/elbow movement
- Avoid exercises or activities that require repetitive movements
- Avoid any heavy lifting with a fully extended arm
- Avoid activities that involve forceful gripping, prolonged/unergonomic computer use, and non-modified sports that involve repetitive arm movements

Medical Epicondylitis (non-surgical)

- Avoid any exercises that cause significant pain or aggravate the elbow
- Avoid forceful wrist flexion and forearm pronation
- Avoid heavy lifting with a grip that places the palm upward

Reverse Shoulder Arthroplasty

Phase I (2-3 weeks after surgery)

- Wear a sling that keeps the shoulder in neutral rotation
- When sleeping, use an abduction pillow that keeps the shoulder in 30-45° of abduction
- No AROM or AAROM of the shoulder
- No PROM in internal rotation
- No reaching behind the back
- No lifting objects

- No supporting body weight with the upper body
- When lying on your back, place a small pillow under your elbow to prevent hyperextension of the shoulder

Phase II (4-6 weeks after surgery)

- Use sling at night while sleeping
- Taper down daytime sling wearing schedule slowly over the next two weeks
- No lifting objects heavier than a drinking glass
- No supporting body weight with the upper body
- No reaching behind the back
- When lying on your back, place a small pillow under your elbow to prevent hyperextension of the shoulder

Phase III (7-8 weeks after surgery)

- Discontinue use of sling
- No reaching behind the back beyond the point of your pants pocket
- No lifting objects heavier than a drinking glass
- No supporting body weight with the upper body
- Avoid shoulder hyperextension

Phase IV (9-11 weeks after surgery)

- No lifting objects heavier than 10 pounds

Phase V (12-16 weeks after surgery)

- No lifting objects heavier than 15 pounds

Rotator Cuff Repair

Phase I (1-6 weeks after surgery)

- Wear sling during day and while sleeping
- Use abduction pillow to keep shoulder in 30-45° of abduction
- No AROM or PROM of the shoulder
- No pushing, pulling, or reaching overhead with the affected arm
- No bearing weight through the affected arm

Phase II (6-10 weeks after surgery)

- Sling can be gradually removed once receiving clearance from the surgeon
- No AROM of the shoulder, even in the absence of pain or swelling
- No aggressive or painful PROM of the shoulder
- No internal rotation
- No bearing weight through the affected arm

Phase III (10-18 weeks after surgery)

- No lifting or any other activities that cause pain
- No bearing weight through the affected arm
- No excessive movements behind the back
- No jerking or sudden movements
- No exercises that place excessive load on the healing tendon

Phase IV (18-22 weeks after surgery)

- No lifting objects heavier than 5 pounds
- No throwing movements or activities
- No jerking, sudden, or uncontrolled movements
- No pushing
- No strengthening exercises that involve a straight arm lateral raise
- No arm raises in the empty can position

Phase V (22-26 weeks after surgery)

- No lifting objects heavier than 10 pounds
- No arm raises in the empty can position
- No overhead lifting
- No activities that involve sudden pushing or lifting
- No activities that progress into painful movements

Shoulder Arthroplasty

Phase I (0-3 weeks after surgery)

- Wear a sling that keeps the shoulder in neutral rotation when sleeping
- When sleeping, use an abduction pillow that keeps the shoulder in 30-45° of abduction
- No AROM of the shoulder
- No reaching behind the back
- No excessive shoulder external rotation or abduction

- No lifting objects
- No supporting body weight with the upper body
- When lying on your back, place a small pillow under your elbow to prevent hyperextension of the shoulder

Phase II (4-6 weeks after surgery)

- Use sling at night while sleeping
- Taper down daytime sling wearing schedule slowly over the next two weeks
- No excessive shoulder external rotation or abduction
- No lifting objects heavier than a drinking glass
- No supporting body weight with the upper body
- When lying on your back, place a small pillow under your elbow to prevent hyperextension of the shoulder

Phase III (7-8 weeks after surgery)

- Discontinue use of sling
- No lifting objects heavier than 10 pounds

Phase IV (9-11 weeks after surgery)

- No lifting objects heavier than 10 pounds
- Avoid exercises that strain the anterior shoulder capsule (e.g. external rotation with more than 80° shoulder abduction)

Section 4 Personal Reflection

A 71-year-old patient has no precautions listed in her chart, but she just underwent a reverse shoulder arthroplasty 2 days ago. What should the therapist's next steps be?

