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An Exploration of Current Pain Curriculums and Physical Therapists' Knowledge of  
Pain: Specifically Emphasizing the Psychological Aspects of Pain

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Abstract

In the mid-1990's and 2000's studies revealed inadequacies in pain curriculums and pain knowledge of both occupational and physical therapists. The current study expands on prior studies by examining the physical therapy field specifically using a literature review and two surveys assessing current educational curriculums and physical therapists' knowledge of pain, specifically knowledge of psychological aspects. The study suggests that while there have been improvements in pain curriculums and physical therapists' knowledge, there are still areas that require enhancement. Regarding curriculums, the discussion focuses on course time devoted to pain information, incorporation of the IASP *Core Curriculum* and coverage of psychological issues. Regarding physical therapists' knowledge in practice, the discussion focuses on understanding of psychological aspects of pain, satisfaction with entry level education, and changes physical therapists would implement to pain management and curriculums.

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Pain is the number one reason why people seek medical treatment (J. Mogil, *The Nature and Nurture of Pain* lecture, Oct. 9, 2007). Physical therapists are critical resources to help patients reduce pain, improve physical functioning and return to the daily activities in their lives. However starting in the mid-1990's numerous studies demonstrated that the pain education in physical therapy curriculums was inadequate and practicing physical therapists showed gaps in their knowledge about pain, especially in regards to the psychological aspects of pain. Many of these studies were conducted and published either before or simultaneously with the publication of the International Association for the Study of Pain (IASP) *Core Curriculum*. The concurrent timing of the IASP *Core Curriculum* and studies revealing inadequate pain education and knowledge suggest that in the mid-1990's momentum was building towards enhancing pain education and emphasizing the importance of pain knowledge.

This paper explores if the current state of pain education has changed since the publication of the *Core Curriculum* and if there have been subsequent improvements in the pain knowledge, especially of psychological aspects, among practicing physical therapists. Now that thirteen years have passed since the publication of the IASP *Core Curriculum*, this paper will examine the following topics: if pain curriculums have changed for the better by incorporating the IASP Curriculum; if knowledge gaps have improved among physical therapists; and if physical therapists have a better understanding of and are addressing the psychological issues associated with pain and its management. Research methods in this paper include an extensive literature review and

two surveys collecting qualitative data. This paper will address the current state of pain curriculums in physical therapy schools and pain knowledge among practicing physical therapists with a specific emphasis on knowledge and coverage of psychological aspects of pain.

### Definitions of Physical Therapy

Physical therapists are healthcare professionals who diagnose and treat medical conditions that limit movement and daily functioning in patients of all ages. The physical therapist works with the patient to reduce pain, promote movement, restore function and prevent disability (APTA Background Sheet, 2007). Physical therapists work in a variety of settings like hospitals, private practices, homecare, schools or nursing homes. In order to practice physical therapy, the physical therapist must be licensed by the state he/she practices in and earn a graduate degree from an accredited program (APTA Background Sheet, 2007).

Currently, most physical therapy programs culminate in a Doctorate of Physical Therapy (DPT). Twenty-five years ago, an undergraduate degree, the Bachelor's of Science in PT (BSPT) was the minimum requirement to practice physical therapy. Later the field transitioned to requiring a graduate degree, the Master's in Physical therapy (MSPT). Now in the past five years, programs have switched from awarding a Master's of PT (MSPT) to awarding the DPT degree. Currently of the 199 colleges and universities offering professional physical therapist programs, 79.4% offer the DPT and 20% are planning to convert to this degree (APTA Background Sheet, 2007). The DPT degree takes three years to complete and requires more depth and breadth than the MSPT, according to the American Physical Therapy Association (APTA). The DPT requires

more evidence based research and longer clinical internships, usually consisting of two 18 week long rotations.

Pain reduction is a primary goal of the physical therapy profession. Scudds & Solomon (1995) assert that “physical therapists play a vital role in the management of pain” (p. 78). Dealing with a patient’s pain is an inescapable part of the career. Thus it is imperative for physical therapists to have a comprehensive understanding of pain mechanisms and theories, assessment and management of pain. All of these aspects of pain have both a physical and psychological component. Thus this paper will explore pain knowledge of physical therapists, with a specific emphasis on understanding of psychological risk factors and implementation of psychological interventions for pain management.

#### Definitions of Pain

The most commonly used definition of pain comes from the International Association for the Study of Pain (IASP). Founded in 1973, the IASP brings together scientists, clinicians, health care providers and policy makers to stimulate and support the study of pain and to translate that knowledge into improved pain relief worldwide. Currently, IASP has more than 6,300 members from 108 countries and in 69 chapters ([www.iasp-pain.org](http://www.iasp-pain.org)). The IASP defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (Kolt, 2004, p. 142). This definition is widely accepted because it incorporates both the physical and psychological aspects of pain.

Physiologically, the pain experience is initiated by nociceptors. Nociceptors, present in numerous body tissues, respond to tissue damaging stimuli or stimuli with the

potential to damage tissue (Kolt, 2004, p. 142). Nociceptors are the part of the nervous system which allow for the sensation, transmission and perception of pain. There are four steps of the pain experience: transduction, transmission, modulation and perception. Transduction is the process which turns harmful stimuli into electrical activity of the sensory nerve endings. Next, during transmission, the electrical impulses are sent throughout the sensory nervous system. Noxious stimuli are carried in the central nervous system (CNS) by two kinds of fibers; alpha-delta and C fibers. The alpha delta fibers are small in diameter and myelinated, which allows the current to travel quickly at 5-30 meters/second. The speed of the myelinated fibers results in a well-localized, sharp, pricking pain. In contrast, C fibers are unmyelinated and conduct activity more slowly at 0.5-2 meters/second. C fiber activity leads to a diffuse pain sensation that is dull, aching and persistent. After transmission, modulation occurs, modifying the nerve impulses through the central, cortical and peripheral sensory inputs. Lastly, perception refers to the cognitive and emotional experience of pain resulting from the previous stages (Kolt, 2004, p. 142-3). Psychological processes like cognition and emotion are involved even in the basic physiology of pain mechanisms. This indicates the importance of understanding the role psychological processes play in pain and incorporating psychological interventions into physical therapy treatment.

There are two main types of pain which are relevant to this paper; acute and chronic. Acute pain is due to trauma and is experienced as intense, short in duration and self-limited (Taylor & Taylor, 1998, p. 71). Self-limited pain will stop if the condition producing the pain stops, like when analgesics block the sensory input (Kolt, 2004, p. 147). In contrast, chronic pain is long-lasting, constant, persists long after the initial

injury and is associated with psychological and social elements in addition to physical ones (Taylor & Taylor, 1998, p. 71). The IASP also defines chronic pain as pain that lasts for more than three months (Kolt, 2004, p. 147).

There are two important theories which help explain the mechanisms of pain; gate control theory and the parallel processing model. It is important to note that both of these theories integrate the psychological processes and their effect on pain. Gate control theory asserts that pain ascends from the point of stimulation through afferent fibers in the spinal cord and into the brain. In some circumstances, the brain activates efferent (descending) fibers which modulate the sensation of the pain. The descending fibers act as a gate which controls the feeling of pain. Additionally, the gate control trigger, a mechanism in the nervous system which activates the system, also controls the ascending pain input. The gate control theory incorporates psychological aspects of pain as it posits that psychological processes such as attention, emotion and prior pain experience can act as control gates which influence the perception of pain (Taylor & Taylor, 1998, p. 70).

While the gate control theory incorporates psychological aspects of pain, the parallel processing model goes further in emphasizing the psychosocial elements of pain perception. According to this theory, pain is modulated along two pathways; informational or emotional. The informational pathway deals with elements such as cause, location and sensory aspects of pain. The emotional pathway produces a general state of arousal and an emotional response to pain such as fear, distress or avoidance. With the initial experience of pain, people develop a schema, representing the informational or emotional aspects of the pain experience. When people feel pain in the future, the overall episode will be determined by which pathway is activated. If one

activates the informational pathway and focuses on the sensation or location of the pain, one will experience less pain than if one activates the emotional pathway (Taylor & Taylor, 1998, p. 70-71).

### Assessment and Measurement of Pain

Proper pain assessment is a critical aspect of rehabilitation and patient care. It is imperative that physical therapists understand pain as a subjective experience, meaning the patient is the most reliable judge of pain levels and intensity. There are three main types of pain measurement; self-report, observational and physiological. Self-report measures are most commonly used in clinical practice because they are easy to administer and allow the patient to describe his/her levels of pain. This section will cover only self-report assessments because they are the most frequently used methods by physical therapists and other healthcare professionals. Examples of self-report measures include verbal rating scales (VRS), numerical rating scales (NRS), visual analogue scales (VAS), and the McGill Pain Questionnaire (MPQ).

VRS's consist of verbal descriptors of pain ordered from least to most intense i.e. "no pain" to "severe pain." NRS's use a series of numbers, e.g. 0-10 or 0-100, with "no pain" corresponding to 0 and "extreme pain" corresponding to the highest number. Patients then choose the number that best reflects their pain intensity. The VAS is a 10 cm line where 0 equals "no pain" and 10 equals "worst ever pain." Patients place a mark on the line which reflects their pain level. The VAS is scored by measuring the distance in millimeters between 0 and the patient's tick mark. The main problem with VRS, NRS, and VAS type scales is that they only measure pain on one dimension – intensity.

The McGill Pain Questionnaire is a multidimensional measure consisting of an intensity scale, a pain drawing and descriptor words. The MPQ is useful because it captures the sensory, affective and evaluative aspects of pain. The descriptor words consist of 20 categories of adjectives which describe sensory, affective, evaluative and “miscellaneous” aspects of pain. Five of the twenty categories assess the psychological components of pain. Patients choose the word in each category that best reflects their current pain (Kolt, 2004, p. 151-153). Additionally, the words of each category represent different intensities, where 1 equals “mild” and ranges up to 5 which represents “excruciating” pain. For example, when measuring the affective aspect of fear the available words are “fearful”, “frightening,” “terrifying” (See Box 13 in Figure 1). Fearful is the mild end of the scale and terrifying represents the maximum end of the scale. Since each word is assigned a numerical value, the words can be added up from each category to give a “pain rating index score” (PRI) (Melzack & Katz, 2006, p. 293-295). The pain drawing is used to measure the spatial and temporal dimensions of the pain. Lastly, the MPQ has a present pain intensity (PPI) score measuring the pain intensity at time of questionnaire completion. Overall, the MPQ takes about 10 minutes to complete, which is short considering the wealth of information it provides.

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*Figure 1* Word categories of the MPQ  
(academic.uofs.edu/)

The IASP has also developed axes to help classify pain. The classifications create a common system for describing and assessing pain. There are five axes describing various elements of pain. Axis I refers to the region of pain e.g. lumbar spine or upper limbs. Axis II describes the organ system involved e.g. nervous system. Axis III indicates the temporal characteristics and pattern of pain e.g. continuous pain, limited duration episodes. Axis IV describes the patient's statement of pain intensity and duration since onset e.g. mild with duration of one month. Lastly, Axis V pertains to the etiology e.g. inflammatory, burns, operation. While the Axes system can be applied in research and clinical settings unfortunately the system is not in wide use (Kolt, 2004, p. 148).

## Management of Pain

### *Physical and Manual Interventions to Manage Pain*

Pain can be managed in a variety of ways: through physical and manual therapy, like modalities; non-pharmacological treatments, like cognitive-behavioral therapy (CBT); and pharmacological treatments. Physical therapists use a variety of modalities to treat pain. Temperature modalities (heat and cold) can be used to reduce pain and raise pain threshold. Heat in the form of heat packs or hydrotherapy increases muscle relaxation by decreasing muscle spindle activity, which can reduce pain and spasms. Cold reduces pain and swelling. Heat and cold are rarely used alone but in conjunction with exercise and stretching. Ultrasound is another heat modality which sends electromagnetic energy to the injured area. Ultrasound decreases pain by reducing the conductivity of the C pain fibers (Charlton, 2005).

In conjunction with temperature modalities, physical therapists perform mobilizations, manipulation, and massage. Mobilization refers to the physical therapist using the hands or fingers to handle tissues. It functions to increase range of motion that cannot be achieved through exercise or passive motion. Manipulation is used for spinal adjustment and involves high velocity thrusts or pushing on the injured area and may lead to biomechanical improvements. Both manipulation and mobilization are used for treating pain problems along with education and exercise. Massage involves the use of touch or force to massage soft tissues such as muscles, tendons, and ligaments without causing movement of the joint. When combined with education and exercise, massage is effective at treating acute and chronic spinal pain (Charlton, 2005).

Exercise is a critical aspect of physical therapy that has many benefits for the patient. Inactivity can reduce strength and function of muscles, ligaments, tendons and bones. Physical activity can improve the strength and functioning of these structures. In addition to pain reduction, exercise enhances mood, increases cardiovascular strength and endurance. Stretching exercises performed along with cardiovascular work or weight training can reduce pain, both sub acute and chronic pain, decrease stiffness and improve range of motion (Charlton, 2005).

### *Psychological Interventions to Manage Pain*

From the definitions and theories of pain, we know that pain is associated with psychosocial factors. Kolt (2004) argues that physical therapists are “in ideal situations to provide some form of psychological assistance to aid the rehabilitation process” due to their close relationships with patients and the work they do (p. 156). Though Kolt advocates integration of physical therapy and psychological interventions, he also cautions that physical therapists should not act as psychologists. Rather PTs can teach some basic cognitive skills to patients and also know when to refer a patient to a psychologist for further treatment.

Cognitive-behavioral therapy (CBT) is the most commonly used therapy method to manage pain. CBT addresses the patient’s thoughts and behaviors and tries to reduce pain, change the focus on the pain, and teach pain coping skills. Overall CBT works to make the patient proactive in their recovery. CBT helps patients see themselves as active, resourceful and competent, increase self-confidence and attribute successes internally and helps patients anticipate problems and respond proactively (Turk & Flor, 2006). These

goals can be accomplished through a variety of CBT techniques such as pain reconceptualization, relaxation, imagery, and increasing self-efficacy.

Reconceptualization changes the view of pain as vague and overwhelming to manageable, addressable and controlled. Reconceptualization can also target cognitive errors associated with living with pain. A common cognitive error encountered by the physical therapists in the current study was selective attention. With selective attention the patient will only attend to negative aspects of the situation and ignore any positive ones. For instance, a patient may say “I am not getting better I still have pain,” but the patient may be ignoring positive facts like decreases in pain intensity or improvement in range of motion. Through reconceptualization the physical therapist can address cognitive errors by showing the patient alternative more adaptive ways of thinking and responding which decrease dysfunction and stress (Turk & Flor, 2006, p. 342).

Muscle relaxation techniques reduce by pain by focusing on the muscle tension associated with pain. Pain elicits muscle tension which in turn reduces blood flow and increases pain. Progressive relaxation works by first recognizing the presence of muscle tension through contraction and then relaxing those muscles. Over time with practice, the patient can learn to relax the muscles without having to tense them first. Wallace et al (1971) proposed that muscle relaxation works by reducing sympathetic nervous system activity (as cited in Kolt, 2004, p. 157). Taylor & Taylor (1998) suggest that muscle relaxation can act as distraction by drawing the focus away from pain and onto the pleasant feeling associated with the relaxation. Moreover the relaxation technique provides a feeling of control over the pain. Linton & Melin (1983) demonstrated the utility of incorporating muscle relaxation with traditional physical therapy (as cited in

Taylor & Taylor, 1998, p. 77). In their study, the rehabilitation plus relaxation group had less reported pain, medication use and better overall treatment evaluations than two control groups who did not use relaxation.

Imagery is another kind of distraction technique that can be used in pain management. In one type of imagery, the patient imagines being in a relaxing environment and how it feels to be there, which can distract the patient from the pain. Or the patient can imagine the pain being washed away, exiting the body or cool soothing colors running over the inflamed area. Numerous studies have found that pleasant or soothing imagery are effective ways to reduce pain (Berntsen, 1987; Brown, 1984; Whitmarsh & Alderman, 1993 as cited in Taylor & Taylor, 1998).

