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APTA American Physical Therapy Association

Pain Education Manual

For Physical Therapist Professional Degree Programs

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Background

Introduction

The presence of pain is one of the most common reasons people seek health care services. National surveys have found that persistent pain—defined as pain lasting longer than 3 months—affects approximately 100 million American adults, roughly one-third of the United States (US) population, and that the economic costs attributable to such pain approach $600 billion annually.[1] With the prevalence of individuals seeking relief from pain, the rise of the opioid crisis came front and center in the United States.

In 2021, The American Physical Therapy Association (APTA) updated a published white paper detailing the role physical therapists (PT) have in the treatment of pain and ultimately, the opioid crisis.[2] The white paper explicitly states, "Physical therapists, who engage in an examination process that focuses on not only the symptoms of pain but also the movement patterns that may be contributing to pain, must become central to this multidisciplinary strategy."[2(p5)] Physical therapists must work collaboratively with patients, health care providers, payers, and legislators to help stop the opioid crisis, but with this call to arms, there is a need for evidence informed knowledge and skills to appropriately address those in pain. Despite the clear role PTs play in treating those in pain and the mounting availability of educational resources, there is equally mounting evidence showing minimal pain content in entry-level health science programs.[3–5]

There is evidence that suggests that pain education for entry-level PT is insufficient.[6–8] Hoger Bement and Sluka have found that there is a mean of 31 hours dedicated to pain education in PT program curricula.[7] Although this amount is more than the reported training physicians in the United States have (11 didactic hours), PTs must possess the requisite knowledge and skills needed to address one of the primary reasons why patients seek medical care.[6,9] The

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International Association for the Study of Pain (IASP) has been an outspoken organization on the importance of professional education on pain in entry-level programs. The IASP published the *Prospectus to Promote Professional Pain Education* that calls for entry-level pain competencies that empower entry-level graduates to effectively treat those in pain.[3]

In June 2018, the APTA's House of Delegates (HOD) passed a motion (RC-43-18) led by Meryl Alappattu, DPT, PhD, and the Florida Physical Therapy Association that charged the APTA to endorse and integrate curricular guidelines for pain education established by the IASP in 2012.[10] As the IASP guidelines were being developed, Fishman and colleagues were developing core competencies for pain education with the creation of an interprofessional committee representing 10 professions.[11] Bement et al followed with the application of these core competencies to PT curricula.[12]

With the need to review pain education within the entry-level PT curriculum, the Pain Education Committee was organized by the Academy of Orthopaedic Physical Therapy (AOPT) in the fall 2019. The committee was charged to develop and initiate strategies to support and facilitate modern, evidence-based pain instruction in professional entry-level PT programs. The Pain Special Interest Group (SIG) and AOPT, in collaboration with the APTA, the IASP, and the American Council of Academic Physical Therapy, identified individuals to serve on this committee.

The first committee meeting took place with APTA stakeholders in September 2019. At the meeting, the APTA agreed that the Pain SIG of the AOPT should lead efforts to develop a resource package for academic entry-level programs that provided a broad spectrum of information for faculty on the topic of pain instruction. These resources are intended to assist programs in the development of their pain curriculum that is aligned with modern pain theory

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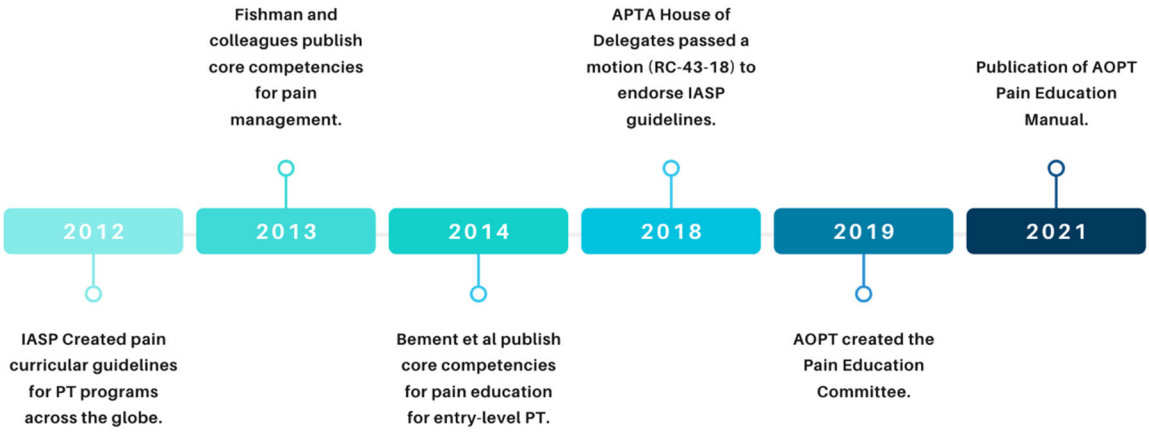
and application, the IASP curricular pain guidelines, and the core competencies for the education of pain.[7,10,11] In February 2021, a final draft of this manual was reviewed by stakeholders involved in the development of the IASP guidelines, the physical therapy pain core competencies, and representative PTs from different physical therapy academies.

Figure 1: Pain Curricular Timeline of Important Events



IASP, International Association for the Study of Pain; APTA, American Physical Therapy Association; AOPT, Academcy of Orthopaedic Physical Therapy

Pain Education Manual

The Pain Educational Manual (PEM) and related activities of the Pain Education Committee are in place to support the continued development of pain instruction in PT education by assisting faculty in their ability to integrate the current best evidence–based examination and interventions related to pain into educational activities. The specific purpose of the PEM is to provide resource information to assist faculty in curriculum planning, development, and academic and clinical teaching related to addressing acute and persistent pain.

The Pain Education Committee developed the PEM based on the evidence-supported assumption that the inclusion of the mechanisms, assessment, and treatment of pain in the

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curriculum of professional entry-level PT education programs is appropriate. Compliance with current PT education program standards as described in practice standards[13] make it clear that the mechanisms, assessment, and treatment of pain are appropriate curricular components of entry-level PT education. In addition to the *Guide to Physical Therapist Practice*, the committee utilized the Curriculum Outline on Pain for Physical Therapy developed by the IASP and the core competencies identified by Bement et al.[12]

The *Guide to Physical Therapist Practice* defines pain as a "disturbed sensation that may cause disability, suffering, or distress. Physical therapists use tests and measures to determine a cause or a mechanism for an individual's pain and to assess the intensity, quality, and temporal and physical characteristics associated with the pain."

In July 2020, the IASP[14] made the first update to the definition of pain since 1979 with the significant revision of the 6 notes on pain:

"An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage."

- Pain is always a personal experience that is influenced to varying degrees by biological, psychological, and social factors.
- Pain and nociception are different phenomena. Pain cannot be inferred solely from activity in sensory neurons.
- Through their life experiences, individuals learn the concept of pain.
- A person's report of an experience as pain should be respected.
- Although pain usually serves an adaptive role, it may have adverse effects on function and social and psychological well-being.
- Verbal description is only one of several behaviors to express pain; inability to communicate does not negate the possibility that a human or a nonhuman animal experiences pain.

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The term “pain” used in this document will be defined by the most recent IASP definition.

Pain Advocacy

Advocacy is needed for patients in pain as well as supporting the role PTs play in the treatment of pain. The APTA has been involved in several recent initiatives that have supported these endeavors. Some recent examples of this include:

- Producing resources for providers and patients supporting TRICARE’s low back pain pilot program in 10 states.
- Advocating to Medicare (Centers for Medicare & Medicaid Services [CMS] and Congress), Medicaid programs, and commercial payers to make permanent coverage of telehealth services furnished by physical therapy providers for those in pain.
- Attending open forum discussions on pain convened by Centers for Disease Control and Prevention.
- Attending CMS meetings on pain where APTA shared feedback on how Medicare can improve coverage and payment policies to promote greater access to nonpharmacological pain treatment options, including physical therapy.
- Collaborating with the Alliance to Advance Comprehensive Integrative Pain Management in partnership with the U.S. Pain Foundation.
- Collaborating with IASP on pain education standards.

Regulatory and Billing Considerations

It is important to adequately bill for services provided when assessing and treating those in pain. Billing for pain-related treatment strategies specifically can be a nebulous task as pain education can be documented through many different billing codes.

- 97112: Neuromuscular Reeducation

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- 97116: Gait Training: Gait Training
- 97110: Therapeutic Exercise: Exercise and Home Exercise Programs
- 97530: Therapeutic Activity: Pacing and Graded Exposure
- 97113: Aquatic Therapy

Pain Educational Standards

The study of pain has been a part of entry-level PT education for many decades; however, there has been little guidance provided to PT educators.[7] In *A Normative Model of Physical Therapist Professional Education: Version 2004,*[15] pain was discussed several times. The "Normative Model" addressed the assessment and treatment of pain as part of the terminal behavioral objectives in multiple matrices, including Compassion/Caring, Diagnosis, Intervention, Foundational Sciences, and Clinical Sciences. The Normative Model listed pain as one of the clinical conditions for which a PT should perform tests and measures. While the Normative Model has become outdated, it remains the foundation on which many entry-level PT curricula were developed.

The Commission on Accreditation in Physical Therapy Education (CAPTE) January 2005 *Self-Study Report Format for Education Programs for the Preparation of Physical Therapist* addressed the examination of pain in CC 5.30p, where the curriculum criteria listed "pain" as a construct to examine but provided no guidance as to the breadth or depth of pain assessment. At that time, the CAPTE criteria did not specifically address interventions for either acute or chronic pain.

The latest edition of CAPTE - *Standards and Required Elements for Accreditation of Physical Therapist Education Programs*[16] was made effective on November 11, 2015. The Standards were revised most recently on December 7, 2017. At this time, "pain" is still only mentioned one

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time in the CAPTE standards. Pain is addressed as one of 23 broad categories under standard 7D19. Pain is specifically listed in standard 7D19q. Standard 7D19 refers to a broad group of items for which PT graduates should be able to "select, and competently administer tests and measures appropriate to the patient's age, diagnosis, and health status including but not limited to, those listed in 7D19a-w." While Standard 7D19q directly refers to pain, the standard does not provide any guidance on the depth and breadth of knowledge, skill, or clinical competency for which graduates must be able to assess pain. Standard 7D19 leaves each program to determine how to optimally ensure that graduates are knowledgeable and competent in the area of pain assessment.

It should be noted that there is a broad heading titled "Intervention," which includes standard 7D27. This standard states, *"*competently perform physical therapy interventions to achieve patient/client goals and outcomes. Interventions include*."* There is a list of 9 categories (a-i) that includes items such as Biophysical Agents, Manual Therapy Techniques, and Therapeutic Exercise. While many of the items in 7D27 may be used in the intervention of patients who present with pain, interventions specifically designed to treat pain are not explicitly addressed in the CAPTE standards.

It should also be noted that the CAPTE standards do not address the spectrum of pain based on acuity (eg, acute, subacute, or chronic pain). The only standard that appears to address acuity tangentially is Standard 6E, which states,

> "*The curriculum plan includes a series of organized, sequential and integrated courses designed to facilitate achievement of the expected student outcomes, including the expected student learning outcomes described in Standard 7. The Curriculum includes organized sequences of learning experiences that prepare students to provide physical*

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therapy care to individuals with diseases/disorders involving major systems, individuals with multiple system disorders, and individuals across the lifespan and continuum of care, including individuals with chronic illness."

Standard 7A, states that "*the physical therapist professional curriculum includes content and learning experiences in the biological, physical, behavioral and movement sciences necessary for entry-level practice. Topics covered include anatomy, physiology, genetics, exercise science, biomechanics, kinesiology, neuroscience, pathology, pharmacology, diagnostic imaging, histology, nutrition, and psychosocial aspects of health and disability."* While pain sciences require the integration of many of these content areas,[12] the CAPTE Standards are silent on pain science and how these basic and clinical science content areas might be integrated to understand pain science.

Despite the lack of guidance provided by CAPTE, entry-level PT education programs are providing instruction in the assessment and intervention of pain. In 2015, Bement and Sluka[7] published the results of a survey that examined the state of physical therapist pain curricula. The survey of entry-level PT faculty revealed that an average of 31 contact hours was devoted to pain; however, the contact hours ranged from 5 to 115 hours. The majority of the programs reported that they covered pain science and the assessment and management of pain; however, only 61% of the respondents believed that pain was adequately covered in their curriculum.[7]

As mentioned previously, in 2018, the APTA HOD passed RC 43-18, which endorsed and promoted the integration of the IASP guidelines into education, practice, and research initiatives. Despite the HOD passing this motion, the current CAPTE Standards fail to include components of the IASP curriculum outline, such as the multidimensional nature of pain, the

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individual components of pain assessment, and the management of pain that falls within the scope of PT practice. Unfortunately, the CAPTE Standards have not been updated to include the recent advances in pain science or the IASP curricular guidelines.

While the endorsement of the IASP curriculum[10] outlined by the APTA HOD[17] was a big step forward in the advancement of pain education, it is unclear at this time how the outline has been incorporated into entry-level PT curricula. It is unlikely that entry-level PT education programs will fully integrate the curriculum outline and suggestions within this document until the CAPTE integrates components of the outline into the accreditation standards.

Curricular Content

Purpose

Why now? Many know and understand that pain is nothing new to PT clinical practice. Pain has been taught since the beginnings of PT education, but why should pain education be progressed now? While pain may have been taught, our understanding of pain has dramatically changed in the last two decades. It is time for entry-level PT educational programs to have guidelines on curricular content to facilitate the progression of programs to ensure they are meeting the current understanding of pain and its implications for clinical practice for the entry level clinician. The opioid epidemic has only highlighted that providers may not be meeting the needs of society in the area of pain knowledge and interventions within our PT graduates (and other providers already licensed) in the area of pain knowledge and skills.

The ongoing opioid crisis reflects the unintended effect of pain treatment within a biomedical model. PTs can provide a leading and transformational role in shifting the treatment of pain to the biopsychosocial model, with scope of practice expertise in physical activity and health and

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wellness. It is of utmost importance that students in DPT programs learn modern pain science, the relevant physiology, and effective evidence-informed assessment and treatment strategies.

The purpose of this section is to outline the essential elements of a pain curriculum appropriate for entry-level PT professional degree programs. There are a multitude of ways to deliver content related to the treatment of pain and this section will provide examples and suggestions for implementation within the DPT curriculum.

The Pain Education Committee established didactic content recommendations based on 8 curricular dimensions in order to provide adequate detail for educators:

1. Epidemiology of acute and chronic pain
2. Diagnosis of pain
3. Basic pain neuroscience
4. Contributing and predisposing factors to chronic pain
5. Physical therapist assessment of pain
6. Physical therapist role in the interprofessional (patient, society) management of pain
7. Physical therapist (conservative) management of pain
8. Medical management of pain

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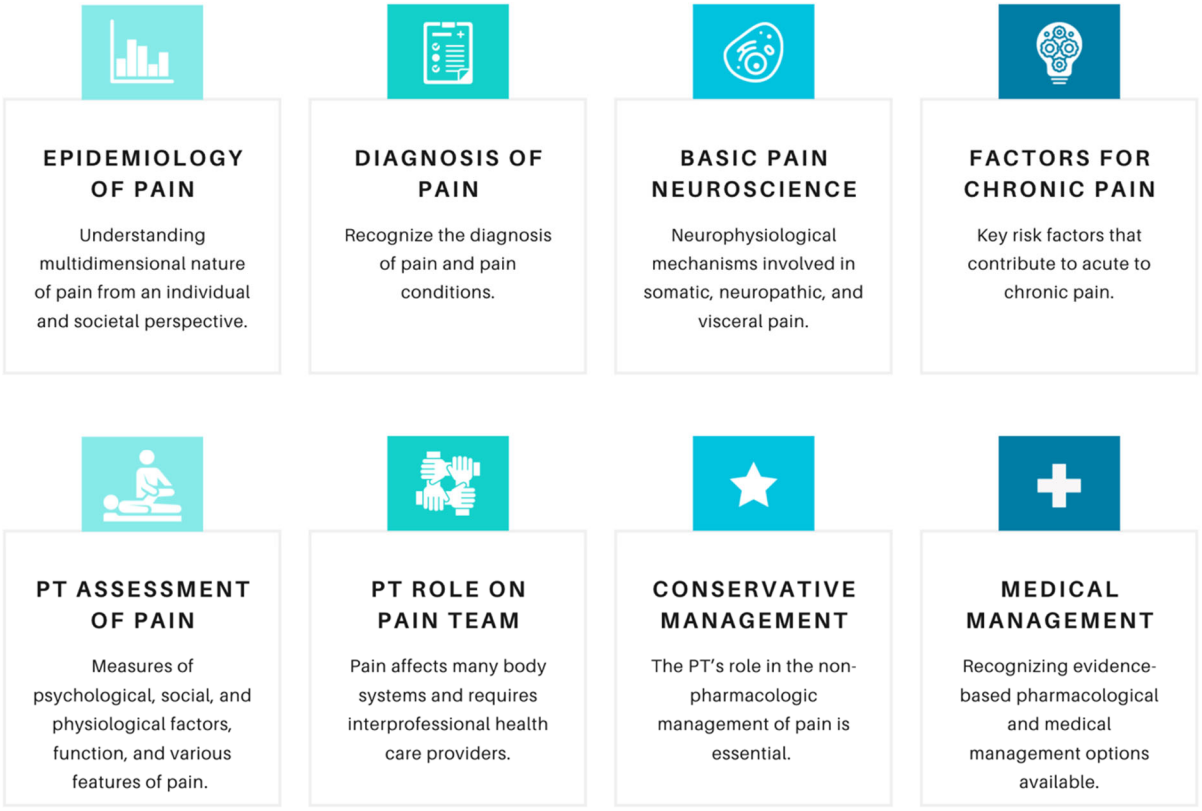
Figure 2: Curricular Pain Dimensions



These 8 dimensions were established based on the IASP Curriculum Outline on Pain for Physical Therapy.[10] The IASP created the curricular competencies to guide global teaching of modern and evidence-based pain content, but recognize the considerable variation in academic structure, practice settings, and scope existing from country to country.

Another important resource that was used in the development of the above curricular dimensions originated from the core competencies described by Bement et al.[12] The authors described pain management domains and core competencies that should be integrated into the

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DPT curriculum. These competencies, along with the IASP guidelines, served as the major foundational elements for the curricular dimensions and objectives that support each dimension.

It should be noted that the intent of this manual is not to provide curricular guidelines specific to the physical therapist assistants (PTA) curriculum, however, this will be an area of development building off of this document.

