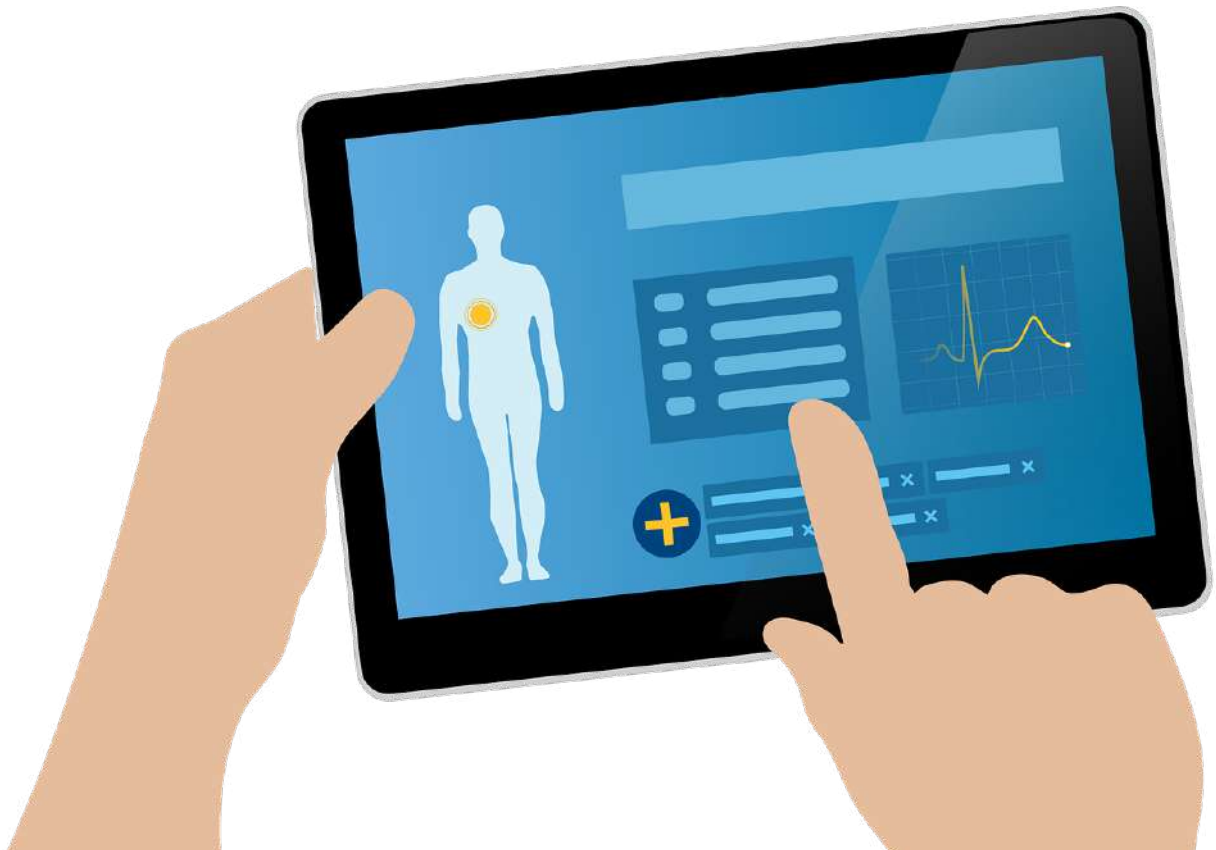
FLEX CEUs

The Changing Landscape of Outpatient Physical Therapy



Introduction

The worldwide pandemic that ensued following the emergence of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in December 2019 triggered an unavoidable chain of events that disrupted healthcare and economic systems around the world. Combined with an already-evolving practice, clinicians in outpatient physical therapy settings quickly found themselves at the precipice of monumental change. In response to this, physical therapists and physical therapy assistants must learn ways to adapt in order to fulfill new responsibilities and roles as providers of healthcare, especially in preparation for the influx of patients who will require therapeutic services after surviving the coronavirus disease 2019 (COVID-19).

Consequently, physical therapists and physical therapy assistants must arm themselves with the proper knowledge and skillset to address a multitude of medically complex and potentially unstable patient presentations across the continuity of care and recovery spectrum. In doing so, clinicians will elevate themselves and their practice to become efficient and responsible system-entry providers for musculoskeletal and chronic pain disorders and movement dysfunction.

Section 1: Background

Clinical Relevance

Section 1 will explore multiple factors that have contributed to the evolution of outpatient physical therapy practice in the recent years. In doing so, clinicians will gain a thorough understanding of the underlying mechanisms that are promoting changes to physical therapy legislation, reimbursement models, and clinical practice.

WHEN did practice begin to shift [1,19,33]

The Affordable Care Act (2010) played a significant role in the initiation of change within outpatient physical therapy practice.

As part of the 2010 Affordable Care Act, Medicare committed to modifying healthcare reimbursement models by the year 2018. In order to do so, Medicare introduced the concept of bundled payments to cover an entire episode of care.

Bundled payments disrupted the notion of traditional care models, like fee-for-service, that have been proven to (1) cause excessive and unnecessary medical costs, (2)

lengthen episodes of care, and (3) encourage unwarranted interventions with serious risks, such as surgery or opioid addiction. Traditional care models have also been associated with limited access to physical therapy services and only after other treatment interventions have been exhausted.

The most notable disruption to traditional care models has been the establishment of the Comprehensive Care for Joint Replacement program in 2016. It initiated bundled payments for joint replacements that fundamentally revolutionized post-operative and post-acute clinical care. Simply put, this program incentivized the use of high-quality and expert clinical services at an affordable price for Medicare beneficiaries.

Both of these landmark legislative actions emphasized a transition to value-based care, which is a framework for selecting treatment based upon prognosis and empirically-based outcomes. Initiated by the Department of Health and Human Services and federal and private payer systems, value-based care is intended to create cost-effective strategies to replace fee-for-service models. Models that use value-based care support inter-professional collaboration in an attempt to provide expert care at a lower cost.

Undeniably, outpatient physical therapy practice shifted substantially following the declaration of the global pandemic in March 2020. Some outpatient physical therapy facilities began to close as a proactive measure to mitigate the spread of infection. Early reports on the effect of COVID-19 on physical therapy practice showed a drastic reduction in outpatient clinic volumes, physician referrals, and direct access visits. However, by July 2020, these trends were beginning to flatten and reverse towards pre-COVID measures, but many outpatient facilities still suffered from a loss of revenue, patient volume, and staff attendance. It is clear that standards of outpatient practice that were vulnerable to the effects of the pandemic will indeed impact the scope of practice for years to come but the depth of such changes, both financially and clinically, remains to be determined.

WHY is the practice changing [1,2,3,19,32]

Relevant changes to outpatient physical therapy practice can be attributed to social, economic, financial, and legislative factors in addition to the most recent effects resulting from systemic changes secondary to COVID-19.

The pandemic contributed to a myriad of changes in physical therapy practice across the spectrum. Notably, many outpatient clinics suffered from an immediate loss of revenue caused by dwindling patient volumes, staff exposure, and insufficient clinic preparation for unforseeable disasters. These factors, when combined with the uncertainty of the

virus and worldwide shortages of personal protection equipment, negatively contributed to unfortunate changes in outpatient practices. However, as vaccine distribution and knowledge of the virus grows, clinicians have begun to see patients again in their outpatient facilities only to find a lingering shift in practice variables in comparison to pre-COVID. Some of these variables include:

- Productivity standards
- Amount of patients that can be treated at one time due to building occupancy restrictions
- Patient to therapist/assistant ratio
- Acuity of patient presentation
- Stability of medical conditions
- Continuity of care
- Income
- Staffing

To add to the recent complexities of change, many COVID-19 survivors are in dire need of rehabilitation services to address the long-term physical consequences of the infection, most of which are still being identified. Unfortunately, due to this lack of knowledge, physical therapists and physical therapy assistants are forced to borrow relevant literature from studies reporting on post-intensive care syndrome (PICS) as the two conditions have been postulated to be similar in needs and clinical presentations. Clinicians should expect COVID-19 survivors, especially those who required intensive critical care or mechanical ventilation while hospitalized, to suffer from prolonged disability, muscle dysfunction, fatigue, chronic pain, and disproportionate dyspnea. As such, many nursing homes and post-acute facilities are ill-equipped to handle patients with COVID-19 who have recovered but still may be infectious, and there is a growing demand for outpatient physical therapy facilities to accept this burden. Experts are concerned that outpatient physical therapy settings are not prepared to meet the influx of complex unstable patients who present with PICS secondary to COVID-19 infection and warn against the potential strain on already-limited healthcare resources if COVID-19 survivors do not receive the necessary care.

Prior to the pandemic, healthcare costs for managing musculoskeletal conditions were quickly escalating into a public health priority. In response to this, there has been a substantial transition to control the excessive expenditures of unwarranted interventions and excessive overutilization. The annual rise in healthcare-associated costs, without an equivocal improvement in patient-related outcomes, is equally concerning.

The role of clinically-effective physical therapy interventions has drawn attention from policy-making officials who seek cost-effective methods to address these heightened healthcare expenditures. These increasing costs can be attributed to:

- Unnecessary referrals for diagnostic imaging
- Specialty practice referrals
- Steroid injections
- Prescription of opioid medications
- Spinal surgeries

Additionally, the negative outcomes associated with traditional care models, especially for spine conditions, have also forced many policymakers to find alternative strategies for safer management of musculoskeletal disorders.

There is a growing body of evidence to suggest that early access to physical therapy is a cost-effective way to safely and effectively manage non-life-threatening musculoskeletal conditions and chronic pain. Physical therapy is considered to be a conservative approach to managing pain and dysfunction associated with musculoskeletal conditions. Several studies have confirmed the effectiveness of early physical therapy interventions and their effect on the diminished frequency of invasive procedures and unwarranted diagnostic imaging. This implies that the initiation of physical therapy services, in addition to the timing of the referral, can have a positive effect on patient outcomes as well as unburdening healthcare costs.