The use of psychological interventions has a number of benefits to the patient. By learning positive coping skills like reconceptualization, progressive relaxation or imagery, the patient can increase feelings of control over the pain which increases self-efficacy. Self-efficacy refers to “the conviction that one has about being able to successfully execute the behavior required to produce a certain outcome” (Kolt, 2004, p. 158). Increasing self-efficacy can reduce pain because the patient will have a stronger belief that they can actually do something to lower their pain. Additionally, the patient in less pain can take less pain medication. By controlling the pain through psychological interventions, the patient realizes he/she is in control of the pain and can rely less on an external form of relief like medicine. This feeling of control can also increase confidence and motivation (Taylor & Taylor, 1998).

While CBT can be extremely beneficial to the patient in physical therapy, physical therapists should not perform the job of psychologists. Rather, physical therapy

should aim to integrate CBT into the already established physical modalities and exercises. For instance, usually in the beginning of a session, the patient will lie down in quiet room and apply heat to the injured body part. This quiet time is an ideal situation to practice muscle relaxation or imagery to deal with stress and pain. Or often the stretching, mobilizations, massage or exercises which ultimately help the patient can unfortunately be painful as well. This kind of scenario is ideal for integrating psychological coping mechanisms to manage the pain sometimes accompanied by the physical therapies.

#### *Pharmacological Interventions to Manage Pain*

Lastly, medication is another important way to manage pain. However for analgesics to be successful, the patient must adhere to their medication regime. For instance, if a patient does not take their pain medications, he/she may not be sleeping adequately which can negatively affect pain levels and slow healing processes. Often the physical therapist acts as a liaison between the treating doctor and the patient, so it is important for the physical therapist to be aware of a patient's medication situation. Overall comprehensive care consisting of manual therapies and exercise provided by the physical therapist, medications to help with pain and psychological interventions are all important ways to manage pain.

#### Psychological Aspects of Pain

The psychological aspects of pain covered in the following section were selected for two reasons: 1) they were identified as significant in an extensive review by Linton (2000); 2) they were identified as significant by the physical therapists surveyed in the current study. This section is intended to provide appropriate background and context to understand the implications and meanings of the data discussed later on. Additionally, the

studies discussed here should provide ample evidence supporting the notion the psychology impacts the experience of pain. The section is not intended as an exhaustive list, discussing every psychological aspect of pain. That said this section covers the affective components anxiety, fear, and stress and cognitive components fear-avoidance, pain beliefs and self-efficacy.

### *Affective Factors*

*Anxiety and fear.* Anxiety and fear are closely related affective aspects of pain. Fear and anxiety can encompass many things: patients may fear the after affects of an activity rather than the short term pain during the activity; they may be afraid of relapses in the days following physical activity; patients can also fear re-injury or harm; lastly patients may be afraid of being unable to cope with pain increases during the activity. Pain-related fear and anxiety can lead to psychological and physical dysfunction. Psychologically, patients with high anxiety and fear show hypervigilance towards pain sensations, higher levels of depression, help seeking, and lower levels of pain coping. Physically, patients with anxiety and fear perform poorly on tasks such as lifting an arm weight or trunk flexion and extension (Keefe, Rumble, Scipio, Giordano, & Perri, 2004).

In addition to having multiple dimensions and impacts, pain-related fear may also have multiple origins. If the pain onset occurred after a traumatic injury, fear-avoidance may be more likely to occur (Crombez, Vlaeyen, Heuts, & Lysens, 1999). Additionally, negative affect may be an antecedent of pain-related fear. According to Eysenck (1992), negative affect makes one more vulnerable to the development of specific fears (as cited in Vlaeyen & Linton, 2000, p. 320). Moreover people high in negative affect are also

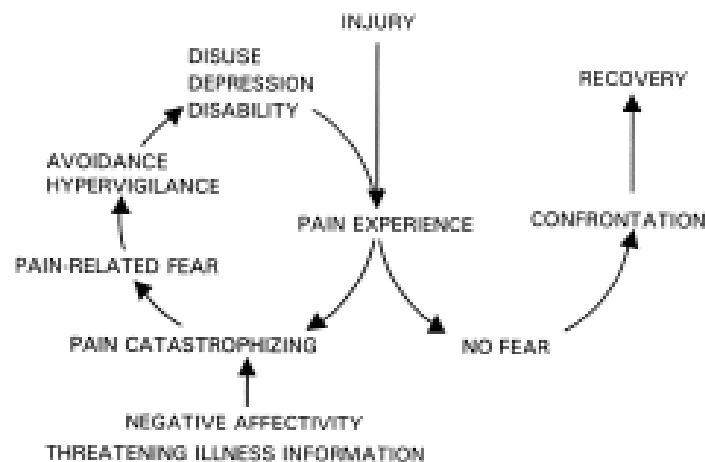
hypervigilant to internal and external threat (Watson & Pennebaker, 1989, as cited in Vlaeyen & Linton, 2000, p. 320).

Crombez et al (1999) explored the effect of pain-related fear in chronic back pain disability by conducting three related studies. The first study found that pain-related fear was a better predictor of disability than pain intensity and general negative affect. In the second study, the expected pain increase from a physical activity was a significant predictor of poor physical performance on the task whereas experienced pain increase during performance was not a significant predictor. The results broadly lend support to the hypotheses that pain-related fear is more disabling than pain itself and that pain-related fear is related to behavioral performance.

*The impact of stress on pain.* Stress is a common problem that can increase pain sensations. The body's physiological reactions to stress help explain why stress can increase pain (Lundberg & Melin, 2002). For instance, when under stress, one tends to hyperventilate increasing blood pH levels while decreasing the amount of CO<sub>2</sub>. High blood pH increases muscle tension and decreases parasympathetic activity, which also makes the muscles more sensitive to sympathetic activity, the pathway responsible for nociception. Stress can also increase the work of the muscle spindles, which are sensory organs in the muscle responsible for coordination of movements and regulation of muscle stiffness. Stress increases muscle spindle activity, which elevates muscle stiffness leading to increases in concentrations of inflammatory substances such as serotonin and bradykinin. This condition creates a feedback loop because it signals to the muscle spindles to become even more active, starting the process all over again. Additionally, the inflammatory substances increase pain sensitivity and pain perception.

### *Cognitive Factors*

*The fear-avoidance model.* Pain-related fear was addressed as an affective symptom relating to disability. However, fear-avoidance, defined as avoidance of movement or activities based on fear can be explained by a cognitive model known as the fear-avoidance model (Vlaeyen & Linton, 2000). In this model, the patient is avoiding fear rather than activity. According to the fear-avoidance model (see Fig. 2), the patient can respond in two ways after an injury; with confrontation or avoidance. Avoidance will occur if pain catastrophizing occurs, meaning the pain experienced after the injury is viewed as threatening. Pain catastrophizing can also be influenced by negative affect and threatening information about illness. The catastrophizing leads to fear, avoidance behaviors and hypervigilance to bodily sensations. Avoiding physical activity leads to disuse, disability and depression which in turn maintain the pain experience, creating a vicious cycle. Alternatively, in the confrontation scenario, the patient who does not develop fear will confront daily activities and rehabilitation leading to recovery.



*Figure 2: The Fear-avoidance Model*

The cognitive model predicts several ways that avoidance can lead to disability (Vlaeyen & Linton, 2000). One, fear causes a basic biological response to escape a threat,

like physical activity. However avoiding daily activities, which one expects will cause pain, can lead to deconditioning and further disability. Secondly, pain-related fear interferes with cognitive functioning. Fearful patients will attend more to threats and focus more on pain-related information. Consequently, other cognitive processes and recruitment of healthy coping mechanisms will not be as available to the fearful patient. Third, the avoidance of activities occurs in anticipation of pain not in response to actual pain. Thus the fearful patient persists in avoidant behaviors because there are few opportunities for the patient to learn which activities actually cause pain and which can be completed with a manageable amount of pain or no pain at all. Finally, avoidance and inactivity lead to disruptions in the physiological systems. For instance, Bortz (1984) found that bed rest led to loss of bone calcium, shortening of tendons and loss in muscle strength (as cited in Vlaeyen & Linton, 2000 p. 324).

*Pain-related beliefs.* Cognitions like patient beliefs about pain have a significant impact on adjustment to pain. Pain-related beliefs impact psychological functioning, physical functioning, coping efforts, pain behavior and pain treatment outcomes (Jensen, Romano, Turner, Good, & Wald, 1999). The Jensen et al (1999) study examined three specific pain beliefs: solicitude (belief in the appropriateness of solicitous responses from family members); disability (belief that one is necessarily disabled because of pain); and harm (belief that pain signifies damage and that exercise and activity should be restricted). Beliefs about solicitude have predicted the use of passive coping strategies (like bed rest) and catastrophizing. Beliefs about disability and harm relate to patients' physical and psychological functioning.

The study results supported the hypothesis that the three specific patient beliefs would predict physical and psychological dysfunction. Moreover after a pain treatment program, decreases in pain and disability were associated with changes in beliefs. Decreases in the belief that pain signifies harm and the belief that pain indicates the need to restrict activity were strongly associated with decreases in pain behaviors, disability and depression after completion of the treatment program.

*Self-efficacy.* While some pain-related beliefs negatively impact the patient other beliefs can help the patient manage pain. Self-efficacy is a pain-related belief that can improve pain tolerance. Self-efficacy is defined as “confidence in [one’s] ability to engage in a course of action sufficient to accomplish a desired outcome, such as the control of [one’s] pain” (Keefe et al, 2004, p. 198-9). Patients reporting higher self-efficacy report lower levels of pain, psychological distress and negative medical outcomes (Buckelew et al, 1994; Buescher et al, 1991; Keefe et al, 1997 as cited in Keefe et al, 2004, p. 199).

Clearly psychological factors have a significant impact on the patient’s pain experience. Unfortunately many aspects of pain, including the psychological, are misunderstood and do not receive the attention they deserve from the health professions. The International Association for the Study of Pain (IASP) was founded in response to the challenge of pain and to enhance research and understanding of this complicated topic. The next section will cover the goals of the IASP, the publication of the IASP *Core Curriculum* and the implications for the field of physical therapy.

### The IASP *Core Curriculum*

Founded in 1973, the IASP brings together scientists, clinicians, health care providers and policy makers to stimulate and support the study of pain and to translate that knowledge into improved pain relief worldwide. The IASP responds to the challenge that pain poses to the patient, healthcare professional and researcher ([www.iasp-pain.org](http://www.iasp-pain.org)). Part of the IASP's mission is to research and distribute guidelines for education about pain. A *Core Curriculum* has been developed and includes discipline specific sections for medicine, dentistry, pharmacy and physical and occupational therapy. *The Core Curriculum for Professional Education in Pain, 3rd edition* was published most recently in 2005. It is available for sale and for free online through [www.iasp-pain.org](http://www.iasp-pain.org) because “the Web [is] an ideal way to bring timely and rapid updates of this curriculum to the widest possible audience. [The IASP] hopes that this resource can become a dynamic and freely available asset for anyone with an interest in pain” ([www.iasp-pain.org](http://www.iasp-pain.org)). By making the *Core Curriculum* available for free online, the IASP demonstrates its commitment to improving education and knowledge of pain among healthcare professionals, including physical therapists.

The *Pain Curriculum for Students in Occupational Therapy (OT) and Physical Therapy (PT)* was first published in December, 1994. The 1994 version is also available online through [www.iasp-pain.org](http://www.iasp-pain.org). The curriculum was developed to address the lack of courses which cover the multi-dimensional nature of pain in adequate depth. With input from physical and occupational therapists around the world, the curriculum was designed to “provide the entry level student with a deeper understanding of the nature of pain which will lead to more effective treatment of the pain patient” (Scudds & Solomon,

1995, p. 78). The curriculum can be incorporated into any educational program in the world and is designed to run over two semesters in the students' final year. The curriculum is versatile and can be used in a variety of ways. For instance, physical therapy programs can "[adopt] this curriculum outright, modify it as necessary for local needs or translate it for local dissemination" (*Outline Curriculum on Pain for Students in Occupational Therapy (OT) and Physical Therapy (PT)*, 1994). As a comprehensive outline of the many aspects of pain, the *Core Curriculum* is an invaluable resource for educational programs.

The *Core Curriculum* for physical therapists emphasizes the importance of understanding psychological aspects of pain. The *Core Curriculum* clarifies the roles and responsibilities of the physical therapist which include promoting well-being of the patient through pain prevention and management, and "being able to recognize the numerous misconceptions that prevail about pain and people with pain and be able to refute and challenge their existence" (*Outline Curriculum on Pain*, 1994). Moreover, in order to carry out "their professional responsibilities," physical therapists "must have a understanding of the physical, psychological, and environmental components of pain and their impact on the pain experience" (*Outline Curriculum on Pain*, 1994). The IASP clearly believes that understanding of psychological aspects of pain is critical part of the therapist's education, and responsibilities as a healthcare professional.

It is encouraging that the IASP *Core Curriculum* emphasizes the importance of psychological pain aspects however its success as teaching physical therapy students about those psychological concepts is also critical. A study by Watt-Watson et al (2004) support the Curriculum an effective method of distributing pain information. The

University of Toronto developed a 20-hour undergraduate pain course based on the information in the IASP *Core Curriculum*. Seventy-three physical therapy students and students from other health professions took the Pain Knowledge and Beliefs Questionnaire (PFBQ) to establish a baseline of knowledge. The score before taking the course was an average 66% correct. After the course the average was 83% correct. In addition to improvements on the PFBQ students also evaluated the pain course as positive and 74% of the sample said the course met or exceeded their expectations. This study supports the IASP *Core Curriculum* as an effective way to organize and present pain knowledge and lends support for its integration into physical therapy educational programs.

#### Physical Therapy Curriculums and Psychological Aspects of Pain

The following studies examined occupational therapists instead of physical therapists as I could not find curriculum studies based on physical therapists. However these studies are still relevant because occupational and physical therapists are similar in their needs regarding pain education. This similarity is indicated by the IASP *Core Curriculum*, which provides the same pain information for both occupational and physical therapists. Occupational therapists focus more on the impact of pain in the occupational setting and help people lead productive lives despite the presence of pain (*Core Curriculum*, 1994). Overall the studies indicated the need for enhanced pain education for occupational therapists and by extension physical therapists. The current study will extend these findings by examining physical therapy curriculums specifically instead of occupation therapy programs.

Unruh (1995) found that fourth year occupational therapy students showed significant pain knowledge deficits, especially about the psychological aspects of pain. Unruh conducted her study at the School of Occupational Therapy at Dalhousie University, Nova Scotia from 1991-1993. Students participated in a 36 hour elective pain course in the last six weeks of their education program. The study surveyed students with the Pain Knowledge and Attitudes Questionnaire before the pain course began to assess baseline pain knowledge. After the six-week course, students completed the same questionnaire in the final class to determine the impact of an elective pain course on subsequent learning.

Prior to taking the pain course, students scored an average of 53% correct and after the course scored an average 86% correct, indicating significant improvement. On average, students improved 19 points after finishing the course. Overall students scored highest on physiological understanding of pain and demonstrated more limited understanding of psychosocial components and cognitive-behavioral strategies. Unruh's study is important because it reveals the need for an improved pain curriculum which adequately provides pain information, especially on the psychosocial aspects of pain and psychological interventions, like CBT.

A follow-up study by Strong, Tooth, & Unruh (1999) conducted in 1996 supports Unruh's original results and indicates the need for enhanced pain curriculum. The Strong et al (1999) study explored whether there was a need for a pain specific course or whether directed exposure to pain information was adequate to educate occupational therapy students about pain. Directed exposure refers to general material regarding pain management taught throughout the curriculum and a small group visit to a hospital. The

Strong et al study used a revised version of the Pain Knowledge and Attitudes Questionnaire from the original Unruh study to survey occupational therapy graduates of the University of Queensland, Australia. The Australian students had comparable scores to the Nova Scotia students *before* they had taken the elective pain course. Without the pain course, Canadian students scored correctly on 53% of the survey. Australian students who also had not taken a course devoted to pain scored correctly on 56% of the survey. The results suggest that generic pain management information and small hospital visits are not adequate educational techniques to meet the standards of the IASP. Moreover, Canadian students who completed the elective pain course improved their scores from 53% correct to 86% correct. The Australian students who were not offered a course were unable to demonstrate the same level of pain knowledge as the Canadian students who completed a pain course. These results support the utility of focused pain education in specific pain classes or lectures rather than spreading pain information and discussion throughout the curriculum.