Curricular Threads

Pain is an experience that can involve multiple body systems and span across many different patient/client populations. Given this breadth, there may be several different themes or curricular threads associated with pain education. This allows for pain to be intentionally delivered in a number of different courses across the curriculum, even if there is a specific course dedicated to pain.[12] Being intentional about the threading of pain across the curriculum may assist in mapping pain throughout a given curriculum. This can help ensure that the breadth and depth of pain content is scaffolded as students' progress through the program. The bullets below are potential curricular threads where pain content can be incorporated. Many of these potential threads align with the core pain values and principles described by Fishman et al.[11]

- **Advocacy**: Given the nature of our health care system's fight with the opioid crisis, PTs must advocate to have a "seat at the table" with key decision makers related to pain policy and standards. Advocating for adequate reimbursement for the PT's role in the treatment of pain is essential, not to mention the need to advocate for the best interests of our patients in pain.
- **Evidence-based practice**: There is a growing list of medical/rehabilitation literature supporting the use of PTs treating those in pain.

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- **Interprofessionalism/Collaboration**: Pain affects many body systems and thus will require the involvement of many health care providers in order to provide holistic, collaborative care.
- **Person/Family Centered Care**: Developing a plan of care that is focused on the goals, expectations, and impairments found during the evaluation are paramount for those in pain. The student must also acknowledge contextual factors that may play a role in the prognosis or outcomes for those in pain, and understand that pain is a unique, individualized experience that can affect both the patient/client and their families.
- **Pain**: Some curricula may indicate pain as a curricular thread given the frequency that patient's present with this complaint and the fact that pain is a component that can occur in nearly all patient cases.

Pedagogical/Andragogical Structure

Jensen and colleagues have called for DPT programs to strive for a culture of excellence that is both learner and person/patient/client-centered and drives towards a praxis of learning.[18,19] This praxis of learning has 4 elements: signature pedagogy, practice-based learning, creating adaptive learners, and professional formation. The education of pain should align with these learning elements and examples of these will be provided in the coming sections.

Signature Pedagogy: Strong DPT pedagogical practice has been shown to be rooted in the human body as a teacher.[18] This supports the notion of pain content being delivered in several different courses across the continuum of the curriculum, even if the curriculum includes a course specifically devoted to pain.[6,12] Because pain involves multiple body systems, anatomical structures, and physiological processes, pain content should be scaffolded to support the human body as the teacher. Scaffolding is a term that describes the progressive knowledge

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required to accomplish an educational task.[20] Furthermore, authentic clinical experiences should reinforce foundational knowledge of pain delivered through the didactic curriculum.

Practice-Based Learning: Authentic teaching experiences and ongoing assessments are key to guiding the entry-level PT student through meaningful learning. The educator should consider, if available, the engagement of DPT students with residents and fellows where case-based discussions and reflection can occur. Interprofessional educational experiences may also reinforce practice-based learning. The need for appropriately and strategically placed clinical cases in the curriculum and actively engaging the learner in clinically based discussions is paramount. This may occur both within the academic or clinical settings. It has been suggested this situated learning should occur early, often, and continuously.[18]

Creation of Adaptive Learning: Creating adaptive learners requires students to be engaged in continuous learning, seeking feedback, self-assessment, and self-reflection on experiences and problem-solving in unique or uncertain cases.[21] It is stressed that learning experiences regarding pain content be focused on not only understanding the evidence, but applying it in a person/patient/client-centered approach. Furthermore, allowing for adequate time to reflect on these learning experiences may help prepare students for clinical situations that are complex, uncertain, and novel, which is often how those in pain, especially persistent pain, often present.[18]

Professional Formation: Placing the patient's needs above one's own is a critical moral obligation that DPT students must recognize and practice. Given the complexity of the pain experience and the multitude of treatment approaches, and options available for people in pain, the DPT student must have learning experiences that draw on professional standards and one's moral compass. This guiding principle further supports the need for pain-related content, cases,

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and assessments falling into the professional practice domain of learning. For example, DPT students may have case discussions based on patients asking opioids or for requests for work duty abilities that may not be appropriate.

The Didactic Pain Curriculum

The Didactic Pain Dimension Table

Each pain content dimension will provide information related to course objectives, learning strategies, and assessments that can potentially align with CAPTE standards, pain core competencies, and IASP guidelines. These can be found in the **Didactic Pain Dimension Table**.

The **Didactic Pain Dimension Table** is intended to be a quick reference for entry-level program faculty. The tables include the 8 pain dimensions and suggested learning domains/levels, sample learning objectives, activities, and alignment with IASP competencies and CAPTE standards (where appropriate).

The authors of these recommendations were aware of the challenge of “curricular creep” and made a conscious attempt to identify the most essential entry-level DPT skills related to the understanding of pain associated with the core competencies and IASP guidelines. The goal was to have a document to provide guidance and a set of recommendations that would be immediately helpful to the educator and that could be implemented in curricula. Each content dimension will be represented in the table with a short narrative describing each dimension. The sections below expand on how to use the Didactic Pain Dimension Table.

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Dimension Course Objectives

As with many aspects within the DPT curriculum, pain has cognitive, affective, and psychomotor domains. Course learning objectives should address all of these domains and should be specific, measurable, and mention the degree to which the student is to perform. Sample course learning objectives will be provided for each dimension. It is suggested that the development of learning objectives incorporate both Bloom's Taxonomy as well as Fink's Taxonomy.[22,23] Fink's taxonomy of significant learning incorporates both cognitive and affective components. Cognitive features of Fink's taxonomy (ie, foundational knowledge, application, and integration) align with Bloom's taxonomy.

Affective components of significant learning from Fink's taxonomy comprises a human dimension, caring, and learning how to learn. These dimensions can build on Bloom's taxonomy as they more specifically align with pain content. For example, the human dimension within the Fink's model looks at personal and social implications of what learners are learning.[23] Tying what the student is learning about pain back to society or personal accounts may reinforce the content.

Psychomotor objectives are also essential when teaching pain to DPT students. We support the use of the Dreyfus model of skill acquisition to align with development of psychomotor objectives.[24]

Course learning objectives should include the degree of mastery the educator wishes to see in the learner.[21] The domain table sample objectives do not include this level of detail due to the variability that a given educator and/or program may wish to establish. It is suggested that educators building off these sample objectives include the degree of mastery.

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Sample course assessments and learning activities that may map to course learning objectives or the learning domain (cognitive, affective, psychomotor) will be provided for each dimension. Both formative and summative assessment examples will be provided. These examples will serve as a means to stimulate faculty to create learning activities and/or use within their own curricula.

Learning Domain and Level

For ease of organization, we grouped objectives into 3 levels (**Table 1**) for each learning domain (cognitive, affective, psychomotor). These levels are mapped through each of the 8 pain dimensions to help faculty determine how to scaffold learning objectives, activities, and assessments.

Table 1. Objective Leveling Table

	Cognitive	Affective	Psychomotor
Level 1	• Remembering† • Understanding† • Foundational Knowledgeα	• Caringα • Human Dimensionα	• Noviceβ • Advanced Beginnerβ
Level 2	• Applying† α • Creating† • Analyze† • Learning How to Learnα	• Learning How to Learnα • Human Dimensionα • Caringα	• Advanced Beginnerβ • Competentβ
Level 3	• Evaluating† • Integrationα • Creating† • Synthesizing† • Learning How to Learnα	• Learning How to Learnα • Integrationα • Human Dimensionα • Caringα	• Proficientβ

†Bloom's taxonomy
αFink's taxonomy
βDreyfus taxonomy

Sample Course Learning Activities/Assessments

For each content domain, there are sample learning activities or assessments that are matched to the above objective level (see table above). The intent is to demonstrate different potential

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learning activities or assessments, both formative and summative, that can occur across the curriculum. By no means does this show the full depth and breadth of possibilities for all activities or assessments, but is intended to stimulate ideas for faculty to use in their curriculum.

Primary Content

Suggested topics that map to each pain domain are provided in the Didactic Pain Dimension Table. These topics provide specific content areas within each pain domain that should be incorporated within entry-level DPT education.

Delivery of Content/Content Resources

Suggested readings, lecture titles/topics and resources are provided in the dimension table. It is not suggested that faculty include all readings or resources. The resources included are intended to help faculty acquire background knowledge to develop content (lectures, activities, etc). There may be multiple readings/resources covering the same topic or content in order to provide breadth and depth available to educators. It is up to the educator to decide which resource best fits in their respective curriculum. Some resources (ie, YouTube videos) can be used in appropriate courses for student engagement.

Example Course(s) Where Content is Delivered

A list of potential courses where the content can be delivered is given in the table. It is important to take note that there are multiple courses that content from one domain may be appropriate to be delivered.

IASP Domain and Core Competency Alignment

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Each pain domain will show alignment to the IASP curricular pain guidelines and the core competencies for the education of pain. The purpose of this pain education manual is to not replicate these domains and competencies, which can be found **here**.

Pain Management Domain and Core Competency Alignment

Each pain domain will show alignment to the core competencies published by Fishman and colleagues and Bement and colleagues.[11,12]

CAPTE Standards and Elements Alignment

Where appropriate, CAPTE standards and elements will be mapped to each content domain. It should be noted that many of the domains do not align with CAPTE standards and elements due to the lack of specificity within CAPTE documents.

Interprofessional and Transprofessional Education

Interprofessional education (IPE) is an important component of integrating pain knowledge and applying it in authentic clinical scenarios. The Interprofessional Education Collaborative suggests 4 practice competencies that should be integrated within the curriculum: values/ethics, roles/responsibilities, interprofessional communication, and teams/teamwork.

Along with the importance of being able to communicate and collaborate interprofessionally, PTs must be able to collaborate within their own profession (transprofessional education - TPE). The physical therapist-physical therapist assistant (PT-PTA) team must share an evidence-informed understanding of pain and the roles/responsibilities that are involved in treating those in pain. It is essential as educators to recognize that time spent dedicated to the topic of pain management should be a critical element within the PT-PTA curricular components within DPT

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education. There will be suggested IPE and TPE activities mapped to each appropriate pain content dimension seen in the next section.

Pain Curriculum - Stand Alone Pain Course, an Integrated Approach or Both?

There is no “right way” to deliver pain content within the entry-level PT curriculum. The important aspect is that faculty are delivering accurate pain content that aligns with the goals and competencies described in this document. The IASP guidelines and the core pain competencies described by Bement et al both recommend a stand-alone pain course along with the use of integrated pain content embedded within appropriate course work across the curriculum.[10,12]

A recent study by Wassinger looked to compare entry level DPT students’ pain knowledge and beliefs across a 3-year (9 semester) curriculum.[6] He found that students’ pain knowledge changed over the course of the curriculum, but less so than students who took a 2-credit hour elective pain course based on the guidelines established by the IASP. Thus, there is emerging data showing support of a stand-alone pain course along with integrated pain content embedded in other courses in the curriculum, where applicable in other courses in the curriculum.

Table 2 is an example of an integrated model of pain content delivery. The dimension tables also provide suggestions for courses that may be appropriate for specific pain content.

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Table 2. Integrated Content Delivery Example

Topic	Year	Course
Diagnosis of pain	2, 3	Evaluation Neuroscience Orthopedics Psychosocial Course Clinical Education
Epidemiology of acute and chronic pain; multidimensional nature of pain; pain across the lifespan	1,2	Foundations Pediatrics Geriatrics Neuroscience Orthopedics
Historical considerations on pain management	2	Pain course
Basic pain neuroscience	1	Neuroanatomy Physiology Pathophysiology (Specific Pain course)
Contributing and predisposing factors to chronic pain	2,3	Evaluation Neuroscience Orthopedics Psychosocial Course Clinical Education
Assessment of pain	2,3	Evaluation Neuroscience Orthopedics Psychosocial Course Clinical Education
Physical Therapist role in the interprofessional management of pain	2,3	Evaluation Neuroscience Orthopedics Psychosocial Course Clinical Education
Pharmacological and Conservative management of pain	2,3	Evaluation Neuroscience Orthopedics Clinical Education

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Pain Curriculum - How much time is dedicated to pain content?

The authors of this manual are not able to recommend a specific credit amount or contact hour dedicated to the delivery of pain education. As mentioned earlier, Hoeger Bement and Sluka reported a mean of 31 contact hours devoted to pain education in US DPT programs.[7] Given that there is sufficient evidence supporting insufficient time dedicated to the teaching of modern pain education within DPT curricula, it is suggested that this be the minimum hours dedicated to the content described in this manual. Faculty should review the information provided in the **Didactic Pain Dimension Table** and either map where the content is located within your program or check off that the content is being covered to help determine if more time is required within your curriculum.

Sample Syllabi are provided (with permission) to serve as examples of how pain content is taught within several different programs. **See Appendix**.

The Role of Clinical Faculty

The role of the clinical faculty is to provide opportunities for each student to develop the knowledge, experience, and skills necessary to provide patients experiencing pain with "evidence-based, person-centered care" as appropriate and allowable for the patient population at the facility.

Clinical Performance Objectives

Clinical education should strive to achieve the following outcomes, developed by consensus[11] by an inter-professional body of health care providers in 2012 and further codified in the IASP

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Curriculum Outline on Pain for Physical Therapy.[10] The following 7 learning outcomes are emphasized below because of their relevance to clinical education (ie, internships, externships). Learning outcomes for clinical education of entry-level physical therapists:

1. Understand and explain the biopsychosocial model and its relevance to pain, one's response to pain, and the impact of pain on one's life.
2. Apply knowledge of basic science of pain to person-centered assessment and management of pain.
3. Assess or measure the biological, physical, and psychosocial factors that contribute to pain, impairment, and disability using valid and reliable assessment tools.
4. Develop an evidence-based management program in collaboration with the client/patient/family, directed at modifying pain and encouraging helpful behaviors, promoting tissue healing, improving function, reducing disability, and facilitating recovery.
5. Implement management that includes patient education, active approaches such as functionally oriented behavioral-movement reeducation approaches and exercise, passive approaches such as manual therapy (where indicated and avoiding erroneous and potentially catastrophic rationales such as 'realignment,' 'stabilizing,' 'correcting'), and the application of electro-physical agents as indicated.
6. Demonstrate awareness of other professionals' skills and competencies to enable appropriate and timely collaboration on referral.
7. Communicate appropriate information to other health professionals involved in providing patient care to optimize interdisciplinary management, including medical and surgical, behavioral, and psychological, or pharmacological approaches.

The specific skills required to achieve these outcomes have been divided among 4 domains: (1) understanding the multidimensional nature of pain; (2) pain assessment and measurement; (3)

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pain management; (4) generalization of the previous domains 1-3 into different contexts (ie, practice settings, ages, acuity levels). Detailed objectives and activities subordinate to each domain are also detailed in the IASP pain curriculum[2]; some of the more clinically relevant objectives are described below.

Domain 1 (IASP Curriculum 2018, pages 6-7). At the completion of the content, the student will be able to explain the complex, multidimensional, and idiosyncratic nature of pain with emphasis on:

A. the neurological pathways from the nociceptor to the cortex, how these pathways are unique to different tissue types (ie, skin, muscle, joint, viscera), and the different pathways involved in the processing and modulating of nociceptive information and the pain experience;
B. the peripheral, spinal, and central sensitization processes, how these forms of plasticity are associated with nociception and pain perception, and the implications for assessment, treatment, and management;
C. the mechanistic descriptors for the clinical classification of pain (nociceptive, nociplastic, and neuropathic); and
D. present theories and science for understanding pain.

Domain 2 (IASP Curriculum 2018, pages 7-8). At the completion of the content, the student will be able to recognize, assess, and quantify the sensory, emotional, and affective aspects of a patient's pain experience, and to document their findings. In particular, the student should be able to:

A. use valid and reliable tools for measuring pain and associated symptoms;
B. assess patient preferences and values to determine pain-related goals and priorities; and

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C. demonstrate empathic and compassionate communication during pain assessment.

Domain 3 (IASP Curriculum 2018, pages 8-9). At the completion of the content, the student will be able to provide treatment based on appropriate understanding of the clinical condition, and collaborative reasoning with respect to the diversity of treatment options, the importance of patient agency, risk management, and flexibility in care. In particular, the student should be able to:

A. include the patient and others, as appropriate, in the education and shared decision-making process for pain care;
B. identify pain treatment options that can be accessed in a comprehensive pain-management plan;
C. monitor effects of pain management approaches to adjust the plan of care as needed; and
D. develop a treatment plan that accounts for the differences between acute pain, acute-on chronic pain, chronic/persistent pain, and pain at the end of life.

Domain 4. Student physical therapists should be able to generalize the above skills to patients in various settings, of all ages, and in all stages of acuity.

Clinical Instruction and Documentation of Student Performance

The clinical instructor (CI) should use progressive questioning of the student on content described above including pain physiology, mechanism-based pain assessment techniques, pain management techniques (from a bio-psycho-social perspective), and exercise prescription for patients with pain in different stages of acuity. This should include the theory of, indications for, precautions for, and contraindications to the following interventions:

- Pre- and post-operative pain education and management

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- Therapeutic pain education for people with chronic pain
- Physical and electrotherapeutic agents
- Neurodynamic movement
- Sensorimotor retraining
- Exercise (ie, aerobic, strength, etc.)
- Graded exposure and graded activity

There are at least 9 performance criteria in the Physical Therapist Clinical Performance Instrument (CPI) that give guidance to the CI for the purposes of evaluating the pain management skills of the student across all domains (cognitive, psychomotor, affective). The list below identifies the criteria that can be used to examine and assess the evaluative skills of the student. These are the same criteria that are used to assess the clinical performance of the student in all areas of the clinical experience.

- Safety (#1)
- Legal practice standards (#5)
- Critical inquiry and the use of logic and evidence in practice (#9)
- Performance of the examination (#11)
- Evaluation of findings (includes diagnosis and prognosis) (#12)
- Design of the plan of care (#13)
- Performance of interventions (#14)
- Education of the patient/client and others (#15)
- Self-directed plan for learning manual therapy (#23)

It is critical that CIs provide documentation to support the skill (cognitive, affective, and/or psychomotor) level of the student. The IASP curriculum provides examples of instructional objectives that are appropriate for the clinical education component.

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- Define and explain pain to others (patients, people, community, colleagues) as a complex, multidimensional experience.
- Explain the current theories and science of pain that considers anatomical, physiological, psychological, and social factors of pain and pain management.
- Critically evaluate and apply reliable and valid pain assessment measures that examine all dimensions of a person's pain experience as well as levels of disability and contributing factors.
- Perform an appropriate physical examination of a patient/client within a prescribed amount of time.
- Perform tests and measures efficiently.
- Provide a rationale for the choice of tests and measures selected.
- Collect information from laboratory and diagnostic tests as part of the examination.
- Collect patient/client pharmacological history as part of the examination.
- Develop a person/family-centered, evidence-based pain management plan applying goals that are specific, measurable, achievable, relevant, and time-framed.
- Ensure the safety of the patient/client throughout the clinical intervention.
- Identify and implement exercise and activity as a key component of physiotherapy/physical therapy management, including across all stages of pain conditions and across the lifespan.
- Assess patient/client/family response to the intervention and modify accordingly.
- Identify the roles and responsibilities of other health care professionals in the area of pain management.