Historically, chronic pain conditions have been described as resistant to treatment and cost-ineffective. An emphasis on identifying cost-efficient pain management models has been prioritized by healthcare systems and health service organizations that recognize the value of physical therapy in providing effective management strategies for chronic pain.

Interestingly, the adoption of Direct Access (DA) has played a significant role in transforming ways in which patients can access physical therapy services. Currently, all 50 states have varying models of DA which include limited direct access, direct access with provisions, and unrestricted direct access. Through DA, patients may access physical therapy interventions while forgoing potentially unwarranted visits to another provider that may prolong recovery and lead to negative outcomes. Other advantages of DA include:

- Reduced waiting times to see a healthcare professional
- Convenience of scheduling
- Reduction of healthcare costs
- Increased autonomy of physical therapists

Critics of DA cite overutilization of physical therapy services, rising healthcare costs to the patient, and inappropriate care as potential issues arising from increased autonomy of physical therapists. However, studies have found these claims to be unsubstantiated and, instead, report on decreased healthcare expenditures, utilization, and similar or superior outcomes when compared to non-DA referrals.

Similar to the potentially unstable medical presentations seen in COVID-19 survivors, some patients are beginning to arrive at outpatient physical therapy clinics with complex medical conditions unrelated to COVID-19. This acute shift in Direct Access directly results from patients' overwhelming fear of exposure to the COVID-19 infection where they would typically seek care in places like emergency departments, urgent care centers, and primary care offices. While this difference in referrals may be transient, it may have lasting implications for clinician preparedness and education regarding complex medical pathologies, patient safety, and body system screenings.

With a growing responsibility as system-entry providers, physical therapists have an enormous duty to accurately assess and identify proper treatment pathways for each patient who presents with a non-life-threatening musculoskeletal condition. Concern has been raised as to whether or not physical therapists are equipped with the knowledge to (1) identify and (2) appropriately refer patients who present with systemic or referred pain patterns that are not of musculoskeletal origin. However, there is strong evidence to suggest that patients who utilize physical therapy as a system-entry point do not have a greater risk of suffering from a missed diagnosis than through any other system-entry provider.

HOW is the practice changing [1,19,20,33]

Prior to the pandemic, telehealth was underutilized by many clinicians and not broadly accepted as a feasible option for delivering effective therapeutic treatments. This viewpoint was mainly driven by poor telehealth reimbursement models and lack of federal support from the Centers for Medicare and Medicaid Services. However, the pandemic significantly altered access points to clinicians and, as a result, the use of telehealth and video consults increased seemingly overnight. Although clinician utilization of video-based consultation and telehealth rose, especially in ambulatory and outpatient clinic settings, patient satisfaction surveys collected in the earlier months of the pandemic reported that in-person outpatient visits continued to be more common and preferred.33 By July 2020, clinicians providing therapeutic modalities through video conferencing once again saw a decrease in virtual visits, but it is likely that telehealth will continue to be a viable option for future healthcare delivery models, especially as the public continues to carefully weigh their exposure risk in fear of infection from COVID-19. As interest in telehealth increases from the consumer and public standpoint, insurance companies and federal lawmakers may find themselves recalculating therapy visit stipulations and specific requirements on outcomes to meet the growing demands for virtual services.

New and innovative ways to deliver care for musculoskeletal conditions have also caused significant disruptions to the traditional care models. If effective, these methods have the potential to help patients avoid costly and invasive procedures.

One method that has recently gained momentum is the introduction of an early physical therapy model. This model emphasizes the role of physical therapy intervention in the beginning of the patient's episode of care as opposed to traditional care models that place therapy services as the patient's last option.

Research studies that have examined the impact of early physical therapy interventions on patients with acute low back pain have found:

- Reduced healthcare costs
- Lower risk for surgical outcomes and injections
- Decreased opioid use

Early intervention also serves to allocate limited healthcare resources towards patients who are most in need while, at the same time, identifying those who may benefit from an interdisciplinary approach to optimize health outcomes.

Recent clinical practice guidelines that advocate for an alternative approach to pharmacological interventions for low back pain have contributed to the growing emphasis on value-based care. In doing so, these models based upon value-based are shifting the timing of interventions, the order of services, and ways in which patients can access providers.

As it currently stands, some healthcare practitioners who refer to physical therapy utilize a diagnostic-based framework to direct decisions for patient care. In this instance, treatment is prescribed based upon a diagnosis that may or may not be amenable to physical therapy services. Newer models of value-based care suggest modifications to the referral process that are based upon (1) outcomes and (2) whether or not the patient would be responsive to treatment. Additionally, these models encourage the use of patient-centered care which involves targeting personalized interventions based upon risk factors, patient characteristics, and prognostic factors. This also underlines the need for therapy clinicians to screen for potential treatment nonresponse to avoid overutilization of therapy services.

WHO/WHAT is contributing to this change [1,19,33]

A significant and driving force to this shift in outpatient physical therapy practice is the induction of physical therapy as a first point of entry to the healthcare system. In traditional care models, where the physician is the initial system entry point, physical therapists are not valued as primary providers. However, this change leverages physical therapists' diagnostic and triage capabilities to improve functional status while limiting healthcare costs. Consequently, this movement is facilitated by legislative and third-party payer support for direct access. As a result, physical therapists are responsible for managing a patient's overall plan of care, including physical therapy diagnosis, treatment, or appropriating referrals to other providers.

Along with this comes the irrefutable influence of insurance reimbursement guidelines on physical therapy access, practice, and outcomes. Additionally, prior to the pandemic, telehealth reimbursement was unnecessarily low which contributed to its poor utilization in a majority of outpatient physical therapy clinics. Since most clinics adopted telehealth during the pandemic as a way to remain financially viable, reimbursement for virtual services has improved as of late April 2020 due to the strong advocacy efforts by

the American Physical Therapy Association and its members.[33] By late May 2020, outpatient physical therapy providers were granted the ability to bill for virtual services provided to Medicare beneficiaries in a landmark decision by the Centers for Medicare and Medicaid Services. Whether or not this change will be permanent and adopted by other insurance payers remains to be seen.

The growing epidemic of prescription opioid and narcotic abuse has provided a timely opportunity for physical therapists to become primary providers of musculoskeletal conditions. As public health policies encourage the utilization of physical therapy services as a safe and effective alternative to pharmacologic pain management, clinicians must be prepared to meet the needs of the population.

Within the physical therapy profession, there is a wide variation in clinical practice and overuse of antiquated interventions that are associated with poor outcomes and overutilization of healthcare costs. In response to this, clinical practice guidelines have been developed with the overarching goal to reduce variations in care and improve outcomes across healthcare settings. For example, clinical practice guidelines that describe evidence-based approaches to imaging practices have been shown to lower the risk for unnecessary services such as invasive procedures, prescription medications, and additional imaging. However, utilization of clinical guidelines are notoriously underutilized by clinicians despite dissemination efforts by knowledge translation task forces.

Section 1: Personal Reflection Question

How have these aforementioned factors affected your clinical practice over the past 1-2 years?

Have you noticed trending changes to (1) your referral patterns for patients who are seen through Direct Access related to COVID-19 or (2) an increased utilization of your services for patients who wish to avoid prescription pain medication?

Section 1: Key Words

Novel coronavirus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) - a contagious and highly infectious pathogen that causes coronavirus disease 2019 (COVID-19).

Affordable Care Act - also known as Obamacare, the Affordable Care Act is a comprehensive health care reform law enacted in March 2010. In addition to making

healthcare more affordable, the Act aims to improve the delivery and cost of innovative medical care.

Bundled payments - a single and comprehensive payment to cover all services rendered during an episode of care.

Traditional care models - healthcare models in which care is focused on medical diagnoses, disability, deficits, and standardized assessments and treatments.

Comprehensive Care for Joint Replacement program - initiated in 2016, the program encourages quality and effective care for Medicare beneficiaries who undergo the most common elective surgeries: hip and knee replacements.

Value-based care - a framework for selecting treatment based upon prognosis and empirically-based outcomes to create cost-effective strategies for healthcare services

Direct Access - legislature that removes the physician referral state mandate to access physical therapist services for evaluation and treatment

System-entry providers - refers to providers who act as the initial point of entry for individuals seeking healthcare services

Early physical therapy models - describes the model in which physical therapy is utilized as a one of the primary intervention for patient care

Section 1: Summary

- Several notable factors have contributed to the evolution of outpatient physical therapy practice in the last decade. Most notably, COVID-19, the Affordable Care Act and Comprehensive Care for Joint Replacement programs initiated healthcare policy reform that resulted in multiple changes for healthcare practitioners.
- COVID-19 has also spurred a significant number of changes to outpatient physical therapy practice with implications for patient to therapist ratio, productivity standards, clinic preparedness, staff volumes, building occupancy restrictions, and acuity or complexity of patient presentations.
- Clinical practice guidelines that support non-pharmacologic interventions for musculoskeletal pain encourage physical therapists and physical therapy assistants to become system-entry providers in order to decrease unnecessary medical procedures, prescriptions, and unwarranted diagnostic imaging.

- The shift from traditional care models, which have been linked to negative health outcomes, are giving rise to value-based care which emphasizes early physical therapy interventions.

Section 2: Effect on clinical care and patient safety

Introduction

The components addressed in Section 1 have significantly contributed to an evolution in community-based physical therapy practice. In doing so, clinicians have been forced to adopt new ways in which patient care is safely and effectively delivered. Section 2 will describe major overarching differences to patient care management in the outpatient physical therapy setting and review pertinent topics to improve patient safety and efficacy.

Clinical Relevance [4,5]

As referenced in Section 1, the pandemic has significantly contributed to a number of changes to outpatient clinicians' responsibilities to clinical care. The imminent threat of infection and exposure has driven many patients to seek skilled therapy services regardless of medical stability. As a result, therapists should be aware of numerous implications that will inevitably impact patient safety and the delivery of effective and appropriate clinical care.