The Strong et al study supplemented the Pain Knowledge and Attitudes Questionnaire results with qualitative data from six occupational therapy graduates in 1996. The small sample size limits the generalizability of the results but the interviews still provide important data regarding pain curriculum and knowledge. The six therapists ranged in their feelings of preparedness to deal with patients' pain from "adequately prepared" to "not very well prepared" indicating the need for a course on pain. Moreover all therapists felt that the inclusion of a pain specific course was a good idea and five of the six therapists expressed interest in a graduate level pain course.

Overall the Strong et al study supports the need for a specialized pain course offering integrated pain knowledge. A pain focused course may “facilitate consolidation of pain knowledge and attitudes. Such consolidation may be more difficult if pain is spread out” (Strong et al, 1999, p. 227). The Strong et al study is valuable because it demonstrates the utility of qualitative data. Although only six participants responded, their answers nonetheless provided important descriptive data assessing the state of pain education in the mid-1990s. In the same way, the current study provides important data assessing the current state of pain education and knowledge among physical therapists in 2007.

While the Strong et al (1999) surveyed Australian and Canadian students, there are also studies of American pain curriculums. Rochman (1998) examined occupation therapy students taking a pain course at four American universities in the 1996-1997 academic years. The pain courses were incorporated into required classes about pathology, physical disabilities or clinical reasoning. A pain survey was administered before the class started, prior to any discussion about pain. The survey consisted of ten common myths concerning the assessment of pain. Students determined whether the statements were true or false, but every statement was false. For example, the statement “Pain is largely an emotional/psychological problem” is false. However, only 51% of the sample correctly identified the myth as false.

Overall the mean score of the survey was 61% correct and the number of correct answers ranged from 0-100%. The results of the study indicated “the need for organized efforts to improve pain knowledge among entry level occupational therapy students” (Rochman, 1998, p. 140). There are many troubling implications of this study. Firstly, the

students in the sample were in their final year of education, getting ready to enter the field as practicing occupational therapists. Unfortunately, the study suggests that these students are entering the field without adequate pain knowledge. For instance, for five of the ten myths, only 53% or less of the sample correctly identified them as false.

The Rochman study demonstrated that the students in this sample were unable to identify common pain myths and therefore are obviously unable to refute or challenge the existence of such myths. Yet the IASP states that a primary responsibility of both the occupational and physical therapist is “to recognize the numerous misconceptions that prevail about pain and people with pain and be able to refute and challenge their existence” (*Outline Pain Curriculum*, 1994). Like the Unruh (1995) study and the Strong et al (1999) study, Rochman also reveals that pain curriculums in the mid-1990’s were falling short of the IASP guidelines.

Studies have demonstrated the physical and occupational therapy students lack pain knowledge. No doubt these studies demonstrate the need for improved pain curriculums. However, perhaps practicing physical therapists make up for knowledge gaps about pain through continuing education courses, on the job training, or mentoring from co-workers. The next section examines the pain knowledge of practicing physical therapists and how physical therapists manage pain in the clinical setting.

#### Physical Therapists’ Knowledge of Pain in Practice

The current study will now examine the effect that physical therapy schools have had on their graduates. Current studies examining practicing therapists’ pain knowledge and attitudes suggest that gaps in pain knowledge remain in spite of experience gained on the job. Wolff, Michel, Krebs & Watts (1991) examined not only pain knowledge among

physical therapists but also attitudes because “difficulties in treating patients with pain are compounded not just by lack of knowledge but also by behaviors that are guided largely by attitudes” (p. 208). Wolff et al received surveyed 119 members of the American Physical Therapy Association (APTA) with the Chronic Pain Knowledge/Attitude Test. The test is designed to evaluate physical therapists’ knowledge and attitudes toward treating patients with benign chronic pain.

Regarding the understanding of psychological factors, the results of this sample are somewhat positive: 73% of respondents understood that pain severity may not correlate with severity of the tissue damage; 53.9% met the criterion score (an 80% or higher on the test’s section) for recognizing pre-morbid factors; 67.2% met the criterion score for identifying psychological responses; and 66.4% met the criterion score in willingness to address psychological issues. Admittedly, these percentages could and should be much higher but it is promising that in all three categories over half of respondents met the criterion score.

Despite moderately positive results regarding psychological aspects of pain, the study still shows that 75% of the sample did not feel their entry-level pain education was adequate. In fact only 2.9% of the sample felt that graduate level education was the most useful source on pain management and pain theory information. Graduate level education was the lowest ranked category behind on the job training, salesperson/other, reading current literature, professional colleagues and continuing education. Inadequate knowledge may contribute to poor attitudes towards pain patients. Indeed, less than 8% of the sample met the criterion score on the attitude component of the test. The majority

of the sample preferred not to work with a chronic pain patient and 75% believed that physical therapy was not beneficial for chronic pain.

Like the curriculum studies, the Wolff et al study suggests that there is inadequate entry level education about physical and psychological pain mechanisms. However Wolff et al extend the curriculum findings and suggest that inadequate knowledge was also present in clinical practice. The authors suggest that continuing education programs could successfully address the inadequacies of pain knowledge in the population of practicing physical therapists who have already graduated from entry level programs.

Granted while the Wolff et al study has important implications for practicing physical therapists, it was published in 1991 before the development of the IASP *Core Curriculum*. However, a more recent study by Overmeer, Linton & Boersman (2004) also found limits in pain knowledge of practicing physical therapists. The Overmeer study had 102 Swedish physical therapists rate physical, psychological, and social risk factors in terms of their importance for acute back pain. The Swedish Council on Technology Assessment in Health Care distributed an evidence based review on neck and back pain. The review found that psychosocial factors have a greater impact on disability than physical ones and those psychosocial factors are strongly linked to the transition from acute to chronic pain. The Overmeer study sought to determine if physical therapists knew which risk factors for development of chronic pain were supported by the evidence based review.

In the survey mailed to physical therapists, a total of 27 factors were listed; 10 physical factors, nine social factors; and eight psychological factors. Only two of the nine social factors, six of the eight psychological factors and none of the ten physical factors

were supported by the evidence based review as established risk factors for developing chronic pain. The evidence supported psychological risk factors included perceived stress level, distress/anxiety, depression, coping strategy, thoughts about the cause of pain and fear-avoidance. The factors without evidence based support were a pain prone personality and pronounced pain behavior. Subjects rated each factor on a four-point Likert scale (1 = not important to 4 = very important). The study also assessed the practice behavior of physical therapists regarding sick leave and instructions on activities and pain relief.

The results showed that over half the sample rated 17 or more risk factors as important when only eight risk factors were actually supported by evidence. While the sample did indicate all of the eight evidence based factors as important, unfortunately they also included a median of ten additional factors that were not evidence supported. Regarding psychological components, all the risk factors were indicating as contributing to chronic pain including the two factors, pain prone personality and pain behavior that were not supported by the evidence. These results indicate that physical therapists are aware of the importance of psychological factors but lack clarity about which ones are important. Additionally, the most frequently indicated risk factors were pain prone personality and pronounced pain behavior. Both of these are psychological risk factors that are not supported by the evidence based review. This finding indicates that proper information about psychological risk factors may not be covered in physical therapists' education, explaining why they have difficulty knowing which psychological factors are important.

Despite their misinformation, 43% of physical therapists believed they could predict which patients would develop chronic pain. While it is critical for physical

therapists to be able to screen patients for psychosocial risk factors, they must be screening for the correct ones. Without proper information and education, the physical therapist will not be able to properly screen for the patients who may be at risk for developing chronic pain. This study demonstrates how inadequate pain knowledge can lead to negative consequences for patient care.

In light of distressing results from the mid-1990's and early 2000's regarding pain education and knowledge, the current seeks to assess the current state of pain curriculums and knowledge of practicing physical therapists. Moreover, all of the curriculum studies examined occupational therapy schools rather than physical therapy schools. By looking at exclusively at physical therapy programs, the current study will try to determine if physical therapy schools have the same inadequacies regarding pain knowledge as occupational therapy education.

#### Qualitative Data Regarding Physical Therapy Curriculums and Clinical Practice

The current study conducted two separate surveys describing the current state of physical curriculums and the pain knowledge of practicing physical therapists. The first survey explored the place of pain education in the overall physical therapy curriculum, specifically looking at coverage of psychological aspects of pain. The second study examined attitudes and knowledge of pain, specifically psychological aspects of pain, among currently practicing physical therapists. Although the small sample sizes limit the generalizability of the findings, the results may help identify recent trends which warrant further and more rigorous study to determine if there have been material changes and improvements since studies in the mid 1990's and early 2000's and since the publication of the *IASP Core Curriculum*.

*Qualitative Data Regarding Curriculums: Method*

*Participants.* Universities offering an entry level Doctorate of Physical Therapy (DPT) degree program that were ranked in the top ten by US News and World Report in 2007 were contacted to take part in the study. Later, four additional schools that were not ranked were added to increase the number of participants. A total of 16 schools were contacted. For each school, the director of the entry level degree program was contacted in addition to one or two full professors. Of the nine schools who responded, eight were ranked in the top ten and one school was unranked.

*Procedure.* The questions were generated after researching background articles on curriculum development in physical therapy education programs. The number of questions was limited to three, in the hope of increasing response rate. Email addresses of subjects were obtained from the universities' websites. The survey consisted of three questions: 1) How many course credits or hours are devoted to pain education; 2) do you incorporate the International Association for the Study of Pain (IASP) *Core Curriculum* into your physical therapy education? Why or why not; 3) What (if any) improvements or changes would you implement to your curriculum regarding pain education. Subjects were sent an email explaining the context and purpose of the study which was to examine physical therapists' knowledge of the psychological aspects of pain. Professors were assured that individual names and the school's name would not be used in the final paper (See Appendix A for an example email and survey). If individuals did not respond within three weeks, a reminder email was sent. Also after three weeks, due to low response rates four additional schools were contacted in the attempt to increase sample size.

*Qualitative Data Regarding Curriculums: Results*

The response rate in regards to institutions was 56% as nine of the 16 schools contacted were represented by the responses. In all 36 individuals were contacted resulting in 10 usable responses for a 27% response rate (10 responses/36 individuals contacted). There were 10 usable responses representing nine schools, meaning that one school had two individuals reply. Some professors did respond but were unable to answer the questions because they conducted only research and were not involved in teaching, referred me to another person better suited to answer the questions or were on sabbatical from the school. These unusable responses were recorded as no response. Responses were numbered 1-10 and responses #7 and #8 represent the same institution.

The 10 individuals who responded had a total of five different advanced degrees; there were eight PT degrees, four DPT degrees, five PhD's, two Doctors in Education, and one MBA. Note that the PT degree represents an undergraduate degree that licenses an individual to practice physical therapy. Currently the DPT is the minimum degree required to become a physical therapist. In the case of three DPTs in this sample, the subjects had both a PT and DPT, meaning they had returned for more schooling to earn a DPT degree in addition to the PT degree.

*Results regarding Question One: How many course credits or hours are devoted to pain education?* There were 10 usable responses to question one, however eight participants indicated the number of hours spent on pain education and two respondents indicated the number of courses devoted to pain. Of the eight that indicated hours, an average of 24.56 hours were spent on pain education. The number of hours ranged from 1

hour to 100 hours. In light of such a large range, the median may be more representative of sample than the average. The median was 21.25 hours.

No programs have a course devoted solely to pain information. All programs indicated that pain comes up in numerous classes and discussions throughout the three year curriculum. Four schools said that psychological aspects of pain were covered in the curriculum. Two programs said that psychology of pain was not addressed at all and the remaining three schools did not confirm whether or not psychologically aspects of pain were addressed in their curriculums.

*Results regarding Question Two: Do you incorporate the International Association for the Study of Pain (IASP) Core Curriculum into your physical therapy education? Why or why not?* Four programs indicated they did use the IASP *Core Curriculum*. Two of these four programs did not teach the *Core Curriculum* verbatim; rather they used certain pieces of the Curriculum for specific classes. This was coded as “Yes” for incorporating the IASP guidelines into pain education. One respondent was unsure whether the program used the *Core Curriculum*. Four schools said they did not use the *Core Curriculum*. Three cited the reason they did not use the Curriculum was because they had never heard of it.

*Results regarding Question Three: What (if any) improvements or changes would you implement to your curriculum regarding pain education?* Only two schools of the nine said they would want to make changes. School #1 said: “Looking at the arrangement of the pain content I would like to deal separately with acute pain and more chronic pain based on evidence. We are in the process of making this change within our curriculum.” School #2 said it would want to “spend more time on chronic pain and its management.”

Three respondents did not answer the question. Five respondents said they would not implement any changes in the curriculum. See Table 1 for a summary of all the respondents' answers.

Table 1: Summary of Curriculum Data

School	Hours/Credits spent on pain	Single course for pain?	Psychology of pain addressed?	Use IASP Core Curriculum?	Make changes to pain education?
#1	10 h	No	Yes (3 h)	Unsure	Yes
#2	20-25 h	No	n/a	Yes	Yes
#3	20 h	No	n/a	No	No
#4	11 h	No	No	Yes	n/a
#5	1 h	No	Yes	No	n/a
#6	100 h	No	Yes	No	No
#7*	1 course	No	n/a	Yes	n/a
#8*	1/3 of all courses	No	Yes	Yes	No
#9	2 h	No	n/a	Yes	No
#10	2 h	Yes	No	No	No

\* note that #7 and #8 represent the same school.

### *Qualitative Data Regarding Curriculums: Discussion*

The results provide pertinent information to understand the current state of physical therapy curriculums and their handling of pain education. The response rate was adequate given the small sample size for the survey. Fifty-six percent of the schools contacted were represented in the final analysis. It is encouraging that physical therapy education programs were willing participants in a study like this. The brief nature of the survey, consisting of only three questions probably increased the response rate.

*Number of hours devoted to pain information.* In regards to question one, the wide range of hours devoted to pain information is interesting. One program posits spending up to 100 hours while three schools indicate they spend only one or two hours on pain.

Many participants indicated that it was difficult to estimate how many actual hours were spent discussing pain because the subject of pain comes up in many courses throughout the curriculum. Thus the range may be due to calculation errors on behalf of participants.

Perhaps what is more telling about the place of pain education within physical therapy curriculum is that no programs have a specific class devoted entirely to pain. School #10 indicated that their school has a two hour lecture given by a pain specialist. School #7/8 has a single class devoted to pain mechanisms within a Neuroscience course. While it is inevitable that pain will come up throughout a physical therapy curriculum, it is troubling that so few programs in this sample offer a pain specific course. Without adequate time to cover the many dimensions of a complex topic like pain, it is likely that students will miss out on in depth information and sound understanding of pain.

Indeed recall that the Strong et al (1999) study found that Australian occupational therapy students who received general pain information throughout the curriculum showed significant gaps in pain knowledge. These Australian students performed significantly worse on the Pain Attitudes and Knowledge questionnaire compared to Canadian students who had taken a comprehensive pain course. Moreover the pain elective pain course created based on the IASP guidelines was a total of 20 hours. Comparatively half of the schools in this sample spend less than 20 hours on pain education. The course created by following IASP guidelines was at least 20 hours, thus it seems doubtful that spending less time than that could adequately cover the material suggested by the IASP. Overall the findings of Strong et al (1999) make it even more distressing that no schools in our sample offer a pain course despite support from the literature to do so.

*Coverage of psychological components of pain.* Concerning psychological aspects of pain, four programs indicated that they discuss psychological aspects of pain. School #1 said within their 10 hours dedicated to pain issues, three hours cover psychological aspects. While the actual number of hours is few, it is still encouraging that almost one-third of those hours are spent on psychological aspects of pain. School #5 gave a conflicting answer that was difficult to code: “We do not have specific content on the psychological aspects of pain. I do have content (about an hour) on acute vs. chronic pain and the psychological aspects of chronic pain syndromes.” School #7/8 has a course focusing on communication and interacting with “people in distress, who are ill, in pain and are angry or depressed, or dying, and how to bring comfort and help them deal with their pain more effectively. This course focuses on the psychology and philosophy of pain and distress.” This course addresses the affective components of pain and teaching people in distress effective coping mechanisms. School #7/8 also has a “Complementary Therapies in Rehab” course that discusses energy medicine and holistic approaches to pain management like acupuncture, massage and biofeedback and many others.