The Clinical Dimension Table

The **clinical dimension table** is intended to be a quick reference for entry-level programs and CIs for the application of modern pain education principles into clinical education. The tables

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include the 8 pain dimensions and suggested learning domains/levels, sample CI activities and experiences, and alignment with the CPI and IASP competencies similar to the didactic dimension table. Please review the explanation of each of the components included in the table on starting on page 14.

The authors of this manual understand that current DPT programs require many resources in order to secure externships/clinical rotations. While content delivery will occur in the didactic components of the curriculum (ie, the classroom), it is essential that the pain content described in this document get reinforced in the clinic with live patient care and practicing clinicians. The intent is that the CI will not be teaching new content, rather reinforcing their knowledge by applying their knowledge and practicing their skills acquired during the didactic component on "real patients."

The sample CI activities/experiences are suggestions and are not expected to be performed in their entirety. These activities allow programs and CIs with ideas of how to reinforce pain knowledge in clinical practice. There are many ideas for activities written in the clinical dimension table and it is suggested that programs communicate to CIs that they may select a few for consideration. Some activities may seem related to "classroom" activities, but these activities can be performed during a lunch and learn time, when a patient cancels, or during scheduled one-to-one time. These activities are also not intended to be performed in one setting alone. We anticipate that these can be performed in many patient populations throughout the lifespan in many practice settings (ie, acute, sub-acute, outpatient).

The Pain Education Committee recognizes that some of the content may be contemporary practice that a CI may not be familiar with, thus necessary resources for implementation should be provided. For example, a CI may wish to have the student perform quantitative sensory

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testing (which may not be universal in most clinical practices). The authors and AOPT realize that additional resources may be helpful to provide to programs and CIs and these are currently under development through “how-to” documents and “pain schools.”

Faculty and Clinical Instructors

Recommended Qualifications for Academic Faculty

Qualifications of instructors responsible for the pain-related cognitive and psychomotor content in professional physical therapist curricula are described below. These are recommended qualifications, which academic programs can use when planning faculty development processes and resources.

1. Faculty actively engages in clinical practice or clinical research within the area of their expertise and instruction.
2. Faculty possesses teaching experience that preferably includes mentoring or formal training in educational processes and methods.
3. Faculty uses and applies evidence-informed concepts within both clinical practice and teaching.

Currently there are no APTA credentialed pain residency or fellowships; however, there are a number of post-professional programs that specialize in pain management for PTs.

In addition to the above preferred qualifications, it is also expected that faculty from accredited physical therapist programs meet required qualifications for academic faculty including, but not limited to, post-professional degrees and active engagement in or a record of scholarly activity (as defined by CAPTE) that contributes to the professional body of knowledge.

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Recommended Qualifications for Clinical Faculty

The recommended qualifications of CIs to mentor professional PT students in pain-related principles, within the clinical environment, are as follows:

1. Clinical instructors are actively engaged in clinical practice within the area of clinical expertise and instruction. Applications of manual therapy/manipulation principles/techniques are performed as a routine component of clinical practice.
2. Experience and/or training in the area of clinical teaching and mentoring is preferred.
3. Clinical instructors use and apply evidence-based concepts within their clinical practice.

Opportunities for Professional Development in Pain

There may be a number of faculty who wish to further their knowledge of pain. There are several options that both academic and clinical faculty may consider for advancing their knowledge of pain:

- Joining IASP as a member
- Joining the Pain SIG of the AOPT
- IASP Pain Schools and Camps: https://www.iasp-pain.org/Education/Content.aspx?ItemNumber=5115&navItemNumber=654
- Post-Graduate Programs: https://www.iasp-pain.org/Education/EducationOpportunityList.aspx?navItemNumber=7614

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March 23, 2021. https://www.apta.org/advocacy/issues/opioid-epidemic-safe-pain-management/beyond-opioids-white-paper

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Didactic Pain Dimension Table	
Dimension: Epidemiology	
Pain is the most common reason people seek medical care. Understanding pain from an individual and societal perspective should promote the recognition of issues in assessing and treating pain. Highlighting the multidimensional nature of pain across the lifespan aims to promote understanding and empathy among physical therapists. Furthermore, it is important to understand the historical and advocacy considerations related to the treatment of pain.	
Curricular Details	
Learning Domain and Level	• Cognitive, Levels 1 & 2
Sample Course Learning Objectives	• Recognize the incidence, prevalence, and economic burden of pain conditions in infants, children, adolescents, adults, and the elderly. • Describe the impact of pain on individuals and potential risk factors for development. • Explain the biopsychosocial model and its relevance to pain, one's response to pain, and the impact of pain on one's life. • Reflect on the changing approaches to pain management throughout history. • Recognize individuals who are at risk for under-treatment of their pain (eg, individuals who are unable to self-report pain, neonates, and cognitively impaired individuals) or populations where disparities exist. • Recognize how resilience contributes to a person's pain experience. • Recognize the importance of advocacy for the treatment of pain conditions.

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Sample Course Learning Activities/Assessments	**Activity (Level 1)**: Students poll groups of people (family members, classmates, etc) to identify those in pain (use multiple pain types/definitions), relate to societal statistics. Related discussion can include health care disparities, pain knowledge of providers. **Activity (Level 1 & 2)**: Have students describe advocacy efforts that PTs can play to help fight the pain crisis in the United States. **Activity (Level 1 & 2)**: Define and explain pain to others (patients, people, community, colleagues) as a complex, multidimensional experience. **Formative Assessment (Level 1 & 2)**: Anonymous polling on key aspects of pain epidemiology and historical aspects of pain. **Summative Assessment (Level 1 & 2)**: Multiple choice questions regarding pain epidemiology, biopsychosocial aspects of pain, and changes across the lifespan.
Primary Content	• Incidence, prevalence, and economic burden pain conditions across the lifespan • Theories on why the incidence/prevalence of chronic pain is increasing • The changing approaches to pain management throughout history • The complex multidimensional nature of pain • The neurophysiologic mechanisms for chronic pain across the lifespan • The special considerations in the management of pain in populations across the lifespan • Ways PTs can advocate for patients with pain at professional association, regional, state, federal, and international levels • The pain experience and health literacy for marginalized patient populations • Ways PTs can advocate for the profession at professional association, regional, state, federal, and international levels

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Delivery of Content/Content Resources	**Readings**: ● Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 5: Individual Differences and Pain Variability ● Institute of Medicine (US) Committee on Advancing Pain, Research, Care, and Education. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research*. National Academies Press (US); 2011. doi: 10.17226/13172 ● Mezei L, Murinson BB, Johns Hopkins Pain Curriculum Development Team. Pain education in North American medical schools. *J Pain.* 2011;12(12):1199-1208. doi: 10.1016/j.jpain.2011.06.006 ● Craig KD, Holmes C, Hudspith M, et al. Pain in persons who are marginalized by social conditions. *Pain*. 2020;161(2):261-265. doi: 10.1097/j.pain.0000000000001719 ● Rethorn ZD, Cook C, Reneker JC. Social determinants of health: if you aren't measuring them, you aren't seeing the big picture. *J Orthop Sports Phys Ther*. 2019;49(12):872-874. doi: 10.2519/jospt.2019.0613 **Lecture**: ● The biopsychosocial nature of pain ● Pain epidemiology nationally and internationally ● Social determinants of health related to pain **Resources**: ● Institute of Medicine (US) Committee on Advancing Pain, Research, Care, and Education. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research*. National Academies Press (US); 2011. doi: 10.17226/13172

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Example Course(s) Where Content is Delivered	• Pain Sciences • Lifespan • Musculoskeletal • Pediatrics • Geriatrics • Professional Practice

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IASP Domain and Core Competency Alignment	• Domain 1, Competencies 1, 5
Pain Management Domain and Core Competency Alignment	• Domain 1, Competencies 1-5
CAPTE Standards and Elements Alignment	• No specific CAPTE element

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Dimension: Diagnosis of Pain

According to the American Physical Therapy Association's position statement (P06-12-10-09), physical therapists shall establish a diagnosis for each patient/client. Prior to making a patient/client management decision, physical therapists shall utilize the diagnostic process in order to establish a diagnosis for the specific conditions in need of the physical therapist's attention. In July 2020, IASP made the first update to the definition of pain since 1979 with the addition of 6 notes on pain. Recently, diagnosis classifications for pain have been added to the International Classification of Diseases 11th Revision (ICD-11). Diagnosis, by definition, directs appropriate management. A working knowledge of pain diagnoses will foster relationships with other members of the pain management team.

Curricular Details

Learning Domain and Level	• **Cognitive**: Level 1
Sample Course Learning Objectives	• Define pain using the 2020 IASP classification with 90% accuracy. • Recognize the diagnostic classification system (ICD-11) for chronic pain with 90% accuracy. • Compare and contrast diagnostic classifications of pain with 90% accuracy.
Sample Course Learning Activities/Assessments	• **Activity (Level 1)**: Students research the history of the definition of pain. • **Activity (Level 1)**: Students research and find ICD-11 pain diagnosis codes. • **Activity (Level 1)**: Using written cases or published case reports of acute or chronic conditions, students determine the pain diagnosis using the ICD-11. • **Formative Assessment (Level 1)**: In-class think, pair, share reflection on pain definition.

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	• **Summative Assessment (Level 1)**: Multiple choice questions on definition of pain.

Primary Content	• Pain mechanisms-based classifications (nociceptive, neuropathic, nociplastic)
	• ICD-11 common pain diagnostic classifications
	• Pain conditions:
	  ○ Complex Regional Pain Syndrome
	  ○ Spinal Pain
	  ○ Fibromyalgia and Myofascial Pain
	  ○ Temporomandibular Disorder
	  ○ Neuropathic Conditions
	  ○ Postsurgical or posttraumatic Pain
	  ○ Headache or Orofacial Pain
	  ○ Pain Associated with Cancer
	  ○ Phantom Limb Pain
	• Medical screening for the patient in pain

Delivery of Content/Content Resources	**Reading**:
	• Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016.
	  ○ Chapter 1: Introduction: Definitions, Concepts, and Models of Pain
	  ○ Chapter 17: Myofascial Pain and Fibromyalgia Syndrome
	  ○ Chapter 18: Temporomandibular Disorders and Headache
	  ○ Chapter 19: Low Back Pain
	  ○ Chapter 20: Neck Pain
	  ○ Chapter 21: Neuropathic Pain and Complex Regional Pain Syndrome
	  ○ Chapter 22: Osteoarthritis and Rheumatoid Arthritis

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	○ Chapter 23: Pain Associated with Central Nervous System Disorders: Central Neuropathic Pain ● Raja SN, Carr DB, Cohen M, et al. The revised International Association for the Study of Pain definition of pain: concepts, challenges, and compromises *Pain.* 2020;161(9):1976-1982. doi: 10.1097/j.pain.0000000000001939 **Lecture**: ● Review definition of pain and diagnosis codes for pain ● Review of common pain conditions detailing signs and symptoms ● Medical screening the person in pain **Resources**: ● Walton DM, Elliott J. *Musculoskeletal Pain - Assessment, Prediction and Treatment: A Pragmatic Approach*. Handspring Publishing Limited; 2020. ○ Chapter 7: The Physiological Nociceptive Domain ○ Chapter 8: The Neuropathic Domain ○ Chapter 9: The Central Nociplastic Domain ● Treede RD, Rief W, Barke A, et al. Chronic pain as a symptom or a disease: the IASP Classification of Chronic Pain for the International Classification of Diseases (ICD-11). *Pain.* 2019;160(1):19-27. doi: 10.1097/j.pain.0000000000001384 ● Nicholas M, Vlaeyen JWS, Rief W, et al. The IASP classification of chronic pain for ICD-11: chronic primary pain. *Pain*. 2019;160(1):28-37. doi: 10.1097/j.pain.0000000000001390 ● Bennett MI, Kaasa S, Barke A, et al. The IASP classification of chronic pain for ICD-11: chronic cancer-related pain. *Pain*. 2019;160(1):38-44. doi: 10.1097/j.pain.0000000000001363

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Example Course(s) Where Content is Delivered	• Complex Patient • Pain Sciences • Musculoskeletal Management • Neurologic Management • Geriatric Management • Pediatric Management

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IASP Domain and Core Competency Alignment	• Domain 1, Competency 3
Pain Management Domain and Core Competency Alignment	• Domain 1, Competency 3
CAPTE Standards and Elements Alignment	• No specific CAPTE element

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Dimension: Basic Pain Neuroscience

To achieve basic competency in pain management, it is critical that the health care professional has a strong foundation in the underlying neurophysiological mechanisms involved in somatic, neuropathic, and visceral pain. The knowledge base required for this dimension is interwoven and threaded throughout several core basic science courses in the entry-level curriculum, including Anatomy, Physiology, Electrophysiology, and especially Neuroanatomy and Neurophysiology. Understanding basic neurophysiology allows the student to appreciate nociplasticity and identify aberrant pain mechanisms in the clinical setting.

Curricular Details

Learning Domain and Level	• **Cognitive**: Level 2,3
Sample Course Learning Objectives	• Explain the cellular and molecular basis for excitability, conductivity, synaptic function, and plasticity of the nervous system. • Describe the role of the NMDA receptor in Frequency Dependent Nociceptive Facilitation (ie, wind-up phenomenon). • Explain how the expression of TRPV1 channels on nociceptors can facilitate heat pain. • Differentiate primary components of neuroanatomy in the peripheral and central nervous system.
Sample Course Learning Activities/Assessments	**Activity (Level 2):** Students trace and/or draw peripheral and central nociceptive pathways. **Activity (Level 2)**: Have students color the areas of the brain involved in the output of pain.

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	Activity (Level 3): Small Group Discussions correlating neurophysiological processing with clinical presentation. **Activity (Level 2):** Have the student fill out the Neurophysiology of Pain Questionnaire (https://my.evidenceinmotion.com/FreeInfo/Therapists/Revised_Neurophysiology-of-Pain-Questionnaire-3.pdf) and discuss the findings with the class. **Formative Assessment (Level 2):** Use of a click and reveal or matching game differentiating components of the peripheral and central nervous system within a learning management system. **Summative Assessment (Level 2 & 3):** Multiple choice questions on the neurobiology and neuroanatomy of pain. **Summative Assessment (Level 3)**: Students video record themselves explaining a component of pain neuroscience as if they are educating a patient in pain.
Primary Content	● Nociceptors and the adequate stimuli to activate nociceptors in different tissue types (ie, skin, muscle, joint, viscera, meninges, such as with migraine) ● Effect of inflammation on nociceptor neuroplasticity ● Afferent innervations of the spinal cord from different tissue types ● Descending pathways that modulate pain transmission ● Peripheral sensitization ● Gate Control Theory of Pain ● Neurogenic inflammation, the neurotransmitters involved in this process, and how these neurotransmitters could contribute to peripheral pain processing ● Ion channels, excitatory neurotransmitters, and inhibitory neurotransmitters in the peripheral nervous system ● Receptors and neurotransmitters in pain modulation ○ Alpha-2 adrenoceptor ○ Relevant 5-HT receptors

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	○ Opioid receptor subtypes and associated physiological effects ○ Opioid-induced hyperalgesia ○ Cannabinoid receptors ● Spinal mechanisms of wind-up associated with central nociplasticity ● Long-term consequences of chronic pain on the brain ● Mechanisms that underlie pain behaviors: referred pain, primary hyperalgesia, secondary hyperalgesia, allodynia, dysesthesia ● Pain facilitation and pain inhibition ○ Brain sites ○ Neurotransmitters that play a role in this process ○ Pathways can be activated by nonpharmacological treatments ● Neurophysiology of motor control changes found with chronic pain
Delivery of Content/Content Resources	**Readings**: ● Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 2: Peripheral Pathways Involved in Nociception ○ Chapter 3: Central Nociceptive Pathways ● Louw A, Puentedura E. *Pain Neuroscience Education-Teaching People About Pain*. 2nd ed. Orthopedic Physical Therapy Products; 2018. ○ Chapter 3: The Neuroscience of Pain **Resources:** ● Kandel ER, Jessell TM, Siegelbaum SA. *Principles of Neural Science*. 6th ed. McGraw Hill; 2021. ○ Chapter 2: Nerve Cells and Behavior ○ Chapter 6: Ion Channels

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	○ Chapter 15: The Somatosensory System: Receptors and Central Pathways ○ Chapter 17: Pain ○ Chapter 35: The Brain Stem
Example Course(s) Where Content is Delivered	• Pain Sciences • Physiology • Neurosciences • Neurologic Management
IASP Domain and Core Competency Alignment	• Domain 1, Competencies 1,3
Pain Management Domain and Core Competency Alignment	• Domain 1, Competency 2
CAPTE Standards and Elements Alignment	7A

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Dimension: Contributing and Predisposing Factors to Chronic Pain

The proportion of people living with chronic pain is steadily rising in many countries. The development of chronic pain is a complex and poorly understood topic. Key risk factors in the progression from acute to chronic pain are debated. Having an understanding of both modifiable and non-modifiable risk factors for chronic pain will be helpful for physical therapists to guide examination and treatment plans in patients with acute pain.

Curricular Details

Learning Domain and Level	**Cognitive Domain**: Level 2,3 **Affective Domain**: Level 2,3
Sample Course Learning Objectives	• Assess the biological, physical, and psychosocial factors that contribute to the development of chronic pain using valid and reliable assessment tools. • Identify professional, system, patient, family, and community facilitators and barriers to effective pain assessment and management. • Develop a treatment plan based on psychometrically sound assessment tools that address risk factors for chronic pain across the lifespan and marginalized populations.
Sample Course Learning Activities/Assessments	**Activity (Level 2)**: Have students complete generic (non-patient specific) psychosocial screening tools for risk of chronic pain, eg, Orebro and interpret results. **Formative (Level 3)**: Evaluate a case study with a sample patient history and intake paperwork to determine modifiable and non-modifiable risk factors for chronic pain.