Additionally, the Affordable Care Act informed several policy changes that have also directly affected physical therapy practice, most notably in the outpatient setting. The introduction of bundled payments, through the Comprehensive Care for Joint Replacement program, produced immediate changes to physical therapy models, especially with respect to discharge disposition.

Preliminary findings of bundled payment models for elective surgeries, like total knee and hip arthroplasties, found a reduction in overall costs through (1) reduced length of stays, (2) decreased readmission rates, and (3) limited discharges to inpatient facilities. More recent studies found a decreased percentage of individuals are discharged to inpatient rehabilitation following a total knee arthroplasty, and an even greater reduction of individuals are sent to skilled nursing facilities since 2016. Conversely, this was also accompanied by a 37% increase in home health agency usage.[5]

These pertinent findings suggest a substantial shift in discharge planning among individuals following elective joint surgeries and emphasizes a concern that complex patient presentations may be inappropriately discharged into home health and outpatient settings as opposed to facility-based post-acute care settings. As a result, clinicians must be prepared to attend to a variety of atypical presentations associated with subacute post-surgical needs such as wound management and infection prevention. The following subsections will provide a review on wound management, stages of recovery, surgical dressings, and red flags for post-surgical infection.

Review on wound management and the stages recovery [6,7,8,14]

The main objective of wound care is to allow the incision to heal naturally without infection or complication. Most wounds will heal within two weeks in healthy individuals.

- Healing of the epidermis, dermis, and soft-tissues are critical in order to prevent bacteria from entering the body from the surface of the skin and external environment.
- Until complete healing occurs and all skin layers are closed, there is a potential risk for bacterial entry that can result in infection of the prosthetic implant or surrounding soft tissue. Due to this risk, ensuring a rapid recovery and complete closure of the surgical wound is critical to the success of elective joint surgeries. Intrinsic factors that may affect or complicate wound recovery include:
    - Prior open surgical procedures that use the same incision site
    - Patients on immunosuppressive therapy
    - Hypokalemia
    - Malnutrition and low protein intake
    - History of diverticulitis
    - Systemic infection
    - Poorly controlled Diabetes Mellitus
    - Obesity
    - Nicotine or tobacco use

- Renal failure
- Hypothyroidism
- Alcohol use
- Anemia
- Rheumatoid Arthritis

Pre-operative strategies to improve wound healing

- Important considerations to proper surgical wound management should include ways to modify intrinsic risk factors and provide timely pre-operative care. Modifiable intrinsic risk factors, such as uncontrolled diabetes, nicotine and tobacco use, obesity, and malnutrition negate normal wound healing and are associated with a heightened risk for post-operative soft tissue complications. Attention to modifiable intrinsic risk factors should be emphasized prior to surgical consideration and prioritized as the patient completes pre-operative prerequisites.
- Proper wound healing is highly dependent upon meeting certain nutritional guidelines. Patients should undergo nutritional counseling before any elective procedure as malnutrition can significantly affect proper wound care. In addition to ensuring proper nutritional intake, individuals should be counseled on ways to control and stabilize blood sugar, weight management, and tobacco cessation in order to lower their risk for complications following elective joint procedures.

Post-operative stages of surgical wound healing

1. **Inflammation**

   Lasting about 2-3 weeks after surgery, the inflammatory stage begins when the incision has been closed. Clotting factors rush to the incision site and begin healing the multiple layers of the skin.

2. **Proliferation**

   About one week following surgery and the initiation of the inflammatory stage, the proliferative stage initiates the development of the vascular supply to the healing tissues.

3. **Maturation**

Lastly, wound maturation occurs at three weeks post-surgery and can last up to a year. During this time, the newly-healed scar tissue becomes stronger with similar characteristics to normal skin tissue. Although newly-formed scar tissue is extremely weak, it will regain about 80% of normal tensile strength within three months. It is important to know that scar tissue will never be equivocal to the strength of normal skin tissue.

Expectations for normal surgical wound healing

- There are three types of wound healing, which are referred to as primary, secondary, tertiary wounds.
    - A primary wound refers to a clean and complete wound closure. This would be the optimal goal and expectation for normal wound healing following a surgical incision.
    - A secondary wound occurs when the deep layers of the dermis are closed while the superficial layer of the epidermis continues to heal internally. When this occurs, the wound edges may not be able to meet, thus, increasing the risk for infection.
    - A tertiary wound requires surgical closure due to inadequate wound healing.
- The presence of serosanguinous drainage after an elective joint procedure is common and seen in 1-10% of patients following a joint arthroplasty. Immediate post-operative drainage within the initial 72 hours is considered to be normal due to drainage from the superficial tissue layers.[6]
- Incisional drainage beyond 72 hours following surgery, also known as persistent incisional drainage, is considered to be abnormal. A majority of cases will resolve spontaneously, however, patients should be closely monitored. Persistent incisional drainage may be a sign of dissolving hematomas, fat ischemia, or necrosis that would warrant additional medical attention.
    - Patients with persistent incisional drainage on post-operative days 2 or 3 may be kept in the hospital setting for observation and treated with dry bandaging. If the wound is superficial, then the patient may see immediate resolution without further complications.

        - At this time, physical therapy interventions may be held in the presence of excessive wound drainage. Active and passive range of motion may be contraindicated as it can increase internal pressure surrounding the joint and soft tissues which may lower oxygenation and affect wound healing. Some patients may be asked to maintain a specific joint position in order to allow the wound to remain dry.
        - Anticoagulants can exacerbate persistent incisional drainage and may be temporarily discontinued.
    - Drainage that is present beyond 72 hours following surgery should be considered potentially infectious and immediately attended in order to decrease the risk of a secondary periprosthetic infection.

Common incisional closures following elective joint replacements

While surgical wound closure is dependent upon surgeon preference and patient anatomy, clinicians should be knowledgeable about the common types of incisional closures and how they may affect wound management and recovery.

- **Staples**
    - Medical clips are primarily utilized to close incisional wounds that have straight edges
    - They provide the strongest closure as compared to other surgical closures but will need to be removed by a physician, physician's assistant, or nurse practitioner. Upon removal of the staples, localized erythema may be present for the first few days. If erythema persists beyond this, then this may be an impending sign of infection.
    - The surgeon will decide how long the staples will need to remain within the patient, which is determined by the wound location and individual prognostic factors for healing.
- **Steri-strips (adhesive strips)**
    - Adhesive strips are small bandages that are utilized to bring the edges of an incisional wound together.
    - The strips are placed apart from one another to allow for normal wound drainage and should be kept dry for the first 24 hours following surgery.

    - They do not need to be removed by a medical professional and will fall from the skin within 7-10 days.

- **Tissue adhesives (skin adhesives)**
    - Skin adhesives are used to close wounds with or without additional sutures.
    - The surgeon or physician will place a small, thin layer of liquid film on the wound. Once it dries, the film will hold the edges of the wound together as it protects against bacterial entry.
    - The skin will fall from the skin within 5-10 days.

Frequently-used surgical dressings for elective joint surgeries

Surgical dressings for elective joint surgeries are separated into primary and secondary dressings. Each layer plays a critical role in protecting the incisional wound from bacteria and infection.

Primary dressings are placed directly over the incisional wound. Secondary dressings are used to cover the primary dressing or hold it in place.

- The most common secondary dressings are 4x4 gauze pads, which are known as dry dressings. Gauze pads are inexpensive, readily available, and most appropriate for draining wounds.
- Other commonly-used surgical dressings have specific properties to create a moist and warm environment that is conducive to healing.
    - Silicone dressings are indicated for incisional wounds with abnormal healing factors that may lead to hypertrophic scars. They are effective by relaxing and softening the scar tissue that adheres to the surrounding skin.
    - Hydrogels are water or glycerin-based dressings that provide moisture to dry wounds and are most commonly used for pressure ulcers, partial-thickness wounds, vascular ulcers, burns, abrasions, or skin tears. The goal of using hydrogel dressings is to loosen necrotic tissue that surrounds the wound. While not commonly seen for uncomplicated post-surgical incisional wounds, hydrogels may be recommended for patients with complex comorbidities.

- Transparent films may be placed over a closed surgical incision in order to protect the site from water and bacteria. It provides a moist healing environment that also helps to debride the wound.

Patient education regarding proper wound management after elective joint surgeries

- Providing education to patients on expectations for wound recovery is equally important as discussing mobility expectations for recovery. Common topics for patient education include:
    - Showering versus bathing
    - Swimming
    - Use of disinfectants or antiseptics
    - Proper wound care supplies
    - Incisional pain
- Incisional pain and discomfort should be expected but tolerable. Pain management techniques and use of over-the-counter pain medications may be recommended by the surgeon.
- Patients should be instructed on the use of proper wound care supplies and cautioned against using disinfectants or antiseptics to clean open wounds. More likely than not, these chemical aids will irritate the newly healed tissue and prolong recovery. Covering open wounds with gauze should be avoided as this is likely to cause pain and discomfort when the dressings are removed. Other protective dressings, like hydrogels or soft silicone dressings, are less likely to aggravate the healing tissue and contribute to pain.
- Depending upon the surgeon's preference, patients may be permitted to shower following discharge from the hospital. However, most surgeons will place restrictions on the patients' ability to take baths or enter swimming pools and/or hot tubs until the incision is fully closed and healed.
- Some patients may need to perform sponge baths around the area of the incision to avoid allowing moisture near the wound. Patients should be reminded of the proper technique through verbal and/or written instructions as well as a demonstration. The appropriate steps to take a sponge bath are as follows:

1. Thoroughly wash and dry your hands with soap and water for 30 seconds.
2. Take a clean gauze and soak in tap water.
3. Dab the wet gauze gently around the sutures or staples, the incision, and surrounding area. Remove any dried blood or drainage.
4. Rinse the wound well with tap water and carefully pat it dry with a new gauze pad or clean towel.

- After cleaning the wound, the patient may need to be taught how to replace the surgical dressing around the incision site. Teach the patient how to secure the new, clean dressing with the secondary bandage and where to properly secure the bandage end.

Signs and symptoms of potential wound infection

It is imperative that clinicians are able to identify impending signs and symptoms of wound infection. Impaired wound healing may be local or systemic.