School #7/8 also indicated that one-third of their curriculum covered pain information. By devoting more time to pain education, this school seems teach pain information in greater depth (i.e. they were one of the few to cover alternative pain treatments and coping strategies). However, the response did not indicate whether the communication class or complementary therapies course were mandatory classes or electives. While both teach pertinent and important information, if they are optional then obviously every student will not necessarily have access to such information. Often

courses devoted to specifically to pain are electives and without taking the elective, the student has no other avenue for in-depth coverage of pain.

School #6 indicated spending 100 hours in pain education, the most of all responses, and within these hours covered symptom magnification (catastrophizing), culture and response to pain, spirituality and pain, relaxation, acupuncture, acupressure and breathing patterns. Like school #7/8, more hours devoted to pain creates room for covering topics like psychological aspects of pain and alternative pain management techniques. Notably, school #6 overhauled their curriculum when switching from the MSPT to the DPT degree. During this transition they tracked their pain content across the curriculum and enhanced the content on pain throughout. In this sense, the change from an MSPT to DPT degree program allows for more in depth coverage of many topics including pain and psychological aspects of pain. By having more hours devoted to pain, the curriculum in turn allots more time for aspects pain and pain management that usually get brushed over or ignored like the psychological aspects of pain and alternative non-traditional treatments for pain. One can see from schools #6 and #7/8 that dedicating a greater number of hours to pain allows for a greater depth of coverage.

However, it is important to note that three programs did not list what was covered in their pain information nor indicated directly whether psychological issues are addressed. Thus for three schools the results do not indicate an affirmatively or negatively if psychological aspects of pain are covered. The two schools that were coded as “no” in this category specifically said that psychological issues of pain were not addressed in their curriculum. Thus it is possible and hopeful that had more school listed the aspects of pain covered in the curriculum, then more of the sample would be covering

psychological issues. These results stem from a methodological error. Question One did not specifically ask what was covered in the pain curriculum or whether psychological issues were addressed, it only asked for the number of hours covering pain. A follow up study should ask specifically if psychological aspects of pain are covered.

*Use of IASP Curriculum.* It is distressing that four schools do not use the IASP curriculum and three said they had never heard of the *Core Curriculum*. Clearly there are problems in the dissemination of information from the IASP if three programs ranked top 10 in the country had not even heard of the *Core Curriculum*. School #1, the only unranked, was unsure if their program used the *Core Curriculum*. It is unclear why three programs that are supposedly leaders in physical therapy education have not heard of the IASP *Core Curriculum* but this problem needs to be addressed. Not only has the IASP created a detailed outline of important pain information, they have specialized that information for the field of physical therapy. Moreover this information is available for free online; it is literally a few internet clicks away! The Curriculum was published 13 years ago and education programs have had ample time to implement its guidelines into their curriculums.

In this sample the number of schools using the curriculum is equal to the schools not using it as four schools indicate incorporating the *Core Curriculum*. School #2 said they use the *Core Curriculum* because “it provides a common language and framework for talking about pain.” School #9 said they use the *Core Curriculum* because it “is the leading guideline. We actually utilize pieces of the guideline for physical therapists.” School #7/8 also uses pieces of the guideline, teaching the IASP Axes of classification

discussed in the pain assessment section of this paper, and using pieces of it in the Clinical Decision Making course.

*Changes to current curriculum.* Only two schools indicated they would make changes to their current pain curriculum. School #1 wants to deal with acute and chronic pain separately and use more evidence based information for teaching chronic pain and is in the process of making these changes. Notably school #1 was the only unranked school to respond to the survey (three other non-ranked schools were contacted but did not respond). Ideally, one would want to argue that since school #1 is not ranked in the US top 10, it must need to advance and improve its curriculum whereas the other top ranked schools do not, which is why only one top ranked school indicated it would make changes. School #2 said it wanted to spend more time on chronic pain and its management.

Five schools said they would not make any changes and two schools did not answer the question at all. Three schools gave justifications for why they would leave the curriculum as it is. School #3 said: “We do an adequate job preparing our students to deal with issues related to pain from the understanding and management perspective to the patient empathy perspective.” Yet according to the respondent, school #3 does not use the IASP curriculum indicating their program would need to make a major change – implementing the *Core Curriculum*. It is possible that school #3 does in fact base its pain curriculum on the IASP guidelines and the study participant was simply unaware of its use. Still even that scenario would be troubling. It is unacceptable for a professor teaching pain to future health professionals to be unaware of the leading guideline for pain curriculum specified for physical therapy.

Schools #7/8 and #6 gave more satisfactory reasons for not changing their current curriculums. School #7/8 explained they evaluate every course after each semester and do final exit interviews yearly to assess the state of the curriculum. They say that students have not requested more information about pain so they “believe we are teaching this content well.” While it is commendable that school #7/8 does yearly and semester evaluations of each course and the overall curriculum, it may not be sound practice to depend on students’ requests for more information. Graduating students may not realize the gaps in their pain knowledge until they begin practicing as physical therapists. However school #7/8 also uses the IASP as a key guideline for their curriculum, covers pain in one-third of the curriculum and cites coverage of psychological aspects of pain. Thus based on the other data points for school #7/8 it seems likely that they are in fact teaching pain information with enough depth.

School #6 explained that they revised their curriculum when they switched from the MSPT to DPT degree and enhanced the pain content at that time. The results from other questions support their assertion that their pain curriculum is sufficient. School #6 gave the highest estimate of all the schools for number of hours (100) spent on pain, and covered psychological aspects of pain and alternative pain management techniques. Although school #6 did not acknowledge use of the IASP curriculum, based on the extensive list they provided of the pain topics their pain curriculum is in depth and adequate (see Appendix B for schools’ full responses).

Overall the curriculum results indicate that some schools, especially #7/8 and #6, are doing a better job than their peers in pain education and satisfactory coverage of psychological aspects of pain. While there are still areas for these schools to improve in,

they can be seen as examples of the positive curriculum changes elicited by the impact of the IASP *Core Curriculum* and transition from the MSPT to DPT degree. The main changes that other programs need to focus on are first of all increasing the number of hours spent on pain information. Next incorporating the IASP *Core Curriculum*, either wholly or in pieces is absolutely necessary. If programs follow the *Core Curriculum*, then psychological aspects of pain will be covered with the appropriate amount of depth.

*Qualitative Data Regarding Clinical Practice: Method*

*Participants.* Eight physical therapists were asked to be interviewed for the current study, of which five agreed. Subjects had an average of 14.3 years in the field of physical therapy with a range 2.5 to 26 years. Degrees ranged from a Bachelor of Science in PT (BSPT) to a PhD in physical therapy (PhDPT). However it is important to note that the minimum degree required to practice physical therapy has changed in the past 25 years. Initially a BSPT was required, then the MSPT became the standard and currently schools are switching to the DPT degree. The physical therapist that “only” had an undergraduate BSPT degree also had 25 years experience in the field. Thus the level of advanced degree is not directly correlated with years of experience. That said, each subjects’ highest degrees included one BSPT, two MSPTs, one DPT degree and one PhD. Subjects worked in a variety of settings including inpatient care, outpatient private practice, school for disabled children, hospitals and homecare.

*Procedure.* Subjects answered thirteen questions, four of which had sub-questions (See Appendix C for the survey questions). The questions assessed the physical therapist’s approach to psychological aspects of pain in clinical practice. The questions also determined if physical therapists are satisfied with their knowledge of pain and from

where they attained their knowledge (e.g. graduate courses, co-workers, continuing education classes). Two subjects were interviewed personally. Two subjects wrote out answers to the questions and one subject was interviewed over the phone due to time and logistical constraints (i.e. lived too far away to take part in personal interview). The physical therapists were numbered one through five. The numbers correspond to years of experience so PT #1 has the most experience (26 years) and PT #5 has the least experience (2.5 years).

*Qualitative Data Regarding Clinical Practice: Results*

Five out of eight physical therapists contacted agreed to answer the study questions, equaling a 63% response rate. Several overarching themes emerged which describe the current approach to pain among physical therapists. The results of the survey help explain the following three topics: 1) physical therapists' understanding of psychological aspects of pain, 2) physical therapists' satisfaction with entry level education, and 3) changes physical therapists would implement to their approach to pain and education curriculums.

*Understanding psychological aspects of pain.* All of the physical therapists discussed the impact of psychological factors on the patient's pain experience and the rehabilitation outcome. Stress, anxiety, depression and anger were the affective elements represented in the responses. Catastrophizing, fear-avoidance and active coping were the cognitive mechanisms addressed by the physical therapists. It should be noted that two physical therapists, #3 and #4, discussed psychological aspects of the pain the most, as each of them mentioned emotional and cognitive aspects of pain three times (See Figure 3). PT #3 addressed fear-avoidance, anxiety, and active coping styles. PT #4 addressed

fear-avoidance, anger, and catastrophizing. Figure 3 refers only to the discussion of affective and cognitive risk factors. In regards to the use of psychological interventions there is a different distribution among physical therapists (See Figure 4).

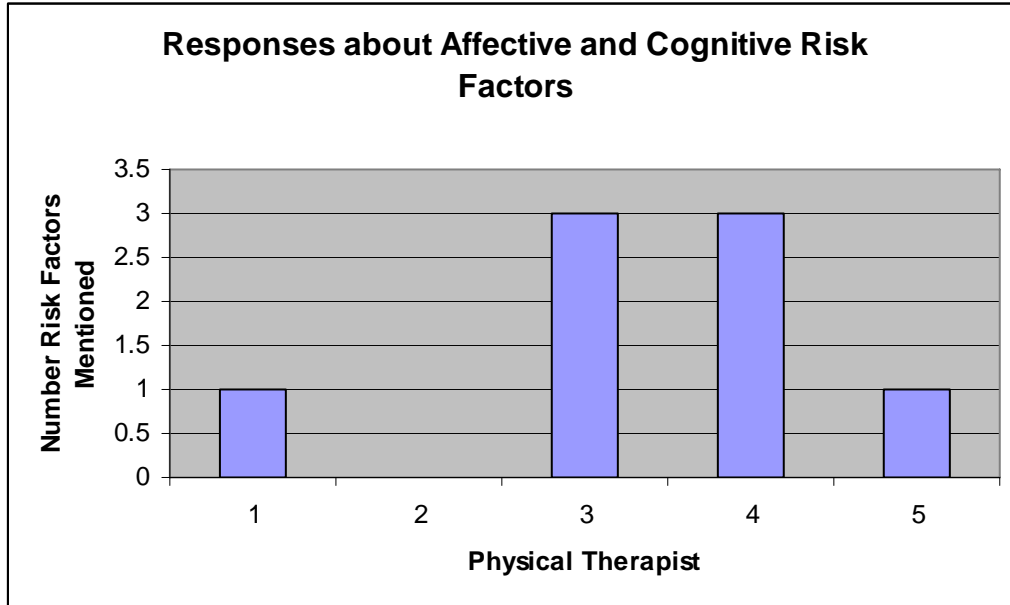


Figure 3 Responses about affective and cognitive aspects of pain broken down by physical therapist

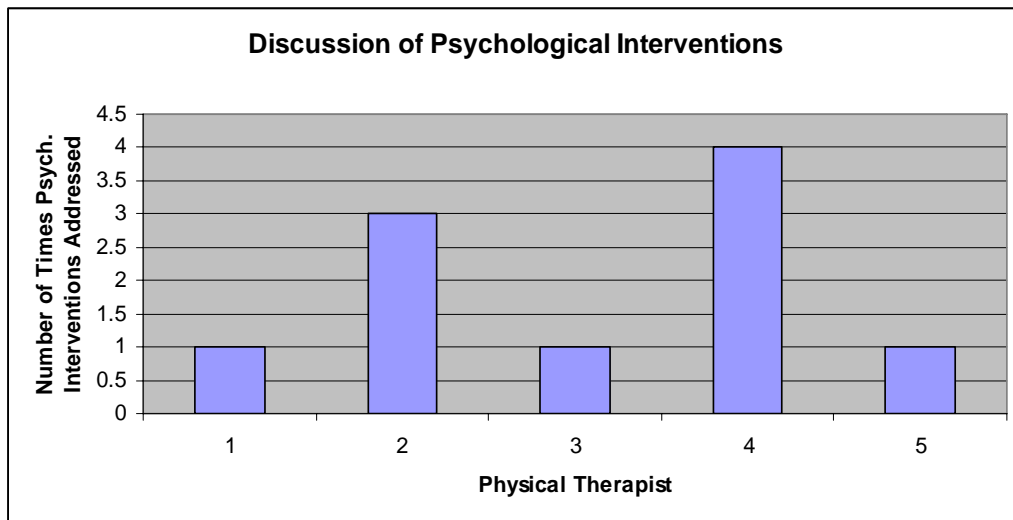


Figure 4 Responses about the use of psychological interventions. For instance, PT #4 mentioned using psychological interventions four times.

In regards to psychological interventions the physical therapists discussed educating the patient about pain, changing the patient's focus away from the pain and using cognitive-behavioral techniques. Again PT #4 mentioned psychological interventions more than his/her peers discussing the importance of pain education, changing a patient's focus (reconceptualization) and cognitive-behavioral therapy techniques like relaxation and breathing exercises.

*Satisfaction with entry level education and changes to curriculum.* There were mixed results regarding satisfaction with entry level education. Only one physical therapist was completely satisfied with the level of pain education and had no suggestions for changes or improvements. The other four physical therapists were satisfied with their individual educations but still had suggestions for improvement or changes that could be made to enhance pain education.

#### *Qualitative Data Regarding Clinical Practice: Discussion*

*Understanding psychological aspects of pain: Anxiety.* As we know from the literature review, anxiety is an affective risk factor that can increase pain and disability. Anxiety was the most referenced affective risk factor among the physical therapists indicating that this sample is aware of the impact anxiety can have on pain. Additionally, specific comments from PT #3 indicate that physical therapists acknowledge and understand the challenge anxiety poses in treating patients but are ready and willing to address this psychological risk factor. PT #3 gave the example of treating a frozen shoulder which requires aggressive stretching often past the patient's pain threshold. Anxiety will negatively impact the treatment because if "[the patient] is high anxiety and you get to the point where you know you to push [the shoulder] and they won't let you.

It's tough." PT #3's response provides an example from clinical practice of how an emotional risk factor, anxiety, can negatively impact pain and the rehabilitation process.

PT #3 recognizes that anxiety can play an important role in the person's pain experience and the physical therapist must respond appropriately to the anxiety to obtain the optimal treatment outcome. PT #3 advocates patience and taking the time to provide information about treatment goals: "You really have to talk them through and really explain to them what the purpose of the treatment is and what we're trying to accomplish. If they have a high anxiety level...then I'm careful to tell them 'We're not trying to make you hurt pain wise.'" Specific pain information is often most useful to help the anxious patient. For instance PT #3 will say: "if [the shoulder] does hurt a little bit, it should not be for lengthy periods. 15-20 minutes after the treatment session, it should be gone." By providing detailed information about the pain and what the patient can expect, the physical therapist demystifies pain. If the patient understands that pain after a stretching treatment is expected and should not last longer than 20 minutes, the pain becomes more manageable and is seen as normal, non-threatening and temporary rather than uncontrolled or a sign of damage.

*Understanding psychological aspects of pain: Pain-related beliefs.* An anxious patient could also hold negative pain-related beliefs which may be increasing the anxiety. The Jensen et al study demonstrated that harm beliefs (beliefs that pain signifies harm and activity should be avoided) predict physical and psychological dysfunction. To counteract harm beliefs the physical therapist provides information that pain is normal and continues with activity like stretching in spite of pain. Certainly this information is important for any patient but an anxious patient may need more reassurance and more

detailed information to address their heightened anxiety. Thus it is critical for physical therapists to be able to recognize anxiety within in a patient and address it accordingly, as PT #3 does.