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	Summative (Level 2 & 3): Multiple choice questions regarding risk factors for pain. **Summative (Level 3)**: Clinical reasoning video or essay describing the treatment for a patient at risk for chronic pain.
Primary Content	● Social determinants of health that may contribute or predispose an individual to chronic pain ○ Socioeconomic or educational factors ○ Workplace satisfaction/productivity demands ● Physiological factors of health that may contribute or predispose an individual to chronic pain ○ Poor sleep and nutritional behaviors ○ Sedentary lifestyle behaviors ○ Effects of substance abuse (smoking, illicit drugs, opioids) ● Psychological factors of health that may contribute or predispose an individual to chronic pain ○ History of physical/sexual abuse ○ Role of adverse childhood experiences (ACEs) ○ Post-traumatic stress
Delivery of Content/Content Resources	**Readings**: ● Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 5: Individual Differences and Pain Variability ● Walton DM, Elliott J. *Musculoskeletal Pain - Assessment, Prediction and Treatment: A Pragmatic Approach*. Handspring Publishing Limited; 2020. ○ Chapter 10: Cognitive Domain ○ Chapter 11: The Emotional Domain

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	○ Chapter 12: The Socioenvironmental Domain ● Rethorn ZD, Cook C, Reneker JC. Social determinants of health: if you aren't measuring them, you aren't seeing the big picture. *J Orthop Sports Phys Ther*. 2019;49(12):872-874. doi: 10.2519/jospt.2019.0613 **Lecture**: ● Biological, psychological, and sociocultural predictors of chronic pain ● Tools to measure social determinants of health ● Lifestyle behaviors that contribute to pain ● Intervention concepts to address modifiable risk factors **Resources**: ● Parreira P, Maher CG, Steffens D, Hancock MJ, Ferreira ML. Risk factors for low back pain and sciatica: an umbrella review. *Spine J*. 2018;18(9):1715-1721. doi: 10.1016/j.spinee.2018.05.018. ● Markozannes G, Aretouli E, Rintou E, et al. An umbrella review of the literature on the effectiveness of psychological interventions for pain reduction. *BMC Psychol*. 2017;*5*(1):1-16. doi: 10.1186/s40359-016-0170-z ● Becker WC, Dorflinger L, Edmond SN, Islam L, Heapy AA, Fraenkel L. Barriers and facilitators to use of non-pharmacological treatments in chronic pain. *BMC Fam Pract*. 2017;18(1):41. doi: 10.1186/s12875-017-0608-2 ● Hoeger Bement MK, St. Marie BJ, Nordstrom TM, et al. An interprofessional consensus of core competencies for prelicensure education in pain management: curriculum application for physical therapy. *Phys Ther.* 2014;94(4):451-465. doi: 10.2522/ptj.20130346

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Example Course(s) Where Content is Delivered	• Complex Patient • Pain Sciences • Health Promotion and Wellness • Musculoskeletal Management • Neurologic Management • Geriatric Management • Pediatric Management
IASP Domain and Core Competency Alignment	• Domain 1, Core competencies 1 & 5 • Domain 2, Core competencies 1-4 • Domain 3, Core competencies 1-4 & 7
Pain Management Domain and Core Competency Alignment	• Domain 1, competencies 1,4 & 5 • Domain 4, competencies 5
CAPTE Standards and Elements Alignment	• No specific CAPTE element

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Dimension: Physical Therapist Assessment of Pain

Assessment of pain requires more than subjective measures of pain intensity. The physical therapist must consider the multidimensional nature of pain and capture objective measures of psychological, social, and physiological factors, function and disability, and various features of the pain state. Quantitative Sensory Testing (QST) uses tools to assess and quantify sensory function in patients with neurologic symptoms, including pain. This testing may include both dynamic and static measures and may assist in determining alterations in nociceptive processing. Ultimately, a 'pain' diagnosis should be made, identifying the altered pain mechanism associated with the patient's presentation.

Curricular Details

Learning Domain and Level	**Cognitive Domain**: Level 1,2,3 **Psychomotor Domain**: Level 1,2,3
Sample Course Learning Objectives	• Identify the appropriate outcome tool (patient-reported outcome, behavior/observation and/or physiologic parameter) for pain depending on pain mechanism, patient population, and function. • Identify the sensory receptor associated with a specific sensory modality, including vibration, temperature, pressure, static and dynamic mechanical detection, pin-prick, and proprioception. • Describe how sensory perception may be altered (both peripheral and central mechanisms) in chronic conditions. • Determine the threshold to perceive a sensory stimulus and appreciate how this threshold can differ in different body regions and change with aging and pain. • Explain the differences between static and dynamic quantitative sensory measures.

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	• Apply quantitative sensory measures in a reliable and valid manner. • Interpret the results of quantitative sensory testing in terms of pain mechanism.
Sample Course Learning Activities/Assessments	**Activity (Level 1 & 2):** Students may administer various outcome tools (patient-reported outcome, behavior/observation and/or physiologic parameter) to friends or family members to appreciate their negative or positive attributes, and ease of use. **Activity (Level 1-3):** Students should practice applying various quantitative sensory testing assessments and experience each of the assessments personally. **Activity (Level 1-3):** Students may practice applying dynamic quantitative sensory testing assessments and interpret the findings via group discussion. **Activity (Level 3):** In small groups, students perform a mock reliability study of their ability to perform a sensory measure. **Activity (Level 2 & 3):** Students can perform quantitative sensory testing in different body regions pre- and post-exercise to appreciate systemic vs. regional effects of exercise on pain. **Summative Assessment (Level 1-3):** Multiple choice questions on the various assessments of pain. **Summative Assessment (Level 1-3)**: Students demonstrating live-patient or simulated patient pain assessment techniques.

Primary Content	• Psychometrically sound assessment measures that examine:
	  ○ Pain Intensity/Severity (eg, Numerical Rating Scale, Visual Analogue Scale, Brief Pain Inventory, PROMIS-29, Location, Type)
	  ○ Function and Disability/Impairment (eg, Six-minute Walk Test, Oswestry Disability Index)

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	○ Risk Assessment (Örebro Musculoskeletal Pain Questionnaire, STarT Back Tool) ○ Psychological Factors (eg, OSPRO-YF, Pain Catastrophizing Scale, Fear Avoidance Scale, Tampa Scale of Kinesiophobia, Stress Scale, Pain Self-Efficacy Questionnaire, Impact of Event Scale) ○ Social Domain (eg, supportive social network, Pain Disability Index) ○ Person-centered Factors (identified by a thorough clinical interview; eg, sex, age, culture, beliefs about pain, expectations, coping strategies, impact) ○ Neuropathic Pain (Leeds Assessment of Neuropathic Symptoms and Signs (LANSS), PainDETECT) ○ Nociplastic Pain (Central Sensitization Inventory) ○ Vulnerable Populations (eg, communication barriers, cognitive impairment, cultural sensitivities, marginalized populations) ○ Social Factors (eg, supportive network, participation in life) ● Sensory measures of cutaneous thermal, pin-prick, and two-point discrimination assessment ● Neurological examination including: ○ Upper motor and lower motor neuron reflex testing ○ Myotomal assessment ○ Sensory assessment of cutaneous mechanical detection including measurement of the location and distribution of sensory changes ● Quantitative sensory testing to identify peripheral sensitization or central nociplasticity, including: ○ Assessment of static and/or dynamic cutaneous allodynia ○ Algometry for pressure pain threshold or tolerance ● Dynamic Quantitative sensory testing to identify peripheral sensitization or central nociplasticity, including:

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	○ Temporal summation ○ Conditioned pain modulation ● Central processing assessment ○ Laterality assessment ○ Graphesthesia ○ Stereognosis
Delivery of Content/Content Resources	**Readings:** ● Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 6: Pain Assessment ● Courtney CA, Kavchak AE, Lowry CD, O'Hearn MA. Interpreting joint pain: quantitative sensory testing in musculoskeletal management. *J Orthop Sports Phys Ther*. 2010;40(12):818-825. doi: 10.2519/jospt.2010.3314 **Lectures**: ● Psychometrically sound pain assessment measures ● Quantitative sensory testing ● How to assess central processing for those in pain **Resources**: ● Walton DM, Elliott J. *Musculoskeletal Pain - Assessment, Prediction and Treatment: A Pragmatic Approach*. Handspring Publishing Limited; 2020. ○ Chapter 7: The Physiological Nociceptive Domain ○ Chapter 8: The Neuropathic Domain ○ Chapter 9: The Central Nociplastic Domain ○ Chapter 13: The Sensorimotor Disintegration Domain

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	• Georgopoulos V, Akin-Akinyosoye K, Zhang W, McWilliams DF, Hendrick P, Walsh DA. Quantitative sensory testing and predicting outcomes for musculoskeletal pain, disability, and negative affect: a systematic review and meta-analysis. *Pain*. 2019;160(9):1920-1932. doi: 10.1097/j.pain.0000000000001590 • Uddin Z, MacDermid JC. Quantitative sensory testing in chronic musculoskeletal pain. *Pain Med*. 2016;17(9):1694-1703. doi: 10.1093/pm/pnv105 • Moseley GL, Butler DS, Beames TB, Giles TJ. *The Graded Motor Imagery Handbook*. Adelaide, Australia: Noigroup Publications; 2012.
Example Course(s) Where Content is Delivered	• Pain Sciences • Musculoskeletal Management • Neurologic Management • Neurosciences • Geriatric Management • Pediatric Management
IASP Domain and Core Competency Alignment	• Domain 2, competencies 1-4
Pain Management Domain and Core Competency Alignment	• Domain 2, competencies 1-4
CAPTE Standards and Elements Alignment	7D19q, 7D19t, 7D19u

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Dimension: Physical Therapist's Role in the Interprofessional Management of Pain

Pain affects many body systems and thus, will require many health care providers in patients with significant pain conditions. Entry-level physical therapy curricula must encompass interprofessional educational opportunities that relate specifically to pain conditions and treatment. These experiences should align with the Interprofessional Education Collaborative (IPEC) 4practice competencies: values/ethics, roles/responsibilities, interprofessional communication, and teams/teamwork. Finally, emphasis towards developing the student's professional formation is important. The student must have learning experiences that draw on professional standards and one's moral compass within the context of an interprofessional cohesive team.

Curricular Details

Learning Domain and Level	**Cognitive**: Level 1,2 **Affective**: Level 1,2
Sample Course Learning Objectives	• Identify members of the pain management team and their roles. • Explain the basic principles of interprofessional practice when treating patients in pain. • Demonstrate appropriate communication skills with other members of the pain management team. • Differentiate the role the physical therapist plays within the pain management team.
Sample Course Learning Activities/Assessments	• **Activity (Level 2)**: With a real or simulated patient case, have a joint case discussion with groups of students, ie, medical, nursing, psychology, dental, etc. There are structured discussion points that align with the patient

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	interview, treatment approaches, and communication strategies needed to manage the case. This can occur throughout the curriculum based on coursework and case complexity. ● **Activity (Level 2 & 3)**: Discuss or pursue an interprofessional group that attends a pain advocacy event at a local, state, or national level. ● **Activity (Level 2)**: Guest speakers from the medical, nursing, psychology, dental, or another health care profession come to speak to class. A Q&A session with follow-up discussion on reflection on the ethics, roles, and communication needed as a PT to work with each speaker is done. ● **Formative Assessment (Level 2)**: Discussion forum or in-class discussion on the PT's role within the health care team or with a challenging ethical situation. ● **Summative Assessment (Level 3)**: Triple-jump assessment involving a patient with persistent pain and the need for specific communication or teamwork with another health care professional managing the patient in pain.
Primary Content	● Members of the pain management team and their roles. ● Communication skills among the pain management team (ie, physicians, PTAs, occupational therapists, psychologists, nutritionists, etc). ● Ethics and values when working within the pain management team. ● Essential functions of collaborative teamwork within the pain management team.
Delivery of Content/Content Resources	**Readings** ● Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 14: Interdisciplinary Pain Management

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	• Watt-Watson J, Hunter J, Pennefather P, et al. An integrated undergraduate pain curriculum, based on IASP curricula, for six health science faculties. *Pain.* 2004;110(1-2):140-148. doi: 10.1016/j.pain.2004.03.019 • McKay SE, Buono FD, Walker J, Glinski C, Printz DMB, Brienza R. Impact of interprofessional embedding of physical therapy in a primary care training clinic. *J Interprof Care*. 2020 Sep 11:1-6. doi: 10.1080/13561820.2020.1798898 **Lecture**: • Health care teams and health care provider roles • Scope of PT practice • Biopsychosocial model of pain and health care collaboration **Resources** • Interprofessional Education Collaborative. Accessed May 19, 2021. https://www.ipecollaborative.org/about-us • IASP Interprofessional Pain Curriculum. Accessed May 19, 2021. https://www.iasp-pain.org/Education/CurriculumDetail.aspx?ItemNumber=2057 • Hoeger Bement MK, St. Marie BJ, Nordstrom TM, et al. An interprofessional consensus of core competencies for prelicensure education in pain management: curriculum application for physical therapy. *Phys Ther*. 2014;94(4):451-465. doi: 10.2522/ptj.20130346
Example Course(s) Where Content is Delivered	• Complex Patient • Professional Practice • Pain Sciences • Musculoskeletal Management

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	• Neurologic Management • Geriatric Management • Pediatric Management • Communication
IASP Domain and Core Competency Alignment	• Domain 3, Core competencies 1,2 • Domain 4, Core competency 4
Pain Management Domain and Core Competency Alignment	• Domain 4, competency 3,4,5
CAPTE Standards and Elements Alignment	• 7D7 • 7D28 • 7D37 • 7D39

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Dimension: Physical Therapist (Non-Pharmacologic) Management of Pain

The PT's role in the non-pharmacologic management of pain is essential. The PT must use a biopsychosocial approach in the care of those suffering from both acute and persistent pain. Although there are a multitude of evidence-based interventions ranging from exercise to graded motor imagery to manual therapy, it is important for the entry-level student to prioritize and reason through a person-centered approach to empower the patient to meet their goals.

Curricular Details

Learning Domain and Level	**Cognitive**: Levels 2, 3 **Affective**: Levels 2, 3 **Psychomotor**: Levels 1,2,3
Sample Course Learning Objectives	• Identify psychosocial impairments and make appropriate recommendations for management. • Apply evidenced-based patient education in live-patient or simulated patients across the lifespan with acute, subacute, and chronic pain. • Demonstrate person-centered, evidence-based pain interventions that may include exercise, manual therapy, neuromodulation techniques, transcutaneous nerve stimulation, or psychologically informed therapy. • Develop a person-centered, evidence-based pain treatment plan that includes goals that are specific, measurable, achievable, relevant, and time-based. • Develop a treatment plan based on the differences between acute, acute-on-chronic, recurrent, chronic pain, pain crises, and pain across the lifespan. • Apply psychologically informed approaches to support improved functional movement and person-centered pain outcomes.

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Sample Course Learning Activities/Assessments	• **Activity (Level 2)**: Shift and share where students share a pain metaphor given a specific patient belief or presentation. • **Activity (Level 2 & 3)**: Have students perform graded motor imagery with the use of laterality training, explicit motor imagery, and mirror training by setting up stations for each. Students rotate through to practice each. • **Activity (Level 2 & 3)**: Students can describe when to use certain types of exercise (aerobic, isometric, etc) for those in pain. Stations where students could come up with specific exercises based on simulated case scenarios can add a clinical element. • **Activity (Level 2 & 3)**: Students can perform a pre- and post-intervention assessment of pain quantitative sensory measures to appreciate the effect of interventions such as transcutaneous nerve stimulation, exercise, and manual therapy on pain measures. • **Activity (Level 2 & 3)**: Students can perform quantitative sensory testing in different body regions pre- and post-exercise to appreciate systemic versus regional effects of exercise on pain. • **Activity (Level 3)**: Use NIH Pain Consortium cases (https://coepes.nih.gov/) to stimulate group case discussion on prognosis and treatment strategies. • **Formative Assessment (Level 1-3)**: Skills check on specific psychomotor skills. • **Formative Assessment (Level 1-3)**: Poll or question the class on confidence with delivering specific pain treatment strategies. • **Formative Assessment (Level 2 & 3)**: Using a video recording platform through a learning management system (LMS) or other platform (ie, Flipgrid), have students record themselves narrating patient education based on specific patient findings and beliefs. Students perform peer review, and faculty give feedback on communication skills and accuracy of the message.

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	• **Summative Assessment (Level 1-3)**: Practical assessment using a real or simulated case with the need to perform specific pain treatment strategies.

