

# American Psychologist

## Core Competencies for the Emerging Specialty of Pain Psychology

Laura D. Wandner, Ravi Prasad, Amir Ramezani, Sylvia A. Malcore, and Robert D. Kerns

Online First Publication, August 2, 2018. <http://dx.doi.org/10.1037/amp0000330>

### CITATION

Wandner, L. D., Prasad, R., Ramezani, A., Malcore, S. A., & Kerns, R. D. (2018, August 2). Core Competencies for the Emerging Specialty of Pain Psychology. *American Psychologist*. Advance online publication. <http://dx.doi.org/10.1037/amp0000330>

# Core Competencies for the Emerging Specialty of Pain Psychology

Laura D. Wandner

Walter Reed National Military Medical Center,  
Bethesda, Maryland

Ravi Prasad

Stanford University School of Medicine

Amir Ramezani

University of California, Davis

Sylvia A. Malcore

Spectrum Health, Grand Rapids, Michigan, and Michigan  
State University

Robert D. Kerns

Yale University, and VA Connecticut Healthcare System, West Haven, Connecticut

The Institute of Medicine (IOM) has reported that approximately 100 million Americans experience chronic pain. The IOM report on pain and the subsequent National Pain Strategy (NPS) issued by the U.S. Department of Health and Human Services have both noted the educational gaps regarding pain management and highlighted the pivotal role that psychology plays in the field of pain management. Fishman and colleagues (2013) emphasized the need for all providers involved in the study and practice of pain management to acquire a common fund of knowledge and proposed a comprehensive set of core competencies that would apply across multiple professions and specialty areas (e.g., anesthesiology, nursing, and psychology). These core competencies are meant to be tailored to allow each pain-related subspecialty to incorporate the factors and competencies unique to their discipline. To date, the terms *pain psychology* and *pain psychologist* are routinely used in public discourse to refer to psychologists practicing integrated, multimodal, and multidisciplinary pain care, but the field of psychology has not yet defined this emerging specialty. It is important for the discipline itself to define these terms and for psychologists to specify the competencies that would be expected of a clinician working as a pain psychologist. The current article represents an initial effort to define the core competencies necessary to fulfill the role of a pain psychologist working in the field of pain management.

*Keywords:* pain psychology, competencies, education, pain

In 2011, the Institute of Medicine (IOM) of the National Academy of Sciences reported that 100 million Americans experience chronic pain at a cost of approximately half a trillion dollars per year. Pain was identified as a public health crisis, not only due to its prevalence and cost but also because chronic pain often is associated with disparities in care and with significant negative impacts, including de-

clines in productive and pleasurable activity, significant emotional distress, and diminished quality of life and well-being (IOM, 2011). A key recommendation of the report was the development and adoption of a comprehensive national action plan to create a cultural transformation in how pain is viewed and treated. This recommendation became a reality with the March 2016 publication of the

---

Laura D. Wandner, Department of Health Psychology, Walter Reed National Military Medical Center, Bethesda, Maryland; Ravi Prasad, Department of Anesthesiology, Perioperative and Pain Medicine, Stanford University School of Medicine; Amir Ramezani, Department of Surgery, University of California, Davis; Sylvia A. Malcore, Division of Psychiatry and Behavioral Medicine, Spectrum Health, Grand Rapids, Michigan, and Department of Psychiatry, Michigan State University; Robert D. Kerns, Departments of Psychiatry, Neurology and Psychology, Yale University and Pain Research, Informatics, Multi-

morbidities and Education Center of Innovation, VA Connecticut Healthcare System, West Haven, Connecticut.

Preparation of this article was supported in part by Department of Veterans Affairs, Health Services Research and Development Service, Grant CIN 13-047. The views expressed in this article are those of the authors and do not necessarily reflect the official policy of the Department of the Army/Navy/Air Force, Department of Defense, Department of Veterans Affairs, or the U.S. government.

Correspondence concerning this article should be addressed to Robert D. Kerns, PRIME/11ACSLG, VA Connecticut Healthcare System, 950 Campbell Avenue, West Haven, CT 06516. E-mail: [robert.kerns@yale.edu](mailto:robert.kerns@yale.edu)



**Laura D.  
Wandner**

National Pain Strategy (NPS) by the U. S. Department of Health and Human Services (Interagency Pain Research Coordinating Committee [IPRCC], 2015). Psychologists were among the authors of both the IOM report and the NPS, underscoring the important role that psychology plays in education, research, and health care delivery in the field of pain.

The IOM (2011) highlighted psychology's leadership in the education and training of scientists and practitioners involved in the field of pain by recognizing its efforts to improve pain assessment and management. In fact, a call for action to build the capacity for pain psychologists was recently published in *Pain Medicine*, a leading journal in the field of pain management (Darnall et al., 2016). Darnall and colleagues (2016) reported on results of nearly 2,000 completed surveys of stakeholders in pain management (e.g., psychologists, therapists, individuals with pain, physicians, physician assistants, nurse practitioners, and the directors of graduate and postgraduate psychology training programs). The authors concluded that there was broad support for a pain psychology specialty across stakeholder groups, as well as for a national initiative to increase training and competency development. Among the training program directors, the authors found unanimous interest in a pain psychology curriculum that could be integrated into existing programs. The International Association for the Study of Pain (IASP), the leading international organization focused on the interdisciplinary pain management practice, has developed a core curriculum for the education of pain management practitioners, but it has not regularly been included in higher education curricula (IASP, 2008).

Other disciplines have moved to establish a specialty in pain management. Some of those specialties, including the medical specialties of pain medicine and pain management nursing, have their own professional organizations and journals. To date, the terms *pain psychology* and *pain psychologist* are routinely used in these professional circles despite the fact that the terms have never been formally defined by the discipline of psychology itself. It is important for the field of psychology to define these terms and the competencies that would be expected of an individual identifying as such a clinician rather than having them characterized by other disciplines. The opioid epidemic and increased national focus on poorly managed pain highlight the contemporary importance of this topic. Psychology's role in helping to shift these trends has been delineated (IPRCC, 2015); however, the variability in practice that may ensue secondary to the lack of a core set of universally agreed-upon knowledge and skills among scientists and practitioners in this arena may hamper efforts to successfully address the opioid and pain crises. Psychologists practicing in primary care have set a precedent for this process (American Psychological Association, 2015), and it is hoped that the current article will generate discussion within the professional psychology community to create a similar pathway in the realm of pain.

Pain psychology is analogous to pain medicine in that it is both a unique and cross-cutting specialty. For example, pain medicine specialists may receive their primary training in anesthesiology, physiatry, psychiatry, or other fields; however, the competencies of a board-certified pain physician represent an accumulation of knowledge and skills that draw on a number of subspecialties in the field of medicine itself. The same is true for pain psychology: A pain psychologist's training may initially be in clinical, counseling, health, pediatric, geriatric, rehabilitation, neuro-, or forensic psychology or in the treatment of substance use disorders, but pain psychology requires a unique integration of competencies across these and other domains that differs from existing psychology subspecialties (Cox, Cox, & Caplan, 2013; Ditomasso, Cahn, Panichelli-Mindel, & McFillin, 2013; Finch, Lochman, Nelson, & Roberts, 2012; France et al., 2008; Fuertes, Spokane, & Holloway, 2013; Lamberty & Nelson, 2012; McDaniel et al., 2014; Molinari, 2011; Packer & Grisso, 2011). The IOM and NPS have suggested that all health professionals should have at least basic competencies in pain management (IOM, 2011; IPRCC, 2015), and there is a need to incorporate pain management education and training into all professional psychology training. The science and practice of pain psychology has matured independently of any other existing specialty. Pain psychologist competencies are founded in science and practice beyond the broader domain of clinical and counseling psychology and other specialties and proficiencies.



**Ravi Prasad**

Of particular relevance in developing competencies for pain psychology is the publication by Fishman and colleagues (2013). An interdisciplinary group of experts in pain management, including a psychologist who is also an author of this article (Ravi Prasad) outlined the knowledge and skills that are deemed essential for all health care professionals working with persons with pain. Through a consensus decision-making process, the authors derived a set of four core competency domains: (a) understanding the multidimensional–biopsychosocial nature of pain, (b) assessing and measuring pain, (c) managing pain, and (d) awareness of how contextual variables affect pain management. It was proposed that this common set of core competencies be tailored within each discipline to address the unique factors associated with each specialty. The authors of the current article believe that a pain psychology–specific elaboration of the foundational principles described in the Fishman article is strongly indicated and, in fact, essential. Accordingly, the goal of this article was to begin to define those competencies that are necessary for a pain psychologist using the Fishman rubric.