*Understanding psychological aspects of pain: Stress.* The interviewees confirmed the important role that stress plays in pain. PT #1 said: “Stress is a major factor in pain and many other illnesses. I do not really believe that you can totally separate psychological factors from pain and patients’ progress or outcomes.” The Lundberg & Melin (2002) demonstrated how stress impacts pain by explaining the physiological mechanisms of stress that increase pain. While a physical therapist may not need to know details of physiological mechanisms, the physical therapist should know that stress is an evidence supported risk factor for increased pain. PT #1 demonstrates an understanding of stress’ impact on pain and the inextricable link between psychological factors and patient’s pain and outcome.

*Understanding psychological aspects of pain: Anger and Acceptance.* While anxiety and stress are common risk factors, PT #4 brought up another emotional factor – anger. This physical therapist talks about patients who are coming to physical therapy because of a car accident or workers’ compensation. In these situations, patients may blame others for why they are in pain. PT #4 says: “One of the major reasons for people to be in pain or to continue to have it is the fact that it was someone else’s fault. The anger that’s harbored...makes peoples’ pain worse and makes them hold onto their pain longer. I’ve had to have conversations with people encouraging them to let it go a little bit.” The connection between anger and continued pain may be explained by a lack of acceptance. Acceptance is defined as “an active willingness to engage in meaningful

activities regardless of the experience of pain-related sensations, thoughts and related feelings that might otherwise hinder such engagement” (Keefe et al, 2004, p. 201).

With acceptance, one is not only accepting the presence of pain but also thoughts (like focusing on the person responsible for the pain) and feelings (like anger) associated with the pain. McCracken (unpublished data) found that patients scoring higher on acceptance reported lower levels of anxiety, depression and disability and higher levels of daily time up and better work status (as cited in Keefe et al, 2004, p. 201). Moreover these results were still significant even after controlling for current pain intensity. Thus PT #4’s observations are supported by the literature. Holding onto pain-related thoughts and feelings and not accepting the circumstances may extend a patient’s pain. By encouraging patients to “let it go,” PT #4 is promoting acceptance of the situation and a willingness to partake in activities despite pain, anger or blaming someone else. In accepting the situation, hopefully these patients will have a better outcome as indicated by the McCracken study.

*Understanding psychological aspects of pain: Fear Avoidance.* PT #3 and #4 both talked about the impact of fear-avoidance but surprisingly the two physical therapists had completely opposite approaches to deal fear-avoidance. PT #3 said to address fear-avoidance: “I would go the route of trying to create as little pain as possible during the session.” In contrast, PT #4 did not advise avoiding pain altogether, rather he/she suggested adjusting the activity: “If you need to do a multi-joint exercise and [the patient is] scared of the bike maybe we start with a heel slide. Start with small successes that lead to big successes down the road. Cut that big activity into small activities so [the patient] will trust you and go to the next step.”

PT #3's response may represent a "fear-avoidant" approach. Normally fear-avoidance is examined in the patient but a study by Linton, Vlaeyen & Ostelo (2002) looked at the fear-avoidance beliefs of general practitioners (GPs) and physical therapists that treat back pain. Linton et al propose that beliefs of physical therapists may be reflected in their behavior just as beliefs of patients are reflected their behavior. Additionally beliefs of physical therapists might be related to actual treatment and advice provided to the patient. The study findings support these hypotheses.

The Linton et al study found that 93% of physical therapists agreed that mental stress can cause pain even in the absence of injury and 96% agreed that psychosocial factors cause pain. Specific to fear-avoidance, the Linton et al study found that some healthcare professionals held fear-avoidant beliefs which reflect fear or worry about pain and reinjury in the patient. For instance, 23% of physical therapists in the sample reported they worried if patients reported pain during an exercise. Sixty-nine percent of physical therapists would advise a patient to avoid movements that are painful. While the majority of the sample held beliefs about pain that are in line with the current research, a minority of physical therapists hold fear- avoidant beliefs that go against the guidelines for treating low back pain.

The guidelines state that normal activity is not harmful; patients should continue activity even if they have pain and sick leave or bed rest is not a good treatment and should not be used. Fear-avoidant beliefs may impact the treatment the physical therapist provides to the patient. Practitioners high on fear-avoidance were twice as likely to believe sick leave was a good treatment even though current guidelines advise against sick leave. Fear-avoidant practitioners were less likely to provide clear information about

what activities could be done even though information about activities is critical for the patient to know.

PT #3's response to a fear-avoidant patient may represent fear-avoidance in the clinician. PT #3 desires "to create as little pain as possible during the session" as not to further distress the fear-avoidant patient. It is possible that PT #3 worries about causing pain in this type of patient and consequently may advise this patient to avoid painful movements as indicated by the answer. These two tendencies match the fear-avoidant practitioners in the Linton et al study; worry over pain reported by the patient during exercise and advising the patient to avoid painful activity. Certainly more in depth analysis is in order to determine if PT #3 is actually fear-avoidant. In this limited context what can be said is that the response may indicate fear-avoidant tendencies in the clinician, which could be addressed with education about the proper ways to manage fear avoidance in patients.

Moreover regardless of PT #3's fear-avoidant beliefs, avoiding pain to treat the fear-avoidant patient is inappropriate approach according to the literature. In fact PT #4's strategy to "Start with small successes that lead to big successes down the road" and "Cutting that big activity into small activities" is more in line with the literature's findings for treating fear-avoidance. PT #3's approach could be classified as "routine care" whereas as PT#4 uses a "graded approach." In "routine care," the patient does an exercise but stops when pain occurs. In "graded activity," the patient works through the pain. The exercise quota, or amount/time of exercise, is gradually increased at each session – so the patient learns to tolerate more exercise despite pain (Fields, 2007).

Patients who worked with a graded approach had a better outcome and returned to work sooner than patients who engaged in routine care (Fields, 2007).

A study by Vlaeyen, de Jong, Geilen, Heuts, & van Breukelen (2001) examined two different treatments of pain-related fear and avoidance. Their study results lend support to the approach of PT #4 and the importance of exposing the fear-avoidant patient to activity in spite of pain or fear. The Vlaeyen et al study compared graded exposure in vivo treatment and the more common graded activity treatment. The treatments were provided to four subjects who were highly fear-avoidant.

The cognitive-behavioral graded exposure in vivo (GEXP) treatment was provided by a multidisciplinary staff at a pain rehabilitation center. In the GEXP condition, the patient was evaluated for their pain problem with special emphasis on the cognitive aspects of the patient's specific fears. Next the staff created a hierarchy of feared movements and activities using the Photograph series of Daily Activities (PHODA). The patients look at the photos and rate the threat value of daily physical movements like household chores, work or leisure activities. After the initial evaluation and creation of the fear hierarchy, the patient is educated that pain can be self-managed, is common and is not a serious disease that needs careful protection. The staff also explains the fear-avoidance model (see Figure 1) and how fear-avoidance can turn into a vicious cycle.

Next the patient is asked to perform the daily tasks from his/her fear hierarchy list. The less frightening tasks are done first and the patient works up to the more frightening ones. Patients are asked to expose themselves to these fearful situations as often as possible until anxiety decreases. By exposing the fear-avoidant patient to the

activity, he/she will stop catastrophizing the pain associated with that activity and realize there is either little to no pain or a manageable amount of pain experienced during the activity. The graded activity (GA) treatment did not include the explanation of the fear-avoidance model or creation of a fear hierarchy. Patients performed an exercise until pain caused them to stop. Then with each exercise session, the time or difficulty of the exercise slowly increased.

The results of the Vlaeyen et al study show that fear of movement/re-injury, pain catastrophizing and fear of pain were reduced after the GEXP treatment and were not reduced after the GA treatment. Moreover reductions in catastrophizing and pain-related fear led to a decrease in self-reported disability. Vlaeyen et al suggest that the GEXP was more effective in reducing pain-related fear because of cognitive changes. By gaining insight into their pain problem and fear-avoidance, patients felt they had “for the first time a credible rationale for their current level of disability” (p.162). In other words, by understanding the fear-avoidance model, understood how fear related to disability and how confronting feared activities would lead to recovery.

In light of the Vlaeyen et al study, one can see how PT #4’s treatment of the fear-avoidant patient may lead to a better outcome than by avoiding all pain possible as PT #3 suggests. PT #4 recommends starting the patient on a smaller activity like a heel slide then working up to riding a stationary bike. This approach is similar to working up the fear hierarchy in the GEXP treatment. By accomplishing a smaller physical task, like a heel slide, the patient can “disconfirm wrongful expectations of danger or harm related to physical movement” (Vlaeyen et al, 2002, p. 163). In realizing that a heel slide does not pose danger or threat, the patient will decrease fear and gain trust in the physical therapist

and work up to confronting more threatening exercises like riding a stationary bike.

Although PT #4 did not mention addressing the fear-avoidance model or creating a fear hierarchy, he is closer to the GEXP treatment than PT #3 who avoids pain altogether.

Moreover PT #4 could easily incorporate the cognitive aspects of GEXP into his graded exposure approach. Vlaeyen et al point out that screening patients for pain-related fear is warranted and easy to do because scales like the Tampa Kinesophobia Scale (TKS) or Pain Anxiety Symptoms Scale (PASS) are short and can be used in any setting.

Identifying activities the patient fears is simple when using pictures of daily activities from databases like the Photograph series of Daily Activities (PHODA). Lastly explaining the fear-avoidance model is easy to do and worth the time because it provides a rationale for the patient as to why they need to face their feared activities and how exposure will help them get better.

*Understanding psychological aspects of pain: Self-efficacy and Patient Education.* PT #3 educates patients to control pain on their own, which increases self-efficacy: “Patient education [can be] in terms of things [patients] can do to help self treat [their pain] such as posturing, stretching and the right strengthening exercises. I think the most important thing is to give [patients] ammunition to help deal with [pain].” By giving a patient “ammunition” PT #3 gives his patients tools to manage their pain without dependence on analgesics, modalities like an ice or heat pack, or the physical therapist stretching or mobilizing them. Self treating one’s pain through posture improvement, stretching and strengthening exercises in addition to addressing physical problems will increase the patient’s self-efficacy. By learning to control pain through one’s own actions, the patient realizes he/she can manage pain without depending on external

sources. Through education, the physical therapist can help bolster the confidence and self-efficacy of their patients. Moreover, increasing self-efficacy can lower levels of pain, psychological distress and negative medical outcomes (Keefe et al, 2004, p. 199).

*Understanding psychological aspects of pain: CBT and Proactive Patients.* One of the goals of cognitive-behavioral therapy is to increase the proactiveness of the patient. Cognitive-behavioral therapy has several features which strive to make patients proactive: collaboration between patient and practitioner; and people operating as active agents in changing their maladaptive thoughts, feelings and behaviors (Turk & Flor, 2006). Additionally, CBT encourages the patient to take an active role and responsibility in their treatment, to actively participate in the intervention, acknowledges the patient's successes and increases self-efficacy (Kolt, 2004, p. 156-7). Several physical therapists discussed the importance of having a proactive patient. If physical therapists were to integrate CBT into treatment then they increase the chances of working with a proactive patient.

PT #3 describes how patient involvement benefits the rehabilitation outcome by explaining the difference between a passive patient who "isn't interested in getting rid of [the pain]. They say 'I don't care why I'm hurting I just want you [the physical therapist] to get rid of it.' They just want you to do something to help their pain" and proactive patients, who "want to know everything about [their pain] and why and how to address it." Proactive patients are easier to work with because "it's easier to show them things and there are fewer questions about what they're doing." Additionally PT #3 thinks proactive patients get better results "because they're doing things at home. A patient comes into therapy one to three times per week and they have all that extra time. If they

keep doing things at home to provoke and aggravate [the injury] then success will be limited. If you show them cause and effect of why something hurt and they're proactive then they will avoid those things that are painful and do those things that are beneficial [like stretches, proper posturing or exercises].”

The proactive patient described by PT #3 takes an active role in their rehabilitation by finding out information about their pain, collaborating with the physical therapist to learn beneficial stretches and exercises to do at home and avoiding harmful activities. Moreover, the proactive patient behaves in ways that fit match the goals of cognitive-behavioral therapy. Physical therapists could encourage patients to be proactive by engaging them with some basic cognitive-behavioral skills. Again, physical therapists should not perform the work of psychologists but rather integrate basic cognitive-behavioral skills into the physical approaches to rehabilitation (Kolt, 2004, p. 156).

*Understanding psychological aspects of pain: CBT and Reconceptualization.*

Responses from physical therapists in the current demonstrate that they are integrating basic cognitive skills, like reconceptualization, without even necessarily realizing they are engaging in CBT. Reconceptualization changes the way one sees pain so that pain transforms from being vague and overwhelming to addressable, manageable and controlled (Kolt, 2004). One part of reconceptualization deals with cognitive errors. A common error associated with pain is “selective attention” in which the person only attends to the negative aspects and ignores any positive things (Turk & Flor, 2006). PT #2 challenges selective attention in patients by trying to switch the patient’s focus from pain to level of function:

Patients are mainly focused on their pain but that’s not the only thing that’s a problem. There may be an associated loss of function that goes along with that.

They are less likely to look at the loss of function and more likely to look at the level of pain. So you have to be able to look at all of those things in terms of them getting better. People may say “I don’t feel much better” but when you quiz them more you point out all the things they can do that they couldn’t do before.

PT #2 realizes that while pain may not be wholly eradicated, physical therapy can have success at improving function. A patient who only focuses on the presence of pain may ignore the functional improvements made over the course of therapy. PT #2 tries to address this by pointing out successes and shifting the focus away from pain. It is important to note that PT #2 did not preface this statement by saying “I engage patients in cognitive-behavioral therapy by challenging their maladaptive patterns of cognitive errors like selective attention.” Rather this physical therapist is simply addressing a problem that many patients face - focusing too much on pain levels. This example illustrates that physical therapists can engage in cognitive-behavioral therapy with ease and may already be doing so just by addressing problems of their patients. PT #2 demonstrates that physical therapists do not need extensive training to incorporate CBT in their current practice. Without having taken additional courses on pain or CBT, PT #2 is still able to utilize reconceptualization in clinical practice.

PT #4 also uses reconceptualization without necessarily acknowledging it:

As PTs you get in the rut of asking ‘How are you feeling?’ I will try to have days at a time when I ask ‘How are you moving?’ If you ask how they are feeling, people focus too much on pain. Part of my job is getting people to realize that yes they have pain but its better than when they walked in the door. They lose sight that it is less intense or less often. I try to get people out of their pain and focus more on how they are moving today.

By simply rephrasing a common question, PT #4 encourages patients to focus on their movement and level of function rather than pain. Reconceptualization encourages patients to acknowledge that although they still have pain its better, less intense or less

often. Using reconceptualization, PT #4 combats selective attention in which a patient only attends to the continuing presence of pain rather than noticing decreases in frequency or intensity and increase in functional ability. By focusing on improvements in pain, albeit still present pain, or functional increases patients implement “alternative, adaptive ways of thinking and responding [which] minimize stress and dysfunction” (Turk & Flor, 2006, p. 342). Since PT #3 and #4 did not specify whether they knew they were using reconceptualization, we have no way of knowing if they were aware of using a simple cognitive-behavioral technique. Certainly if they knew, they would be encouraged to continue to do so as cognitive-behavioral therapy is beneficial to patients.

*Satisfaction with entry level education and changes to curriculum.* In regards to education, all physical therapists indicated they were satisfied with their individual entry level preparation. Still the therapists provided important and interesting suggestions for how curriculums can be improved. PT #3 said “I was very satisfied with what I got out of my education.” However PT #3’s response to the question “Which psychological factors do you think contribute most to the patient’s pain level and the patient’s progress and outcome,” quickly showed where his/her entry level education was lacking. PT #3 responded by saying: “This [question] gets back to what I think PT programs don’t spend enough time on – really defining the psychological issues.” This answer suggests that though satisfied with the overall education received, more information about psychological issues would have been useful. This observation is supported by the numerous studies addressed in the introduction which suggest that enhanced pain information especially on psychological aspects is needed.