Section 4 Key Words

Contraindications - Medical conditions, injuries, or other circumstances that disqualify someone from receiving a specific medical treatment (modality, exercise, medication, etc.); these are also known as absolute contraindications

Local application - When a therapy modality is applied directly on or to an area of the body it is intended to target

Precautions - Medical conditions, injuries, or other circumstances that warrant a therapist making modifications or more closely monitoring a patient as they receive a specific medical treatment (modality, exercise, medication, etc.); these are also known as relative contraindications

Risks - Potential adverse effects that may result from a particular modality, exercise, medication, or other medical treatment

Section 5: Case Study #1

An OTR with 11 years of experience is working in a hospital setting. This OT typically covers inpatient care with patients who are admitted for a few days after mostly simple procedures. By the time they see this therapist, they are almost ready for discharge. One day, the hospital is extremely short-staffed, so the director of rehab sends her to the ICU to cover a few shifts. The OT expressed some hesitancy about this, but the DOR reassured her, saying she won't need to

perform any evaluations, just “a few simple cotreats.” The OT agrees and goes to see her first patient, who is on a ventilator with a tracheostomy. The SLP she is cotreating with is not there yet, so the OT introduces herself and tells the patient she will be repositioning him to get ready for therapy. The patient nods as the OT grabs his tracheostomy tube and pushes it over his shoulder to move it out of the way. This knocks it out of place, and the patient gasps for air as the OT rings the call bell for nurses to assist. After 1.5 minutes, ICU staff stabilized the patient, but this was still a significant amount of time to be without oxygen. The patient is exhibiting some disorientation, which is new for him, but it’s too soon to tell the exact extent of his injuries.

1. Walk through the steps needed to complete an RCA for this medical error.
2. Is the OT at fault here or was the medical error chiefly due to another factor?

Section 6: Case Study #1 Review

This section will review the case studies that were previously presented. Responses will guide the clinician through a discussion of potential answers as well as encourage reflection.

1. Walk through the steps needed to complete an RCA for this medical error.

- Identify the problem by defining specifically what the error is

The error here involves knocking the patient’s tracheostomy tube out of place when trying to move him.

- Collect data and other factual evidence that pertains to the error

This may include an incident report from the OT; an encounter note from the OT; encounter notes from RNs, MDs, and other

professionals who assessed and/or treated the patient right after the incident; and a log of vital signs from before, during, and immediately after in the incident.

- Locate root causes using one of several methods to trace the problem back to its main source

Using the Is/Is Not exercise:

Is	Is Not
• What is the problem? Accidentally knocking a patient's tracheostomy tube out of place when moving him • Where is the problem? In the ICU of an inpatient hospital • When is the problem occurring? During the time when OT was scheduled to cotreat the patient with SLP • How big/small is the problem? Big. The patient was without oxygen for 1.5 minutes before medical staff were able to stabilize him and he is now displaying some new disorientation, which is not a good sign.	• What is not the problem? The ICU staff's response to the situation, the initial tracheostomy placement, the SLP not arriving to the cotreatment yet • Where is not the problem? Other wings of the same hospital • When is not the problem? Just before the cotreatment began and just after the cotreatment was canceled due to the incident • How big/small is not the problem? The problem does not pertain to other patients in the ICU, nor does it pertain to other patients in the hospital

Using the 5 Whys Technique:

- The patient's tracheostomy tube was knocked out during a treatment session.
- **"Why?"**
- The therapist moved it improperly and unnecessarily.
- **"Why?"**
- The therapist didn't want the tube to get in the way while she repositioned the patient.
- **"Why?"**
- The therapist did not know how to reposition someone while safely accounting for a tracheostomy tube.
- **"Why?"**
- The therapist has hardly any experience working with ICU patients who have lines and tubes.
- **"Why?"**
- The therapist works in another part of the hospital and agreed to cover a shift in a unit where she had only previously observed.
- Suggest and implement solutions with two aims: (1) addressing the root cause of the existing problem and (2) preventing future errors from occurring

A primary solution involves offering hospital-wide training on the basics of treating patients on other floors and/or with special medical

needs (e.g. those on ventilators, with tracheostomies, etc.) to assist with assignment and coverage changes. Other possible solutions include regular competency checks to ensure therapists and other clinicians are qualified to treat specialty units such as the ICU or NICU.

- Follow up by monitoring the efficacy of the plan and making ongoing adjustments as needed

The director of rehabilitation should offer mentoring to guide this therapist in the process of undergoing the aforementioned training and engaging in other learning opportunities.

2. Is the OT at fault here or was the medical error chiefly the result of another factor?

The OT was at fault here. Her initial hesitance resulted from knowing she was not qualified or experienced enough to cover the ICU. Therefore, it was neglectful for her to not mention that to her supervisor and decline the assignment.

Section 7: Case Study #2

A 32-year-old patient is seen by OT in an inpatient hospital just a couple of hours after undergoing a rotator cuff repair surgery. The patient has hypertension and a pacemaker, so his doctor wants to closely monitor him for 3-4 days as he recovers. Before getting started, the OT asks him if he has any precautions from the doctor, and the patient says no. The OT mentions wanting to give the patient a sling for daytime and nighttime use. The patient swiftly gets up out of bed in an attempt to shake the therapist's hand, and does so by pushing up on the bed with two fully extended arms. The patient winces and cries out afterwards and asks the therapist

if it was supposed to hurt when he did that. In an attempt to assist with the patient's apparent pain, she offers to take him to the rehabilitation gym for their session. He agrees and they walk there together. The OT sets him up for therapeutic ultrasound and asks where most of his pain is. He points to the pectoralis major just inferior to the shoulder that was operated on. The therapist begins providing ultrasound there and chats with the patient while doing so. After about 30 seconds, the patient reports chest pain and starts rubbing that area with his unaffected arm. The therapist continues providing the modality, but moves the ultrasound closer to the shoulder.

1. What medical errors did this OT make?
2. What standard aspects of the therapy process could have prevented these errors?

Section 8: Case Study #2 Review

This section will review the case studies that were previously presented. Responses will guide the clinician through a discussion of potential answers as well as encourage reflection.

1. What medical errors did this OT make?

There are several in this scenario. Before treatment, this OT did not complete a chart review nor did she check with the patient's doctor about any precautions that may be in place. Without knowing the patient well (specifically, not being able to verify whether or not he is a good historian), the therapist relied solely on the patient's answer to inform her clinical decision-making skills and treatment planning. The second error involves not properly responding to the patient being in pain after violating weight bearing precautions. The third error involves administering a physical agent

modality that is contraindicated with one of the patient's health conditions (having a pacemaker).

2. What standard aspects of the therapy process could have prevented these errors?

By completing a more thorough evaluation, nearly all of these errors could have been avoided. A chart review is a pivotal aspect of the OT evaluation process and, in this case, would have made the therapist aware the patient has a pacemaker. The therapist also knew of the need to follow rehabilitation precautions (as evidenced by her asking the patient if there were any precautions in place). However, by doing a chart review, the therapist would have seen mention of precautions and known to follow them. Even if there were no precautions listed in the patient's chart, the therapist would have needed to confirm this with the surgeon before moving forward with any treatment. Lastly, the therapist neglected to pick up on signs of adverse effects related to her physical agent modality of choice. Since the patient has a pacemaker, therapeutic ultrasound should not have been used in the vicinity of the shoulder, chest, and heart. However, there was another opportunity for the therapist to protect the patient in this process. When the patient reported chest pain and began rubbing his chest, the therapist should have discontinued the modality, as chest pain is not a typical effect of ultrasound. Instead, the therapist chose to adjust the location treated, which would lead to further patient injury.