This article assumes that pain psychologists exhibit the core values and competencies of all psychologists and trainees. Fishman and colleagues' (2013) work is expanded by proposing competencies specific to psychologists working in the field of pain management. It is not imperative that pain psychologists be experts in each identified domain; rather it is expected that they have at least foundational competencies in each and readily apply them in practice.

## **Domain 1: Multidimensional Nature of Pain: What Is Pain?**

A competent pain psychologist must demonstrate awareness of the multidimensional nature of pain. This competency domain focuses on knowledge regarding (a) the complex, multifactorial and individual-specific nature of pain; (b) the relevant and evolving theories and science for understanding pain; (c) the terminology used to describe pain and associated conditions; and (d) the ability to communicate the aforementioned to patients and other practitioners.

The biopsychosocial model recognizes that the experience of pain is the result of complex interactions among biological, social, and psychological factors. It has emerged as the predominant conceptual framework in the field of pain management (Gatchel, Peng, Peters, Fuchs, & Turk, 2007). There are other significant integrated models that emphasize the role of the central nervous system, and particularly the brain, in determining the experience of pain. These include the gate-control–neuromatrix model of pain; models emphasizing localized pain–brain circuitry, functional cortical connectivity, and cortical reorganization; and the activation of emotional circuits by chronic pain (Jensen & Turk, 2014; Melzack & Wall, 1965). All of these models are informed by and reinforce important observations about the multidimensional nature of pain, including the experience of pain itself and its effects on physical and emotional functioning, overall well-being, and quality of life (Kerns & Jacob, 1995; Turk et al., 2003).

Also of value to pain psychologists are the foundational and heuristic roles of operant theory and social–cognitive theory (Main, Keefe, Jensen, Vlaeyen, & Vowles, 2015; Turk & Gatchel, 2012). When applied to pain management, these models help psychologists better understand the development and perpetuation of factors commonly associated with adaptation and changes in functioning, quality of life, and well-being.

Social and psychological factors can impact patients' pain experiences; thus, knowledge about these conceptual frameworks is also critical. Paradigms such as the fear–avoidance model characterize patients' experience of pain and their engagement in treatment, allowing clinicians to better tailor care plans to meet their patients' needs (Lethem, Slade, Troup, & Bentley, 1983; Vlaeyen & Linton, 2000). Other models, such as the sociocommunication model of pain, pain empathy model, and communal coping models, can help pain psychologists better understand their patients based on a variety of interpersonal and social variables and may improve the therapeutic alliance (Goubert et al., 2005; Hadjistavropoulos et al., 2011; Sullivan, 2012). Although not the only models with which pain psychologists should be familiar, those just listed can enhance psychologists' understanding of the complex interplay of factors that contribute to the onset and maintenance of pain and facilitate



**Amir Ramezani**

the development of effective treatment interventions. It is important to note that these models have largely evolved to address the experience of pain specifically and are not generally linked to other domains of psychological science.

Pain psychologists can excel in their practice by becoming aware of different types of pain conditions, their pathophysiology, and common medical and mental health comorbidities; however, it is essential that they be able to communicate this knowledge using terminology that is understandable by patients, caregivers, and other providers. Mastery of such communication skills is important to developing a client-centered and team-based approach to care.

## **Domain 2: Pain Assessment and Measurement**

Pain psychologists practicing in various clinical settings (e.g., primary care, rehabilitation) have historically played important roles in elaborating frameworks for pain screening and for conducting comprehensive pain assessments; developing and validating assessment approaches; and using information from assessments to inform the development of patient-centered, multimodal and interdisciplinary plans of care. Competencies in this domain focus on (a) the assessment of individuals with pain and related symptoms using appropriate approaches (e.g., interview, psychophysiological assessment, screening tools, standardized tests and measures); (b) the awareness of system, provider, and individual contributors that can affect the assessment process; and (c) communication in the context of assessment.

Informed by the biopsychosocial model, comprehensive understanding of pain includes a focus on biological, psychological, and social factors and how each of these do-

mains reciprocally interact with each other and can change over time (Gatchel et al., 2007). Pain psychologists should have expertise across all of the biopsychosocial model domains, with a specific focus on bringing the foundational principles in human learning to bear on interdisciplinary team discussions. In turn, assessment of pain should include the application of this model to conceptualizing pain as having multiple contributing factors. As Bruns and Disorbio (2009) pointed out, the treatment team should have a collaborative approach in the evaluation process. Evaluations are best framed as a portion of an integrated treatment process that works toward accomplishing patients' goals.

Pain psychologists conduct pain assessments across the life span, with patients of different demographic groups and a wide spectrum of pain conditions. Patient assessments can occur at different stages of the course of persistent pain. It is also relevant to distinguish between screening that can be used to detect potential risks and/or the need for additional intervention—evaluation versus assessment, which may include information from multiple sources and is more comprehensive in nature (American Psychological Association, 2014). Screening can include identification of biopsychosocial risk factors for pain and factors that can influence recovery (McLinton, McLinton, & van der Linden, 2018; H. S. Robinson & Dagfinrud, 2017). Furthermore, stratified treatment interventions based on screening of degree of psychosocial risk factors have demonstrated efficacy in reducing disability and pain (Murphy, Blake, Power, & Fullen, 2016). Dorflinger and colleagues' (2014) description of the implementation of an interdisciplinary team approach to pain assessment and management in primary care settings shows a promising option to include specialty assessments of patients' pain experiences earlier in the trajectory of the development and perpetuation of chronic pain. Pain psychology's involvement in early evaluation is also supported by the recognition that pain, disability, and length of recovery are influenced by psychosocial risk factors such as pain catastrophizing, fear-avoidance beliefs, magnitude of reported disability at injury onset, beliefs about ability to return to work, appraisals about pain continuation, social support, mood, and anxiety (Campbell, Foster, Thomas, & Dunn, 2013; Esteve, Bendayan, López-Martínez, & Ramírez-Maestre, 2017; Hill et al., 2008; McLinton et al., 2018; Wertli et al., 2014).

Assessment and screening often take place when patients' pain persists for more than several weeks and after it has already begun to have a negative impact on physical and emotional functioning. Pain psychologists benefit from the ability to evaluate the concern(s) that are most temporally relevant to patients and to select and administer evidence-based assessments appropriate for their overall health, pain, injury, and quality of life (Bruns & Disorbio, 2013). Psychologists use comprehensive pain assessment to inform an integrated, patient-centered, evidence-based, multimodal,



**Sylvia A. Malcore**

and interdisciplinary plan of care. It facilitates individualization of treatment plans, helps identify gaps in care, and facilitates establishing and assessing toward goals. Patient assessments may include multiple sources of information and domains of functioning. Pain psychologists should be knowledgeable about and have the capacity to select from a broad array of psychometrically sound self-report questionnaires and related methods, and their expertise in psychometrics and measure development may offer a relatively unique competency to the treatment team. There are a number of psychological measures that are appropriate for the assessment of patients with chronic pain or have been designed specifically for patients who have chronic pain, many of which have demonstrated substantial reliability and validity (Bruns & Disorbio, 2013; Turk & Melzak, 2011).

Pain psychologists should also be knowledgeable about other approaches to pain assessment (i.e., Keefe, Somers, Williams, & Smith, 2011) and should possess an understanding of tests and procedures commonly used by other disciplines to assess pain (Flor, 2014). This reinforces the importance of interdisciplinary care, because no one assessment approach is likely to capture the complex nature of the pain experience. In fact, relying solely on biomedical assessment tools may have inherent limitations (Fillingim et al., 2013). In a prospective, longitudinal study with patients identified with risk factors for lower back pain, psychosocial risk factors were stronger predictors of outcome in comparison to structural findings on magnetic resonance imaging (MRI) and discography (Carragee, Alamin, Miller, & Carragee, 2005).

Pain psychologists may also conduct specific psychological evaluations, such as preprocedural or presurgical

screenings, opioid risk assessments, and forensic evaluations related to disability claims. For example, many third-party payers require a psychological evaluation prior to authorizing use of implantable device therapies. Pain psychologists completing presurgical or preprocedural evaluations assess factors including patient knowledge of the procedure and its associated risks, awareness of periprocedural self-care needs, treatment expectations, compliance history, and other factors known to influence outcomes (Block, Gatchel, Deardorff, & Guyer, 2003; Bruns & Disorbio, 2009, 2014). They may also be called upon to participate in the selection of patients who may benefit from opioid therapy or, conversely, to identify those who may be at risk from it.