PT #3 went on to suggest adding a physical therapy related psychology course to existing curriculums. According to PT #3, a school could use “your standard psychology course and mesh it into the PT program to make it based on patient care for physical problems but dealing with the psychological issues that may come along with it.” PT #3’s suggestion is valid considering the IASP did exactly as described by PT #3. The IASP took their outline of pain curriculum and adjusted it to apply to the field of physical therapy. Within the outline there is extensive coverage of psychological aspects. PT #3 suggests a comprehensive course because although his/her curriculum covered psychological issues over three years, the issues “didn’t necessarily link up.” In this physical therapist’s experience, pain information “was presented by different lecturers in different ways.” This set up made it challenging to synthesize information and PT #3 suggests that “if everything were all done at once to introduce a broader terminology there would have been better understanding of that terminology.” PT #3’s comments have important implications for the physical therapy programs that do not have a single pain course.

The rationale for many of these schools as indicated by the study data discussed earlier is that they do not need a specific course because pain is discussed in almost every course throughout the curriculum. Indeed PT #3 acknowledges that all the pertinent psychological and pain information was covered. However the problem lies in the synthesis and incorporation of that knowledge. If information about pain and psychological aspects of pain are presented in pieces over a three year curriculum, students may not have the opportunity to understand the broader context and application of such information.

Recall that no schools in the sample used a single comprehensive course to teach pain information. Obviously it is a very small sample size which may not be indicative of all entry level education programs in the country. However, eight of the nine schools that responded were ranked as the top ten physical therapy programs, according to US News and World Report. Thus if the best schools in the country are not teaching pain in a single course but rather teach pain material throughout the three year curriculum, it seems likely that other schools would follow the same model. Future studies would want to poll a larger sample to see how many schools offer a comprehensive course on pain.

Moreover, it is distressing given the results of the Strong et al (1999) study and PT#3's comments, both of which support teaching of pain information through a single course, that no schools in this sample offer a comprehensive course on pain. Another implication of these results relates to cross-cultural differences. The Unruh (1995) and Strong (1999) studies were conducted in Canada and Australia respectively. Perhaps other countries have prioritized pain education more than the US. A follow-up study could examine whether physical therapy schools in other countries are more likely to offer a comprehensive pain course in physical therapy programs compared to the United States.

While a pain course would improve basic knowledge, mentoring also plays a critical role in preparing the student for a career in physical therapy. PT #2 asserts that "the education a PT receives is not at all adequate to begin to treat patients in general. Experience comes from working with someone with experience, being mentored, having good clinical rotations and actually doing. That's how you learn." Typically most physical therapy programs offer two clinical rotations each lasting for 18 weeks, totaling

nine months of internship before graduation. PT #2 suggests increasing the clinical internship to a full year in the same way that medical doctors have a full year of residency.

PT #4 echoed these comments about mentorship and learning through treating actual patients rather than spending time in the classroom. PT #4 said, “I think my entry level education was better than some. I had the pleasure of treating patients since I was in undergrad. I don’t think an entry level education gives you enough because it doesn’t give you enough exposure to the people. I think I was better because of my mentors.” These comments indicate that PT #4 felt better prepared because of the extended exposure to patients since undergraduate education (PT #4 worked as an athletic trainer in undergrad) and superior mentorship. Clearly a combination of exposure to patients and the opportunity to treat patients under the guidance of an experienced mentor could lead to better trained and prepared physical therapists.

*Profile of PT #4 as an example of adequate pain knowledge and pain attitudes in the physical therapist.* PT #4 is unique in his/her positive attitude toward chronic pain patients, knowledge of cognitive and affective risk factors and willingness to incorporate CBT techniques into clinical practice. I argue that part of PT #4’s progressive outlook is due to the attitude of the mentors PT #4 worked with in physical therapy school. PT #4 acknowledges the influence of mentors saying, “I attribute [my knowledge of chronic pain] to my mentors. I had the ability to work with this one professor. We saw a lot of chronic pain people and we learned a lot of alternative techniques.” PT #4 attributes much of his/her preparation to the mentors in the physical therapy education program. According to PT #4, the mentor who exposed him/her to numerous chronic pain patients

and alternative pain management techniques significantly influenced his/her attitude and knowledge of pain and the psychological aspects of pain.

The data regarding PT #4 demonstrate he/she is more open to discussing and acknowledging psychological components of pain. Figure 3 and Figure 4 illustrate that PT #4 discussed cognitive/affective risk factors and psychological interventions more often than his/her peers. PT#4 demonstrated knowledge of pain catastrophizing, emotions like anger and fear-avoidance. PT #4 also demonstrated strong interest in incorporating cognitive-behavioral techniques into current practice: “I think a lot of people want coping skills. People love the idea of meditation. I would love to say that I have those some of those things. I’ve thought about having some individual CD players. Most of our chronic pain patients get their own room and it’s usually dark.” By having a dark private room, chronic pain patients could easily meditate or use relaxation techniques. With the addition of individual CD players, patients could also listen to music as a distraction from pain or way to relax. Moreover when discussing CBT, PT #4’s comments illustrate his enthusiasm for psychological pain interventions. He/she commented at various points in the interview about CBT: “Yes I would totally be into that”; “I would totally embrace that”; and “I would encourage that.”

PT #4 also seemed to have the most positive attitude toward chronic pain patients, who are most commonly associated with having psychological problems in addition to pain. For example when asked about working with chronic pain patients PT #4 said, “It’s really easy to label people as crazy but I’m smart enough to see that I need to get broader in my approach. Clinicians have a hard time seeing themselves as the problem; it’s easy to blame the problem as the patient coming in. A lot of chronic pain and psychological

pain gets pushed aside and gets the raw end of the deal because of it.” PT #4 is careful not to blame the chronic pain patient or write chronic pain people off as “crazy.” Rather PT #4 is willing to look inward at the clinician’s role in treating chronic pain.

One can see that PT #4 is more open-minded regarding chronic pain when comparing these comments to those of PT #2. When asked about chronic pain patients PT #2 said, “My general experience in working with people with chronic pain is that at some psych level they don’t really want to get better. I believe that their pain serves them in some positive way.” PT #2 attributes lack of motivation within chronic pain patients to get rid of their pain because the pain serves them. The debate over psychological versus physical causes of chronic pain is a topic beyond the scope of this paper. Still, the contrast of PT #2 and #4 in their attitudes towards chronic pain demonstrates that PT #4 is more open-minded in his/her approach to chronic pain patients. I argue that PT #4’s positive attitude is due in part to the mentorship of the professor who exposed students to numerous chronic pain patients and alternative treatment techniques. Moreover PT #4 has only four years working as a physical therapist and had not taken and continuing education classes. Thus arguably most of PT #4’s superior knowledge and attitudes stems from graduate education and influence of mentors.

#### Conclusion and Implications for Future Research

Overall the two qualitative results demonstrate that there have been positive changes regarding both pain curriculum development and physical therapists pain knowledge and management in practice. From the results, one can see that the current state of curriculum and knowledge has improved since the 1990’s and early 2000’s.

However there are still problems and weaknesses that need to be addressed in the field of physical therapy and understanding and treating pain.

In regards to curriculum development two schools (#7/8 and #6) seem to be teaching pain information in more depth and breadth than their peers. Firstly, these schools indicated the greatest number of hours or course time spent teaching pain. This extra time allows for greater depth of coverage to include psychological aspects of pain and alternative pain interventions like CBT. Additionally schools with better pain information integrate the IASP *Core Curriculum*, as shown by school #7/8. Also the transition from awarding the MSPT to DPT degree was a perfect opportunity to overhaul the curriculum and increase pain information as school #6 did. Schools #7/8 and #6 provide encouraging examples of changes that have occurred with the publication of the IASP *Core Curriculum* and the transition from the MSPT to the DPT degree. Clearly these schools have chosen to make pain curriculum development a priority and that shows in the depth and breadth of coverage.

The results also show that some aspects of pain curriculums have not changed. Firstly, not one school in this sample offer a course dedicated to pain. This is a severe problem because without a comprehensive course, students may not have the opportunity to synthesize and deeply understand pain information as demonstrated by Strong et al (1999). Knowledge gaps or misunderstandings about pain will lead to the mistreatment of pain in practice. Secondly, four schools do not use the IASP curriculum and three programs had never heard of the *Core Curriculum*. If programs are not accessing the available material then clearly they cannot begin to implement the IASP guidelines. Yet as school #7/8 demonstrates and the Watt-Watson (2004) study shows schools that

integrate the IASP *Core Curriculum* have graduate students with better, more accurate pain knowledge.

Lastly there were mixed results regarding the coverage of psychological aspects of pain, as four schools did cover psychological components and five schools did not. However with the exception of schools #7/8 and school #6, the programs that did indicate coverage of psychology had very limited hours dedicated to pain in the first place. Thus most of those limited hours are going to first cover physiological mechanisms and psychology of pain and psychological interventions may get brushed over.

In light of these results, the main changes that other programs need to focus on are firstly simply increasing the number of hours spent on pain information. Preferably the hours increase will be in the form of a class dedicated to pain rather than spreading pain information over the three year curriculum. Next incorporating the IASP *Core Curriculum*, either wholly or in pieces is absolutely necessary. If programs follow the *Core Curriculum*, then psychological aspects of pain will be covered with the appropriate amount of depth.

The results regarding physical therapist knowledge of pain in clinical practice had some encouraging results as well as areas that need improvement. All five physical therapists in the sample acknowledge the impact of psychological factors on the pain experience. Every subject also mentioned the utility of alternative pain treatments like CBT, breathing, relaxation, yoga or acupuncture. Specifically, the sample recognized the importance of risk factors like anxiety, depression, anger and fear-avoidance. While it is encouraging that all the physical therapists recognized the impact of psychological risk factors there was some confusion about how to treat psychological issues. For instance

with fear-avoidance, one physical therapist recommended avoiding all pain possible. However such an approach goes against the recommendations in literature (see Fields, 2007; Vlaeyen et al, 2001; and Linton et al, 2002).

Obviously recognizing psychological risk factors is a critical first step for physical therapists. However knowing the correct way to address different psychological factors is equally as important. The data suggest that physical therapists have improved in their understanding that psychological factors are important and ability to recognize different ones. However there is a need for improvement in knowing the appropriate way to address psychological factors. Certainly more in depth coverage of pain during entry level education could cover the management of psychological problems. Additionally continuing education courses specific to managing psychological issues could also address such knowledge gaps.

In regards to pain management, the physical therapists emphasized the need for a proactive patient, the utility of CBT and increasing self-efficacy. While all agreed that psychological interventions were important, individuals ranged in their willingness to incorporate them into actual clinical practice. PT #4 seems to represent complete openness to alternative pain management. In contrast, PT #5 acknowledges that CBT techniques are important but would prefer the patient to a psychologist as he/she would feel uncomfortable engaging with CBT. While it is encouraging that all the physical therapists readily acknowledge CBT as a legitimate way to treat pain, they range in their comfort level with using CBT themselves. Ideally in the future, every physical therapist would feel confident in their ability to teach patients basic cognitive skills in addition to traditional rehabilitation. Education and mentoring that emphasizes alternative

psychological pain interventions could help physical therapists become more comfortable with utilizing CBT.

Regarding satisfaction with pain education, all the physical therapists said they were satisfied with their individual educations but still had suggestions for improvements. A critical change that came up in both curriculum and clinical data is the need to teach pain in one comprehensive course. As PT #3 noted, spreading information throughout the three year curriculum may cover all the important issues but makes it difficult for these concepts to “link up” or synthesize. Another interesting suggestion from multiple physical therapists is to increase the amount of mentoring. A knowledgeable mentor is an invaluable resource to the physical therapy student, as evidenced by PT #4’s comments about the importance of mentoring in his/her education. In order to increase the amount of mentoring, schools could increase the length of clinical rotations. If physical therapists spent a year in residency as medical students do, they would have more opportunities for exposure to patients, different pain problems (i.e. acute and chronic) and different treatment options (i.e. traditional therapy or psychological interventions).

While still providing important data about the state of physical therapy curriculums and clinical pain knowledge, the study has weaknesses. First of all, the small sample size of both schools and clinicians limits the generalizability of the results. It would have been ideal to have a greater representation of school types not just programs that were ranked in the top ten. Additionally, there were methodological problems with the questions given to schools. Question one asked for the number hours or credits spent on pain education. Consequently some participants indicated hours and others listed number of courses devoted to pain. Obviously it was not possible to calculate a truly

accurate average of course time spent on pain. Simply specifying hours or credits in the question would have solved this problem. Additionally, there was no question asking if there was a specific course on pain. Luckily, all schools volunteered this information either indicating specifically that they did not have one course on pain or saying that pain was covered throughout the curriculum. Lastly, the survey did not ask what kind of pain information was covered and if psychological aspects of pain were included in the curriculum. Some schools volunteered this information or listed all the pain topics covered. However, for four schools this information was not indicated making it difficult to determine the importance of psychological pain aspects within the different curriculums.

Future studies would want to correct these methodological errors and expand the scope of the study. Obviously sampling all 199 schools that have entry level degree programs would provide a much more accurate picture of the current state of pain curriculums. Additionally, cross-cultural comparisons would be useful. Many of the studies looking at curriculums and physical therapists came from different countries including Canada, Australia, Sweden and America. It would be interesting to see if certain countries have better pain curriculums than others by assessing number hours dedicated to pain education, presence of comprehensive pain courses and integration of the *IASP Core Curriculum*. Moreover, if there were difference between countries, it would be important to determine if the differences in pain education have an impact for patients. If a country's clinicians are more knowledgeable about pain and its management, will that country see a decline in musculoskeletal disorders, chronic pain problems or low back pain?

There were also weaknesses in the survey of practicing physical therapists. First of all, the therapists were not interviewed in a uniform way. The method included a phone interview, two in person interviews and two subjects who wrote out their answers to the questions. Participant #1 had the shortest responses presumably because when writing answers, they said less than if they had been talking. Their short responses limited the amount of information and data provided for the study. Secondly, four of the five physical therapists worked in a private outpatient clinic. Physical therapists who work in a school, hospital or in patient setting may have different views on pain and the psychological aspects of pain. Obviously a future study would want to expand the subject pool to include physical therapists from multiple settings and interview them in the same way. Future studies could expand on the existing qualitative data by including a hypothesis testing element. For instance, assess physical therapists on their pain knowledge and then determine if physical therapists with more pain knowledge have better outcomes with their patients. Or a future study could survey how much physical therapists integrate CBT skills into the traditional rehabilitation techniques then determine if patients treated with CBT and traditional physical therapy fared better than those without the CBT.

Despite some weaknesses and limitations, the current study is still an important first step in assessing the current of pain curriculums and pain knowledge, especially of the psychological aspects of pain, among physical therapists. The Strong et al (1999) study is a key example the utility of qualitative data in creating a more thorough study. In their study, Strong et al tested occupational therapists on their pain knowledge and then followed up with six interviews. One can view the current study as the first step of a

larger study that would incorporate quantitative data with the qualitative data. Regardless of being qualitative or quantitative, the current study provides important current information about physical therapists' pain knowledge and their pain curriculums in 2007.

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Appendix A  
Email Sent to Physical Therapy Educational Programs

Hi my name is Jennifer Chu. I'm a senior at Haverford College, working on My psychology thesis. After Haverford, I plan on going to physical therapy school, so for my thesis I have combined my interests in psychology and PT.

I am exploring physical therapists' knowledge of pain, specifically the psychological aspects of pain. As part of my research I am contacting the top ten PT programs in the country.

I would really appreciate your participation. Please take a few moments of your time to answer the following three questions.

1. How many course credits or hours are devoted to pain education? Do you cover psychological aspects of pain in these hours/courses?
2. Do you incorporate the International Association for the Study of Pain (IASP) *Core Curriculum* into your PT education? Why or why not?
3. What (if any) improvements or changes would you implement to your curriculum regarding pain education or educational changes in the field generally?

School names and personal names will not be used. Your answers will just provide qualitative data supporting my paper.

Thank you so much for your time and helping me complete my senior research. If you have any questions, feel free to contact me or my thesis advisor, Marilyn Boltz, [mboltz@haverford.edu](mailto:mboltz@haverford.edu).

Sincerely,  
Jennifer Chu

Appendix B  
Curriculum Data Responses

Response 1

I will need to contact some of our associated faculty who teach some of this content.