Primary Content	• Determine the effect of, apply, and demonstrate the following interventions on pain conditions/pain mechanisms:
	  ○ Patient education on pain, eg, pain neuroscience education
	  ○ Exercise and other active treatments, including isometric and aerobic exercise
	  ○ Manual therapy
	  ○ Neuromodulation techniques
	  ○ Transcutaneous nerve stimulation (TENS)
	  ○ Dry needling (where within practice act)
	  ○ Cognitive-behavioral therapy
	  ○ Graded motor imagery
	  ○ Graded exposure/graded activity
	  ○ Cognitive functional therapy
	• Strategies addressing lifestyle behaviors that contribute to pain output
	  ○ Sleep
	  ○ Nutrition
	  ○ Exercise
	• Establishing goals for patients in pain

Delivery of Content/Content Resources	**Psychologically Informed Education/Pain Neuroscience Education** • Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 9: Overview of Other Electrophysical and Thermal Agents

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	• Malfliet A, Kregel J, Coppieters I, et al. Effect of pain neuroscience education combined with cognition-targeted motor control training on chronic spinal pain: a randomized clinical trial. *JAMA Neurol*. 2018;75(7):808-817. doi: 10.1001/jamaneurol.2018.0492 • Lluch E, Dueñas L, Falla D, Baert I, Meeus M, Sánchez-Frutos J, Nijs J. Preoperative pain neuroscience education combined with knee joint mobilization for knee osteoarthritis: a randomized controlled trial. *Clin J Pain*. 2018;34(1):44-52. doi: 10.1097/AJP.0000000000000511 • Louw A, Puentedura E. *Pain Neuroscience Education-Teaching People About Pain*. 2nd ed. Orthopaedic Physical Therapy Products; 2018. • Butler DS, Moseley GL. *Explain Pain*. NOI Group Publications; 2003. • Louw A, Zimney K, O'Hotto C, Hilton S. The clinical application of teaching people about pain. *Physiother Theory Pract*. 2016;32(5):385-395. doi: 10.1080/09593985.2016.1194652 • Shepherd M, Louw A, Podolak J. The clinical application of pain neuroscience, graded motor imagery, and graded activity with complex regional pain syndrome-A case report. *Physiother Theory Pract*. 2020;36(9):1043-1055. doi: 10.1080/09593985.2018.1548047 • Archer KR, Coronado RA, Wegener ST. The role of psychologically informed physical therapy for musculoskeletal pain. *Curr Phys Med Rehabil Rep*. 2018;6(1):15-25. doi: 10.1097/PRP9.0000000000000847 **Graded Motor Imagery** • Moseley GL, Butler DS, Beames TB, Giles TJ. *The Graded Motor Imagery Handbook*. Noigroup Publications; 2012. • Sawyer EE, McDevitt AW, Louw A, Puentedura EJ, Mintken PE. Use of pain neuroscience education, tactile discrimination, and graded motor imagery in

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	an individual with frozen shoulder. *J Orthop Sports Phys Ther*. 2018;48(3):174-184. doi: 10.2519/jospt.2018.7716 ● Shepherd M, Louw A, Podolak J. The clinical application of pain neuroscience, graded motor imagery, and graded activity with complex regional pain syndrome-A case report. *Physiother Theory Pract*. 2020;36(9):1043-1055. doi: 10.1080/09593985.2018.1548047 **Manual Therapy** ● Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 10: Manual Therapy ● Sluka KA, Wright A. Knee joint mobilization reduces secondary mechanical hyperalgesia induced by capsaicin injection into the ankle joint. *Eur J Pain*. 2001;5(1):81-87. doi: 10.1053/eujp.2000.0223 ● Skyba DA, Radhakrishnan R, Rohlwing JJ, Wright A, Sluka KA. Joint manipulation reduces hyperalgesia by activation of monoamine receptors but not opioid or GABA receptors in the spinal cord. *Pain.* 2003;106(1-2):159-168. doi: 10.1016/s0304-3959(03)00320-8 ● Courtney CA, Witte PO, Chmell SJ, Hornby TG (2010**)** Heightened flexor withdrawal response in individuals with knee osteoarthritis is modulated by joint compression and joint mobilization. *J Pain.* 2010;11(2):179-85. ● Courtney CA, Steffen AD, Fernández-de-las-Peñas C, Kim J, Chmell SJ. (2016) Joint mobilization enhances conditioned pain modulation in individuals with osteoarthritis of the knee. *J Orthop Sports Phys Ther*. 2016;46(3):168-176. doi: 10.2519/jospt.2016.6259 ● Bishop MD, Beneciuk JM, George SZ. Immediate reduction in temporal sensory summation after thoracic spinal manipulation. *Spine J*. 2011;11(5):440-446. doi: 10.1016/j.spinee.2011.03.001

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	• Sterling M, Pedler A, Chan C, Puglisi M, Vuvan V, Vicenzino B. Cervical lateral glide increases nociceptive flexion reflex threshold but not pressure or thermal pain thresholds in chronic whiplash associated disorders: A pilot randomised controlled trial. *Man Ther.* 2010;15(2):149-153. doi: 10.1016/j.math.2009.09.004 • Louw A, Puentadura E, Schmidt S, Zimney K. *Integrating Manual Therapy and Pain Neuroscience*. Orthopaedic Physical Therapy Products; 2019. • Louw A, Nijs J, Puentedura EJ. A clinical perspective on a pain neuroscience education approach to manual therapy. *J Man Manip Ther*. 2017;25(3):160-168. doi: 10.1080/10669817.2017.1323699 **Exercise** • Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 7: Exercise-Induced Hypoalgesia: An Evidence-Based Review • Lima LV, Abner TSS, Sluka KA. Does exercise increase or decrease pain? Central mechanisms underlying these two phenomena. *J Physiol*. 2017;595(13):4141-4150. doi: 10.1113/JP273355 • Naugle KM, Fillingim RB, Riley JL 3rd. A meta-analytic review of the hypoalgesic effects of exercise. *J Pain*. 2012;13(12):1139-50. doi: 10.1016/j.jpain.2012.09.006 • Vaegter HB, Handberg G, Graven-Nielsen T. Similarities between exercise-induced hypoalgesia and conditioned pain modulation in humans. *Pain.* 2014;155(1):158-167. doi: 10.1016/j.pain.2013.09.023 • Nijs J, Meeus M, Cagnie B, et al. A modern neuroscience approach to chronic spinal pain: combining pain neuroscience education with cognition-targeted motor control training. *Phys Ther*. 2014;94(5):730-738. doi: 10.2522/ptj.20130258

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	• O'Sullivan PB, Caneiro JP, O'Keeffe M, et al. Cognitive functional therapy: an integrated behavioral approach for the targeted management of disabling low back pain. *Phys Ther.* 2018;98(5):408-423. doi: 10.1093/ptj/pzy022 **TENS** • Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 8: Transcutaneous Electrical Nerve Stimulation and Interferential Therapy • Vance CG, Dailey DL, Rakel BA, Sluka KA. Using TENS for pain control: the state of the evidence. *Pain Manag*. 2014;4(3):197-209. doi: 10.2217/pmt.14.13 • Dailey DL, Rakel BA, Vance CG, et al. Transcutaneous electrical nerve stimulation reduces pain, fatigue and hyperalgesia while restoring central inhibition in primary fibromyalgia. *Pain.* 2013;154(11):2554-2562. doi: 10.1016/j.pain.2013.07.043 • DeSantana JM, Da Silva LF, De Resende MA, Sluka KA. Transcutaneous electrical nerve stimulation at both high and low frequencies activates ventrolateral periaqueductal grey to decrease mechanical hyperalgesia in arthritic rats. *Neuroscience*. 2009;163(4):1233-1241. doi: 10.1016/j.neuroscience.2009.06.056 **Sleep/Nutrition** • Nijs J, Mairesse O, Neu D, et al. Sleep disturbances in chronic pain: neurobiology, assessment, and treatment in physical therapist practice. *Phys Ther*. 2018;98(5):325-335. doi: 10.1093/ptj/pzy020

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	• Siengsukon CF, Al-Dughmi M, Stevens S. Sleep health promotion: practical information for physical therapists. *Phys Ther*. 2017;97(8):826-836. doi: 10.1093/ptj/pzx057 **Patient Education Materials - Books** • Turk DC, Winter F. *The Pain Survival Guide: How to Reclaim Your Life*. American Psychological Association; 2006. • Lorig K, Holman H, Sobel D, Laurent D. *Living a Healthy Life with Chronic Conditions: Self-management of Heart Disease, Arthritis, Diabetes, Asthma, Bronchitis, Emphysema & Others*. Bull Publishing Company; 2006. • Darnall B. *Opioid-Free Pain Relief Kit: 10 Simple Steps to Ease Your Pain*. Bull Publishing Company; 2016. • Butler DS, Moseley GL. *Explain Pain*. NOI Group Publications; 2003. **Patient Education Materials - Videos** • Understanding Pain: Brainman Chooses: https://www.youtube.com/watch?v=jIwn9rC3rOI • Understanding Pain in Less Than Five Minutes: https://www.youtube.com/watch?v=5KrUL8tOaQs • Understanding the Complexity of Pain: https://www.youtube.com/watch?v=Zv6RPoVZx9M • Tame the Beast - It's Time to Rethink Persistent Pain: https://www.youtube.com/watch?v=ikUzvSph7Z4
Example Course(s) Where Content is Delivered	• Complex Patient • Pain Sciences • Health Promotion and Wellness • Musculoskeletal Management • Neurologic Management

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	• Geriatric Management • Pediatric Management
IASP Domain and Core Competency Alignment	• Domain 2, Core competency 3 • Domain 3, Core competencies 1-7 • Domain 4, Core competency 4
Pain Management Domain and Core Competency Alignment	• Domain 3, competencies 1-7 • Domain 4, Core competency 4
CAPTE Standards and Elements Alignment	• 7D27c, 7D27f, 7D27h, 7D27i

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Dimension: Medical Management of Pain

It is essential that entry-level DPT students recognize that physical therapy is not the only appropriate intervention for those suffering from pain conditions. Being able to identify pharmacological and medical management strategies is essential in contributing to the pain management team as well as being capable of educating patients on the totality of options available to treat pain based on best evidence.

Curricular Details

Learning Domain and Level	**Cognitive**: Levels 1,2 **Affective**: Levels 2
Sample Course Learning Objectives	• Recognize the indications, evidence, proposed mechanisms and adverse effects for pharmacologic agents for pain management (eg, non-opioid medication, selective (COX2) and nonselective nonsteroidal anti-inflammatory drugs, gabapentinoids, reuptake inhibitors), opioid analgesia (weak and strong), as well as co-analgesics and topical analgesics. • Determine when an opinion is indicated from other health professionals for the use of multimodal treatments, including but not limited to nonpharmacological, pharmacological, and surgical procedures or interventions. • Implement an individualized pain-management plan that integrates the perspectives of patients, their social support systems, and health-care providers in the context of available resources.

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Sample Course Learning Activities/Assessments	• **Activity (Levels 1 & 2)**: Small group matching medical management strategies with common pain types or conditions. • **Activity (Levels 1 & 2):** Individual or group review of indications/contraindications and clinically relevant considerations for physical therapy, eg, joint pain with venlafaxine. • **Activity (Levels 1 & 2):** Chart review of medical management for a complex patient with details on what medications are relevant for pain. • **Activity (Levels 1 & 2):** Panel discussion of experts discussing the pros and cons of medical marijuana, nerve blocks, radiofrequency ablation, etc. • **Formative Assessment (Levels 1 & 2):** Group case studies of medication errors related to opioid abuse - analyze and discuss better options.

Primary Content	• Indications for pharmacologic pain management including:
	  ○ Nonsteroidal anti-inflammatory agents and antipyretics
	  ○ Systemic and spinal opioids, endorphins
	  ○ Local anesthetics
	  ○ Medicines indicated for neuropathic pain
	  ○ Other medicines active against neuropathic pain (eg, anticonvulsants, antidepressants)
	• Indications for psychotherapeutic and behavioral approaches including:
	  ○ Individual, family, and group psychotherapy
	  ○ Cognitive-behavioral therapy
	  ○ Relaxation techniques (biofeedback, etc)
	  ○ Hypnotherapy, operant approach, stress management
	• Indications for brain and spinal cord stimulation
	• Indications for Nerve blocks (image guided) including:
	  ○ Local anesthetics
	  ○ Spinal Injections

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	○ Neurolytic solutions ○ Ablative Radiofrequency ● Indications for surgical techniques including: ○ Nerve decompression ○ Neurosurgical techniques ○ Orthopedic techniques
Delivery of Content/Content Resources	**Readings** ● Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 12: Medical Management of Pain **Lecture**: ● Pharmacologic treatment for pain ● Psychotherapeutic and behavioral approaches for pain ● Investigating nerve blocks for pain ● Spinal cord and brain stimulation for pain **Resources**: ● Kaye AD, Jones, MR, Kayes AM, et al. prescription opioid abuse in chronic pain: an updated review of opioid abuse predictors and strategies to curb opioid abuse: Part 1. *Pain Physician*. 2017;20(2S):S93-S109. ● Peter P, Katzung BG, Jobst E, Tinsley S, Masters SB, Trevor AJ. *Pharmacology for the Physical Therapist*. McGraw Hill Professional; 2020: Chapters 17-19. ● Hoeger Bement MK, St. Marie BJ, Nordstrom TM, et al. An interprofessional consensus of core competencies for prelicensure education in pain

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	management: curriculum application for physical therapy. *Phys Ther*. 2014;94(4):451-465. doi: 10.2522/ptj.20130346 • Sluka K. *Mechanisms and Management of Pain for the Physical Therapist*. 2nd ed. Lippincott Williams & Wilkins; 2016. ○ Chapter 12: Medical Management of Pain
Example Course(s) Where Content is Delivered	• Pharmacology • Complex Patient • Health & Wellness • Pain Sciences • Musculoskeletal Management • Neurologic Management • Geriatric Management • Pediatric Management • Cardiopulmonary Management
IASP Domain and Core Competency Alignment	• Domain 3, Core competencies 4,5,6 • Domain 4, Core competencies 3,4
Pain Management Domain and Core Competency Alignment	• Domain 3, competencies 4,5 • Domain 4, competencies 3,4,5
CAPTE Standards and Elements Alignment	• No specific CAPTE element for specific elements

Abbreviations: CAPTE, Commission on Accreditation in Physical Therapy Education; IASP, International Association for the Study of Pain; LMS, learning management system; PTs, physical therapists; PTAs, physical therapist assistants

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Clinical Pain Dimension Table

Dimension: Epidemiology

- Pain is the most common reason people seek medical care.
- Understanding pain from an individual and societal perspective should promote the recognition of issues in assessing and treating pain.
- Highlighting the multidimensional nature of pain across the lifespan aims to promote understanding and empathy among physical therapists.
- Furthermore, it is important to understand the historical and advocacy considerations related to the treatment of pain.

Clinical Instruction Details

Clinical Learning Domain and Level	• Cognitive, Level 1
Sample Clinical Instructor Activities or Experiences *Please refer to the didactic dimension table for more activities as appropriate.	• **Activity (Level 1):** Challenge the student to find a peer-reviewed publication that relates to the prevalence or burden of chronic pain and discuss the findings with the student. What take-home points did the student have and how do the findings relate to clinical practice? • **Activity (Level 1)**: Explore one or more podcasts or videos about pain, pain management, or the opioid epidemic. Some suggestions include “The Pain Reframed Podcast,” “The Pain Rebel Podcast”. The “Invisibilia” podcast has an episode on pain entitled “The Fifth Vital Sign” meant for a general audience. A good YouTube video from Stanford University Healthcare system can be found at: https://youtu.be/n_tL6U2FSuY

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	• **Activity (Level 1)**: Discuss "Pain Matters" (http://www.painmattersfilm.com), a 65-minute documentary that explores what chronic pain is, its individual and societal impact, and the future of pain management through the stories and struggles of 6 individuals living with chronic pain and their loved ones, as well as perspectives from leading national experts in pain management. • **Activity (Level 1)**: Discuss the basic facts of the opioid epidemic in the United States after having the student review sources they can reference in the future, such as this website: https://www.hhs.gov/opioids/about-the-epidemic/index.html or the editorial, "Physical Therapists' Role in Solving the Opioid Epidemic" *J Orthop Sports Phys Ther*. 2018;48(5):349-353. doi: 10.2519/jospt.2018.0606 and commentary *J Orthop Sports Phys Ther*. 2018;48(8):669-671. doi: 10.2519/jospt.2018.0204 • **Summative Assessment**: Present at least one peer-reviewed published study during an in-service or journal club discussing the application of a biopsychosocial approach to pain and functional restoration.
Clinical Performance Instrument (CPI) Alignment	• Communication • Evaluation • Diagnosis and Prognosis • Educational Interventions • Plan of Care
IASP Domain and Core Competency Alignment	• Domain 1, Competencies 1,5

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Domain: Definition of Pain

- According to the American Physical Therapy Association's position statement (P06-12-10-09), physical therapists shall establish a diagnosis for each patient/client. Prior to making a patient/client management decision, physical therapists shall use the diagnostic process in order to establish a diagnosis for the specific conditions in need of the physical therapist's attention.
- In July 2020, The International Association for the Study of Pain (IASP) made the first update to the definition of pain since 1979 with the significant revision of the 6 notes on pain: "An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage"

    - Pain is always a personal experience that is influenced to varying degrees by biological, psychological, and social factors.
    - Pain and nociception are different phenomena. Pain cannot be inferred solely from activity in sensory neurons.
    - Through their life experiences, individuals learn the concept of pain.
    - A person's report of an experience as pain should be respected.
    - Although pain usually serves an adaptive role, it may have adverse effects on function and social and psychological well-being.
    - Verbal description is only one of several behaviors to express pain; inability to communicate does not negate the possibility that a human or a nonhuman animal experiences pain.

- Recently, diagnosis classifications for pain have been added to the International Classification of Diseases 11th Revision (ICD-11). Diagnosis, by definition, directs appropriate management. A working knowledge of pain diagnoses will foster relationships with other members of the pain management team.

Clinical Instruction Details

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Clinical Learning Domain and Level	• Cognitive, Level 1,2
Sample Clinical Instructor Activities or Experiences *Please refer to the didactic dimension table for more activities as appropriate.	• **Activity (Level 1):** Discuss the IASP definitions of pain. Familiarize the student with the IASP website (https://www.iasp-pain.org/), particularly the patient/PT resources (https://www.iasp-pain.org/PatientResources?navItemNumber=678), taxonomy of terms, advocacy efforts, etc. • **Activity (Level 1):** Discuss the differences between nociceptive, neuropathic, and nociplastic pain. Link these definitions/pain mechanisms to patients that you have seen with your student. • **Activity (Level 2):** If the student wants more depth, point them towards a research publication about the neuromatrix theory of pain such as: ○ Melzack R. Evolution of the neuromatrix theory of pain. The Prithvi Raj Lecture: presented at the Third World Congress of World Institute of Pain, Barcelona 2004. *Pain Pract*. 2005;5(2):85-94. doi: 10.1111/j.1533-2500.2005.05203.x ○ Moseley GL. A pain neuromatrix approach to patients with chronic pain. *Man Ther*. 2003;8(3):130-140. doi: 10.1016/s1356-689x(03)00051-1 • **Activity (Level 1,2):** Discuss the following questions with the student to drive reflection on their own experiences with pain (from Mosley LG and Butler DS. *Explain Pain Supercharged*. NOI Group Publishers; 2017): ○ Have you had a situation when you had an injury but did not experience pain at the time? ○ If there was no pain, how did you know you were injured? ○ Why might the brain have decided not to make pain at the time of injury? ○ What would have happened if the brain did use pain to protect you at that moment? ○ Have you had a situation when your pain persisted for a long time when perhaps it shouldn't have?

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	○ Why might the brain have persisted in making pain? ● **Activity (Level 2):** Diagnose a patient with chronic musculoskeletal pain using the ICD-11: Perrot S, Cohen M, Barke A, Korwisi B, Rief W, Treede RD; IASP Taskforce for the Classification of Chronic Pain. The IASP classification of chronic pain for ICD-11: chronic secondary musculoskeletal pain. *Pain.* 2019;160(1):77-82. doi: 10.1097/j.pain.0000000000001389 ● **Activity (Level 1):** Have the student watch the following videos about pain. Discuss their thoughts on how these videos can be applied in clinical practice with those in pain that may currently be on their caseload. ○ Why Things Hurt, A TedX Talk by Lorimer Moseley (15 minutes) http://www.youtube.com/watch?feature=player_embedded&v=gwd-wLdIHjs ○ Understanding Pain: Brainman Stops His Opioids https://www.youtube.com/watch?v=MI1myFQPdCE ○ Understand Pain. A short animated 5-minute video guide https://www.youtube.com/watch?v=C_3phB93rvI or https://www.youtube.com/watch?v=RWMKucuejIs ○ Tame the Beast https://www.tamethebeast.org/ ● **Formative Assessment**: Have the student accurately use appropriate pain diagnoses within the assessment component of a plan of care. ● **Formative Assessment**: Have the student demonstrate how some of the videos seen above can be used for patient education for current patients on their caseload.
Clinical Performance Instrument (CPI) Alignment	● Accountability ● Cultural Competence ● Evaluation ● Diagnosis and Prognosis

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	• Documentation • Financial Resources
IASP Domain and Core Competency Alignment	• Domain 1, Competency 3

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Dimension: Basic Pain Neuroscience

- It is critical that health care professionals have a strong foundation in the underlying neurophysiological mechanisms involved in somatic, neuropathic, and visceral pain.