- Clinicians should always assess the incision and surrounding areas for changes in color, drainage, edema, or temperature. Furthermore, therapists should instruct the patient on impending signs or symptoms of a local wound infection such as:
    - A fever greater than 101 degrees F
    - A swollen, red, or sore wound
    - Wound feels warm to the touch, itchy, or a rash has formed
    - There is a strong odor or pus coming from the wound/incision site
- The following signs and symptoms may be suggestive of an infected wound with systemic involvement. Clinicians should be observant of the following:
    - Vomiting or diarrhea
    - Lightheadedness upon standing
    - Headache
    - Sore throat
    - Rash

    - Confusion or new onset of cognitive changes
    - Fever greater than 102 degrees F
- While uncommon, some patients may experience an allergic reaction to the surgical dressing. In order to avoid an adverse reaction, use each dressing once and discard after use. Patients may need additional evaluation in the presence of hives, rash, swelling, or severe itching.

Section 2: Personal Reflection Question

If you reflect upon your recent month's referral patterns, have you seen an increase in the acuity of your referrals, especially patients with unstable medical pathologies or total joint arthroplasties? If yes, how has your clinical practice evolved to meet their needs?

Importance of acknowledging other systems

Clinical relevance

The events of 2020 have contributed to a shift in referral patterns in which patients are seeking physical therapy as their primary entry into the healthcare system. As described in-depth in Section 1, early physical therapy emphasizes the role of physical therapy interventions in the beginning of the episode of care as opposed to a concluding option. With this transition in referrals comes a responsibility to accurately identify, screen, and assess other systems that may affect movement patterns.

The number of patients who are seeking physical therapy interventions with complex medical presentations is rising. There is also emerging evidence to support the value of physical therapists in offsetting the volume of patients seen in emergency departments, especially for musculoskeletal injuries, falls, and individuals who desire to avoid exposure to COVID-19. Also, given the alarming number of overcrowded hospitals and emergency departments, physical therapists and physical therapy assistants should expect to see increasing patient complexity especially during pandemics.[32]

Combined with the shift in discharge planning among individuals following total knee/ hip arthroplasty, it is pertinent that clinicians are aware of relevant literature and information regarding medical emergencies and multi-system screening. The following subsections will focus on two pertinent areas to this topic: the clinical practice guideline for treating patients with venous thromboembolism and a review of systems.

Clinical Practice Guideline for Venous Thromboembolism/Lower Extremity Deep Vein Thrombosis [18]

Background

- The American Physical Therapy Association created a clinical practice guideline (CPG) to (1) describe the appropriate management of patients at risk for a venous thromboembolism (VTE) and (2) describe the decision-making process for clinicians who are faced with patients who have been diagnosed with a lower extremity deep vein thrombosis (DVT).
- Regardless of practice setting, clinicians may come across a VTE or DVT at any time and should have the knowledge to identify red flags associated with each condition.
- The CPG identifies a need for the physical therapist to (1) prevent VTE, (2) screen for DVT, (3) contribute to the health care team in making appropriate decisions regarding safe mobility for these patients, (4) provide patient education, and (5) prevent long-term consequences of DVT.

Summary of the CPG

- A venous thromboembolism (VTE) is the formation of a blood clot in a deep vein that may lead to complications, such as a DVT, a pulmonary embolism, or postthrombotic syndrome (PTS).
- Major signs and symptoms of DVT include:
    - pitting edema
    - pain
    - tenderness
    - swelling
    - warmth
    - erythema
    - prominent superficial veins

The presence of any one of these signs and symptoms should raise the suspicion of a DVT and prompt the clinician to conduct an additional assessment.

- Use of the Wells criteria for DVT has been recommended by multiple experts to stratify risk of DVT across various patient populations and practice settings in the continuum of care. Its use, in conjunction with the therapist's clinical-decision making skills, should be considered and discussed within the patient's interdisciplinary team.
- Postthrombotic syndrome (PTS) occurs when a clot in the vein of the lower extremity obstructs blood flow and leads to venous hypertension. PTS is a frequent complication and develops in up to 50% of patients regardless of anticoagulant use.
    - If undetected, damage can occur within the vein and lead to inflammation and necrosis.
    - This obstruction in blood flow can lead to signs and symptoms of PTS including:
        - chronic aching pain
        - intractable edema
        - limb heaviness
        - leg ulcers
- The CPG also provided recommendations to stratifying risk for developing a VTE or DVT.
    - Patients who can ambulate were found to be at increased risk for developing a VTE when standing for at least six hours or while resting in bed or a chair.
    - Patients who undergo surgery with an anesthesia time of greater than 90 minutes are at a higher risk for developing a VTE or DVT.
    - If the surgical procedure involves the pelvis or lower limb and anesthesia time is greater than 60 minutes, then risk of developing a VTE or DVT is much greater.
- Personal risk factors for VTE or DVT include:

- previous venous thrombosis or embolism
- age
- active cancer or cancer treatment
- severe infection
- oral contraceptives
- hormonal replacement therapy
- pregnancy or given birth within the previous 6 weeks
- immobility (bed rest, flight travel, fractures)
- surgery
- anesthesia
- admission to critical care
- central venous catheters
- obesity

Preventative measures

In patients at risk for DVT, preventative measures should be taken immediately, including:

- Patient education on lower extremity exercises
- Ambulation
- Proper hydration
- Use of compression devices
- Use of anticoagulants

Patients who are at a high risk for VTE who undergo surgical procedures should be provided intermittent pneumatic compression devices in conjunction with anticoagulant therapy.

Physical therapy implications

- When a patient has a recently diagnosed DVT, clinicians should check with the physician to ensure that therapeutic threshold levels of anticoagulants have been achieved prior to mobilization.
- Clinicians need to screen for fall risk whenever a patient is taking an anticoagulant medication. Research studies have shown that individuals who take anticoagulant medications have higher rates of morbidity and mortality than those without anticoagulants due to subsequent bleeding.

Review of systems [9,10,21,22,32]

Background

- Physical therapy direct access licensure necessitates a greater responsibility on behalf of the clinicians to determine appropriateness of care as well as to recognize impending signs and symptoms that do not correlate with movement dysfunction. Clinicians should be cognizant of the potential for concomitant disease, systemic involvement, or cognitive/mental dysfunction that may negate optimal outcomes.
- Additionally, autonomy that accompanies direct access referrals requires a significant responsibility in determining appropriateness of treatment approaches. The ability to identify factors that may not be responsive to physical therapy interventions and dictate further evaluation is commonly referred to as red flag screening.
- Lastly, the impact of the global pandemic has created a unique opportunity for clinicians in outpatient settings to act as the first point of contact in the healthcare system for those who seek to diminish the risk of exposure to COVID-19. Therapists are well-qualified to address multiple medical complexities and may find opportunities to develop innovative clinical models for musculoskeletal conditions but will require an ability to be knowledgeable in meeting the needs of various complex patient presentations.

Red flag screening

Red flag screening refers to the process in which physical therapists perform a brief assessment, or screening, of the anatomical and physiological status of the cardiovascular, pulmonary, integumentary, musculoskeletal, and neuromuscular systems.

The patient's cognitive status, communicative abilities, and learning style may also be screened in order to assist with the diagnostic process and identify events that can mimic conditions that are amenable to physical therapist intervention. These findings are relevant in that they can provide alternative explanations for the patient's symptoms. Depending upon the results of the screening, the patient may require additional testing or a referral to another healthcare provider.

- The comprehensive look at the review of systems includes the following:
    - Cardiovascular/pulmonary systems
    - Endocrine system
    - Eyes, ears, nose, or throat
    - Gastrointestinal system
    - Genitourinary/reproductive systems
    - Hematologic/lymphatic systems
    - Integumentary system
    - Neurologic/musculoskeletal systems
- Red flag screening also involves a review of symptoms with the main objective of identifying potential non-musculoskeletal system involvement. An example of this would be to ask a patient who presents with shoulder pain if he or she had recently experienced chest pressure to rule out a potential problem within the cardiopulmonary system. If positive responses are reported, then the physical therapist should be prompted to ask additional questions, perform a detailed examination of that system, and/or refer to a qualified healthcare provider. Overall, the objective of red flag screening is to ensure that serious pathologies with referred pain patterns are considered.

The importance of conducting a systems review

A review of systems should be performed during the subjective/history-taking phase of the initial clinical evaluation. It may also be performed throughout the episode of care. Each encounter should include questions related to major body functions or systems to identify a need for additional medical attention.

- Recently, evidence has suggested that this approach to medical screening has low diagnostic accuracy.
- An alternative approach has been proposed in which an assessment/screening of red flags may help to identify an association with a change in health status. This collection of findings allows the physical therapist to screen for the individual's ability to carry out mobility-related tasks for the purpose of achieving functional goals during treatment.
    - In response to this new proposal for screening for red flags, researchers have suggested the use of a standardized screening tool to reduce the excessive variability in the reporting of red flag symptoms.
    - A standardized screening tool to review systems would enable clinicians to make accurate conclusions in the presence of red flags to better inform clinical decision making skills.

Optimal Screening for Prediction of Referral and Outcome (OSPRO) [9,22]

The OSPRO is a standardized screening tool that was created for patients seeking community-based physical therapy for neck, shoulder, back, and knee conditions. The tool contains common symptom descriptors that screen for potential systemic involvement.

- It includes 10 or 23 questions pertaining to signs and symptoms of the cardiovascular, gastrointestinal, endocrine, nervous, integumentary, pulmonary, and musculoskeletal systems with different accuracy values, depending on the length of the questionnaire.
- For the 10-item tool, patients with red flags were correctly identified 95% of the time. The 23-item version correctly identified 100% of patients with red flags symptoms.[9]
- Interestingly, the questionnaire is also strongly correlated with the PHQ-9 for depressive symptoms.[9]
    - Yellow (psychological factors) flag screening measures are considered to be separate components of the systems review process, however, there may be implications for overlap in the presence of psychopathology. The strong correlation between the OSPRO and depressive symptoms is suggestive of a relationship between red flag and depressive symptoms.