Pain psychologists should routinely assess for the presence of comorbid mental health conditions, as there is a significant body of literature reflecting higher rates of substance use disorders, and depression and anxiety disorders in individuals with chronic pain (Knaster, Karlsson, Estlander, & Kalso, 2012). Additional relevant areas to assess may be weight management, sleep disorders, tobacco use, and other lifestyle factors that have the potential to impact pain and functioning (Bastian et al., 2017; Goral, Lipsitz, & Gross, 2010).

Pain psychologists also require an understanding of the influence of socioeconomic and cultural factors on the experience of pain and health and how this can impact assessment (IPRCC, 2015). Age, gender, and racial and ethnic disparities in pain assessment and treatment are well documented in the literature (Green & Hart-Johnson, 2010). The IOM report cited several groups, including children, older adults, and veterans, among several other groups, as being disadvantaged and vulnerable to disparities (IOM, 2011). For example, Black veterans, relative to Whites, were found to be less frequently screened for the presence and intensity of pain in Veterans Health Administration primary care settings despite a policy that requires such screening (Burgess et al., 2013). Stereotyping and bias during the process of screening likely contribute to well-documented differences and disparities in care. Low wealth has been found to be a strong predictor of high-impact chronic pain (Janevic, McLaughlin, Heapy, Thacker, & Piette, 2017), and special programs have been created to specifically address pain treatment disparities in low-income areas (Thorn et al., 2018). These observations highlight the importance of cultural education for health care professionals providing care to persons with pain. Providers should use their knowledge of socioeconomic, cultural, and other individual differences to guide the assessment process, because doing so may help reduce health disparities. Patient factors are particularly wide-ranging and complex, and pain psychologists must be mindful of assessing the biopsychosocial factors affecting patient engagement with recommendations for health care (Kerns et al., 2014). Kerns and his colleagues have offered



**Robert D. Kerns**

specific recommendations for improving shared decision-making regarding pain treatment and for promoting patient engagement in self-management approaches more specifically (Dorflinger, Kerns, & Auerbach, 2013; Frantsve & Kerns, 2007).

Development of competencies that promote optimal communication throughout the assessment process is also necessary. This includes communication in a variety of domains related to assessment, such as the ability to cointerview, coassess, and cointervene with other providers. Pain psychology has long recognized the importance of working with caregivers and partners in evaluations and treatment (Main et al., 2015). Psychologists should be skilled in providing comprehensive feedback to patients, potential sources of social support, and the treatment team regarding evaluations as well as have an awareness of potential barriers to feedback, such as time restrictions from a referring provider (Fouad et al., 2009). Psychologists should also be mindful of patients' concerns regarding their health records (Peel, 2012). This may include clarifying with patients who will have access to their medical records, which can be of relevance in forensic settings and worker's compensation. Informed consent and limitations on confidentiality should be openly discussed with patients.

### **Domain 3: Management of Pain: How Is Pain Relieved?**

A competent pain psychologist implements evidence-based, patient-centered psychological or behavioral approaches to manage, treat, and relieve pain (Kerns, Sellinger, & Goodin, 2011). Broadly, this domain focuses on

collaborative approaches to decision-making, consideration of a diversity of treatment options, the importance of patient agency, risk management, and flexibility in care informed by the comprehensive pain assessment. More specifically, pain psychologists should demonstrate the ability to (a) identify appropriate evidence-based psychological treatment options in collaboration with the patient; (b) share decision-making with relevant parties in a team, health care system, and the patient and family; (c) develop a comprehensive, integrated treatment plan; (d) promote health and self-management; and (e) monitor and adjust treatment plans across inpatient and outpatient settings.

Psychologists have played particularly important roles in the development of theoretically informed and empirically validated treatment approaches for pain management (Kerns et al., 2011). Many treatments for pain focus on improving function and quality of life rather than reducing pain intensity, and this education should be delivered to patients in a fashion that is not insensitive to the physical discomfort that they are experiencing.

Cognitive-behavioral therapy (CBT) has been shown to improve pain intensity, activity level, and disability in patients living with a wide range of pain conditions. It is also effective in reducing functional deficits related to neurological disorders across different demographic groups, including underserved, younger, and older adult patients (Ehde, Dillworth, & Turner, 2014). Although there is evidence to support CBT-based interventions in pain treatment, a rigorously conducted Cochrane review found mixed or limited evidence of the effects of CBT on pain intensity, mood, and disability in individuals living with neuropathic pain and on pain intensity in individuals living with chronic pain (Eccleston, Hearn, & Williams, 2015; Williams, Eccleston, & Morley, 2012). These findings highlight the importance of understanding the nuances of why a treatment pathway may be effective in some situations but not all and using such knowledge to inform patient care.

In addition to CBT, there are additional psychological treatments that have demonstrated efficacy in treating chronic pain and comorbid conditions—treatments including pain coping skills training, motivational interviewing (MI), operant behavioral approaches, behavioral sleep management, behavioral weight management and graded in vivo exposure, directive emotional expression interventions (e.g., emotional awareness and expression therapy), and third-generation CBT that integrates acceptance-, compassion-, and commitment-based approaches (e.g., acceptance and commitment therapy, mindfulness-based stress reduction, mindfulness-based cognitive therapy; Carson et al., 2005; Chapin et al., 2014; Jensen & Turk, 2014; Kerns et al., 2011; Lumley et al., 2017; McCracken & Vowles, 2014; Stayner, Ramezani, Prasad, & Mahajan, 2016). Furthermore, spouse-assisted-couples therapy and internal family systems—family therapy interventions should be considered as ad-

ditional alternatives or adjuncts to psychological treatments. These interventions have been shown to improve pain intensity, depression, physical functioning, and compassion as well as to improve partner support and marital quality as well as less pain-soliciting roles and illness-related conflict between partners (Martire, Schulz, Helgeson, Small, & Saghafi, 2010; Shadick et al., 2013).

Learning and implementing multiple interventions can inherently become challenging for the clinician. When integrating the aforementioned psychological treatment options, professionals should utilize conceptual frameworks from other areas of psychology to facilitate treatment delivery. For example, pain psychologists working with seniors should understand the unique needs of this population prior to implementing more specialized pain-based interventions. This is particularly salient when working with complex patients with high medical and psychiatric comorbidities (Ramezani, Rockers, Wanlass, & McCarron, 2016). Psychological treatment should also be weighed with the age, disability, or litigation status and culture of the patient to ensure that there is evidence-based support for its inclusion in the care plan.

Psychological preparation for surgical interventions has been shown to lead to better clinical and health system outcomes (Powell et al., 2016). Psychological preparations have included CBT-based health behavior management, medical anxiety management, mindfulness-based therapies, stress management, psychoeducation, coping skills training, developing realistic pre- and postprocedural expectations, and education on substance abuse and procedures (Dao et al., 2011; Ehde et al., 2014; Erci, Sezgin, & Kacmaz, 2004; Nelson et al., 2013; Wahlin & Tonnesen, 2014). Beneficial clinical and health system outcomes include decreased depression and anxiety associated with surgery, improved recovery postsurgery, decreased use of sedative and pain medications, decreased pain, and shortened hospital stays (Johnston & Vogeleson, 1993; Sparkes, Duarte, Raphael, Denny, & Ashford, 2012). Pain psychologists may wish to become familiar with the range of interventions available within their health care system to inform discussions they may have with members of their treatment teams about identifying risk factors and optimizing outcomes (Block et al., 2003).

Technology-based interventions also have a long history of applicability to chronic pain, and familiarity with them is advantageous (Heapy et al., 2015). Technology-based interventions include telehealth—telemedicine, computerized or online interventions, and psychophysiological treatments. Telehealth—telemedicine interventions may extend beyond patient care and involve teaching pain management treatment modalities to health care providers (Agboola, Ju, Elfiky, Kvedar, & Jethwani, 2015; Dubin et al., 2015). Online interventions, computer-based programs, or smartphone applications have been shown to reduce pain inten-

sity and improve satisfaction (Fisher, Law, Palermo, & Eccleston, 2015).

Psychophysiological treatments are diverse in their application and in their modality. Specific biofeedback, neurofeedback, functional MRI feedback, and cranial electric stimulation treatments have been shown to be effective in the treatment of chronic pain conditions (Chapin, Bagarinao, & Mackey, 2012; Jensen, Grierson, Tracy-Smith, Bacigalupi, & Othmer, 2007; Sielski, Rief, & Glombiewski, 2017; Tan et al., 2011). Psychophysiological interventions can enhance patient learning and the effects of behavioral treatment (Piaserico et al., 2016; Shedden Mora, Weber, Neff, & Rief, 2013).