Clinical Instruction Details

Clinical Learning Domain and Level	• **Cognitive**: Level 2,3

Sample Clinical Instructor Activities or Experiences
*Please refer to the didactic dimension table for more activities as appropriate.
	• **Activity (Level 2):** Have the student fill out the Neurophysiology of Pain Questionnaire (https://my.evidenceinmotion.com/FreeInfo/Therapists/Revised_Neurophysiology-of-Pain-Questionnaire-3.pdf) and discuss the findings with your student.
	• **Activity (Level 2):** Identify the difference between peripheral drivers of pain and affective drivers of pain (bottom-up vs top-down drivers) and discuss current/relevant patient cases that may involve peripheral vs affective drivers of pain.
	• **Activity (Level 2,3):** Review with the student the meaning of the following terms and how these aspects may manifest in current clinical/patient cases:
	  ○ Nociception
	  ○ Nociceptor
	  ○ Neuropathic
	  ○ Nociplastic
	  ○ Descending inhibition
	  ○ Nervous System Sensitization (peripheral and central)
	  ○ Central nociplasticity
	  ○ Facilitation

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	○ Inhibition ○ Temporal Summation ○ Pain Neuromatrix ○ Pain experience ○ Neuroplasticity • **Activity (Level 2):** Have the student physical therapist watch a video about the rubber hand illusion: https://youtu.be/DphlhmtGRqI. Demonstrate and practice sensory-motor testing (sensory discrimination testing, or local stabilizer activation) with the student and relate this to sensory and/or motor smudging. • **Activity (Level 2,3):** Experiment with temporal summation. Have the student take a pin-tip (from a reflex hammer or sensory testing kit) and apply to their wrist over a period of 60 seconds. Then, have them report a pain rating and discuss what happens with the pain rating over the 60 seconds. Reflect on how this may present in a patient case. If appropriate, apply on a patient and interpret the findings. • **Activity (Level 2,3):** Experiment with central inhibition-conditioned pain modulation by placing a hand in ice water. Record pain ratings with a stimulus pre and post ice water exposure and summarize the response. If appropriate, apply on a patient and interpret the findings. • **Formative Assessment:** Discuss with the student the findings from the Neurophysiology of Pain Questionnaire and how they may or may not be accurate. Discuss further how this may be used with patient care and how this can assist with patient education. If appropriate, apply on a patient and interpret the findings. • **Summative Assessment**: Have the student educate the patient on basic pain physiologic changes and mechanisms that match their pain presentation.

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Clinical Performance Instrument (CPI) Alignment	• Diagnosis and Prognosis • Examination • Procedural Interventions • Educational Interventions
IASP Domain and Core Competency Alignment	• Domain 1, Competencies 2,3

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Dimension: Contributing and Predisposing Factors to Chronic Pain

- The proportion of people living with chronic pain is steadily rising in many countries.
- The development of chronic pain is a complex and poorly understood topic.
- The pain experience is influenced to varying degrees by biological, psychological, and social factors.
- The longer pain persists, the more influenced it can be to psychological and social factors.
- Managing stress, anxiety, and fatigue, as well as pain and physical deconditioning, is often essential to enable patients to follow through with their treatment plan and fully recover.
- Motor planning and motor control impairments can also develop in response to pain and persist long after tissue has healed.
- Neuropathic pain, especially iatrogenic postoperative neuropathic pain, is a common feature of acute pain that transitions to chronic pain.
- Key risk factors in the progression from acute to chronic pain are debated.

Clinical Instruction Details

Clinical Learning Domain and Level	• **Cognitive Domain**: Level 2,3 • **Psychomotor Domain**: Level 3
Sample Clinical Instructor Activities or Experiences *Please refer to the didactic dimension table for more activities as appropriate.	• **Activity (Level 2,3):** Discuss non-mechanical factors that may contribute to pain and disability, such as sensory sensitivity, fatigue, stress, poor pacing, low self-efficacy, kinesiophobia, anxiety, and depression. Identify patients within your current caseload where these factors may be present and contributing to one's pain.

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	• **Activity (Level 2):** Have the student collect relevant patient cases and review screening tools. Consider having the student fill out the questions themselves to experience the tools firsthand. Some examples include:
	  ○ ACR Criteria for Fibromyalgia
	  ○ Central Sensitization Inventory
	  ○ Fear Avoidance Beliefs Questionnaire
	  ○ Orebro Musculoskeletal Pain Questionnaire
	  ○ Tampa Scale for Kinesiophobia
	  ○ Pain Catastrophizing Scale
	  ○ Start Back
	  ○ Insomnia Severity Index
	  ○ STOP-Bang Questionnaire
	  ○ Sleep Hygiene Index
	  ○ Pittsburgh Sleep Quality Index
	  ○ Epworth Sleepiness Scale
	  ○ Pain Self-Efficacy Questionnaire
	• **Activity (Level 2):** Have the student review and fill out the OSPRO-YF tool (https://www.orthopt.org/yf/) and compare to the above tools to consider how this can be implemented into clinical practice.
	• **Activity (Level 2,3):** If there are resources available at your institution such as social work, psychology group exercise classes, massage, or acupuncture, help the student collect the names and contact information for those resources to share with patients and other clinicians.
	• **Formative Assessment:** Discuss with the student the benefits and challenges of using yellow flag questionnaires in clinical practice.
	• **Summative Assessment:** Have the student role-play or apply with a patient the following:
	  ○ Help the patient “make sense of their pain” from a multidimensional perspective and within the context of their own story.
	  ○ Discussion with a patient on the adoption of healthy lifestyle behaviors.

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	(O'Sullivan PB, Caniero JP, O'Keeffe M, et al. Cognitive functional therapy: an integrated behavioral approach for the targeted management of disabling low back pain. *Phys Ther*. 2018;985(5):408-423. doi: 10.1093/ptj/pzy022)
Clinical Performance Instrument (CPI) Alignment	• Clinical Reasoning • Screening • Examination • Evaluation • Diagnosis and Prognosis • Procedural Interventions • Outcomes Assessment
IASP Domain and Core Competency Alignment	• Domain 1, Core competencies 1 & 5 • Domain 2, Core competencies 1-4 • Domain 3, Core competencies 1-4 & 7

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Dimension: Physical Therapist Assessment of Pain

- Assessment of pain requires more than subjective measures of pain intensity.
- Consider the multidimensional nature of pain and capture objective measures of psychological, social and physiological factors, function and disability, and various features of the pain state.
- Quantitative Sensory Testing (QST) uses tools to assess and quantify sensory function in patients with neurologic symptoms, including pain. This testing may include both dynamic and static measures and may assist in determining alterations in nociceptive processing.

Clinical Instruction Details

Clinical Learning Domain and Level	• **Cognitive Domain**: Level 1,2,3 • **Psychomotor Domain**: Level 1,2,3

Sample Clinical Instructor Activities or Experiences
*Please refer to the didactic dimension table for more activities as appropriate.
	• **Activity (Level 1,2)**: Identify instances in the caseload where a patient's pain intensity, character, or distribution do not appear to accurately reflect tissue pathology.
	• **Activity (Level 2,3)**: Discuss alternative ways to assess for pain beyond the numeric pain scale or visual analogue scale (ie, non-verbal assessment tools for persons with dementia and/or other neurocognitive limitations to use of verbal/visual scales).
	• **Activity (Level 2,3)**: Practice mechanism-based pain assessment including:
	  ○ the neurological examination
	  ○ quantitative sensory testing
	  ○ screening for psychosocial factors

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	• **Activity (Level 1-3):** Students should use various quantitative sensory testing assessments. Practice first with the CI and then use with your patients. • **Activity (Level 1-3):** Students should use dynamic quantitative sensory testing assessments and interpret the findings. Practice first with the CI and then use with your relevant patients. • **Activity (Level 2 & 3):** Students can perform quantitative sensory testing in different body regions pre- and post-exercise when working with patients in pain to appreciate systemic vs regional effects of exercise on pain in clinical practice. • **Activity (Level 2,3)**: Download an app (ie, Recognise (Noi Group) or Orientate (Reflex Pain Management Ltd.) for right-left discrimination and have the student review the components of the app. Discuss how to use the app to quantify laterality data. The student may be at a point to demonstrate how to use it with a patient. • **Activity (Level 2,3)**: Print out the radar graph described in O'Sullivan et al's article on Cognitive Functional Therapy for assessing patients with severe or persistent spinal pain (O'Sullivan PB, Caneiro JP, O'Keeffe M, et al. Cognitive Functional Therapy: an integrated behavioral approach for the targeted management of disabiling low back pain. *Phys Ther*. 2018;98(5):408-423. doi: 10.1093/ptj/pzy022). Have the student write out all the measures or examination tools that they can think of for the factor indicated on each ray on the graph. The point is to get them thinking about factors besides the tissues; not to write out every physical test, measure, and treatment they can think of. • **Formative Assessment**: After a patient's history has been taken, take the student out of the room and ask them to relate the patient's history to specific pain mechanisms and work together to plan out appropriate physical examination procedures to perform based on appropriate pain mechanisms.

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	• **Formative Assessment**: Educating patient and family on results of assessment/explanation of chronic pain.
Clinical Performance Instrument (CPI) Alignment	• Examination • Evaluation • Diagnosis and Prognosis • Evaluation • Outcomes Assessment
IASP Domain and Core Competency Alignment	• Domain 2, Core competencies 1-4

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Dimension: Physical Therapist's Role in the Interprofessional Management of Pain

- Pain affects many body systems and thus will require many health care providers in patients with significant pain conditions. Entry-level physical therapy curricula must encompass interprofessional educational opportunities that relate specifically to pain conditions and treatment.
- These experiences should align with the IPEC 4 practice competencies: values/ethics, roles/responsibilities, interprofessional communication, and teams/teamwork.
- Emphasis towards developing the student's professional formation is important. The student must have learning experiences that draw on professional standards and one's moral compass within the context of an interprofessional cohesive team.

Clinical Instruction Details

Clinical Learning Domain and Level	**Cognitive**: Level 1,2,3 **Affective**: Level 1,2
Sample Clinical Instructor Activities or Experiences *Please refer to the didactic dimension table for more activities as appropriate.	• **Activity (Level 1,2)**: Encourage the student to present at an interdisciplinary care conference or rounds if that is possible at the facility. • **Activity (Level 2)**: Attend a patient visit with the student to have them advocate for the patient and communicate rehabilitation needs or considerations. • **Activity (Level 2)**: Have the student reflect on a time where they felt a patient might have been misusing medications and how they might communicate that to the health care team. • **Activity (Level 2,3)**: Have the student attend medical rounds and report on pain related updates or pose questions to the team regarding pain treatment strategies.

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	• **Activity (Level 2,3)**: Have the student spend a day with addiction medicine, social worker, psychologist, or pain physician if that is available. • **Formative Assessment**: Brainstorm with the student about the characteristics of patients who might benefit most from psychological care, from medical care, and from rehabilitation. • **Formative Assessment**: Have the student reflect on a time they communicated with another member of the pain team and how this assisted their role as a PT for patients in pain.
Clinical Performance Instrument (CPI) Alignment	• Professional Development • Clinical Reasoning • Documentation • Diagnosis and Prognosis • Direction and Supervision of personnel
IASP Domain and Core Competency Alignment	• Domain 3, Core competencies 1,2 • Domain 4, Core competency 4

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Dimension: Physical Therapist (Non-Pharmacologic) Management of Pain

- The PT's role in the non-pharmacologic management of pain is essential.
- The PT must use a biopsychosocial approach in the care of those suffering from both acute and persistent pain.
- Although there are a multitude of evidence-based interventions ranging from exercise to graded motor imagery to manual therapy, it is important for the entry-level student to prioritize and reason through a person-centered approach to empower the patient to meet their goals.

Clinical Instruction Details

Clinical Learning Domain and Level	**Cognitive**: Levels 1,2,3 **Psychomotor**: Levels 1,2,3
Sample Clinical Instructor Activities or Experiences *Please refer to the didactic dimension table for more activities as appropriate.	• **Activity (Level 2,3)**: Discuss with the student how evaluating and treating a pediatric patient with pain would be different than evaluating and treating an adult patient in pain, a noncommunicative adult/child, or a marginalized patient population as relevant to the CI's clinical setting. • **Activity (Level 2,3)**: Ask the student to develop a pain management plan for common presentations of nociceptive, neuropathic, and nociplastic dominant pain conditions; encourage them to include breathing and relaxation, body scans, pacing, graded exposure, and TENS, as indicated. • **Activity (Level 1-3)**: The student should perform basic therapeutic pain education for patients with nociceptive, neuropathic, and nociplastic dominant pain. As a brief exercise, ask them to identify the main points they want to hit for a given case ahead of the patient session. There are many videos about this available online for assistance. Here is one suggestion: https://youtu.be/aH9NG1c6mlY

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	• **Activity (Level 1-3)**: The student should educate patients about flare-ups and how to use a flare-up plan. They should develop a flare-up management plan with their patient when appropriate. The "traffic light," from *A World of Hurt* is a good resource on this topic. (Kolski MC, O'Connor A. *A World of Hurt: A Guide to Classifying Pain.* Thomasland Publishers, Inc; 2015.) • **Activity (Level 2-3)**: Watch a video on motivational interviewing (https://www.youtube.com/watch?v=EvLquWI8aqc). Help the student identify 2 or 3 patients that are not meeting therapy goals and have them apply this communication technique with those patients. • **Activity (Level 2 & 3)**: Students can perform a pre- and post-intervention assessment of pain quantitative sensory measures to appreciate the effect of interventions such as TENS, exercise, and manual therapy on pain measures. • **Activity (Level 2 & 3)**: Students can perform quantitative sensory testing in different body regions pre- and post-exercise to appreciate systemic vs regional effects of exercise on pain. • **Activity (Level 1-3)**: Download Insight timer or a similar app and practice some basic meditations. Practice body scans and diaphragmatic breathing. • **Activity (Level 1)**: Suggest that the student use a TENS unit for a period of time using the high and low-frequency setting. • **Activity (Level 3)**: Use NIH Pain Consortium cases (https://coepes.nih.gov/) to stimulate CI case discussion on prognosis and treatment strategies.
Clinical Performance Instrument (CPI) Alignment	• Communication • Clinical Reasoning • Documentation • Evaluation • Diagnosis and Prognosis • Procedural Interventions • Plan of Care

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	• Educational Interventions
IASP Domain and Core Competency Alignment	• Domain 2, Core competency 3 • Domain 3, Core competencies 1-7 • Domain 4, Core competency 4

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Dimension: Medical Management of Pain

- It is essential that entry-level DPT students recognize that physical therapy is part of comprehensive pain management for those suffering from pain conditions.

Clinical Instruction Details

Clinical Learning Domain and Level	**Cognitive**: Levels 1,2 **Affective**: Levels 2
Sample Clinical Instructor Activities or Experiences *Please refer to the didactic dimension table for more activities as appropriate	• **Activity (Level 1-3)**: Have the student spend a day with pain medicine providers--inpatient or outpatient as available at your facility. • **Activity (Level 2-3)**: Have the student perform a research literature review on a common medical procedure for chronic pain seen in your clinic. The student could potentially provide an evidence-based review of relevant literature or develop a handout/pamphlet for patients relevant to the procedure. • **Activity (Level 2-3)**: Brainstorm: what are signs that a patient's pain is not well-managed? What are symptoms or patterns of symptoms that correlate with neuropathic pain or inflammatory pain? • **Activity (Level 2-3)**: Check out the VOMIT (Victims of Medical Imaging Technology - https://www.aptei.ca/product/vomit-radiology-facts-wall-poster/) poster to kick off a discussion about the role of imaging in musculoskeletal care and pain management. (This is easily found via web search.) How does imaging relate to patient education? How does it relate to inter-professional communication with medical providers?

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Clinical Performance Instrument (CPI) Alignment	• Professional Development • Communication • Clinical Reasoning • Evaluation • Diagnosis and Prognosis • Educational Interventions
IASP Domain and Core Competency Alignment	• Domain 3, Core competency 4,5,6 • Domain 4, Core competencies 3,4

Abbreviations: CI, clinical instructor; IPEC, Interprofessional Education Collaborative; PT, physical therapy; TENS, transcutaneous electrical nerve stimulation

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Appendix - Sample Syllabi

Syllabus
PHYT 7755 Pain Science for the Physical Therapist

Instructor: Craig Wassinger, wassinger@etsu.edu

Office Hours: Office hours are Monday and Wednesday 1-3pm via Zoom. Other days and times available by appointment. Zoom office: https://etsu.zoom.us/j/9681247577

Credit Hours: 2

Prerequisites: Successful entry into the 3rd year of the ETSU DPT curriculum

Purpose and Goals

Pain is the primary reason why people seek medical attention. Research has shown that physical therapists are deficient in their understanding of pain. This course addresses noted gaps by introducing students to pain biology, psychology, examination and treatments for both acute and chronic pain.