Section 9: Case Study #3

An OTA working in a skilled nursing facility is treating an 81-year-old patient who was recently admitted after a total hip arthroplasty. The patient has delirium resulting from a urinary tract infection that has just been diagnosed and treated in

the past day. Therefore, she is considered a fall risk, though there is nothing in her chart officially stating this. The OTA goes to the patient's room to perform treatment there and helps the patient get to the edge of her bed. She then gives her hand weights to warm up with while the therapist sits in a chair at the foot of her bed to complete point-of-service documentation. Soon after, the patient says the weights are too heavy for her to work with and leans forward to place them on her nightstand. While doing so, the patient slips off the bed and falls on the floor.

1. What is the medical error here?
2. What are some education-based solutions that can help remedy this error?
3. What strategies can be used to prevent this same error from occurring in the future?

Section 10: Case Study #3 Review

This section will review the case studies that were previously presented. Responses will guide the clinician through a discussion of potential answers as well as encourage reflection.

1. What is the medical error here? What was the main cause of this error?

The error here was a patient fall. This fall was caused by (1) the OTA not properly supervising the patient during therapeutic exercises, (2) the absence of flags on the patient's chart indicating she was a fall risk, and (3) negligence on the OTA's behalf when it came to doing her own assessment for fall risk.

2. What are some education-based solutions that can help remedy this error?

Education-based strategies are considered some of the most effective for addressing medical errors involving patient falls. These may include in-service training to all clinicians on the topic of fall prevention; proper evaluation and screening techniques for those at risk of falls; and signs and symptoms of delirium in elderly patients.

3. What strategies can be used to prevent this same error from occurring in the future?

It would also be helpful if supervisors at the facility offer training on proper techniques to follow after a fall and the importance of completing point-of-service documentation only when it is safe to do so, (e.g. not at all with high-risk or cognitively impaired patients, only when patients are in a stable position, only when you are still able to directly monitor them).

Section 11: Case Study #4

An OTR is treating a 10-year-old child with Autism Spectrum Disorder in a school setting. The student has been difficult to work with, often declining to engage with the therapist, verbally refusing sessions several times each month, and even sometimes running away from her during sessions. As a result, the student's attendance has been spotty and she is making limited progress toward her outlined goals. One year after she started treating the student, the OTR attended an annual review meeting for her. During this time, the Chair of Special Education reviews all paperwork and notices there are no signed OT consent forms on file for the student. After looking into it further to ensure nothing was misplaced, the Chair confirms that informed consent was never obtained for this student. In this district, this responsibility falls to the treating therapist. The Chair informs the student's parents of this, and they respond by saying they plan to file a malpractice lawsuit against the school since they never consented to treatment of

any kind as they don't believe their child needs OT. They feel their child's rights were violated since she so often declines to work with the therapist. The therapist looks back on her documentation from when she started working with the student and wrote in her first note that she received verbal informed consent from parents

1. What is the medical error in this scenario?
2. Do the parents have grounds to file a malpractice lawsuit?

Section 12: Case Study #4 Review

This section will review the case studies that were previously presented. Responses will guide the clinician through a discussion of potential answers as well as encourage reflection.

1. What is the medical error in this scenario?

The medical error here is a lack of written informed consent for a student who has been treated for over a year.

2. Do the parents have grounds to file a malpractice lawsuit?

The parents do not have grounds to file a malpractice lawsuit for several reasons. Firstly, there is timely and documented proof they verbally consented to treatment before it started. Secondly, their child did not experience any harm as a result of this treatment, so the lawsuit could not be for malpractice. Thirdly, there is documented proof that the student has declined therapy on many occasions and the therapist has respected that, leading to a poor attendance record. Therefore, the student did not experience any emotional distress or other harm as a result of therapy or attempts at therapy. Without the presence of injury, complications, or

harm, there are no grounds for a lawsuit on the basis of lack of informed consent.



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