Pain psychologists should have a broad, working knowledge of the evolving empirical literature of medical, rehabilitative, complementary, and integrative health approaches. Such familiarity may promote patients' initial engagement and ongoing adherence to treatment. Increasingly, psychologists may incorporate use of some of these approaches into rehabilitative treatment; for example, recent published trials of CBT for chronic musculoskeletal pain incorporated structure exercise and walking programs (Kerns et al., 2014).

The next steps in building pain treatment competency are to acquire and apply knowledge of strategies that cultivate collaborative approaches. Such strategies are important for pain psychologists, as well as other pain providers, and entail the inclusion (as appropriate) of the patient, family members, and health care professionals from other disciplines in the education and decision-making process when developing a pain care plan. Throughout the process of developing the plan, use of psychological approaches such as MI may enhance patient readiness to adopt the treatment plan and to participate fully (Jensen, Nielson, & Kerns, 2003). Studies have shown that integrated, interdisciplinary decision-making and multimodal treatment plans help to address the patient's health care needs, increase treatment involvement, improve access to care, improve quality of health care, and strengthen interventions (Brown Levey, Miller, & Degruy, 2012; Gatchel, McGeary, McGeary, & Lippe, 2014; Runyan, 2011).

To treat patients with chronic pain, it is important for pain psychologists to be able to treat comorbid conditions, promote self-management strategies, help patients develop and evaluate treatment plans, and assist patients in assessing the effects of pain management plans. It is possible to treat comorbid physical health and mental health conditions using the evidence-based approaches to implement a biopsychosocially informed treatment approach (Ramezani, McCarron, Lashai, & Lenaerts, 2015; Zachariae, Lyby, Ritterband, & O'Toole, 2016). Psychologists should be familiar with treatment protocols, such as MI and CBT, that can enhance patients' participation in their health care, increase treatment adherence, and increase motivation and

access to resources (Alperstein & Sharpe, 2016; Kerns et al., 2014).

The ability of pain psychologists to monitor the effects of treatment is important to ensure meaningful progress and to inform necessary adjustments to the treatment plan. This is accomplished by regularly following up with patients and team members to inquire about whether initial goals are being met. Inter-session monitoring of symptoms, goal progress, and practice of newly acquired skills can be useful in this context. Care plans should be dynamic in nature and adjust according to patient response to treatment (Turk & Melzak, 2011).

#### **Domain 4: Clinical Care: How Does Context Influence Pain Management?**

Both the IOM report and NPS have emphasized the importance of attending to the cultural context in which pain occurs (IOM, 2011; IPRCC, 2015). This includes the socio-cultural background of patients and their families, the characteristics of the communities in which they live, and the same characteristics as they apply to patients' provider networks and health care system(s). All of the aforementioned help shape how pain is uniquely defined and experienced by patients and their environment.

The ability to identify factors that can facilitate or interfere with effective pain evaluation and treatment is an important prerequisite to meeting the needs of patients and their families. The experience of pain and individuals' responses to treatment vary across age, race, ethnicity, gender, and education level (Meints, Miller, & Hirsh, 2016; Molton & Terrill, 2014; M. E. Robinson et al., 2001; Tait & Chibnall, 2014). Social factors are of particular relevance because they have been found to directly modulate the pain experience (Krahé, Springer, Weinman, & Fotopoulou, 2013). For example, the types of responses individuals with pain receive from others in their environment can influence medication use, health-related quality of life, affective distress, and pain-related disability (Cunningham, Hayes, Townsend, Laures, & Hooten, 2012; McGeary et al., 2016). Spousal communication in particular is an important social context to assess because criticism, hostility, punishing responses, and invalidation from significant others have been found to influence pain, mood symptoms, and relationship quality (Burns et al., 2018; Cano & Tankha, 2018; Edmond & Keefe, 2015). Understanding how factors associated with pain, health behavior, illness, and disease interact with cultural, institutional, societal, and regulatory influences to shape pain perception and treatment is critical knowledge for a pain psychologist to possess (Turk & Melzak, 2011).

Disability is a complex issue that is often interwoven in the clinical presentation of pain. Payments received for pain through various pathways and systems (e.g., workers' compensation, Social Security disability insurance, litigation set-

tlements, private long-term disability insurance) may serve as financial incentives to maintain the condition. Other forms of secondary gain—such as release from undesirable tasks or solicitous responses from family members—may also influence response to treatment (Romano et al., 1995; Turk, Kerns, & Rosenberg, 1992). Disability can also occur due to vocational issues (e.g., lack of employer accommodations for patient's impairment, patient's limited awareness or access to alternative work) or iatrogenically secondary to a prescribed treatment pathway (e.g., medication-related limitations) or when an employer does not allow modifications in the work environment to address patients' impairment. Pain psychologists should maintain an awareness of the psychosocial risk factors associated with disability to facilitate creating evidence-based treatment plans that maximize patient outcomes.

Because pain care does not take place in a vacuum, it is important to possess at least a rudimentary comprehension of the role, scope of practice, and contribution of different professionals within a treatment team while concurrently appreciating that systems' factors that can affect outcomes. This would include a fundamental understanding of the broad categories of pain (e.g., acute, chronic, cancer, non-cancer, end of life) and their associated treatment foci, specific pain conditions, interventional approaches to care, pharmacological pain management, and the scientific foundations of the other health disciplines on the pain care team (Mezei, Murinson, & Johns Hopkins Pain Curriculum Development Team, 2011). Because the field is dynamic, ongoing continuing education in the aforementioned areas is necessary to ensure that a psychologist is applying the most current information in patient care. Clear and concise verbal and written communications with team members that maximize the use of new and emerging health technologies (e.g., electronic health records, secure messaging) while adhering to relevant ethical and confidentiality guidelines can help cultivate an understanding of the treatment plan across disciplines and reinforce an interdisciplinary approach to care. It is similarly important to recognize that the mission and structure of the health care organization, relevant historical factors, and the position of psychology within the system shape the delivery of care. Finally, understanding the monetary aspects of care delivery, including billing and coding, is essential to ensure financial viability.

One of the more significant roles played by pain psychologists is that of an advocate in assisting patients with identifying and meeting treatment goals. Efforts to improve health involves interacting with a number of systems to inform policy relevant to pain management at local, state, and federal levels. Advocacy work also occurs within the discipline itself to support increased research and clinical training. Pain psychologists often fulfill additional roles beyond advocacy and the clinical delivery of services, including (a) encouraging behavior that demonstrates appro-

appropriate respect for patient autonomy and professional autonomy of other health care professionals, (b) assessing team dynamics and intervening to maximize effectiveness, and (c) providing education about psychology to team members (Hunter et al., 2008).

Although the delivery of interdisciplinary care may be facilitated by working in a setting in which multiple disciplines practice alongside one another, this option might not be available. In such situations, a single clinician may deliver multimodal care or the interdisciplinary work may occur virtually. Though it is much more challenging to do so, it remains important for independent private practitioners to understand how contextual factors influence delivery of care, including any potential impact that may arise as a result of not being a part of a collocated team and communication strategies that should be implemented to address these potential limitations.

## Discussion

Chronic pain has been identified as a public health challenge by the IOM for a number of reasons, including its high prevalence; its direct and indirect financial costs, including those stemming from the opioid crisis; and notable disparities in access and quality of care, as well as its effects on vulnerable populations (IOM, 2011). To begin to address this public health challenge, it is important to utilize health strategies at both the population and individual levels. Clinicians, scientists, and politicians have acknowledged the magnitude of the problem and proposed clinical and policy changes to attempt to address the challenges associated with pain care and research. The NPS blueprint for transforming pain care in America highlights the importance of developing an approach to increasing the number of pain management practitioners across different disciplines, including psychologists, who play important roles in the assessment and management of pain (IPRCC, 2015).

The terms *pain psychology* and *pain psychologist* are frequently cited in public discourse about integrated, multimodal, and interdisciplinary pain care. Job postings have already begun to establish definitions of *pain psychology* and the requisite skills necessary to practice in this domain, but there has been great variability in how these are characterized. Psychologists working in this field are commonly referred to as pain psychologists; however, there is presently no established definition of this term, nor have parameters been delineated to guide the training of individuals in this realm. Pain psychology is not currently recognized as a specialty or proficiency by the American Psychological Association. It is important for the field of psychology itself, similar to the case with other disciplines in the pain management field, to define what constitutes a pain psychologist rather than have this term applied ambiguously by others. Formalization of the specialty of pain psychology

could positively impact reimbursement, an issue that is a serious threat to the continued emergence of this specialty and its integration into clinical practice. This article is the first attempt to define what it means to be a pain psychologist and the competencies necessary to be a competent pain psychologist, and this article advances the models for education and training necessary to achieve these competencies.