Provide students with current understanding of the multidimensional nature of pain

Provide an advanced understanding of painful clinical conditions commonly managed with physical therapy

Provide evidence-based assessment and measurement tools for patients in pain

Provide an evidence-based overview of treatment considerations for patients seeking physical therapy for painful conditions

Major Course Topics

The multidimensional nature of pain; pain assessment and measurement; treatment of pain (acute and chronic); common clinical pain conditions treated by physical therapists

Learning Outcomes

At the completion of this course, the student is expected to:

Differentiate between different types of pain as presented by patients
Apply knowledge of basic science of pain to the assessment and management of people with pain
Assess and measure the biological and psychosocial factors that contribute to pain, physical dysfunction and disability using valid and reliable assessment tools
Develop an evidence-informed physical therapy management program in collaboration with the client/patient, directed at modifying pain, promoting tissue healing, improving function and reducing disability
Implement management that includes patient education, active approaches such as functionally oriented behavioral movement re-education approaches and exercise (including pacing), and passive approaches such as manual therapy, and application of electrophysical agents as relevant
Demonstrate an awareness of their scope of practice to evaluate and manage patients experiencing pain using evidenced-based practice strategies for clinical decision-making

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Understand when it is appropriate to refer patients in a timely manner for additional care to practitioners with expertise such as medical and surgical, behavioral and psychological, or pharmacological interventions
Recognize individuals who are at risk for under-treatment of their pain (e.g., individuals who are unable to self-report pain, neonates, cognitively impaired)
Practice in accordance with an ethical code that recognizes human rights, diversity, and the requirement to "do no harm."
Reflect critically on effective ways to work with and improve care for people with pain
Recognize the role of patients in pain to the individual and society
Promote awareness of assessment tool for various common pain conditions

Class Meeting Times

MWF 9:30-12
Jan 20 – Feb 12, 2021

Major Assignments

1) Written Exam: One cumulative examination will be required for this course. This will be an open book exam to be completed individually. The exam will be administered on D2L. There will be a time limit on the exam with an average of 1:30 seconds per question. The exam must be completed at one time.
   Due Date 2/28

2) Pain Neuroscience Education Practical and Reflective Assignment: Students will provide an educational session to someone unfamiliar with pain neuroscience. This can include friends, relatives, spouses, patients, clinical instructors etc. Following the education session the students will have this individual complete a short survey on their thoughts and beliefs regarding the education session. Students will be asked to reflect on the comments in the survey and on their presentation of the information.
   Due Date 4/4

3) Chronic Pain Patient Redesign Assignment: Students will be given a sample case report for a patient with chronic pain including the subjective and objective history and initial interventions chosen. They will be asked to review the included plan of care and revise components based on their understanding of treatment for patients with chronic pain.
   Due Date 5/2

Grade Assignment

Final Examination:	25%
Pain Education:	25%
Chronic Pain Plan of Care Redesign Assignment:	25%
Lecture Based Quizzes	15%

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Participation and Attendance:	10%
	100%

Grading Scale

94.51-100%	A
89.51-94.50%	A-
85.51-89.50%	B+
81.51-85.50%	B
77.51-81.50%	B-
73.51-77.50%	C+
70-73.50%	C
Below 70%	F*

*See Departmental Student Handbook

Attendance Policy

Attendance is important for your success in this (and any) course. Prior notice to the coursemaster is appreciated if you are unable to attend class. If you are unable to provide prior notice, please contact me via email as soon as possible.

> ** I am acutely aware that we are in the midst of a global pandemic. If you have ongoing challenges meeting the needs for this course please set up and appointment and we will work together to ensure your learning needs are met and balanced with other needs. **

Office Hours/Contact Information: I do not have set office hours for this course. Please email me to set up a time meeting. Also, I have a 24-business hour email reply policy. Certainly, feel free to contact me more than once if you have not had a reply in this time period.

Other Information

Assignments: All assignments are to be completed individually unless expressly stated otherwise. All assignments will be turned in using D2L dropbox. Late assignments will be deducted 10% per day late.

Academic Misconduct: Academic misconduct will result in disciplinary action. Acts of dishonesty in academic work that may constitute academic misconduct include but are not limited to plagiarism, the changing or falsifying of any academic documents or materials, cheating and using unauthorized notes, tests or other materials. Penalties for academic misconduct will vary with the seriousness of the offense and may include a grade of "F" for the course or additional disciplinary sanctions. The student is referred to the Graduate Catalog for institutional policies and procedures.

Special Needs Policy: Students are required to report physical and learning disabilities to the Office for Students with Disabilities. At the beginning of each academic year, the student should insure that the paperwork necessary to document their special learning or physical disability has been completed and all the instructors are informed of that need.

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Student Assistance: Counseling services are available to ETSU students. Services are free, confidential, short term, mental health counselling. The counseling center is located in room 345 of the Culp Center, 423-439-4841, counselingcenter@etsu.edu.

In addition to Counseling Services at the Counseling Center, the School of Graduate Studies provides the services of the Graduate Student Success Specialist to graduate students who need assistance in finding campus or off-campus resources to help them in meeting their daily living needs. The Graduate Student Success Specialist is located in Room 462 in Sherrod Library, 439-7062, gradsuccess@etsu.edu.

Recommended Textbook(s)

Kathleen Sluka, Mechanisms and Management of Pain for the Physical Therapist, 2nd Edition, IASP Press, ISBN-10: 1496343239

Required Reading(s)

To be assigned

Bibliography, Recommended Readings, and/or Supplemental Materials

Adriaan Louw, Therapeutic Neuroscience Education: Teaching Patients about Pain, OPTP, 2013, ISBN-10: 0985718641

David Butler, Lorimer Moseley, Explain Pain, 2nd Edition, 2013, ISBN-10: 0987342665

Apkarian AV, Baliki MN, Geha PY. Towards a theory of chronic pain. Prog Neurobiol. 2009 Feb;87(2):81-97. Epub 2008 Oct 5. Review.

Engers AJ, Jellema P, Wensing M, van der Windt DAWM, Grol R, van Tulder MW. Individual patient education for low back pain. Cochrane Database of Systematic Reviews 2008, Issue 1. Art. No.: CD004057. DOI: 10.1002/14651858.CD004057.

Foster G, Taylor SJC, Eldridge S, Ramsay J, Griffiths CJ. Self-management education programmes by lay leaders for people with chronic conditions. Cochrane Database of Systematic Reviews 2007, Issue 4. Art. No.: CD005108. DOI: 10.1002/14651858.CD005108.pub2.

Furlan AD, van TulderMW, CherkinD, Tsukayama H, Lao L, Koes BW, Berman BM. Acupuncture and dry-needling for low back pain. Cochrane Database of Systematic Reviews 2005, Issue 1. Art. No.: CD001351. DOI: 10.1002/14651858.CD001351.pub2.

Green S, Buchbinder R, Hetrick SE. Physiotherapy interventions for shoulder pain. Cochrane Database of Systematic Reviews 2003, Issue 2. Art. No.: CD004258. DOI: 10.1002/14651858.CD004258.

Kendall N, Burton K, Watson PJ, Main C. Tackling musculoskeletal problems: a guide for clinic and workplace. TSO. London 2009.

Moseley, G. L., Nicholas M K, et al. (2004). A randomized controlled trial of intensive neurophysiology education in chronic low back pain." Clin J Pain 20(5): 324-30.

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Persson A L, Veenhuizen H, Zachrison L, Gard G. Relaxation as treatment for chronic musculoskeletal pain: a systematic review of randomised controlled studies. Physical Therapy Reviews.2008;13(5):355-365.

LIVE SESSION PROFESSIONALISM GUIDELINES

1) Keep video on during large and small group discussion so I can see you and you can see who you are working with

2) Aim to have your entire face in the video screen with the camera at eye level while seated

2) Try to find a private space for class. It is ok if you have others (kids, pets, spouses, etc) come into the screen but try to limit your distraction and distraction to others

3) Use a virtual background if you anticipate busy surroundings

4) Limit private chats during the lecture or discussion

5) Feel free to stand up, stretch, etc. as needed

6) Use the mute feature unless speaking

7) It is ok to snack or drink

8) Take a break as needed. Be sure to turn off your camera while away

9) Please wear pants!

Any or all of the information contained in this syllabus is subject to change at the sole discretion of the coursemaster

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Clinical Pain Sciences

PHTH 8147
Fall 2019

TEMPLE UNIVERSITY
College of Public Health

Instructor Information

Instructor: William Egan

E-mail: billegan@temple.edu

Telephone: 215-204-9024

Office Location: 601 Ritter Annex

Office Hours: Mondays 9-12

Course Day(s): Wednesday

Course Time: 8:30-9:50

Course Location: STAR 228

Course Prerequisites or Co-Requisites

Current third year student in the DPT program.

Course Description

One in five individuals within the United States live with persistent pain. Physical therapists are well positioned to take a leading role in addressing the societal and individual burden of chronic pain. This course will equip the physical therapy student with contemporary knowledge and critical thinking to enhance their understanding, assessment, and management of patients with complex and persistent pain disorders. Using a combination of lecture and group discussions/activities this course will build upon foundational knowledge from physiology, neuroscience, psychosocial issues, bioethics, and the clinical management course series. The course will emphasize a person-centered assessment process using a biopsychosocial framework. Students will learn the clinical application of non-invasive, conservative management strategies including: pain education, self-management principles, cognitive behavioral techniques, and graded motor imagery.

Course Technology Requirements

Temple email, Canvas Learning Management System, internet based educational resources.

All students are required to comply with Temple University's Computer and Network Security Policy at https://computerservices.temple.edu/tech-policies.

Course Format/Instructional Methods

Lecture, discussion, small group activities.

On average, over the semester, this course will require approximately 3 hours of your time per week. Please plan to spend approximately 1.5 hours each week reading materials, completing assignments, and watching assigned videos. Additionally, plan to spend an additional 1.5 hours/wk for the scheduled class meeting time

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Course Objectives and Competencies

#	LEARNING OBJECTIVE	DIRECT/INDIRECT ASSESSMENT TOOL
1.	Integrate concepts about the biology of pain into the management of an individual with persistent pain.	Discussion, case assessment
2.	Compare and contrast the prevalence, etiology, and presentation of common persistent pain disorders.	Discussion, case assessment
3.	Identify and utilize appropriate patient-reported assessment tools for individuals with persistent pain.	Discussion, case assessment
4.	Conduct a comprehensive, person-centered examination for an individual with persistent pain.	Discussion, case assessment
5.	Develop a comprehensive, multifactorial assessment for an individual with persistent pain.	Discussion, case assessment
6.	Guide individuals with persistent pain in setting goals, problem solving, and developing a long-term management plan.	Discussion, case assessment
7.	Engage in a person-centered discussion about pain to help individuals understand their persistent pain condition.	Discussion, case assessment, educational handout
8.	Employ cognitive-functional strategies to help individuals move with less pain, gain physical confidence, and improve their fitness levels.	Discussion, case assessment, educational Handout
9.	Apply graded motor imagery for a patient with persistent pain.	Discussion, case assessment
10.	Utilize concepts about the biology of pain to enhance the effectiveness of traditional pain treatment methods.	Discussion, case assessment, educational Handout

Course Materials

Lectures: Lecture materials will be located on Canvas.

Podcasts and videos:

- Lorimer Moseley Pain Video
    - http://youtu.be/gwd-wLdIHjs
- 10 minute Pain Video
    - http://www.pain-ed.com/blog/2016/05/18/a-10-minute-guide-to-understanding-pain-and-what-to-do-about-it/

Readings:

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There will be weekly readings posted on Canvas.

Suggested Books and Websites:

- NOI Group: David Butler and Lorimer Moseley
    - Explain Pain: Book and CE Course
    - Explain Pain Handbook: Protectometer
    - Explain Pain Supercharged
    - http://noigroup.com/en/Home
    - https://bodyinmind.org/
    - https://www.tamethebeast.org/
- ISPI: Adrian Louw
    - Therapeutic Neuroscience Education: Book and CE course
    - Why Do I Hurt?
    - http://www.ispinstitute.com/
- Pain-In-Motion: Jo Nijs
    - Free resources and link to articles
    - http://www.paininmotion.be/
- Tasmanian Pain Booklet
- http://outpatients.tas.gov.au/__data/assets/pdf_file/0003/172578/CSS_-_Physiotherapy_-_Understanding_Persistent_Pain_Booklet.pdf
- Greg Lehman Pain Workbook
    - http://www.greglehman.ca
- Pain-ed
    - http://www.pain-ed.com/
    - Pain-ed youtube channel

Required Course Assignments

Discussion (40% of total course grade): There will be 4 on-line discussions (each worth 10% of total course grade) within Canvas on the week's readings or other course materials. Each student should post their discussion response and respond to at least two other classmates' posts by the due date.

Educational Project (25% of total course grade): Working in groups of 3-4, students will develop an educational resource to be used with patients in the clinic. Guidelines and a grading rubric for this assignment are on Canvas.

Due Wednesday, October 9th

Case assignment (30% of total course grade): Working in groups of 3-4, students will interview an

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individual with a persistent pain disorder. They will develop a written case report of this individual that includes the history, multi-factorial assessment, goals, and proposed management strategies. Guidelines and a grading rubric for this assignment are on Canvas.

Part 1: Due Wednesday, September 25th (worth 15% of total course grade)

Part 2: Due Wednesday, October 30th (worth 15% of total course grade)

Course participation (5% of total course grade): As third year students, you have valuable experiences, thoughts, and opinions to share with your peers. Each week students will have the opportunity to participate in small group activities that will facilitate critical thinking and discussion of key course concepts with their peers. To enhance these activities students should do the assigned readings prior to the course and full and actively engage in the activities. The **DPT student participation rubric** will be used to assess course participation.

Students will lose 5% of the assignment grade for each day that an assignment is completed past the due date.

Grading Scale

93-100 A	87-89 B+	77-79 C+	0-69 F
90-92 A-	83-86 B	70-76 C	
	80-82 B-		

Each assignment will receive a numerical grade and be weighted in the calculation of a final numerical grade as indicated above. Grades with 0.50% or higher will be rounded to the next appropriate whole number. Please refer to DPT Student Handbook for full grading policy.

Policy on Attendance and Participation

Policy on Class Preparedness and Participation

In order to facilitate deep learning and informed in-class discussion, it is expected that students will complete assigned readings and assignments ***prior*** to each week. It is expected that all students will contribute to the class discussions and answer questions displaying an informed knowledge from the reading assignments.

Policy on Absences and/or Lateness

Every student is expected to attend all classes and participate in all group activities associated with class assignments. Every student is also expected to be in class on time as promptness is a professional behavior and only an excused absence or lateness will be permitted. By comparison, any unexcused absence or lateness including the missing of any class prior to a subsequent class in which an exam is scheduled later in that day are subject to penalty. Every faculty member is encouraged to monitor and enforce student attendance in class and therefore has been given the right to deduct points from the overall point value accumulated by a student over that duration of the semester. However, the faculty member must operate within the terms of any attendance or professional behavior penalties identified by the course coordinator in advance and documented within the course syllabus. When an absence is unavoidable, the student should contact the departmental secretary at 215-707-4815 and the appropriate faculty member via email, in accordance with professional courtesy.

If a student plans an absence, the student should notify each and every relevant faculty member as early as possible of the planned absence. If the absence will be for more than one class session in any course, the student should obtain all relevant course materials and review them. Should the student have any

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questions after that time, the student is advised to contact the appropriate faculty member and be prepared to ask specific questions regarding points that remain unclear.

E-mail

To facilitate communication, the university requires you to have an e-mail account ending in @temple.edu. During the semester, I will try to return your e-mail within 36 hours unless I am out of the office or the university is closed. E-mails sent after noon on Fridays will generally not be returned until Monday—please plan accordingly.

Course Minimum Grade

Please refer to DPT Student Handbook.

Incomplete

A student will be eligible for a grade of "Incomplete" only if he/she/they: 1) has completed at least 51% of the work at a passing level, 2) is unable to complete the work for a serious reason beyond his or her control, and 3) files a signed agreement with the instructor outlining the work to be completed and the timeframe in which that work will be completed. The student is responsible for initiating this process and all signed incomplete forms must be sent to the Associate Dean for Academic Affairs prior to the start of study days in that semester. (http://policies.temple.edu/PDF/41.pdf).

Withdrawal from the Course

If a student wishes to withdraw from a course, it is the student's responsibility to meet the deadline for the last day to withdraw within the current semester (www.temple.edu/registrar/documents/calendars/). Please consult the University policy on withdrawals (http://policies.temple.edu/PDF/337.pdf).

Statement on Academic Rights & Responsibilities

Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has a policy on Student and Faculty Academic Rights and Responsibilities (Policy #03.70.02), which can be accessed at http://policies.temple.edu/PDF/99.pdf.

Academic Honesty

According to the University Student Code of Conduct, students must not commit, attempt to commit, aid, encourage, facilitate, or solicit the commission of academic dishonesty and impropriety including plagiarism, academic cheating, and selling lecture notes or other information provided by an instructor without the instructor's authorization. Violations may result in failing the assignment and/or failing the course, and/or other sanctions as enumerated in the University Code of Conduct, which can be accessed at http://studentconduct.temple.edu/policies.

Disability Disclosure Statement

Any student who has a need for accommodation based on the impact of a documented disability should contact Disability Resources and Services (DRS), Ritter Annex 100, (215) 204-1280 or 215-204-1786 (TTY) or drs@temple.edu, to make arrangements. Students requesting accommodations should meet with the instructor as soon as possible after the start of classes to discuss their needs and to provide documentation from DRS. Accommodations are not retroactive.

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Counseling Services

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation. These concerns or stressful events may lead to diminished academic performance and ability to participate in daily activities. Counseling services are available through Tuttleman Counseling Center at https://www.temple.edu/temple-students/health-and-wellness/health-and-counseling

Sexual Misconduct

Temple University is committed to providing a learning and working environment that emphasizes the dignity and worth of every member of its community, free from discriminatory conduct. Sexual harassment is contrary to this commitment and will not be tolerated. Please refer to the University policy on sexual harassment at: http://policies.temple.edu/PDF/366.pdf Additional resources related to sexual harassment and ways in which to report an incident can be found at: http://sexualmisconduct.temple.edu/

Permission to Record

Due to the potentially sensitive nature of class discussions, recording of lectures and guest speakers is not permitted without express permission of the instructor. Recording of lectures as a disability accommodation is permitted, but individual students should speak with the course instructor in advance so that it can be done appropriately and respectfully of all class members. Students may not reproduce, sell or otherwise distribute any recorded materials for purposes other than educational reasons.

Library Resources

Students may request appointments with Librarians, who can provide targeted assistance at all stages of your project - individual or small group appointments are available. Easy access to program specific resources may be found in Library research guides http://guides.temple.edu/hsl.

College of Public Health students should be aware that there are multiple campus libraries available to them. The Health Sciences site (highlights resources typically used by those in the health professions. Find it by clicking on the Health Sciences Libraries link in top left part of the TULibraries webpage https://library.temple.edu/ or go directly there https://library.temple.edu/hsl. You may also connect with a library through the online chat function for assistance: https://library.temple.edu/hsl/ask

Continuity of Instruction in Event of Emergency

Students are to register for the TUAlert System to be made aware of University closures due to weather or other emergency situations. Please go here to register: http://www.temple.edu/safety/. In the event of an emergency, class materials/instructions will be provided via Canvas or zoom. Registered students will be alerted to any alternate testing or submission of assignment rfrom the instructor via email.