    - Implications for use of the OSPRO may be directed towards pain management pathways that emphasize non-pharmacological care, psychologically-informed practices, or chronic pain management.

- In previous studies, researchers have suggested the use of a two-phase approach when screening for the presence of psychological factors. Findings from the OSPRO support this approach and provide evidence for performing a two-tiered review of systems for musculoskeletal conditions.
    - For example, creators of the OSPRO recommend using a focused review of systems for patients who endorse positive symptom responses to the 10 or 23-item tool as opposed to immediately referring to another healthcare provider.
- The 10 item OSPRO has predictive capabilities when determining quality-of-life at 12 months post intervention.[22]
    - The 23-item tool also holds predictive value for identifying comorbidity status at 12 months post intervention.[22]
    - This finding is clinically relevant because musculoskeletal pain may be exacerbated by the presence of multiple comorbid conditions that can influence the outcomes of perceived health status, function, and disability.
- Examples of screening questions from the OSPRO[9]:
    - **Cardiovascular:** Have you recently experienced (1) chest pain or (2) light-headedness?
    - **Pulmonary:** Have you recently experienced (1) shortness of breath or (2) difficult breathing?
    - **Gastrointestinal:** Have you recently experienced (1) nausea or (2) vomiting?
    - **Urogenital:** Have you recently experienced (1) difficulty urinating or (2) blood in the urine?
    - **Endocrine:** Have you recently experienced (1) excessive thirst or (2) excessive hunger?
    - **Nervous:** Have you recently experienced (1) abnormal sensations (eg, numbness, pins and needles, burning) or (2) weakness?

- **Integumentary:** Have you recently experienced changes in (1) skin color or (2) skin texture?
- **Musculoskeletal:** Have you recently experienced (1) night pain or (2) pain with rest?

Section 2: Personal Reflection Question

Are you including a review of systems within your history-taking portion of the evaluation? What are your thoughts on a standardized questionnaire, like the OSPRO? Should this replace your current method?

Section 2: Key Words

Epidermis - the outermost layer of the skin

Dermis - lies deep to the epidermis and contains blood vessels, connective tissue, and nutrients

Elective joint surgeries - elective joint surgeries refer to surgeries in which patients opt to undergo surgical procedures to replace specific joints in the body

Primary wound - a clean and complete wound closure

Secondary wound - closure of the deep layers of the dermis while the superficial layer of the epidermis heals internally

Tertiary wound - requires surgical closure

Serosanguinous drainage - discharge that contains blood and blood serum

Persistent incisional drainage - discharge from an incision beyond 72 hours following surgery

Primary and secondary dressings - surgical dressings that play a critical role in protecting the wound from bacteria and infection

Venous thromboembolism (VTE) - the formation of a blood clot in a deep vein that may lead to complications, such as a DVT, a pulmonary embolism, or postthrombotic syndrome

Wells criteria - a set of clinical criteria that calculates one's risk for developing a deep vein thrombosis

Postthrombotic syndrome - occurs when a clot in the vein of the lower extremity obstructs blood flow and leads to venous hypertension

Red flag screening - the ability to identify systemic factors that may not be responsive to physical therapy interventions

Optimal Screening for Prediction of Referral and Outcome (OSPRO) - a standardized screening tool that was created for patients seeking community-based physical therapy for neck, shoulder, back, and knee conditions.

Section 2: Summary

- COVID-19 and other mitigating factors have caused systemic changes to healthcare models which have resulted in differences in outpatient physical therapy referral patterns. As a result, clinicians must be prepared to attend to a variety of atypical presentations associated with subacute post-surgical needs such as wound management and infection prevention.
- Understanding proper wound management can mitigate adverse risks of elective surgeries, such as inadequate wound healing or infection, and improve functional outcomes in patients.
- Clinical practice guidelines, such as the Clinical Practice Guideline for Venous Thromboembolism/Lower Extremity Deep Vein Thrombosis, can be useful in making informed decisions regarding patients who present with signs and symptoms indicative of DVTs.
- Clinicians who act as system-entry providers should understand how to perform a review of systems and red flag screening in order to investigate the potential presence of non-musculoskeletal conditions that mimic musculoskeletal complaints.

Section 2: Case study

A 40-year old female presents to an outpatient orthopedic physical therapy clinic on post-operative day 3 following a left total knee arthroplasty. Her medical record states that her body mass index is 29, and the patient was recently treated for hyperthyroidism. She denies alcohol and nicotine use but states that she takes a daily iron pill for anemia. Pain level, without medication, is rated at 6/10 on the Visual Analog Scale and described as a “deep aching pain.”

Her objective findings are as follows:

Test and measure	Findings
Observation of wound	No drainage observed, covered with gauze pads and an ACE wrap.
Palpation	Incision is mildly tender to palpate Presence of pitting edema on left calf
Left knee active range of motion	3-105 degrees
Left knee passive range of motion	0-107 degrees
Patellar mobility	Not tested
Gait	Modified Independent with a step-to gait pattern while using a rolling walker

1. Which intrinsic risk factors may affect this patient's wound healing?
2. Is the absence of drainage on post-operative day 3 expected or abnormal? If abnormal, then what is the most appropriate next step to be taken by the physical therapist?
3. According to the clinical practice guideline, which signs and symptoms in the patient's presentation should alert the clinician to screen for Postthrombotic Syndrome(PTS)? What is the importance of screening for PTS?

Section 3: Effect on clinician roles and responsibilities

Introduction

This monumental shift in community-based physical therapy practice has also affected clinician roles and responsibilities. In addition to acting in a professional and ethical manner, clinicians have found themselves at a transitional phase in which they are becoming system-entry providers. Judicious utilization of urgently-needed outpatient services in response to meeting the needs of COVID-19 survivors also dictates the essentiality of clinician knowledge.

Section 3 will provide support for this forthcoming responsibility and review necessary concepts to enhance the clinician's ability to effectively manage numerous patient

presentations as well as the impending long-term physical consequences of COVID-19 infections. Post-acute care facilities, like nursing homes, are underprepared or unwilling to take on the growing burden and, therefore, facilities in outpatient or ambulatory settings must be able to meet this demand.

The value of resting vital signs [11,12,23]

Background

As discussed in Section 1, physical therapists are rapidly gaining recognition as system-entry providers, especially when treating musculoskeletal conditions. As clinicians begin to welcome patients with various pre-existing conditions and complex coexisting morbidities, they should be aware of underlying medical conditions that may affect the physical therapy diagnosis, plan of care, and prognosis. Therefore, it is imperative that physical therapists and physical therapy assistants have a thorough and comprehensive understanding of the body's physiological values at rest and during physical activity.

Respiratory rate

The respiratory rate is defined as the number of breaths per minute. A normal breathing rate for an adult at rest is 12 to 20 beats per minute.

- Other important parameters, especially in consideration of existing comorbidities, include:
    - Quality of breathing
    - Depth of breathing
    - Pattern of breathing
- Tachypnea is a breathing rate greater than 20 breaths per minute and may occur:
    - Under normal physiological conditions like exercise, emotional changes, and pregnancy.
    - During abnormal conditions like pain, pneumonia, pulmonary embolism, asthma, foreign body aspiration, anxiety conditions, sepsis, carbon monoxide poisoning, and diabetic ketoacidosis.
- Bradypnea occurs when the breathing rate is less than 12 breaths per minute. It can occur:

    - As a result of an underlying respiratory condition that leads to respiratory failure.
    - From excessive usage of central nervous system depressants like alcohol, narcotics, benzodiazepines or metabolic derangements.
- Other abnormal changes to respiratory rate may indicate a serious underlying medical condition that can be undetected in an otherwise healthy individual. Some examples of abnormal changes to respiratory rate include:
    - Apnea is the complete cessation of airflow to lungs for 15 seconds. It occurs during cardiopulmonary arrests, airway obstructions, and an overdose of narcotics and benzodiazepines.
    - Hyperpnea is defined as an increased depth of breathing and can be observed during physical activity and heightened states of anxiety, lung infections, or in patients with congestive heart failure.
    - Hyperventilation is described as both increased in the rate and depth of breathing and can be observed in heightened states of anxiety or emotional stress, during physical activity, or certain pathological conditions like diabetic ketoacidosis or lactic acidosis.
    - Hypoventilation refers to the decreased rate and depth of ventilation. This can arise from excessive sedation, metabolic alkalosis, and obesity hypoventilation syndrome.

Heart rate

A comprehensive physiological assessment includes the measurement of the resting heart rate, which can be determined using several techniques including pulse palpation, auscultation with a stethoscope, or the use of a heart rate monitor.

- Clinical considerations when assessing pulse include:
    - Rate
    - Rhythm
    - Volume

    - Amplitude
    - Rate of increase
    - Symmetry
- An accepted range for healthy adults at rest is between 60 to 100 beats per minute. Clinicians should be aware that normal resting heart rate is often increased in children and older adults.
    - Rates above 100 beats per minute are referred to as tachycardia
    - Rates below 60 beats per minute are referred to as bradycardia.
- Assessing the rhythm of the pulse at rest can be essential in detecting an underlying pathology that can be exacerbated with physical activity.
    - Measurements should describe the rhythm as regular, irregular, or irregularly irregular.
    - A sinus arrhythmia occurs with a change in the rate of the pulse and respiration. The pulse rate increases during inspiration and decreases during expiration.
    - An irregularly irregular pattern can be indicative of abnormal physiological conditions such as atrial flutter or atrial fibrillation.
- The pulse rate is a way to assess physiological and pathological conditions that can affect the body. Measuring heart rate through pulse palpation involves palpating for the pulse, typically at the radial artery, and counting for 30 or 60 seconds. For patients with a confirmed and/or pre-existing heart pathology, the 60-second count should be utilized.
- Most clinicians measure pulse rate using the radial artery, which is palpated on the radial aspect of the forearm, proximal to the wrist joint.
- Other commonly-used sites to measure a peripheral pulse are:
    - Carotid pulse
    - Radial pulse
    - Ulnar pulse

- Brachial pulse
- Posterior tibialis
- Dorsalis pedis pulse
- Femoral pulse

- Clinicians can use auscultation to measure heart rate. This method is most accurate when the heart sounds are clearly audible and the patient's torso is not moving. The bell of the stethoscope should be placed to the left of the sternum in the fourth intercostal space, above the level of the nipple.