I can tell you we have approximately 10 hours of content dedicated to the issues of Pain. With at least 3 dedicated specifically to the psychological issues. However our curriculum is a very integrated curriculum and pain is most certainly discussed in relation to patient cases many time through out the curriculum. I do not know if we include the IASP in the content. I will try to contact the faculty member who teaches this content to find out for sure. Looking at the arrangement of the pain content I would like to deal separately with acute pain and more chronic pain base on evidence within our filed I think the intervention approaches are quite different. We are in the process of making this change within our curriculum.

Response 2.

1. How many course credits or hours are devoted to pain education?

This is difficult to say as there is no single course on the topic. Let's say on the order of 10-15 hours on the anatomy, patho-anatomy, physiology and pathophysiology, and several 10's of more hours on its management, both chronic and acute.

2. Do you incorporate the International Association for the Study of Pain (IASP) *Core Curriculum* into your PT education? Why or why not?

Yes, because it provides a common language and framework for talking about pain.

3. What (if any) improvements or changes would you implement to your curriculum regarding pain education?

Spend more time on chronic pain and its management.

Response 3.

I can only guess on how many hours are spent discussing pain in our curriculum. We probably address pain issues in virtually every course we offer as pain is a common denominator with our patients. We discuss it from the neuroanatomical/physiological perspective (6 hours) as well as pain management in many courses. I would guess eight courses, at least, spend time talking about pain and ways to manage it. That could be as many as 20 hours.

To my knowledge we do not use IASP in our curriculum.

We do an adequate job of preparing our students to deal with issues related to pain from the understanding and management perspective to the patient empathy perspective.

Response 4.

How many course credits or hours are devoted to pain education?

Pain education is incorporated into many courses in the Doctorate Program in Physical Therapy which is the entry level program at Temple University. In the Neuroscience course, I teach 3 hours related to somatic and visceral pain pathways incorporating both ascending and descending mechanisms.

In the Modalities/ Electrotherapy course, I teach 2 hours related to differentiating various pain conditions (acute, chronic; and pain scales appropriate to various ages).

As part of the use of heat, cold and electrotherapy, I teach the use of these modalities to relieve pain as well as have the students complete simulated clinical laboratory exercises. Because this is integrated, then I would estimate that pain would be addressed at least 6 hours for this. Students also use the pain scales in the laboratory settings.

Pain assessment and management is also covered in other courses in an integrated fashion. These courses would include the basic skills course; as well as the orthopedic courses that cover both traumatic and surgical orthopedics. Pain management would also be addressed when discussing amputees and use of prostheses; surgical pain associated with cardiac and respiratory conditions, etc. I do not know that we could specify a particular number of hours that would be devoted specifically to pain because pain assessment and management is covered in most of the clinical courses.

2. Do you incorporate the International Association for the Study of Pain (IASP) *Core Curriculum* into your PT education? Why or why not?

We do not cover the specific *Core Curriculum* because many of the components are covered in the above mentioned courses.

3. What (if any) improvements or changes would you implement to your curriculum regarding pain education?

Faculty review their courses each year to determine if there needs to be a change. We need to remain current in the ever changing health care environment. Because we collaborate with our colleagues about course content, we can identify a need and the appropriate course to address the need.

#### Response 5.

We do not use or teach the model of pain that you referred to in your questionnaire nor do we have specific content on the psych aspects of pain . I do have content ( about an hour) on acute vs. chronic pain and the psych aspects of chronic pain syndromes. I hope that this is helpful.

#### Response 6.

1. How many course credits or hours are devoted to pain education?

I am not sure I can calculate this accurately, as it is a topic covered over the course of the three year curriculum and not divided out into a particular course. Pain is addressed in at least 26 of our 37 courses. I would estimate approximately 100 hours total across the curriculum. See #2 for content.

2. Do you incorporate the International Association for the Study of Pain (IASP) *Core Curriculum* into your PT education? Why or why not?

I do not believe we do do this. No one on my faculty has made me aware of such a curriculum by that name. We cover the following topics

- neurological mechanisms of pain, neuroanatomy of the sensory systems
  - sensory screening, screening for pain (includes palpation)
  - pain as a moderator of health, wellness, illness, and injury
  - visual analog and other pain scales; includes reliability and validity of pain measures
  - process of inflammation
  - pain referral patterns (includes referred organ pain)
  - interviewing patients for accurate pain history
  - anatomy, innervated structures that cause pain
  - signs and symptoms of pain associated with diseases and surgeries
  - accreditation requirements for asking patients about pain
  - joint pain assessment, kinesiology and musculoskeletal assessments
  - assessment of the impact of pain on function, including antalgic gait patterns etc.
  - cardiac and pulmonary referred pain
  - tissue healing, wounds, burns (includes staging)
  - symptom magnification
  - chronic pain
  - culture and response to pain
  - spirituality and pain
  - modalities for the treatment of pain (e.g. cold, heat, electrical stimulation, ultrasound, hydrotherapy, massage etc.)
  - fibromyalgia
  - thalamic pain, pain with dystonia
  - regional pain syndromes (was RSD)
  - equipment used to help manage pain e.g. orthotics, splints, slings, wheelchairs, seating devices
  - radiculopathies, neuropathies
  - fallacy of no pain-no gain
  - healthy approaches to pain in sports
  - anesthesia, relaxation, breathing patterns, acupuncture and acupressure, introduction to chiropractic management of pain
3. What (if any) improvements or changes would you implement to your curriculum regarding pain education?

When we revised our curriculum as a transition from the MS to a DPT (Doctor of Physical Therapy Program), we enhanced the content on pain in the curriculum and tracked it across the curriculum. We are satisfied at this time with the content.

Response 7.

Since there is only a single class on Pain in PTS 541, I do not teach the IASP *Core Curriculum*. However, I do teach the IASP pain classification system so that students are able to differentiate the different forms of hyperesthesia (allodynia, hyperalgesia, sensitization, neuropathic (and central) pain, neuralgia, paresthesia, dysesthesia, anesthesia dolorosa) and understand the differences in the neurophysiologic basis of each of these forms of pain.

Here are the objectives that I cover in the class on Neurophysiology of Pain

1. Describe the primary afferent fibers associated with noxious input and the quality of the sensation that it transmits
2. Discuss the differences between primary and secondary hyperalgesia
3. Describe the phenomenon of referred pain and how it occurs.
4. Discuss the Gate Control theory of localized pain modulation
5. Discuss similarities and differences between opioid and non-opioid central modulation of pain

#### Response 8.

1. How many course credits or hours are devoted to pain education?

Physical therapists' practice is mainly oriented toward helping people in pain, or preventing pain, so of course, much of our curriculum is about diagnosing and treating pain in various systems. So each of our courses that teach patient diagnosis and treatment covers the topic of pain as it relates to what the topic is. For example, in Musculoskeletal Rehab II. Dr Raya teaches the examination, evaluation and treatment of headaches. Dr. Fiebert teaches the examination, evaluation and treatment of spine pain in his Spine course. These courses also include how to relate and communicate with those in pain to offer comfort, and to elicit accurate information in the history.

And our basic science courses of neuroanatomy and neurophysiology and kinesiology and biomechanics also teach the science of pain.

We then have an entire course in communication that deals in great part with how to interact with people in distress, who are ill, in pain and are angry or depressed, or dying, and how to bring comfort and help them deal with their pain more effectively. This course focuses on the psychology and philosophy of pain and distress, and the moral aspects of our actions with people in pain who become so focused on their pain that they become unable to be "whole" people, to act on their behalf in the world. We then need to advocate for them so that they can once again respond to the world in full measure and focus.

Our Complementary Therapies in Rehab course discusses energy medicine and holistic approaches to pain management (e.g. acupuncture, magnets, laser, Reiki, myofascial release, massage, Rolfing, biofeedback, etc) and the whole controversy of placebo and its affect on pain in treatment versus its effect on the outcomes of a randomized control trial.

But we do not have a course, per se, in pain and pain management. Of the 105 credits in our curriculum, I would guess that at least a third of those credits would relate to the epistemology of pain and its management.

2. Do you incorporate the International Association for the Study of Pain (IASP) *Core Curriculum* into your PT education? Why or why not?

We certainly do mention this Association in Clinical Decision Making 1 and 2, but I am not aware that any of our faculty are teaching the entire *Core Curriculum*. I am copying this email to the faculty who may, indeed include this in their courses, for example, in electrotherapy and health promotion and neurological evaluation, for them to comment to you directly if I am mistaken (and copy to me please)

3.. What (if any) improvements or changes would you implement to your curriculum regarding pain education?

We do intensive course by course, semester by semester and final curriculum exit evaluations with the students each year and we have never heard the students request more information about pain or pain education. So we believe we are teaching this content well.

#### Response 9.

1. How many course credits or hours are devoted to pain education?

We hold a course on Pain mechanisms and Management, 2 sh (total 30 hours of class time)

2. Do you incorporate the International Association for the Study of Pain (IASP) *Core Curriculum* into your PT education? Why or why not?

Yes, as this is the leading guideline. We actually utilize pieces of the guidelines for physical therapists.

3. What (if any) improvements or changes would you implement to your curriculum regarding pain education?

I would continue with what we have now.

#### Response 10.

I have a pain medicine specialist give an introductory talk (about 2 hours) to our students and relates mainly to pain measurement. I have answered your questions below (under your questions)

1. How many course credits or hours are devoted to pain education?

2 hour at least as formal lecture but pain is talked about during case-discussions

2. Do you incorporate the International Association for the Study of Pain (IASP) *Core Curriculum* into your PT education? Why or why not?

Not to my knowledge. The reason being I am not aware of this curriculum

form IASP

3. What (if any) improvements or changes would you implement to your curriculum regarding pain education?

Nothing in my component of the curriculum

Appendix C  
Interview Questions for Physical Therapists

1. How many years have you been in the field of physical therapy?
2. What clinical settings have you worked in?
3. How do you assess/measure a patient's pain?
4. How do you manage a patient's pain?
5. Do you feel there is room for improvement in your approach to patient's pain? What changes would you make?
6. Which psychological factors do you think contribute most to the patients pain level and the patient's progress and outcome? How do you address psych factors?
7. Where does pain reduction fall in your priorities for the patient? If you have a chronic pain patient, where elimination or reduction of pain is not possible, are you comfortable addressing alternative pain coping skills such as CBT
  - a. Do you think further education is would help you become more comfortable?
  - b. At that point would you refer a chronic patient to another type of treatment?
  - c. Would you prefer to work with a non-chronic pain patient?
8. What kind of information about pain is most important to impart to the patient?
9. From where have you gained your knowledge about pain i.e. graduate courses, continuing education classes, mentors/co-workers or studies and current research?
  - a. Have you or do you plan to take any continuing Ed courses on pain/psych aspects of pain?
10. Do you feel that your education and knowledge of pain is adequate? Why or why not?
11. Would you want to see any changes or improvements in the curriculum about pain, specifically psychological aspects of pain, either at your institution or in the field generally?

Appendix D  
Physical Therapists Interviews

PT #1

1. How many years have you been in the field of physical therapy? 26 years
2. What clinical settings have you worked in? Inpatient rehab, acute NICU, Early intervention, Another inpatient rehabilitation, Institution for Developmentally Disabled, School for children with Cerebral Palsy, a gait laboratory and outpatient PT owned private practice. I also have been a faculty member since 1992 (Thomas Jefferson University 8 years and Neumann for 7), but I always have been clinically active except for one year when I did my clinical research in the gait laboratory or the Penn College of Podiatric Medicine, now part of Temple)
3. How do you assess/measure a patient's pain? We use a form that the patient fills out in the waiting room adapted from the Magill questionnaire. It also has a VAS scale on it and a diagram for people to circle where their pain is and then write whether it feels internal or external. I usually ask people verbally also to rate their pain on a 0-10 scale with 0 being no pain and 10 pain the worse it can be.
4. How do you manage a patient's pain? Depends on what is causing the pain, muscle soreness, inflammation, malalignment, overuse, weakness, asymmetry?????. I may use a modality, ice, heat, electrical stim, ultrasound or I might use stretching or a manual technique to realign a body part to bring about less pain....sometimes strengthening even reduces pain....this question is way too vague....
5. Do you feel there is room for improvement in your approach to patient's pain? I am happy with my approach and I think my patients are too. What changes would you make? If I was not happy with my approach I would have learned and fixed it....These days I am happy with my approach.
6. Which psychological factors do you think contribute most to the patients pain level and the patient's progress and outcome? Stress is a major factor in pain and many other illnesses. I do not really believe that you can totally separate psychological factors from pain and patients progress or outcomes.

How do you address psych factors? If warranted, I refer patients to psychologists or psychiatrists, or back to their primary physician for a recommendation that they might benefit from such a referral. Many of the more common and less severe psychological factors, all clinicians deal with, including me...

7. Where does pain reduction fall in your priorities for the patient? If you have a chronic pain patient, where elimination or reduction of pain is not possible, are you comfortable addressing alternative pain coping skills such as CBT - unfortunately, many chronic pain patients I have seen have not gotten their problems addressed adequately. I try to address the patients problems to the best of my ability and then I try to help them learn to manage their pain from there.

Do you think further education is would help you become more comfortable? no, as I already have had a lot of education in this arena, I also worked on a pain unit in inpatient rehabilitation.

At that point would you refer a chronic patient to another type of treatment? If I do not see change after 2-3 treatments and if I can no longer help the patient I either refer to someone I think can help them, or back to the physician that referred them to me.

Would you prefer to work with a non-chronic pain patient? Yes

8. What kind of information about pain is most important to impart to the patient? Again, too vague, depends on the patient, their pain, what is causing it, whether it is likely to go away. Managing pain can mean managing what is causing the pain, or dealing with the pain in alternative ways, relaxation techniques, hydrotherapy, massage, float tanks, yoga, exercise and friendship are all ways I have tried to promote in various situations.

9. From where have you gained your knowledge about pain i.e. graduate courses, YES continuing education classes, YES mentors/co-workers YES or studies YES and current research YES? I try to pay attention to things that might help me be more as a therapist, and a teacher and as a person who has a body and has family that have bodies themselves.

a. Have you or do you plan to take any continuing Ed courses on pain/psychological aspects of pain? I have, I do not think I will soon.

10. Do you feel that your education and knowledge of pain is adequate? Why or why not? Yes because when I do read and attend things, I rarely hear new information.

11. Would you want to see any changes or improvements in the curriculum about pain, specifically psychological aspects of pain, either at your institution or in the field generally? no. I think we deal with it all the time in academia as well as in the clinic

PT #2

1. BSPT, 1983
2. private practice Hospital
3. You have to understand that pain is a subjective entity and the descriptions of pain are many and so I tend to not be as specific about the persons pain per se as what they feel that doesn't feel normal to them and depending on what the particular problem I may use an ANS say 0-10 just to get a qualitative value for whatever it is that they're feeling
4. Essentially from a physiologic standpoint there are two reasons people get pain chemical and mechanical. And in the case of patients if they have chemical pain typically PTs aren't as involved that's something where drugs come into play you may be able to alleviate some chemical pain by using modalities. Mechanical pain is which PTs should be the experts in treating. Normal tissue is deformed in such a way that the NS is stimulated. The example of that is bending your finger back and it starts to hurt. Mechanical pain can turn into chemical pain. Mechanical pain

- is usually treated with exercise. Movements, positions postures things that make the person feel better we teach them how to do that
5. The short answer is yes. Typically people with chronic pain are much more difficult to take care of there is a whole psych component that can go along with chronic pain. The person has begun to adapt that painful condition into their entire life and that requires a little more in depth analysis of what's going on and that also requires a willingness on the part of the patient to want to get rid of the pain. Often pain can be used for the person's benefit for some kind of gain. It doesn't have to be financial. It could be that having more people focused on me
  6. Pain reduction is not listed above or below. You make a mistake by just saying let's treat the patient's pain and not worry about the other issues the other issues may in fact and in most cases are causing the pain. If someone has a frozen shoulder that by itself hurts, the treatment hurts and often times it's stretching through the pain you can't address the person's problem
  7. I think that there are certain qualitative pieces of info that are important for a person to have. For example there is a common misconception about no pain no gain. Well there are times where feeling a little bit of pain is a natural and normal thing that should be used as a help and guide for performing an exercise. You need to provide information regarding pain as a tool for the patient again this is a subjective thing and it's their issue what they feel. And you need to give them information on how that pain level may or may not change
  8. Psychological factors do play into how the person feels and their makeup affects them
  9. Yes as a PT you have a number one obligation to provide assistance to someone and if you can't do that you have an obligation to move that patient to where they can get help. That may be completely referring the patient elsewhere or working in conjunction with some other venue of treatment whether that's traditional or non-traditional, acupuncture, yoga whatever it is that it takes to help the person to get better. As far as the patient is concerned they are mostly focused on their pain but that's not the only thing that may be the problem. There may be an associated loss of function that goes along with that. They are less likely to look at the loss of function and more likely to look at the level of pain. So you have to be able to look at all of those things in terms of them getting better. People may say I don't feel much better but when you quiz them more you point out all the things they can do that they couldn't do before.
  10. Yes. I find chronic pain patients to be very difficult to deal with because of all those psych overflows that go along with that. My general experience in working with people with chronic pain is that they in general at some psych level don't really want to get better. And I believe that their pain serves them in some positive way
  11. There is always room for improvement. There are always things you can use to provide comfort to a person. But I don't really look at what I am treating people's pain. I think that the focus should never really be on just dealing with their pain as a PT
  12. I'd say I've learned the most about pain is from the patients themselves. In my years of seeing people I've seen thousands of different patients and they all come

with their own perspective. And there is so much that we really don't know about pain and painful conditions that we really need to look to the patients themselves, our own bodies, our own selves. The connection between the mind body is a pretty amazing thing.