General Policies

All University www.temple.edu/grad/policies/index.htm and College of Public Health policies will be upheld. The *Graduate Student Handbook* for the College of Public Health details College expectations: (http://cph.temple.edu/student-handbooks)

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Course Schedule

Week	Topic	Objectives
1 8/28	Course overview and introduction **On-line Discussion due**	1,2
2 9/4	Peripheral nociceptive and neurogenic pain	1,2
3 9/11	Central sensitization **On-line Discussion due**	1,2
4 9/18	Assessment of the individual with persistent pain	3,4,5,6
5 9/25	Therapeutic Neuroscience Education I **Part one of Patient Case due**	1,7,9
6 10/2	Therapeutic Neuroscience Education: II **On-line Discussion due**	1,7,9
7 10/9	Therapeutic Neuroscience Education: III **Pain education assignment due**	1,7,9
8 10/16	Selected Persistent pain disorders **On-line Discussion due**	1,8,9
9 10/23	Cognitive functional therapy	1,7,9
10 10/30	Graded motor imagery **Part two of patient case due**	1-9

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University of South Carolina
Department of Exercise Science, Arnold School of Public Health
Physical Therapy Program

Spring 2021

Course Title: Pain Mechanisms & Treatment

Course Number: PHYT 761

Course Description: This course will address the theoretical models for understanding the basis for pain. Pain assessment and physical therapy pain management will be addressed. Emphasis will be placed on the development of clinical decision-making and problem solving.

Department Offering: Exercise Science, Physical Therapy Program

Credit Hours: Two

Instructor:

Shana Harrington PT, PhD
Board-Certified Sports Clinical Specialist, Manual Therapy Certified
Office101G – Blatt
803-777-9112
sharring@mailbox.sc.edu

Contact Hours: Lecture - 26, Lab - 2

Schedule/Room: Virtual – synchronous, Wednesdays 10:45am-12:35pm

Prerequisites: Enrolled full-time in the professional program with satisfactory completion of all course work to date.

Learning Outcomes (Course Objectives):

At the completion of this course, the student should be able to:

1. Know and apply key pain terms (e.g., pain, primary hyperalgesia, secondary hyperalgesia, referred pain, nociception, allodynia, neuropathic, pain threshold, pain tolerance, conditioned pain modulation, temporal summation). Cognitive Domain [7D11]
2. Identify and understand the multidimensional nature of pain. Cognitive Domain [D18, 7D27h]
3. Recognize the components of the biopsychosocial model (biological, psychosocial, and social) and their influence on the experience of pain across the lifespan. Cognitive Domain [7D39]

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4. Describe the current theories and mechanisms of pain and apply these concepts to pharmacological and nonpharmacological interventions employed to reduce pain. Cognitive Domain ([D20]
5. Explain clinical signs and symptoms in patients in pain to known basic science mechanisms of pain. Affective Domain [7D16, 7D17]
6. Evaluate a person in pain using reliable and valid pain assessments. Cognitive Domain [7D17, 7D19q, 7D31]
7. Selects evidence-based treatment strategies based on the evaluation/assessment of pain (e.g., identifying and treat fear avoidance behaviors). Affective Domain [7D9, 7D11, 7D30]

Teaching Methods and Learning Experiences: Instructional strategies used in this class include: faculty-student interaction, lecture, class discussion, small group discussion, case studies, case presentations, lab session and active learning

Student Evaluation/Grading Breakdown:

Students will be evaluated based on the following academic responsibilities in the course

Exam 1 – 12.5%
Exam 2 – 12.5%
Final Exam 3 – 12.5%
Discussion Board & Voice Thread: 32.5%
Assignment 2: 10% - FAM
Assignment 2: 10% - Pain syndromes
Professionalism/Class participation/Attendance: 10%

Letter grades will be assigned based on the following scale:

A = 89.6% to 100%
B+= 87.6% to 89.5%
B = 79.6% to 87.5%
C+= 77.6% to 79.5%
C = 69.6% to 77.5%
D+= 67.6% to 69.5%
D = 59.6% to 67.5%
F = less than 59.6%

Late assignments will NOT be accepted and will NOT receive credit.
Specific content related to each assignment will be on Blackboard.

Examinations:

Examinations will be administered via Blackboard using the Respondus Monitor and Lockdown Browser. All students will be expected to have a working webcam as tests will be video-monitored within Respondus. In order to access each exam, students must

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download the browser using the link provided. Respondus Lockdown Browser Access:http://www.respondus.com/lockdown/download.php?id=943743695

Assignments

Discussion Board & Voice Thread

There are several interactive discussion board and voice thread assignments that you will need to complete. Further instructions and due dates are included in Blackboard.

Assignment 1: Fear avoidance model. DUE February 22 at midnight via blackboard.

Students will be divided into random groups and will be asked to read the following article:

> George SZ, Zeppieri Jr G. Physical therapy utilization of graded exposure for patients with low back pain. *journal of orthopaedic & sports physical therapy.* 2009;39(7):496-505.

A series of questions (along with the article) will be posted on blackboard for each group to answer based on the article.

Assignment 2: Persistent Pain Health Conditions. (Group Project) DUE via blackboard on TBD by midnight.

Students will be divided into random groups and assigned a pain condition (TBD). Each group will create a pamphlet and include the following:

• Demographics of pain condition- 5 points

- • Background on pain condition- 10 points
  - ✓ Include type of pain (neuropathic, nociceptive, and/or central)
  - ✓ Be able to explain to a patient the underlying mechanisms of their pain
- Evaluation and assessment- 10 points
  - ✓ Two best pain assessment tools and rationale (include copy if new to class)
  - ✓ Other PT issues besides pain that should be addressed
  - ✓ Biopsychosocial (address each of the three categories)
- Physical therapy treatment (evidence-based approach using systematic reviews)- 20 points
  - ✓ Identify how each treatment will work to reduce pain
  - ✓ Be able to justify your treatment to the patient
  - ✓ Be able to justify your treatment to other healthcare providers on the medical team
  - ✓ Include the references (AMA format) of the systematic reviews as evidence of your recommendations

• Other aesthetics, easy to read - 5 points

* For clarification and to parallel the scoring rubric, the pamphlet should have the same headings/titles as the bullet points listed above.

Professionalism/Participation Grade:

Build Rapport: If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let your instructor know as early as possible. As you will find, building rapport and effective relationships are key to

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becoming an effective professional. Make sure that you are proactive in informing your instructor when difficulties arise during the semester so that we can help you find a solution.

Commit to Integrity: As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this class and also integrity in your behavior in and out of the classroom.

In an online learning environment, a positive learning environment relies upon creating an atmosphere where diverse perspectives can be expressed. Each student is encouraged to take an active part in class discussions and activities. Honest and respectful dialogue is expected. Disagreement and challenging of ideas in a supportive and sensitive manner is encouraged. Hostility and disrespectful behavior is not acceptable.

Additional online classroom etiquette

- This is a virtual classroom; therefore, appropriate classroom behavior is expected.
- Log into your class or meeting from a distraction-free, quiet environment.
- Please keep your audio on mute until you want to speak. This will help to limit background noise.
- Close unneeded applications on your computer to optimize the video quality.
- If you would like to speak or answer a question, use the “Raise Hand” feature. Then unmute yourself after you are called on by your teacher.
- When you are speaking, let others know that you are finished by saying something like, “That’s all,” or “I’m done,” or “Thank you,” so that everyone knows you have finished your comments.
- Remember to sign out or “leave the meeting” when the session is finished.

Please refer to the policies & procedure manual for a complete description of professionalism.

Required/Recommended Text(s) and Other Learning Resources:
Required text - Sluka, K. A. (2016). *Mechanisms and management of pain for the physical therapist*. Lippincott Williams & Wilkins.

Online Resources
APTA Pain Management
APTA Safe Pain Management Advocacy
APTA Position Paper: Primary Health Services Enhancement Act

Additional Reference/Resources:

Supplemental readings may be assigned and will be posted in Blackboard.

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Technology Requirements
Online lectures will be provided through Blackboard Collaborate. Therefore, you must have access to the Internet to view/hear lectures. No special software is required. The PowerPoint lecture presentations, links to articles, assignments, quizzes, and rubrics are located on the Blackboard site for the course. To participate in learning activities and complete assignments, you will need:

- Access to a working computer that has a current operating system with updates installed, plus speakers or headphones to hear lecture presentations;
- Reliable Internet access and a USC email account;
- A current Internet browser that is compatible with Blackboard (Google Chrome is the recommended browser for Blackboard);
- Microsoft Word as your word processing program; and
- Reliable data storage for your work, such as a USB drive or Office365 OneDrive cloud storage.

If your computer does not have Microsoft Word, Office 365 ProPlus package is available to you free of charge and allows you to install Word, Excel, PowerPoint, Outlook, OneNote, Publisher, and Access on up to 5 PCs or Macs and Office apps on other mobile devices including tablets. Office 365 also includes unlimited cloud storage on OneDrive. To download Office 365 ProPlus, log into your student (University) email through a web browser, choose Settings (top right corner), and select software. If you have further questions or need help with the software, please contact the Service Desk (https://www.sc.edu/about/offices_and_divisions/university_technology_services/support/servicedesk.php).

Technical Support
If you have problems with your computer, technology, IT-related questions, support, including Blackboard, please contact the Division of Information Technology (DoIT) Service Desk at (803) 777-1800 or submit an online request through the Self-Service Portal (https://scprod.service-now.com/sp) or visit the Carolina Tech Zone (https://www.sc.edu/about/offices_and_divisions/university_technology_services/support/ctz.php). The Service Desk is open Monday – Friday from 8:00 AM – 6:00 PM (Eastern Daylight Time). If you are located in the Columbia, SC area, the Thomas Cooper Library at USC has computers for you to use in case you encounter computer issues/problems. If you are not located in the Columbia, SC area, most regional campuses and public libraries have computers for public use.

Academic Responsibility:
Students enrolled in the DPT program are governed by the University of South Carolina Code of Academic Responsibility which states; *It is the responsibility of every student at the University of South Carolina at Columbia to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. Any student who violates this rule or who knowingly assists another to violate this rule shall be subject to discipline.*

For information regarding the expected professional behaviors in all courses in the Doctor of Physical Therapy program, please go to the DPT Policy and Procedure

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Manual. Deficiencies in professional behaviors that are exhibited in this course will be documented and may result in referral to the DPT Student Success and Progression Committee and the course grade

Attendance:
Students enrolled in the DPT program are expected to attend, and be on time, to all classes unless otherwise excused. To be excused you are to notify the instructor of the course (preferably prior to the absence) to document the reason for the absence. Student absent from a class are expected to obtain the content of the class missed. Students exhibiting a pattern of unexcused absences shall be subject to discipline by the DPT faculty.

Attendance will be taken via Blackboard Collaborate. You will be marked absent if you do not attend each class. This will account for a portion of your professionalism grade (5%). If you are experience wifi issues that is preventing you from attending, please notify Dr. Harrington of these issues the day this occurred.

Ethical Behavior:
Students enrolled in the DPT program are expected to adhere to the ethical standards of the Physical Therapy Profession. The Code of Ethics, adopted by the American Physical Therapy Association, shall be binding on all students enrolled in the DPT Program.

Wearing a face covering and eye protection is required in the laboratory exercise unless otherwise instructed.

DPT Remediation Policy
Please view the Policies & Procedures regarding remediation:
http://www.sc.edu/study/colleges_schools/public_health/internal/documents/dpt_policy_and_procedures_manual.pdf

Remediation Instructions specific to PHYT 761:
You must have an average of 79.6% or above to pass this course. Remediation will be evaluated on a case by case basis by course instructor.

USC Honor Code:
Every student has a role in maintaining the academic reputation of the University. Students are to refrain from engaging in **plagiarism, cheating, falsifying their work, and/or assisting other students** in violating the Honor Code. Two important components of the Honor Code are:

- Faculty members are required to report potential violations of the Honor Code to the Office of Academic Integrity.

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- When a student is uncertain as to whether conduct would violate the Honor Code, it is the responsibility of the student to seek clarification from the appropriate faculty member.

Your enrollment in this class signifies your willingness to accept these responsibilities and uphold the Honor Code of the University of South Carolina. Please review the Honor Code. Any deviation from this expectation will result in a minimum academic penalty of failing the assignment and a referral to the Office of Academic Integrity.

Accommodation of Disabilities:
Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.

If you have registered with and receive accommodations from the Student Disability Resource Center (SDRC) for a course, your faculty member will be notified. However, it is your responsibility to reach out to the faculty member to set up the accommodations. For example, if you have extended test time, you must contact the faculty member at the beginning of the semester (or when accommodation is received) to coordinate alternative test taking times

Social Justice and Diversity:
The Physical Therapy Program seeks to promote social justice and to embrace diversity. All program faculty, supervisors, staff, and students shall maintain respect for differences including, but not limited to, race, ethnicity, sexual orientation, age religion/spirituality, ability, socioeconomic status, and culture. Each person will be responsible and accountable for creating and maintaining a culture of respect at every level of the program.

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Course Outline of Content & Assignment Schedule: (Instructor Harrington)

Date	Module	Topic	Assignments
Jan 13	One: Pain Neuroscience	Introduction. Definitions, Concepts & Models of Pain	Chapters 1 & 2 *Voice Thread:* What is Chronic Pain: https://www.youtube.com/watch?v=gy5yKbduGkc
Jan 20		Peripheral Pathways involved in nocioception. Central Nociceptive Pathways,	Chapters 3 & 4 *Discussion board:* How does your brain respond to pain - Karen Davis: http://www.iasp-pain.org/Education/Content.aspx?ItemNumber=3552 *Discussion Board:* TEDx_Lorimer Mosely – why things hurt: http://www.iasp-pain.org/Education/Content.aspx?ItemNumber=3544
Jan 27		Individual Differences & Pain Variability	Chapter 5 *Discussion Board:* Watch Maley Lecture: https://youtu.be/BEKgT6DSqYA
Feb 3		**Exam 1**	
Feb 10	Two: Pain Assessment & Management	Pain Assessment. Principles of PT practice.	Chapters 6 & 7 *Voice Thread:* It doesn't have to hurt – pain in babies and young children http://www.iasp-pain.org/Education/Content.aspx?ItemNumber=3545
Feb 17		Influences of Nonspecific Pain. Education & Self-Management for Pain control	Chapters 8 & 9 *Discussion board:* TED TALK: Elliot Krane: The mystery of chronic pain http://www.ted.com/talks/elliot_krane_the_mystery_of_chronic_pain.html
Feb 24		Clinical Effectiveness for Self-Management Programs. Exercise Induced Hypoalgesia	Chapters 9 & 10 Assignment: Fear Avoidance Model

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March 2		Interdisciplinary Pain Management. Medical Management of Pain. Psychological approaches to pain	Chapters 14 & 15 *Discussion Board:* What Chronic Pain Has Taught me about Resilience https://youtu.be/mvdPPRETq4w
March 10*		Pain Lab	**This will be held in Blatt 104 from 10:15am – 12:15pm**
March 17		**Exam 2**	
March 24	Three: Pain Syndromes	Pain Syndromes – Myofascial pain, FM, CRPS	Chapters 3 & 17 *Discussion Board:* The Pace of Pain. https://youtu.be/V3gEfdAcO_8
March 31		Pain Syndromes – neuropathic pain, TMD, headache, cancer & pelvic pain	Chapters 18, 19, 20 & 21 *Discussion Board:* APTA Pain Management resource https://www.apta.org/patient-care/public-health-population-care/pain-management
April 7		Pain Syndromes – OA, RA, Chronic low back & neck pain.	Chapters 22 *Voice Thread:* Pain and the brain https://youtu.be/zR-1M95Kthw
April 14		**FINAL EXAM**	
			Assignment: Persistent Pain Health Conditions (group project)

DISCLAIMER: The above schedule in this course is subject to change.

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During the second semester (Spring) of the 1st year they get content related to Pain Education in 3 different courses in our program.

- PHTH 731 – Rehabilitation Neuroscience (this is our basic neuroscience course)
    - We cover lectures on physical and electric properties along with synapses and synaptic transmission, we also cover neuroplasticity and the somatosensory system, autonomic, peripheral nerves, spinal cord, brainstem, cerebrum, and limbic systems that all have small portions that cover some of the nociceptive pathways and signaling.
    - We have on 3 hour lecture dedicated to just pain science specific info. Here are the class objectives for that specific class.
        - Classify the three types of nociceptive transduction mechanisms.
        - Be able to identify the signaling molecules that enhance sensitization.
        - Understand the process of action potential generation and how receptor adaption affects transduction.
        - Describe key points about ion channels and their relation to nociception with therapy patients.
        - Differentiate between first and second pain and the type of nerve fiber associated with each.
        - Identify the spinal cord tracts that relay nociceptive signals and the relation to sensory discriminative and motivational affective components of pain.
        - Discuss the Gate Control Theory and it's relation to therapy.
        - Understand bottom-up brain processing of nociceptive information and the some of the related brain areas involved.
        - Discuss top-down (descending) pain modulation (facilitation and inhibition) processes and their relation to therapy interventions.
        - Differentiate between peripheral and central sensitization and the various potential mechanisms involved with each.
        - Define the various terms within the IASP Pain Taxonomy definitions.
        - Understand the basic mechanisms involved with Referred Pain and Visceral Pain.
- PHTH 718 – Differential Diagnosis and Pathology of Musculoskeletal Disorders
    - We cover Pain Assessment and Types of Viscerogenic Pain Patterns
    - Objectives for the 3 hour lecture period
        - Understand the 3 primary mechanism-based classifications of musculoskeletal pain.
        - Gain knowledge and appreciation for psychosocial aspects of persistent pain.
        - Identify key "yellow flags" in musculoskeletal patients with pain.
        - List key homeostatic output mechanisms involved during pain and list potential treatment options for each.
- PHTH 702 – Physical Agents and Electrotherapy
    - We cover more detailed clinical information regarding chronic and persistent pain (I utilize the EIM PNE course work going through the NPQ). They also get educated on the PNE process and practice the metaphors and explaining pain
    - Objectives for the 3 hour lecture period
        - Understand the difference between pain and nociception
        - Summarize central sensitization and the role of the nervous system in persistent pain states due to central sensitization.
        - Review pain evaluation measurement tools

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        - List the brain areas involved in a pain experience
    - Objectives for the 2 hour lecture/lab day
        - Develop clinical stories and metaphors to explain pain neuroscience to a person in pain.

In their 4th semester, Fall of year 2 in the program. We go over Complex Regional Pain Syndrome and the GMI program

- PHTH 730 Musculoskeletal 1 – Upper extremity MSK course
    - 2 hour lecture/lab objectives
        - Understand the three primary pathophysiological mechanisms involved with CRPS
        - Describe the basic neuroplastic changes in the central nervous system involved with CRPS
        - Provide evaluation of a sensitive nervous system
        - Provide treatment for a sensitive nervous system through a graded motor imagery approach

We also cover neurodynamics within each of our MSK classes for upper and lower extremity and spine.

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