Although the pain psychology competencies overlap with competencies for the practice of clinical and counseling psychology and specialties within psychology (Cox et al., 2013; Ditomasso et al., 2013; Finch et al., 2012; France et al., 2008; Fuertes et al., 2013; Lambert & Nelson, 2012; Molinari, 2011; Packer & Grisso, 2011), they are also substantially distinct and represent a maturation of both the science and practice of pain psychology consistent with its recognition as a separate specialty. Given the vast array of unique needs of individuals living with pain and the diversity of settings in which pain management services are researched and delivered, it is not practical to attempt to develop a set of all-encompassing competencies for the science and practice of pain psychology; thus, the competencies and recommendations suggested in this article should be considered comprehensive but not exhaustive.

As the field of pain psychology becomes more clearly defined, it will be important to include training recommendations (e.g., similar to the training guidelines for clinical health psychology; Kerns, Berry, Frantsve, & Linton, 2009) for this newer specialty of professional psychology. The foundations outlined in this article can serve as the building blocks for expanding pain education across the full continuum of psychology training.

Regardless of the reader's level of agreement with the ideas set forth in this article, it is hoped that researchers and clinicians will see benefit in identifying a core fund of knowledge to guide the work of psychologists working in the field of pain management. The aim of this article was to serve as a catalyst for communication regarding the science and practice of psychology within the field of pain management. There is a strong likelihood that this area will have greater visibility in the near future, because recent practice guidelines have concluded that few other treatments are supported by a higher level of evidence compared to those that are psychologically based (e.g., Colorado Division of Workers' Compensation, 2017). This is of particular importance in the current environment in which the chronic pain and opioid crises are driving renewed interest among health care professionals in nonpharmacologic approaches to pain management.

## References

- Agboola, S. O., Ju, W., Elfiky, A., Kvedar, J. C., & Jethwani, K. (2015). The effect of technology-based interventions on pain, depression, and quality of life in patients with cancer: A systematic review of random-

- ized controlled trials. *Journal of Medical Internet Research*, 17(3), e65. <http://dx.doi.org/10.2196/jmir.4009>
- Alperstein, D., & Sharpe, L. (2016). The efficacy of motivational interviewing in adults with chronic pain: A meta-analysis and systematic review. *Journal of Pain*, 17, 393–403.
- American Psychological Association. (2014). *Distinguishing between screening and assessment for mental and behavioral health problems*. Retrieved from <http://www.apapracticecentral.org/reimbursement/billing/assessment-screening.aspx>
- American Psychological Association. (2015). *Competencies for psychology practice in primary care*. Retrieved from <http://www.apa.org/ed/resources/competencies-practice.pdf>
- Bastian, L. A., Driscoll, M. A., Heapy, A. A., Becker, W. C., Goulet, J. L., Kerns, R. D., . . . Haskell, S. G. (2017). Cigarette smoking status and receipt of an opioid prescription among veterans of recent wars. *Pain Medicine*, 18, 1089–1097.
- Block, A. R., Gatchel, R. J., Deardorff, W. W., & Guyer, R. D. (2003). *The psychology of spine surgery*. Washington, DC: American Psychological Association. <http://dx.doi.org/10.1037/10613-000>
- Brown Levey, S. M., Miller, B. F., & Degruy, F. V., III. (2012). Behavioral health integration: An essential element of population-based healthcare redesign. *Translational Behavioral Medicine*, 2, 364–371. <http://dx.doi.org/10.1007/s13142-012-0152-5>
- Bruns, D., & Disorbio, J. M. (2009). Assessment of biopsychosocial risk factors for medical treatment: A collaborative approach. *Journal of Clinical Psychology in Medical Settings*, 16, 127–147. <http://dx.doi.org/10.1007/s10880-009-9148-9>
- Bruns, D., & Disorbio, J. M. (2013). The psychological assessment of patients with chronic pain. In T. R. Deer, M. S. Leong, A. Buvaendran, V. Gordin, P. S. Kim, S. J. Panchal, A. L. Ray (Eds.), *Comprehensive treatment of chronic pain by medical, interventional, and integrative approaches: The American Academy of Pain Medicine textbook on patient management* (pp. 845–858). New York, NY: Springer. [http://dx.doi.org/10.1007/978-1-4614-1560-2\\_75](http://dx.doi.org/10.1007/978-1-4614-1560-2_75)
- Bruns, D., & Disorbio, J. M. (2014). The psychological evaluation of patients with chronic pain: A review of BHI 2 clinical and forensic interpretive considerations. *Psychological Injury and Law*, 7, 335–361. <http://dx.doi.org/10.1007/s12207-014-9206-y>
- Burgess, D. J., Gravely, A. A., Nelson, D. B., van Ryn, M., Bair, M. J., Kerns, R. D., . . . Partin, M. R. (2013). A national study of racial differences in pain screening rates in the VA health care system. *Clinical Journal of Pain*, 29, 118–123. <http://dx.doi.org/10.1097/AJP.0b013e31826a86ae>
- Burns, J. W., Post, K. M., Smith, D. A., Porter, L. S., Buvaendran, A., Fras, A. M., & Keefe, F. J. (2018). Spouse criticism and hostility during marital interaction: Effects on pain intensity and behaviors among individuals with chronic low back pain. *Pain*, 159, 25–32. <http://dx.doi.org/10.1097/j.pain.0000000000001037>
- Campbell, P., Foster, N. E., Thomas, E., & Dunn, K. M. (2013). Prognostic indicators of low back pain in primary care: Five-year prospective study. *Journal of Pain*, 14, 873–883. <http://dx.doi.org/10.1016/j.jpain.2013.03.013>
- Cano, A., & Tankha, H. (2018). Spousal criticism and hostility in response to pain: What is the alternative? *Pain*, 159, 1–2. <http://dx.doi.org/10.1097/j.pain.0000000000001045>
- Carragee, E. J., Alamin, T. F., Miller, J. L., & Carragee, J. M. (2005). Discographic, MRI and psychosocial determinants of low back pain disability and remission: A prospective study in subjects with benign persistent back pain. *Spine Journal*, 5, 24–35. <http://dx.doi.org/10.1016/j.spinee.2004.05.250>
- Carson, J. W., Keefe, F. J., Lynch, T. R., Carson, K. M., Goli, V., Fras, A. M., & Thorp, S. R. (2005). Loving-kindness meditation for chronic low back pain: Results from a pilot trial. *Journal of Holistic Nursing*, 23, 287–304. <http://dx.doi.org/10.1177/0898010105277651>
- Chapin, H., Bagarinao, E., & Mackey, S. (2012). Real-time fMRI applied to pain management. *Neuroscience Letters*, 520, 174–181. <http://dx.doi.org/10.1016/j.neulet.2012.02.076>
- Chapin, H. L., Darnall, B. D., Seppala, E. M., Doty, J. R., Hah, J. M., & Mackey, S. C. (2014). Pilot study of a compassion meditation intervention in chronic pain. *Journal of Compassionate Health Care*, 1, 1–12.
- Colorado Division of Workers' Compensation. (2017). *Chronic pain disorder medical treatment guideline*. Retrieved from [https://www.colorado.gov/pacific/sites/default/files/Rule\\_17\\_Exhibit\\_9\\_Chronic\\_Pain\\_Disorder.pdf](https://www.colorado.gov/pacific/sites/default/files/Rule_17_Exhibit_9_Chronic_Pain_Disorder.pdf)
- Cox, D. R., Cox, R. H., & Caplan, B. (2013). *Specialty competencies in rehabilitation psychology*. New York, NY: Oxford University Press. <http://dx.doi.org/10.1093/med:psych/9780195389241.001.0001>
- Cunningham, J. L., Hayes, S. E., Townsend, C. O., Laues, H. J., & Hooten, W. M. (2012). Associations between spousal or significant other solicitous responses and opioid dose in patients with chronic pain. *Pain Medicine*, 13, 1034–1039. <http://dx.doi.org/10.1111/j.1526-4637.2012.01434.x>
- Dao, T. K., Youssef, N. A., Armsworth, M., Wear, E., Papatopoulos, K. N., & Gopaldas, R. (2011). Randomized controlled trial of brief cognitive behavioral intervention for depression and anxiety symptoms preoperatively in patients undergoing coronary artery bypass graft surgery. *Journal of Thoracic and Cardiovascular Surgery*, 142(3), e109–e115. <http://dx.doi.org/10.1016/j.jtcvs.2011.02.046>
- Darnall, B. D., Scheman, J., Davin, S., Burns, J. W., Murphy, J. L., Wilson, A. C., . . . Mackey, S. C. (2016). Pain psychology: A global needs assessment and a national call to action. *Pain Medicine*, 17, 250–263. <http://dx.doi.org/10.1093/pm/pnv095>
- Datz, G., & Bruns, D. (2013). Billing psychological services for patients with chronic pain. In T. R. Deer, M. S. Leong, A. Buvaendran, V. Gordin, P. S. Kim, S. J. Panchal, & A. L. Ray (Eds.), *Comprehensive treatment of chronic pain by medical, interventional, and integrative approaches: The American Academy of Pain Medicine textbook on patient management* (pp. 845–858). New York, NY: Springer.
- Ditomasso, R. A., Cahn, S. C., Panichelli-Mindel, S. M., & McFillin, R. K. (2013). *Specialty competencies in clinical psychology*. New York, NY: Oxford University Press. <http://dx.doi.org/10.1093/med:psych/9780199737567.001.0001>
- Dorflinger, L., Kerns, R. D., & Auerbach, S. M. (2013). Providers' roles in enhancing patients' adherence to pain self management. *Translational Behavioral Medicine*, 3, 39–46. <http://dx.doi.org/10.1007/s13142-012-0158-z>
- Dorflinger, L. M., Ruser, C., Sellinger, J., Edens, E. L., Kerns, R. D., & Becker, W. C. (2014). Integrating interdisciplinary pain management into primary care: Development and implementation of a novel clinical program. *Pain Medicine*, 15, 2046–2054. <http://dx.doi.org/10.1111/pme.12554>
- Dubin, R. E., Flannery, J., Taenzer, P., Smith, A., Smith, K., Fabico, R., . . . Furlan, A. D. (2015). ECHO Ontario Chronic Pain & Opioid Stewardship: Providing access and building capacity for primary care providers in underserved, rural, and remote communities. *Studies in Health Technology and Informatics*, 209, 15–22.
- Eccleston, C., Hearn, L., & Williams, A. C. (2015). Psychological therapies for the management of chronic neuropathic pain in adults. *Cochrane Database of Systematic Reviews*, 2015(10), CD011259. <http://dx.doi.org/10.1002/14651858.CD011259.pub2>
- Edmond, S. N., & Keefe, F. J. (2015). Validating pain communication: Current state of the science. *Pain*, 156, 215–219. <http://dx.doi.org/10.1097/01.j.pain.0000460301.18207.c2>
- Ehde, D. M., Dillworth, T. M., & Turner, J. A. (2014). Cognitive-behavioral therapy for individuals with chronic pain: Efficacy, innovations, and directions for research. *American Psychologist*, 69, 153–166. <http://dx.doi.org/10.1037/a0035747>