Blood pressure

It is imperative to measure blood pressure at rest and with exercise as a method to determine tolerance to physical therapy interventions. Table 3.1 illustrates classifications of blood pressure for adults.

Table 3.1 Classification of Blood Pressure for Adults

Classification of blood pressure	Systolic blood pressure measurement (mm Hg)		Diastolic blood pressure measurement (mm Hg)
Normal	Less than 120	AND	Less than 80
Prehypertension	120-139	OR	80-99
Stage 1 Hypertension	140-159	OR	90-99
Stage 2 Hypertension	Greater than or equal to 160	OR	Greater than or equal to 100

- Special considerations for blood pressure: as the body ages, blood pressure may rise due to arterial stiffness. Conversely, clinicians should be alert for possible signs and symptoms of orthostatic hypotension, which results from decreased or impaired autonomic responsiveness. Orthostatic hypotension can be induced or exacerbated through polypharmacy and reduced fluid intake.

- Prior to measuring a patient's blood pressure, clinicians should ensure that the following prerequisites are met:

    - The patient should not have any caffeine drink at least 1 hour prior before blood pressure is taken.
    - The patient should not have any nicotine products at least 15 minutes before blood pressure is taken.
    - The patient should use the restroom prior to checking the blood pressure. A full bladder adds 10 mm Hg to the measurement.
- Criteria for ensuring an accurate reading:
    - Patients should be given 5-10 minutes to allow vital signs to return to a resting state.
    - Clinicians should refrain from having a conversation with the patient while checking blood pressure. Talking or active listening adds 10 mmHg to the pressure measurement.
    - The patient's back and feet should be supported with legs uncrossed. Unsupported back and feet add six mmHg to the pressure measurement. Crossed legs add 2-4 mmHg to the pressure measurement.
    - The arm should be supported at the level of the heart. An unsupported arm adds up to 10 mmHg to the pressure measurement.
- The following steps outline the correct procedure for measuring blood pressure at rest:
    1. Wrap the cuff firmly around the upper arm at the level of the heart and align it with the brachial artery. Be sure to use the appropriate cuff size that encircles at least 80% of the upper arm.
    2. Place the stethoscope below the antecubital space over the brachial artery. There is equal evidence to support the use of the bell or the diaphragm side of the stethoscope.
    3. Inflate cuff pressure to 20 mm Hg above the first Korotkoff sound.
    4. Slowly release the pressure at a rate equal to 2-3 mm Hg per second.
    5. The systolic blood pressure can be heard at the point when two or more Korotkoff sounds are heard. Diastolic blood pressure is measured at the point before the disappearance of the Korotkoff sounds.

- Eliminate potential sources of error with these considerations:
    - An inaccurate sphygmomanometer
    - Using an improper cuff size (i.e., a cuff that is too small)
    - Rate of cuff inflation or deflation
    - Improper stethoscope placement
    - Background noise

Physiological responses to exercise [11,12,23]

Heart rate

- With exercise, the heart rate response should rise incrementally at a rate of 10 beats per minute per 1 MET.
- A failure of the heart rate to (1) decrease by at least 12 beats within the first minute or (2) 22 beats by the end of two minutes following exercise is strongly associated with an increased risk of mortality in individuals diagnosed with heart disease.

Blood pressure

- With exercise, systolic blood pressure is expected to rise incrementally at a rate of 10 mm Hg per 1 MET. Upon cessation of activity, systolic blood pressure should return to resting level within six minutes.
- Research studies have proven that a delayed recovery of the systolic blood pressure is highly correlated to a poor prognosis.
- With exercise, diastolic blood pressure should not change significantly. However, an increase in diastolic blood pressure greater than 10 mm Hg is considered to be an abnormal response to exercise.

Considerations for terminating exercise

- Systolic blood pressure that rises above 250 mm Hg
- Systolic blood pressure greater than, or equal to, 210 mm Hg in men and greater than, or equal to, 190 mm Hg in women

- A decrease of systolic blood pressure either below the resting measurement or by 10 mm Hg or more

Medical relief and disaster mitigation [13,33]

Background

Clinic preparation for medical emergencies should be discussed thoroughly amongst administration, clinicians, and support staff. Additionally, the clinic should have policies and procedures in place regarding appropriate steps to take in an emergency and a plan to maintain safety for all individuals on the premises.

Prior to the pandemic, only 30% of outpatient practice settings maintained an emergency preparedness plan to inform policies, procedures, and communication.[33] In light of this realization, clinics should acknowledge the importance of preparing for emergency situations and have internal discussions regarding communication strategies, personal protection equipment, and staff resources.

Clinic preparation [30]

The Centers for Medicare and Medicaid Services (CMS) recommends that clinics establish an emergency preparation plan including:

- Immediate and emergent care of patients
- Notifying the patient's physician
- Appropriate documentation

CMS also offers guidance on employee safety in the workplace and states that there must be two individuals, who are both employed by the clinic, on site whenever a patient is being treated.

Disaster Mitigation

- Physical therapists may be called to assist with disaster response and recovery efforts. In this role, clinicians are an integral component to emergency preparation as they are qualified to understand mechanisms of injuries and various health conditions.
- Both physical therapists and physical therapy assistants may assist with triaging and providing or stabilizing acute interventions for injuries such as spinal cord injury, amputation, traumatic brain injury, fractures, burns, and peripheral nerve

injury. This recommendation arises from guidelines described by the World Health Organization's Minimal Technical Standards and Recommendations for Rehabilitation.

- Clinicians can provide interventions to alleviate the burden on critical care units and/or reduce the need for equipment.
- As experts in movement, therapists may address mobility challenges during an evacuation or migration to displacement facilities for people with disabilities, wheelchairs, or older adults who use assistive devices.
- The physical therapy skillset is also invaluable in providing management and oversight to non-life-threatening orthopedic conditions placed on colleagues and other frontline medical personnel.
- Additional responsibilities for clinicians during times of medical relief or disaster mitigation include:
    - First Aid
    - Amputation - Post-Operative Management
    - Screening for Fractures
    - Diagnostic Imaging
    - Infection Control

Drug regimen review and medication reconciliation [15,16,17]

Background

In addition to performing a review of systems as discussed in depth in Section 2, clinicians have the responsibility to conduct a comprehensive and thorough evaluation to understand the underlying influences on a patient's presentation. Furthermore, physical therapists and physical therapy assistants should be knowledgeable about the extrinsic influences on patient presentation, including medications, that would impact the ability, participation, and progress associated with physical therapy interventions. Addressing prescribed and non-prescribed medications in a drug regimen review and medication reconciliation falls within the physical therapy scope of practice and is an integral component of the episode of care.

Clinicians should conduct drug regimen reviews and medication reconciliation to ensure care and health outcomes are optimized. Medications and potential adverse effects can negate an individual's capacity for exercise, especially when taking multiple medications. Additionally, certain medications can impact a patient's condition, cognitive function, or progress during an episode of care.

Many older adults suffer from chronic coexisting morbidities that require several medications as a component of their medical management.

- 92% of individuals ages 65 and older are taking at least one prescription drug.[15]
- 43% of individuals greater than 65 have taken at least 5 or more prescription drugs in the past 30 days.[15]
- Nearly 91% of individuals ages 65 and older take at least one prescription drug per day.[15]

Community-dwelling older adults are at a high risk of medication mismanagement for multiple reasons which include:

- Polypharmacy, the act of taking five or more drugs, increases the risk of drug interactions, adverse drug events, non-adherence, and changes to functional health status.
- A limited understanding of medication instructions
- Poor adherence to medication regime
    - Those who live alone, have chronic diseases, cognitive impairments, or clinical depression are more prone to medication errors.
    - Other critical factors include the complexity of care and having more than one prescribing physician, especially in the presence of polypharmacy.

Medication reconciliation

Medication reconciliation is the process of writing a current list of patients' medications, including drug name, dosage, frequency, and route, and comparing it with information contained in the medical chart. The primary objective of medical reconciliation is to confirm that the patient is taking the prescribed medications in the correct manner.

The Centers for Medicare and Medicaid Services requires healthcare providers across different settings to perform medication reconciliation and/or a drug regimen review.

While specific guidelines under this requirement vary according to practice setting, the main goal is to ensure consistency of patient safety. This task falls under the responsibility of the physical therapist and physical therapy assistant when the patient is receiving outpatient physical therapy services.

Adverse drug reactions versus side effects

- With the transition into system-entry providers, physical therapists should be educated on adverse drug reactions and how they can affect patient care. While physical therapists are not responsible for prescribing medications, they play a substantial role in preventing adverse drug reactions through medication reconciliation. In doing so, physical therapists are optimizing safe transitions into the outpatient setting and directing additional care as needed.
- An adverse drug reaction (ADR) occurs when the body has an unfavorable response to a prescribed pharmaceutical drug.
    - ADRs are one of the most common types of abnormal medication interactions that can occur following hospital discharge.
    - ADRs can be an undesirable secondary effect that is not considered to be a therapeutic effect of the medication. It differs from the therapeutic effect of the medication, or any response to a medication that is noxious and unintended, and occurs when the prescription is prescribed for diagnosis or treatment.
- The term “side effect” is often used interchangeably with ADR. However, side effects are considered to be one of five ADR categories. A side effect is an expected or well-known reaction that occurs with a predictable frequency in a specific patient population which may or may not constitute as an ADR.

  In addition to side effects, other ADRs include:

    - Hypersensitivity
    - Idiosyncratic response
    - Toxic reactions
    - Adverse medication interactions

Physical therapy implications

Clinicians have a responsibility to perform medication reconciliations and drug regime reviews whenever appropriate. They must document changes in the dosing, frequency, or effects of the medication. Clinicians should also note any non-prescription medications, such as supplements or over-the-counter medications.