13. The education that a PT receives and I believe this to be true for entry level, masters level doctor people getting DPTs is not at all adequate to begin to treat patients in general. Experience comes from working with someone with experience, being mentored by somebody having good clinical rotations and actually doing. That's how you learn. School is about the basic science stuff the support for what we do. What we do as PTs is an art and that art form is being able to take the basic science info and attach that to ourselves and take this art form and creativity and developing treatment plans that include modalities and exercise and creating something unique for the individual patient.
- I think there should be less classroom time and more clinical residency time. More time spent actually working with patients much in the way physicians do a full year of residency. I think that's actually where our profession is lacking. The DPT is coming about but

PT #3

Degree: MSPT

1. Yrs: 15 y
2. Fields: inpatient acute care, rehab, 2 outpatient sports med. Outpatient ortho specializing hands. Outpatient ortho. Home care. Insurance review
3. How do you assess/measure a patient's pain?
  - location, intensity (ratings, # scale,) behavior (what makes it worse or better) nature
  - pain is always subjective and difficult to assess
  - if find location, how it behaves, what makes it worse or better you're establishing the quality, quantity these are things that help you measure future progress but also being able to develop differentiated diagnosis based on pain behavior as well not just clinical assessment, that's part of your assessment as well
4. How do you manage a patient's pain?
  - a. Patient education in terms of things that they can do to help self treat it and that could be in posturing through doing the right stretches the right strengthening exercises. I think the most important thing is to give them ammunition to help deal with it. And beyond that some modality care although the problem with modality care is there is very little proven about what that modality is doing
  - b. I think that your most valuable or your best value is to teach them how to manage it and provide them things in therapy that are directed toward gaining flexibility and strength because usually pain is a component of a lack of something like that.
  - c. Pain mechanisms to patient: Without getting into too big of a detail with them, one of the big ways is chemical inflammation versus mechanical pain. Chemical is constant pain. When you're interviewing the patient, if its

contact and never goes away. Like they may tell its constant but when you question them and you find out “well than it doesn’t hurt me then” will then its not constant. Mechanical is there is something pinching or obstructing. Yea I try to explain that to them beucase then they get a better grasp on why we would be doing something.

- d. And that doesn’t always work for everybody I mean maybe the person is interested they just want to get rid of it> “I don’t care why im hurting I just want you to get rid of it” So there are proactive patients that want to know everything about and why and how to address it and then there are non proactive patients that just want you to do something to help them with their pain
  - e. I would say they generally yea its pretty true that [proactive patitnes have a better outcome]. I think its easier to show them things and there is less question about whatthey;re doing. I think they get better resuts because they’re doing things at home. A pateient comes into therapy 1-3x a week and they have all that extra time and if they keep doing things at home to provoke and aggravate it then your success is gonna be limited but if you show them cuase and effect of why something might hurt and they’re proactive then they’ gonna tend to avoid those things that are painful and do those things that are beneficial
5. Do you feel there is room for improvement in your approach to patient’s pain? What changes would you make?
    - a. Any time you stop trying to learn about something then youre stagnant and not improving. Things evolve. I think there is room for improvement with all aspects of treatment
    - b. I think adding the MPQ would at least be a documented way of qualifying and quantifying a persons pain levels and more and more insurance carriers might actually demenad that.
  6. Which psychological factors do you think contribute most to the patients pain level and the patient’s progress and outcome? How do you address psych factors?
    - a. This gets back to what I think PT programs don’t spend enough time on is really defining the psychological issues
    - b. I think that they could link programs betterI think that they could offer a PT related psychology course. Like take your standard psychology terms and mesh it into PT program to make it based on patient care for physical problems but dealing with the psych issues that may come along with it. I mean probably when I think back to it progably every course I took in PT scholl talked about pscyh issues but it didn’t nesscearily link up. I eamn it was presented by different lecturers in different ways maybe if everything were all odne at once to introduce a more broad terminally and understanding of that terminology to a better degree than I think that owl more useful. I also believe
    - c. All these things old effect an outcome and levels of progress
    - d. They could all potentially outcome esp. if person is not getting the help they need. I mean I would at some with depression as having no

- motivation. It would be a passive treatment. They would come to PT and do their thing but not do anything to directly address it.
- e. Coping strategies. There are times with what do treatment wee they may not be able to cope with feeling any discomfort. Its ok to feel little bit of discomfort or pain when your doing that stretch and they cant cope with that.
  - f. And they cant categorize what might be acceptable and what might not be acceptable. I try to explain pressure and stretch versus outright pain. I use a bent finger theory. Pressure on but if you to far but if you to far ouch that hurts. And I have them feel like what its feels to stretch their finger. At first try to avoid pain at first
  - g. Catastrophizing: everything is just out of control that's a very hard person to work with. Its very hard. Identified catastrophizing incorrectly
  - h. Look how much better youre shoulder is now. Look what you CAN do now. Its gonna be a battle between positive and negative
  - i. Because of anxiety rhea may not be able to cope with anything. Like if they come in with a frozen shoulder and you know you have to stretch that shoulder you absolutely have to stretch that shoulder. And if they have an anxiety level where they are high anxiety you get to that point where you know you have to pysch it and they wont let you. Its tough. And you have to really talk them through and really explain to them whets the purpose of the treatment and what we're trying to accomplish. And if they have a high anxiety y level where we're really trying to manage pain, where we're really trying not to create pain, then im really careful lot tell them look we're trying to accomplish this we're not trying to make you hurt pain wise or of it does hurt a little bit it should not be there for lengthy periods. 15-20 minutes after a treatement session, it should be gone.
  - j. You try to get them to calm down and get the stress down so that you can the treatments be effective
  - k. Fear-avoidance: you know I would go the route of trying to create as little pain as possible during the session and try to go back to if we're stretching our and if it goes away when you stop then its ok. And if lasts for more than 15 minute than we need to adjust what we're doing "I'm not sure what the fear might be about" Try to explain to home what we're trying to accomplish and we're trying to create pain
7. Where does pain reduction fall in your priorities for the patient? If you have a chronic pain patient, where elimination or reduction of pain is not possible, are you comfortable addressing alternative pain coping skills such as CBT
    - a. Do you think further education is would help you become more comfortable?
    - b. At that point would you refer a chronic patient to another type of treatment?
    - c. Would you prefer to work with a non-chronic pain patient?
  8. What kind of information about pain is most important to impart to the patient?
  9. From where have you gained your knowledge about pain i.e. graduate courses, continuing education classes, mentors/co-workers or studies and current research?

- a.
  - b. Have you or do you plan to take any continuing Ed courses on pain/psych aspects of pain? Most connoting ed courses were based on treatment approaches to deal with pain but the physical treatment of dealing with persons pain. I.e. mobilizations. I haven taken any courses on psychological issues of pain
10. Do you feel that your education and knowledge of pain is adequate? Why or why not? I was very satisfied with what I got out of my education and I think that there could have a been a little bit more even a partial semester course I think that could have been helpful and useful.
  11. The most challenging group to deal with are chronic pain patients. A steady diet of that and most people will burn out. I think you can make an impact on each and everyone of those people but its very unlikely that your going to make a 100% resolution of that person's pain. If that person has psych issues and they're being addresses then you have a higher likelihood of helping that person 100%. But even if you can help the, 75% that could be a huge deal for them. And then they learn to manage what they have with the coping strategies that you might teach them and the coping strategies that a psychologist might teach them as well. If you can work that together then I think that's ideal
  12. Would you want to see any changes or improvements in the curriculum about pain, specifically psychological aspects of pain, either at your institution or in the field generally?
  13. Do you manage chronic versus acute pain differently? With acute pain I think you can be more hands on and provide some modality care for acute pain, ice heat and you still go about educating them properly to get them out of that acute state. I think the problem with chronic is that they've already had a certain amount of dependency on the medical system and they being to almost anticipate and expect "what are you gonna do for me" and you've gotta try to turn that around on them and avoid or at least minimize your type of hands on care that you're gonna do with them like mobilizations and the other thing is you have to be very careful about modalities because that's facilitating dependence. You know "why are feeling better" "well that hot pack made me feel better." That ES that's why im getting better. You need to try to get them to the reasons why they're pain is getting better and its because they're taking a role in helping it along.
  14. And then the other thing with acute pain is certainly most people with acute pain have not developed a psychological issue because of the acuteness of it but a lot of acute pains that go on will begin to cause psychological issues and most people with chronic pain who have psych issues probably didn't have the psych issue to being with. There may have been an underlying factor that precipitated it but I think that pain will affect you psychological over time
  15. How do you confront those psych issues? A lot of our patients are being refried from a physician and its sort of a fine line and its hard to say to a patient "I think you need psychological counseling because you don't want to tick off your referring source, because we're relying on getting referrals from all kinds of physicians. So there are times when its appropriate to call the physician who refried and say look there just seems to be something going on here beyond the

- physical component and its really being careful with your wording because you can really upset that referring physician and never get another patient. Its not that the patient is crazy, its just there really is something going on here that needs to be addressed.
16. They are atoll in pain. Its not a psychosomatic problem where its all in their head, I don't believe that either I think that un the perfect world there'd receiving psych counseling adjunct with going to PT to deal with the physical component of pain. You get a little rusty when you see a chronic pain patient. Its not they shouldn't be treated in PT at the sate time. There is a physical component there and a psychotically component that both together are causing the pain to not go away. It could be something as simple as recondition. Chronic is anything more than 3 months. And once your chronic, its hard to get those people 100% better.
  17. I think you're more successful if get patient to buy into realistic scientific basis for pain

PT #4

1. 4 yrs, MSPT; DPT 1 extra year. Pharmacology, radiology, more research. Really no different. Nasacort to have and ergo over these things and refractive them day to day. Only in the way elective in alternative meds and pain management otherwise no more pain info
  2. outpatient private clinic. Own privative. Outpatient orthopedic. High level things, young population high functioning young and athletic, low back and neck pain
  3. paperwork side pf things VAS for low backs and necks. Lone to mark 0-10 mark on line where pain is. Probably only thing on intake from measures pain from 0-10. occasionally may be reason. Measure more functional disability than pain because its so subjective from person to person. Use obswrecski scale thetas related to function. In their history.  
As PTs you get in a rut of how you are feeling. I will try to hake days at a time where I ask how you are mocking. If you ask how the yare feeling they focus on pain. Yea we treat pine that's why we have jobs cause people have pain. I think we put too much focus on peoples pain. Part of my job is getting people to realize that yes they still have pain but its beater than when they walked in the door. They lose sight that their pain is less intense or less often. I try to get people out of their pain and more on their focus of how are they moving today. We care about their pain but we try to make people care less about their pain. We try to measure their function. Cause that's what insurance companies.
  4. Try to not to make pain the focus. Im gonna try to find a pain free arc to work with
  5. you can tell when you have a pain magnifier. You put any pressure on they're body and they say it really hurts. I will deal with that person a little bit differ I will try not to acknloelge their pain or give as much sympathy to people that are pain magnifiers. If try not to feed into it too much and reinforce people that are pain magnifiers or if there is some other motivation for people seeking PT
- 7pain info: I try to at the end of each evaluation I try to give them the take home message in the way of the on and off switch in terms of their pain. Finding a position that reduces pain. What did you learn here today? Certain positions can minimize

your pain. Before you have pain you need to learn the off switch of position or something that can affect their pain. What is the off switch and what are good posturing.

Patient education is a large part of PTs job and education is empowering for the patient. People respond well to that especially for the pain magnifiers. Anything I can give them to help demystify their pain is going to be helpful

8. Study there is a study as far as workman's comp one of the major reasons for people to be in pain or to continue to have is the fact that its someone else's fault. If you fell down the stairs and it was your fault your more apt to get better. But if it was someone else's fault. The anger that's harbored that kind of notion that reality makes peoples pain worse and makes them hold on to their pain longer. Ive had to have conversations with people encouraging them to let it go a little bit. That's one of the main issues we deal with is that its someone else's fault. Getting people not to forgive the people are at fault. When tis someone else fault their pain will persist.

Fear-avoidance: we definably see that. It doesn't have to be pekoe that have more psychological aspects of their pain. I think that's when its important to understand where you need to go. If you need to do a multjopit exercise if they're scared of the bike maybe we start with a heel slide start with small successes that lead to big successes down the road. Cutting that big active into small activities so they will trust you and go with you to the next step. Being honest with people give people an element of control and they will be more apt to go with you that goes back to interpersonal skills and getting your patient to trust you.

9. absolutely. I think a lot of people want that (coping skills) even from the view of alternative medicine acupuncture. Yes I would be totally into that. People love the idea do meditation. I would love to say that I have some of those things. Ive thought about having some individual CD players. I don't but I would encourage that. Most of our chronic pain patients get their own room and its usually dark. I would totally embrace that. If it works then that's all that matters. If it works and the persons believes in the process then its more apt to work. Whatever gets the outcome.

I attribute that to my mentors had the ability to work with this gentleman we saw a lot of chronic pain people. And we learned a lot of alternative techniques. Its really easy to label people as crazy but im smart enough to see that I need to get broader in my approach. Clinicians have a hard time seeing themselves as the problem its easy to blame the problem as the pateient coming in. a lot of the chronic pain and psych pain profiles get pushed aside and get the raw end of the deal because of it.

E work with a group that is an alternative medicine practice. I think a lot of patients are fed up with just the western medicine of take a pill. People want something different. You have to as a practitioner you need to have a lot of things at your disposal. You need to have a lot of everything you don't have all the answers. and if you cant help the patient you need to send them to someone who can.

10. I kind of like a challenge and ive always told myself that I wanted to be that guy that other pimple send their mystery patients to. In that case you have to take difficult cases. Working with acute pain is easier but its not necessarily whets going to make you a great PT.

11. Yes there is always room for improvement. I would say I would def need a better understanding and physical practice of the alternative techniques. There is thought in the future for certification in acupuncture. I love the idea of adding more bags of tricks. I think all PTs need to listen more and I bring that to my practice every day. Be better at the alternative approach and mullet disciplinarily approach and not be afraid of more than one clinician working on the same patient I need to open my horizons of working with other professionals.

12. You learn in PT school the degree you get grieves you the tools to start learning when you go out. You just have to “do” you gotta get your hands dirty. You have to learn what not to do. Keep your mind open to new techniques.

Continuing ed I think any think that gives you insight to the person that what

14. I tank my entry level knowledge was better than some I think that prepare dame better than most. I had the pleaser of treating patients since I was in undergrad. I think that made me better than an entry level. I don't think an entry level education gives you enough because I don't hank it gives you enough exposure to the people. I think I was better because of my mentors.

PT #5 not available