- Erci, B., Sezgin, S., & Kacmaz, Z. (2004). The impact of therapeutic relationship on pre-operative and post-operative patient anxiety. *Australian Journal of Advanced Nursing*, *26*, 59–66.
- Esteve, R., Bendayan, R., López-Martínez, A. E., & Ramírez-Maestre, C. (2017). Resilience and vulnerability factors when pain is acute as predictors of disability: Findings from a two-year longitudinal study. *Pain Medicine*, *18*, 2116–2125. <http://dx.doi.org/10.1093/pm/pxx053>
- Fillingim, R. B., Ohrbach, R., Greenspan, J. D., Knott, C., Diatchenko, L., Dubner, R., . . . Maixner, W. (2013). Psychological factors associated with development of TMD: The OPPERA prospective cohort study. *Journal of Pain*, *14*(12, Suppl.), T75–T90. <http://dx.doi.org/10.1016/j.jpain.2013.06.009>
- Finch, A. J., Lochman, J. E., Nelson, M. W., & Roberts, M. C. (2012). *Specialty competencies in clinical child and adolescent psychology*. New York, NY: Oxford University Press.
- Fisher, E., Law, E., Palermo, T. M., & Eccleston, C. (2015). Psychological therapies (remotely delivered) for the management of chronic and recurrent pain in children and adolescents. *Cochrane Database of Systematic Reviews*, *2015*(3), CD011118. <http://dx.doi.org/10.1002/14651858.CD011118>
- Fishman, S. M., Young, H. M., Lucas Arwood, E., Chou, R., Herr, K., Murinson, B. B., . . . Strassels, S. A. (2013). Core competencies for pain management: Results of an interprofessional consensus summit. *Pain Medicine*, *14*, 971–981. <http://dx.doi.org/10.1111/pme.12107>
- Flor, H. (2014). Psychological pain interventions and neurophysiology: Implications for a mechanism-based approach. *American Psychologist*, *69*, 188–196. <http://dx.doi.org/10.1037/a0035254>
- Fouad, N. A., Grus, C. L., Hatcher, R. L., Kaslow, N. J., Hutchings, P. S., Madson, M. B., . . . Crossman, R. E. (2009). Competency benchmarks: A model for understanding and measuring competence in professional psychology across training levels. *Training and Education in Professional Psychology*, *3*(4, Suppl.), S5–S26. <http://dx.doi.org/10.1037/a0015832>
- France, C. R., Masters, K. S., Belar, C. D., Kerns, R. D., Klonoff, E. A., Larkin, K. T., . . . Thorn, B. E. (2008). Application of the competency model to clinical health psychology. *Professional Psychology: Research and Practice*, *39*, 573–580. <http://dx.doi.org/10.1037/0735-7028.39.6.573>
- Frantsve, L. M. E., & Kerns, R. D. (2007). Patient-provider interactions in the management of chronic pain: Current findings within the context of shared medical decision making. *Pain Medicine*, *8*, 25–35. <http://dx.doi.org/10.1111/j.1526-4637.2007.00250.x>
- Fuertes, J. N., Spokane, A. R., & Holloway, E. (2013). *Specialty competencies in counseling psychology*. New York, NY: Oxford University Press.
- Gatchel, R. J., McGeary, D. D., McGeary, C. A., & Lippe, B. (2014). Interdisciplinary chronic pain management: Past, present, and future. *American Psychologist*, *69*, 119–130. <http://dx.doi.org/10.1037/a0035514>
- Gatchel, R. J., Peng, Y. B., Peters, M. L., Fuchs, P. N., & Turk, D. C. (2007). The biopsychosocial approach to chronic pain: Scientific advances and future directions. *Psychological Bulletin*, *133*, 581–624. <http://dx.doi.org/10.1037/0033-2909.133.4.581>
- Goral, A., Lipsitz, J. D., & Gross, R. (2010). The relationship of chronic pain with and without comorbid psychiatric disorder to sleep disturbance and health care utilization: Results from the Israel National Health Survey. *Journal of Psychosomatic Research*, *69*, 449–457. <http://dx.doi.org/10.1016/j.jpsychores.2010.05.012>
- Goubert, L., Craig, K., Vervoort, T., Morley, S., Sullivan, M. J., Williams, A. C. d. C., . . . Crombez, G. (2005). Facing others in pain: The effects of empathy. *Pain*, *118*, 285–288. <http://dx.doi.org/10.1016/j.pain.2005.10.025>
- Green, C. R., & Hart-Johnson, T. (2010). The adequacy of chronic pain management prior to presenting at a tertiary care pain center: The role of patient socio-demographic characteristics. *Journal of Pain*, *11*, 746–754. <http://dx.doi.org/10.1016/j.jpain.2009.11.003>
- Hadjistavropoulos, T., Craig, K. D., Duck, S., Cano, A., Goubert, L., Jackson, P. L., . . . Fitzgerald, T. D. (2011). A biopsychosocial formulation of pain communication. *Psychological Bulletin*, *137*, 910–939. <http://dx.doi.org/10.1037/a0023876>
- Heapy, A. A., Higgins, D. M., Cervone, D., Wandner, L., Fenton, B. T., & Kerns, R. D. (2015). Systematic review of technology-assisted self-management interventions for chronic pain: Looking across treatment modalities. *Clinical Journal of Pain*, *31*, 470–492. <http://dx.doi.org/10.1097/AJP.0000000000000185>
- Hill, J. C., Dunn, K. M., Lewis, M., Mullis, R., Main, C. J., Foster, N. E., & Hay, E. M. (2008). A primary care back pain screening tool: Identifying patient subgroups for initial treatment. *Arthritis & Rheumatism*, *59*, 632–641. <http://dx.doi.org/10.1002/art.23563>
- Hunter, J., Watt-Watson, J., McGillion, M., Raman-Wilms, L., Cockburn, L., Lax, L., . . . Salter, M. (2008). An interfaculty pain curriculum: Lessons learned from six years experience. *Pain*, *140*, 74–86. <http://dx.doi.org/10.1016/j.pain.2008.07.010>
- Institute of Medicine. (2011). *Relieving pain in America: A blueprint for transforming prevention, care, education, and research*. Washington, DC: National Academies Press.
- Interagency Pain Research Coordinating Committee. (2015). *National pain strategy: A comprehensive population health level strategy for pain*. Retrieved from <http://iprcc.nih.gov/docs/draft/nationalpainstrategy.pdf>
- International Association for the Study of Pain. (2008). *Core curriculum for professional education in pain* (3rd ed.). Seattle, WA: IASP Press.
- Janevic, M. R., McLaughlin, S. J., Heapy, A. A., Thacker, C., & Piette, J. D. (2017). Racial and socioeconomic disparities in disabling chronic pain: Findings from the Health and Retirement Study. *Journal of Pain*, *18*, 1459–1467.
- Jensen, M. P., Grierson, C., Tracy-Smith, V., Bacigalupi, S. C., & Othmer, S. (2007). Neurofeedback treatment for pain associated with complex regional pain syndrome type I: A case series. *Journal of Neurotherapy*, *11*, 45–53. [http://dx.doi.org/10.1300/J184v11n01\\_04](http://dx.doi.org/10.1300/J184v11n01_04)
- Jensen, M. P., Nielson, W. R., & Kerns, R. D. (2003). Toward the development of a motivational model of pain self-management. *Journal of Pain*, *4*, 477–492. [http://dx.doi.org/10.1016/S1526-5900\(03\)00779-X](http://dx.doi.org/10.1016/S1526-5900(03)00779-X)
- Jensen, M. P., & Turk, D. C. (2014). Contributions of psychology to the understanding and treatment of people with chronic pain: Why it matters to all psychologists. *American Psychologist*, *69*, 105–118. <http://dx.doi.org/10.1037/a0035641>
- Johnston, M., & Vogege, C. (1993). Benefits of psychological preparation for surgery: A meta-analysis. *Annals of Behavioral Medicine*, *15*, 245–256.
- Keefe, F. J., Somers, T. J., Williams, D. A., & Smith, S. J. (2011). Assessment of pain behaviors. In D. C. Turk & R. Melzack (Eds.), *Handbook of pain assessment* (3rd ed., pp. 134–133). New York, NY: Guilford Press
- Kerns, R. D., Berry, S., Frantsve, L. M. E., & Linton, J. C. (2009). Life-long competency development in clinical health psychology. *Training and Education in Professional Psychology*, *3*, 212–217. <http://dx.doi.org/10.1037/a0016753>
- Kerns, R. D., Burns, J. W., Shulman, M., Jensen, M. P., Nielson, W. R., Czapinski, R., . . . Rosenberger, P. (2014). Can we improve cognitive-behavioral therapy for chronic back pain treatment engagement and adherence? A controlled trial of tailored versus standard therapy. *Health Psychology*, *33*, 938–947. <http://dx.doi.org/10.1037/a0034406>
- Kerns, R. D., & Jacob, M. C. (Eds.). (1995). *Handbook of health and rehabilitation*. New York, NY: Plenum Press.
- Kerns, R. D., Sellinger, J., & Goodin, B. R. (2011). Psychological treatment of chronic pain. *Annual Review of Clinical Psychology*, *7*, 411–434. <http://dx.doi.org/10.1146/annurev-clinpsy-090310-120430>