- Clinical relevance of performing medical reconciliations and drug regime reviews is to avoid adverse drug events (ADEs) that have been proven to be one of the most common types of adverse events following hospital discharge.
- Non-adherence with medications in older adults is of an utmost concern, and many initiatives have directed efforts towards addressing polypharmacy and complicated medication regimens.
    - Rate of non-adherence is 35% for patients who take more than four prescription medications.[16]
    - Those who are diagnosed with progressive diseases, treatment failure, and who require hospitalization are also at risk for medication non-adherence, which could be fatal under certain circumstances.
    - Polypharmacy has been associated with functional decline in older adults, and the use of prescription medications is inversely correlated with an ability to perform instrumental activities of daily living.
- Patients who admit to skipping a medication or changing a dosage or type of medication are at risk for changes in functional status and/or cognitive abilities.
- Clinicians must screen fall risk in patients who are taking more than one medication. Changes in cognition, awareness, or reaction can affect one's risk for falls and lead to drastic consequences. Many studies have suggested that individuals who suffer falls while taking certain medications, like anticoagulants, have a higher mortality rate than those who are not taking anticoagulants.
- Physical therapists should be aware that medication use can impair fatigue levels, especially in those who report taking one or more medications. Sedative effects of medications are well known and may affect patients in various ways.

Screening for depression [1,9,24,25,26,27,28]

Clinical relevance

The burden of care that arises from depression and other mental disorders calls for awareness and ways to detect underlying signs and symptoms. For physical therapists and physical therapy assistants, the correlation between mental health and musculoskeletal conditions, pain patterns, and chronic diseases should highlight the importance of a holistic and comprehensive interdisciplinary approach to the management of such conditions.

The nature of circumstances created by the widespread COVID-19 pandemic in 2020 will have lasting social and economic consequences in the upcoming years. Most individuals found themselves directly or indirectly affected by the tumultuous effects of the pandemic, and the burden of such changes may have drastic repercussions on mental wellness. As a result, the need for mental health and depression screening is well-justified for all patients, regardless of medical condition or injury.

Correlation between depression and musculoskeletal disorders

- Depression affects 5-10% of the general population in America and is one of the leading causes of disability.[25]
- While there have been several studies to associate the concurrent prevalence of pain with depressive symptoms, the percentage of individuals who are affected varies across practice settings.
    - Within primary care settings, about 27% of patients who present with musculoskeletal disorders also endorse subjective reports that are consistent with major depressive symptoms.[25]
    - Within outpatient physical therapy settings, researchers have estimated prevalence rates similar to that in primary care settings. Other studies have reported higher prevalence rates for depressive symptoms in outpatient physical therapy settings, between 40-47%, in, patients who present with low back and musculoskeletal pain.[25]

Importance of screening for depressive symptoms by physical therapy clinicians

As system-entry providers, physical therapists may be the first healthcare practitioner to encounter patients with musculoskeletal pain. Screening for depressive symptoms

should be routine due to the aforementioned correlation between depressive symptoms and musculoskeletal conditions.

- Screening for depressive symptoms needs to be completed due to its significant correlation with poor treatment outcomes, increased medical resource utilization, and decreased work productivity for patients with chronic musculoskeletal pain.
- A positive screen to identify patients who are at a high risk for clinical depression would signify additional action and a referral to the appropriate healthcare provider.
    - In the presence of a positive screen for depressive symptoms, modification of the physical therapy treatment plan and episode of care would be warranted. Physical therapists should prioritize improving the patient's health outcomes in addition to preventing the development of chronic pain patterns.
    - Many research studies have described the fear-avoidance model as it relates to musculoskeletal pain patterns in which key components of the psychological processes that undermine the development and evolution of chronic pain have been identified.
    - In addition to focusing on pain-related fear and catastrophizing, the fear-avoidance model also implies that depressive symptoms play a role in the development of long-term disability.
- A 2-stage screening process has been suggested in which self-reported symptoms and age-appropriate standardized depression screening measures are collected.
    - Screening tools that have been correlated with clinical testing, like the Beck Depression Inventory (BDI) and Beck Depression Inventory-second edition (BDI-II), the Center for Epidemiologic Studies Depression Scale (CES-D), and the Hamilton Depression Rating Scale (HADRS), can identify the presence or absence of depressive symptoms.
    - The Patient Health Questionnaire (PHQ) is a screening measure that is rising in popularity due to its significant association with the standard criteria for depression.[26]
    - A recent study examined the reliability of patient-reported depressive symptoms and found low sensitivity within clinical contexts. Authors of the

study do not recommend using patient-reported depressive symptoms to confirm or refute the presence of depressive symptomatology.[26] This emphasizes the importance of performing a 2-stage screening process, as opposed to relying upon patient-reported measures alone, in all patients who present with acute or chronic onset of musculoskeletal pain.

Requirements for MIPS Reporting

On 1/1/2019, physical therapists in private practice settings were eligible to participate in the Merit-based Incentive Payment System (MIPS), which is one of two components in the Quality Payment Program (QPP) that was launched by the Centers of Medicare and Medicaid Services in 2017.

- Under MIPS, there are four reporting categories including:
    - Quality
    - Improvement Activities
    - Promoting Interoperability
    - Cost
- For clinicians who participate in MIPS, screening for depression is a requirement under the 2020 PT/OT specialty measure set within the Quality reporting category.
- As part of the requirements, patients who are 12 years and older must be screened for depression using an age-appropriate standardized depression screening tool. If the patient scores positive, then a follow-up plan must be documented.
    - According to the Centers of Medicare and Medicaid Services, a screening is a clinical or diagnostic tool that can identify individuals who are at risk for developing a specific disease or condition.
    - Refer to Table 3.1 for depression screening tools and measures that qualify for MIPS reporting[28]

Table 3.2 Depression Screening Tools and Measures

12-17 years	18 years and older	Perinatal

• Patient Health Questionnaire for Adolescents (PHQ-A) • Beck Depression Inventory-Primary Care Version (BDI-PC) • Mood Feeling Questionnaire (MFQ) • Center for Epidemiologic Studies Depression Scale (CES-D) • Patient Health Questionnaire (PHQ-9) • Pediatric Symptom Checklist (PSC-17) • PRIME MD-PHQ-2	• Patient Health Questionnaire (PHQ-9) • Beck Depression Inventory (BDI or BDI-II) • Center for Epidemiologic Studies Depression Scale (CES-D) • Depression Scale (DEPS) • Duke Anxiety Depression Scale (DADS) • Geriatric Depression Scale (GDS) • Cornell Scale for Depression in Dementia (CSDD) • PRIME MD-PHQ-2 • Hamilton Rating Scale for Depression (HAM-D) • Quick Inventory of Depressive Symptomatology Self-Report (QID-SR) • Computerized Adaptive Testing Depression Inventory (CAT-DI) • Computerized Adaptive Diagnostic Screener (CAD-MDD)	• Edinburgh Postnatal Depression Scale • Postpartum Depression Screening Scale • Patient Health Questionnaire 9 (PHQ-9) • Beck Depression Inventory, Beck Depression Inventory–II, Center for Epidemiologic Studies Depression Scale, and Zung Self-rating Depression Scale

- A documented follow-up plan should occur following a positive depression screening.

  Required documentation includes at least one of the following[28]:

- Additional evaluation or assessment for depression
- Suicide Risk Assessment
- Referral to a healthcare provider who is qualified to diagnose and treat depression
- Pharmacological interventions
- Other interventions or follow-up for the diagnosis or treatment of depression

Examples of a follow-up plan related to physical therapy practice may include[28]:

- Additional evaluation or assessment for depression
- Completion of any Suicide Risk Assessment
- Referral to another healthcare provider for further evaluation for depression

Community resources for mental health/depression

1. American College of Obstetricians and Gynecologists (ACOG)

   Resources for Perinatal and Mood Disorders

   https://www.acog.org/topics/perinatal-mood-and-anxiety-disorders

2. ACOG Toolkit for Healthcare Providers

   https://www.acog.org/-/media/project/acog/acogorg/files/pdfs/publications/2018-postpartum-toolkit.pdf

3. ACOG Position Statement on Screening for Perinatal Depression

   https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2018/11/screening-for-perinatal-depression

4. National Institute of Mental Health (NIMH)

   Fact Page on Depression

   https://www.nimh.nih.gov/health/topics/depression/index.shtml

5. NIMH Research study list

   https://www.nimh.nih.gov/research/research-conducted-at-nimh/join-a-study/adults/adults-depression.shtml

6. Centers for Disease Control and Prevention

   Treatment Locator

   https://www.cdc.gov/mentalhealth/

7. CareForYourMind

   Community resource for patients who are unable to afford quality mental health services. Information is provided regarding access to services, resources for veterans, workplace solutions, Medicare, and more.

   https://careforyourmind.org

8. Families for Depression Awareness

   Community resource that provides education, training, and support for families and caregivers.

   https://familyaware.org

9. National Alliance on Mental Health

   NAMI is an organization and community resource for people with mental illness.

   https://www.nami.org/Home

10. American Psychological Association

    The APA is a professional organization of psychologists that shares factual information on mental illness and how psychologists are trained to help.

    https://www.apa.org/helpcenter

Section 3: Personal Reflection Question

Are you currently conducting mental health screenings in your clinic? If not, consider ways in which you can initiate a brief screen. What are your perceived barriers to conducting a brief mental health screening and how can you address them?

If you already conduct mental health screenings, then what are some of your action steps and follow-up to ensure that the patients who screened “yes” for depressive symptoms are being seen?

Section 3: Key Words

Respiratory rate - the number of breaths taken per minute

Tachypnea - a breathing rate greater than 20 breaths/minute

Bradypnea - a breathing rate less than 12 breaths/minute

Resting heart rate - measurement of the heart rate during quiet resting, usually between 60 to 100 beats per minute in healthy adults

Sinus arrhythmia - an irregular heartbeat that occurs with a change in the rate of the pulse and respiration

Orthostatic hypotension - results from impaired autonomic responsiveness and can be exacerbated with polypharmacy or reduced fluid intake

MET - the amount of energy expended at rest or during any task, also known as the resting basal metabolic rate

Polypharmacy - the act of taking five or more drugs at the same time

Medication reconciliation - the process of writing a current list of patients’ medications, including drug name, dosage, frequency, and route, and comparing it with information contained in the medical chart

Adverse drug reaction (ADR) - occurs when the body has an unfavorable response to a prescribed pharmaceutical drug

Side effect - an expected reaction that occurs with a predictable frequency in a specific patient population, may or may not constitute as an adverse drug reaction

Adverse drug events - an injury caused by medications

Depression - a medical illness that negatively affects feelings, perception, and behaviors within an individual

Fear-avoidance model - a model that describes how chronic musculoskeletal pain is affected as a result of avoidance behaviors that are based on fear. The model also states

that negative thoughts towards pain, including catastrophic thoughts, can cause pain-related fear, avoidance of daily activities, and hypervigilance of symptoms.

Merit-based Incentive Payment System (MIPS) - a quality incentive payment program that relates payments to quality and cost efficient care.

Section 3: Summary

- Changes to physical therapy practice have elevated the standard of clinician roles and responsibilities to adequately address the needs of patients who present to outpatient clinics. Also, it may be appropriate to screen all patients for depression due to the socioeconomic fallout related to the COVID-19 pandemic.
- Physical therapists and physical therapy assistants should understand normal physiological values at rest and during physical activity. Knowledge of such values can allow clinicians to identify abnormal resting and exercise physiological states that may warrant medical attention.
- Clinicians and clinics should be prepared to handle a variety of medical emergencies or disaster mitigation efforts. Physical therapists and physical therapy assistants are well-qualified to offer appropriate medical and first aid services to those in need.
- Performing medical reconciliation and drug regimen reviews fall within the physical therapy scope of practice and should be performed to ensure patient safety across practice settings.
- Administering screenings for depressive symptoms, especially in patients with low back pain or chronic pain patterns, is encouraged and recommended in order to address psychosocial aspects of pain and to identify the need for additional healthcare providers. Clinicians should also be aware of the potential need to screen all patients for depressive symptoms given the widespread socioeconomic effects of COVID-19 on the general population.

Section 3: Case study

A 40-year old female presents to an outpatient orthopedic physical therapy clinic on post-operative day 3 following a left total knee arthroplasty. Her medical record states that her body mass index is 29, and the patient was recently treated for hyperthyroidism. She denies alcohol and nicotine use but states that she takes a daily iron pill for anemia.

Upon her re-evaluation at 30-days post TKA, the patient's objective findings are as follows:

Test and measure	**Findings**
Observation of wound	Complete closure, mild keloid
Palpation	Moderately tender to palpate in surrounding soft tissues (6/10 pain on Visual Analog Scale)
Left knee active range of motion	2-0-115 degrees
Left knee passive range of motion	5-0-119 degrees
Patellar mobility	Medial/lateral excursion is within functional limitation and pain-free Anterior/posterior excursion is within functional limitation and pain-free
Gait	Independent with single point cane and step-through gait pattern at 0.9 m/sec
Resting pain level	5/10 on Visual Analog Scale
Resting vital signs	Respiratory rate 19 breaths per minute Heart rate 88 beats per minute Blood pressure 119/70 mm Hg

During her last physical therapy session, the patient states that she has not been taking her anticoagulant medication consistently but thinks that "it is fine." She also endorses mild frustration towards her inability to ambulate without an assistive device.

1. What would be the best course of action for the physical therapist to take regarding the patient's self-discharge of her anticoagulant medication?

2. What are some pertinent observations that one can make based upon the patient's resting vital signs? Are they considered to be normal physiological values at rest?

3. What inferences can be made about this patient's current functional status, pain level, resting vital signs, and subjective reports?

Section 4: Case study review

Section 4 will review the case studies that were previously presented in each section. Responses will guide the clinician through a discussion of potential answers as well as stimulate intellectual reflection.

Section 2 Prompt

A 40-year old female presents to an outpatient orthopedic physical therapy clinic on post-operative day 3 following a left total knee arthroplasty. Her medical record states that her body mass index is 29, and the patient was recently treated for hyperthyroidism. She denies alcohol and nicotine use but states that she takes a daily iron pill for anemia. Pain level, without medication, is rated at 6/10 on the Visual Analog Scale and described as a "deep aching pain."

Her objective findings are as follows:

Test and measure	**Findings**
Observation of wound	No drainage observed, covered with gauze pads and an ACE wrap.
Palpation	Incision is mildly tender to palpate Presence of pitting edema on left calf
Left knee active range of motion	3-105 degrees
Left knee passive range of motion	0-107 degrees
Patellar mobility	Not tested
Gait	Modified Independent with a step-to gait pattern while using a rolling walker

1. Which intrinsic risk factors may affect this patient's wound healing?

2. Is the absence of drainage on post-operative day 3 expected or abnormal? If abnormal, then what is the most appropriate next step to be taken by the physical therapist?

3. According to the clinical practice guideline, which signs and symptoms in the patient's presentation should alert the clinician to screen for Postthrombotic Syndrome(PTS)? What is the importance of screening for PTS?

Section 2 Discussion

1. Which intrinsic risk factors may affect this patient's wound healing?

   Intrinsic risk factors that may affect this patient's wound healing include an elevated body mass index and a history of anemia. Although the patient was recently treated for hyperthyroidism, it is not considered to be a risk factor for poor wound healing.

2. Is the absence of drainage on post-operative day 3 expected or abnormal? If abnormal, then what is the most appropriate next step to be taken by the physical therapist?

   The absence of drainage, particularly serosanguinous drainage, on post-operative day 3 is a normal finding. An abnormal finding would be the presence of serosanguinous drainage on post-operative day 3 in which the clinician should monitor the patient closely for localized signs and symptoms of an infection.

3. According to the clinical practice guideline, which signs and symptoms in the patient's presentation should alert the clinician to screen for Postthrombotic Syndrome(PTS)? What is the importance of screening for PTS?

   Postthrombotic syndrome occurs when a clot in the lower extremity obstructs blood flow. If left untreated, the patient can experience inflammation and necrosis in the affected veins. It is a frequent complication and should be screened in patients following surgical interventions. Currently, the patient reports a "deep aching pain" with pitting edema on the left calf. These signs and symptoms warrant further investigation.

Section 3 Prompt

A 40-year old female presents to an outpatient orthopedic physical therapy clinic on post-operative day 3 following a left total knee arthroplasty. Her medical record states

that her body mass index is 29, and the patient was recently treated for hyperthyroidism. She denies alcohol and nicotine use but states that she takes a daily iron pill for anemia.

Upon her re-evaluation at 30-days post TKA, the patient's objective findings are as follows:

Test and measure	**Findings**
Observation of wound	Complete closure, mild keloid
Palpation	Moderately tender to palpate in surrounding soft tissues (7/10 pain)
Left knee active range of motion	2-0-115 degrees
Left knee passive range of motion	5-0-119 degrees
Patellar mobility	Medial/lateral excursion is within functional limitation and pain-free Anterior/posterior excursion is within functional limitation and pain-free
Gait	Independent with single point cane and step-through gait pattern at 0.9 m/sec
Resting pain level	5/10 on Visual Analog Scale
Resting vital signs	Respiratory rate 19 breaths per minute Heart rate 88 beats per minute Blood pressure 119/70 mm Hg

During her last physical therapy session, the patient states that she has not been taking her anticoagulant medication consistently but thinks that "it is fine." She also endorses mild frustration towards her inability to ambulate without an assistive device.

1. What would be the best course of action for the physical therapist to take regarding the patient's self-discharge of her anticoagulant medication?
2. What are some pertinent observations that one can make based upon the patient's resting vital signs? Are they considered to be normal physiological values at rest?
3. What inferences can be made about this patient's current functional status, pain level, resting vital signs, and subjective reports?

Section 3 Discussion

1. What would be the best course of action for the physical therapist to take regarding the patient's self-discharge of her anticoagulant medication?

   The clinician should perform a medication reconciliation to confirm which medications should be taken as well as their intended duration. Because patients who admit to skipping a medication or changing a dosage or type of medication are at risk for changes in functional status and/or cognitive abilities, the clinician should screen for any changes in functional and cognitive status in addition to encouraging the patient to follow-up with the prescribing provider.

2. What are some pertinent observations that one can make based upon the patient's resting vital signs? Are they considered to be normal physiological values at rest?

   At rest, the patient's vital signs fall within an expected range albeit approaching abnormal. In particular, the patient's respiratory and heart rate are elevated at rest which may lead the clinician to ask follow-up questions regarding mental health, pain levels, or dyspnea.

3. What inferences can be made about this patient's current functional status, pain level, resting vital signs, and subjective reports?

   While the patient is performing at an appropriate functional level at her one-month follow-up assessment, she endorses elevated pain levels at rest and during palpation. Passive and active knee range of motion values fall within expectation which would indicate adequate physical recovery following a left TKA. The clinician should be mindful of a possible psychological component to this patient's pain patterns, elevated resting vital signs, and subjective report of frustration despite regaining adequate physical function. From these findings, the clinician

should administer a depression screening tool or another standardized screening tool for mental health.

Conclusion

This course reviewed the background and influential factors on the evolution of outpatient physical therapy practice as well as their impact on patient care and clinician roles and responsibilities. Following the successful completion of this course, the clinician should have a thorough understanding of the components that have driven this change, both externally and internally. The clinician should also comprehend the importance of preparing for changes in patients' acuity, especially following the influx of COVID-19 survivors and elective joint surgeries, as well as medical complexities that warrant a review of systems. Lastly, the clinician should assimilate the role of a system-entry provider while evaluating physiological responses to exercise, performing medication reconciliation, and screening for depressive symptoms. These new roles and responsibilities will further justify the specialization of physical therapy services in the presence of musculoskeletal and chronic pain disorders and solidify the value of skilled therapeutic interventions in the healthcare system.

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