- Knaster, P., Karlsson, H., Estlander, A. M., & Kalso, E. (2012). Psychiatric disorders as assessed with SCID in chronic pain patients: The anxiety disorders precede the onset of pain. *General Hospital Psychiatry, 34*, 46–52. <http://dx.doi.org/10.1016/j.genhosppsych.2011.09.004>
- Krahé, C., Springer, A., Weinman, J. A., & Fotopoulou, A. (2013). The social modulation of pain: Others as predictive signals of salience—A systematic review. *Frontiers in Human Neuroscience, 7*, 386. <http://dx.doi.org/10.3389/fnhum.2013.00386>
- Lamberty, G. J., & Nelson, N. W. (2012). *Specialty competencies in clinical neuropsychology*. New York, NY: Oxford University Press.
- Lethem, J., Slade, P. D., Troup, J. D., & Bentley, G. (1983). Outline of a fear-avoidance model of exaggerated pain perception—I. *Behaviour Research and Therapy, 21*, 401–408. [http://dx.doi.org/10.1016/0005-7967\(83\)90009-8](http://dx.doi.org/10.1016/0005-7967(83)90009-8)
- Lumley, M. A., Schubiner, H., Lockhart, N. A., Kidwell, K. M., Harte, S. E., Clauw, D. J., & Williams, D. A. (2017). Emotional awareness and expression therapy, cognitive behavioral therapy, and education for fibromyalgia: A cluster-randomized controlled trial. *Pain, 158*, 2354–2363. <http://dx.doi.org/10.1097/j.pain.0000000000001036>
- Main, C. J., Keefe, F. J., Jensen, M. P., Vlaeyen, J. W. S., & Vowles, K. E. (Eds.). (2015). *Fordyce's behavioral methods for chronic pain and illness*. Philadelphia, PA: Wolters Kluwer.
- Martire, L. M., Schulz, R., Helgeson, V. S., Small, B. J., & Saghabi, E. M. (2010). Review and meta-analysis of couple-oriented interventions for chronic illness. *Annals of Behavioral Medicine, 40*, 325–342. <http://dx.doi.org/10.1007/s12160-010-9216-2>
- McCracken, L. M., & Vowles, K. E. (2014). Acceptance and commitment therapy and mindfulness for chronic pain: Model, process, and progress. *American Psychologist, 69*, 178–187. <http://dx.doi.org/10.1037/a0035623>
- McDaniel, S. H., Grus, C. L., Cubic, B. A., Hunter, C. L., Kearney, L. K., Schuman, C. C., . . . Johnston, S. B. (2014). Competencies for psychology practice in primary care. *American Psychologist, 69*, 409–429. <http://dx.doi.org/10.1037/a0036072>
- McGeary, C. A., Blount, T. H., Peterson, A. L., Gatchel, R. J., Hale, W. J., & McGeary, D. D. (2016). Interpersonal responses and pain management within the U.S. military. *Journal of Occupational Rehabilitation, 26*, 216–228. <http://dx.doi.org/10.1007/s10926-015-9605-2>
- McLinton, S., McLinton, S. S., & van der Linden, M. (2018). Psychosocial factors impacting workplace injury rehabilitation: Evaluation of a concise screening tool. *Journal of Occupational Rehabilitation, 28*, 121–129. <http://dx.doi.org/10.1007/s10926-017-9701-6>
- Meints, S. M., Miller, M. M., & Hirsh, A. T. (2016). Differences in pain coping between Black and White Americans: A meta-analysis. *Journal of Pain, 17*, 642–653. <http://dx.doi.org/10.1016/j.jpain.2015.12.017>
- Melzack, R., & Wall, P. D. (1965, November 19). Pain mechanisms: A new theory. *Science, 150*, 971–979. <http://dx.doi.org/10.1126/science.150.3699.971>
- Mezei, L., Murinson, B. B., & Johns Hopkins Pain Curriculum Development Team. (2011). Pain education in North American medical schools. *Journal of Pain, 12*, 1199–1208. <http://dx.doi.org/10.1016/j.jpain.2011.06.006>
- Molinari, V. (2011). *Specialty competencies in geropsychology*. New York, NY: Oxford University Press.
- Molton, I. R., & Terrill, A. L. (2014). Overview of persistent pain in older adults. *American Psychologist, 69*, 197–207. <http://dx.doi.org/10.1037/a0035794>
- Murphy, S. E., Blake, C., Power, C. K., & Fullen, B. M. (2016). Comparison of a stratified group intervention (STarT Back) with usual group care in patients with low back pain: A nonrandomized controlled trial. *Spine, 41*, 645–652. <http://dx.doi.org/10.1097/BRS.0000000000001305>
- Nelson, E. A., Dowsey, M. M., Knowles, S. R., Castle, D. J., Salzberg, M. R., Monshat, K., . . . Choong, P. F. (2013). Systematic review of the efficacy of pre-surgical mind-body based therapies on post-operative outcome measures. *Complementary Therapies in Medicine, 21*, 697–711. <http://dx.doi.org/10.1016/j.ctim.2013.08.020>
- Packer, I. K., & Grisso, T. (2011). *Specialty competencies in forensic psychology*. New York, NY: Oxford University Press.
- Peel, D. (2012). *Woman's story ignites major debate over privacy safeguards for mental health care*. Retrieved from [https://aishealth.com/sites/all/files/latest-issue-pdf/aug\\_1\\_2012/rpp0812.pdf](https://aishealth.com/sites/all/files/latest-issue-pdf/aug_1_2012/rpp0812.pdf)
- Piaserico, S., Marinello, E., Dessi, A., Linder, M. D., Coccarielli, D., & Peserico, A. (2016). Efficacy of biofeedback and cognitive-behavioural therapy in psoriatic patients: A single-blind, randomized and controlled study with added narrow-band ultraviolet B therapy. *Acta Dermatologica Venereologica, 96*, 91–95.
- Powell, R., Scott, N. W., Manyande, A., Bruce, J., Vogele, C., Bryne-Davis, L. M., . . . Johnston, M. (2016). Psychological preparation and postoperative outcomes for adults undergoing surgery under general anesthesia. *Cochrane Library, 5*, CD008646.
- Ramezani, A., McCarron, R. M., Lashai, B., & Lenaerts, M. E. P. (2015). Head pain and psychiatric illness: Applying the biopsychosocial model to care. *Current Psychiatry, 14*, 12–26.
- Ramezani, A., Rockers, D. M., Wanlass, R. L., & McCarron, R. M. (2016). Teaching behavioral medicine professionals and trainees an elaborated version of the Y-model: Implications for the integration of cognitive-behavioral therapy (CBT), psychodynamic therapy, and motivational interviewing. *Journal of Psychotherapy Integration, 26*, 407–424. <http://dx.doi.org/10.1037/int0000048>
- Robinson, H. S., & Dagfinrud, H. (2017). Reliability and screening ability of the StarT Back screening tool in patients with low back pain in physiotherapy practice, a cohort study. *BMC Musculoskeletal Disorders, 18*, 232–238. <http://dx.doi.org/10.1186/s12891-017-1553-x>
- Robinson, M. E., Riley, J. L., III, Myers, C. D., Papas, R. K., Wise, E. A., Waxenberg, L. B., & Fillingim, R. B. (2001). Gender role expectations of pain: Relationship to sex differences in pain. *Journal of Pain, 2*, 251–257. <http://dx.doi.org/10.1054/jpai.2001.24551>
- Romano, J. M., Turner, J. A., Jensen, M. P., Friedman, L. S., Bulcroft, R. A., Hops, H., & Wright, S. F. (1995). Chronic pain patient-spouse behavioral interactions predict patient disability. *Pain, 63*, 353–360. [http://dx.doi.org/10.1016/0304-3959\(95\)00062-3](http://dx.doi.org/10.1016/0304-3959(95)00062-3)
- Runyan, C. N. (2011). Psychology can be indispensable to health care reform and the patient-centered medical home. *Psychological Services, 8*, 53–68. <http://dx.doi.org/10.1037/a0023454>
- Shadick, N. A., Sowell, N. F., Frits, M. L., Hoffman, S. M., Hartz, S. A., Booth, F. D., . . . Schwartz, R. C. (2013). A randomized controlled trial of an internal family systems-based psychotherapeutic intervention on outcomes in rheumatoid arthritis: A proof-of-concept study. *Journal of Rheumatology, 40*, 1831–1841. <http://dx.doi.org/10.3899/jrheum.121465>
- Shedden Mora, M. C., Weber, D., Neff, A., & Rief, W. (2013). Biofeedback-based cognitive-behavioral treatment compared with occlusal splint for temporomandibular disorder: A randomized controlled trial. *Clinical Journal of Pain, 29*, 1057–1065. <http://dx.doi.org/10.1097/AJP.0b013e3182850559>
- Sielski, R., Rief, W., & Glombiewski, J. A. (2017). Efficacy of biofeedback in chronic back pain: A meta-analysis. *International Journal of Behavioral Medicine, 24*, 25–41. <http://dx.doi.org/10.1007/s12529-016-9572-9>
- Sparkes, E., Duarte, R. V., Raphael, J. H., Denny, E., & Ashford, R. L. (2012). Qualitative exploration of psychological factors associated with spinal cord stimulation outcome. *Chronic Illness, 8*, 239–251. <http://dx.doi.org/10.1177/1742395311433132>
- Stayner, S., Ramezani, A., Prasad, R., & Mahajan, G. (2016). Chronic pain and psychiatric illness: Managing comorbid condition. *Current Psychiatry, 15*, 27–33.
- Sullivan, M. J. (2012). The communal coping model of pain catastrophizing: Clinical research implication. *Canadian Psychology, 53*, 32–41. <http://dx.doi.org/10.1037/a0026726>

- Tait, R. C., & Chibnall, J. T. (2014). Racial/ethnic disparities in the assessment and treatment of pain: Psychosocial perspectives. *American Psychologist, 69*, 131–141. <http://dx.doi.org/10.1037/a0035204>
- Tan, G., Rintala, D. H., Jensen, M. P., Richards, J. S., Holmes, S. A., Parachuri, R., . . . Price, L. R. (2011). Efficacy of cranial electrotherapy stimulation for neuropathic pain following spinal cord injury: A multi-site randomized controlled trial with a secondary 6-month open-label phase. *Journal of Spinal Cord Medicine, 34*, 285–296. <http://dx.doi.org/10.1179/2045772311Y.0000000008>
- Thorn, B. E., Eyer, J. C., Van Dyke, B. P., Torres, C. A., Burns, J. W., Kim, M., . . . Tucker, D. H. (2018). Literacy-adapted cognitive-behavioral therapy vs education for chronic pain at low-income clinics: A randomized controlled trial. *Annals of Internal Medicine, 168*, 471–480. <http://dx.doi.org/10.7326/M17-0972>
- Turk, D. C., Dworkin, R. H., Allen, R. R., Bellamy, N., Brandenburg, N., Carr, D. B., . . . Witter, J. (2003). Core outcome domains for chronic pain clinical trials: IMMPACT recommendations. *Pain, 106*, 337–345. <http://dx.doi.org/10.1016/j.pain.2003.08.001>
- Turk, D. C., & Gatchel, R. J. (2012). *Psychological approaches to pain management*. New York, NY: Guilford Press.
- Turk, D. C., Kerns, R. D., & Rosenberg, R. (1992). Effects of marital interaction on chronic pain and disability: Examining the down side of social support. *Rehabilitation Psychology, 37*, 259–274. <http://dx.doi.org/10.1037/h0079108>
- Turk, D. C., & Melzak, R. (2011). *Handbook of pain assessment* (3rd ed.). New York, NY: Guilford Press.
- Vlaeyen, J. W., & Linton, S. J. (2000). Fear-avoidance and its consequences in chronic musculoskeletal pain: A state of the art. *Pain, 85*, 317–332. [http://dx.doi.org/10.1016/S0304-3959\(99\)00242-0](http://dx.doi.org/10.1016/S0304-3959(99)00242-0)
- Wahlin, S., & Tonnesen, H. (2014). Time for alcohol-free operations. Two standard drinks a day doubles the risk of postoperative complications. *Lakartidningen, 11*, 1966–1969.
- Wertli, M. M., Eugster, R., Held, U., Steurer, J., Kofmehl, R., & Weiser, S. (2014). Catastrophizing—a prognostic factor for outcome in patients with low back pain: A systematic review. *Spine Journal, 14*, 2639–2657. <http://dx.doi.org/10.1016/j.spinee.2014.03.003>
- Williams, A. C., Eccleston, C., & Morley, S. (2012). Psychological therapies for the management of chronic pain (excluding headache) in adults. *Cochrane Database of Systematic Reviews, 2012*(11), CD007407. <http://dx.doi.org/10.1002/14651858.CD007407.pub3>
- Zachariae, R., Lyby, M. S., Ritterband, L. M., & O'Toole, M. S. (2016). Efficacy of Internet-delivered cognitive-behavioral therapy for insomnia—A systematic review and meta-analysis of randomized controlled trials. *Sleep Medicine Reviews, 30*, 1–10. <http://dx.doi.org/10.1016/j.smrv.2015.10.004>

Received February 14, 2017

Revision received February 2, 2018

Accepted March 14, 2018 ■