

FOREWORDS

Foreword

The time for integrative pain management has arrived. The use of drugs as the main and often only approach to pain, especially the overuse of opioids, is at a tipping point. The United States President, the American Medical Association, the Institute of Medicine, the US military, the Center for Disease Control and others have all called for better management of pain and reduction in drug use – but what will be offered instead? Behavioral and integrative approaches are the logical and evidence-based alternatives. After searching for a path into mainstream care, pain is the tip of the spear for self-care, non-pharmacological and integrative approaches – perfect timing for this book.

But this is not just a book written to fill a void. *Integrative Pain Management* is a carefully and thoughtfully constructed guide on how to help patients after the drugs have been taken away. Here we have a dozen methods with pain reducing abilities. The book describes methods from massage therapy, tissue manipulation, taping, movement approaches such as yoga and Qi-Gong, and mind-body approaches such as mindfulness and body awareness. The introductory chapters provide a clear introduction to the neurobiology and theoretical models of pain. The book ends with a step-wise guide for setting up and operating an integrated team for pain management.

One of the most unique and valuable features of this book is the richness and logic of the information provided. Each chapter provides both quantitative data from the most recent research, and qualitative descriptions of patients' experiences. In addition, a history of each method is provided with the

addition of recent developments in practice and a description of how the method is applied. The figures and illustrations are clear, well selected and carefully placed. Reading it provides not only information but better understanding. By the time this book is published, three large systematic reviews of massage for musculoskeletal, surgical and cancer pain will have been published showing good evidence for their use, adding to the knowledge base summarized here.

But can these approaches get into the mainstream? I see patients in an integrative pain medical clinic. Patient after patient comes in seeking rapid relief and new methods. When I speak to them about the options in this book, they are often interested, but our healthcare system cannot effectively deliver them. Reimbursement for massage and meditation therapies is thin or non-existent. Most pain centers are not trained in how to work in an integrative fashion, resulting in poorly targeted therapies. Patients often need help in engagement and lose interest in therapies that require time and new skills.

It is my hope that there will now be accelerated adoption of integrative approaches to pain in health care. As our health care system and the public awake to these methods and their growing evidence, this book should become a mainstay in that adoption.

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INTRODUCTION

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Purpose

Our understanding of the pathophysiology of chronic pain has increased substantially over the past 20 years ... Pain is now considered a conscious experience

Moseley and Vlaeyen 2015

Untreated and undertreated pain is the most pervasive health problem today (Dubois, Gallagher, and Lippe 2009). Juxtaposed with the lack of adequate treatment worldwide is the dependency on prescription drug use to treat pain. There are an estimated 15 million people around the globe who suffer from opioid dependency, and an estimated 69,000 people die from opioid overdose each year (WHO 2014), many of whom are on low doses with acute and intermittent use (Fulton-Kehoe et al. 2015). Prolonged use of pain medications has been shown to worsen pain symptoms and pose substantial risk (Menard 2014; Fulton-Kehoe et al. 2015). In the USA alone, non-steroidal anti-inflammatory drugs (NSAIDs) and acetaminophen send 80,000 people to the ER annually, and NSAID use is associated with increased risk of GI bleeds, impaired renal function, and cardiovascular death (Menard 2014). The cost of pain spans economic, social, mental (Waters-Banker et al. 2014), and functional domains of human life. The economic cost of chronic pain, including lost productivity and treatment in the USA alone, is estimated at nearly \$635 billion annually (Get The Facts 2014).

Failure to adequately treat pain results in an escalation of medical problems: secondary muscle changes and postural aberrations can generate additional pain (Bronfort et al. 2008). Emotional and spiritual changes affect behavior and mood. Social bonds are disrupted; inability to perform activities of daily living result in isolation, unemployment, and invalidism (IOM 2011). In addition, it is common to see depression, anger, anxiety, fear, and suicidal ideation associated with persistent pain

(Goldberg and McGee 2011; Moseley and Vlaeyen 2015; European Pain Federation 2015).

Advances in understanding pain and effective treatments to address pain, coupled with inclusion of various perspectives on optimal health, are changing the landscape of what is available for individuals experiencing pain. There is an international trend towards integrative health care (IOM 2011), incorporating evidence-informed, patient-centered complementary practices that address the cadre of complications associated with pain.

Many integrative approaches to pain are non-invasive with few side effects. While the clinical safety of complementary approaches can be a concern, there is little evidence of harm in massage, movement, or mindfulness approaches (Cambron et al. 2007; Ernst 2003). Research supporting the safety and effectiveness of complementary and alternative medicine (CAM) practices is increasing. These disciplines are beneficial on many levels: approaches outlined in this book have been linked to lower healthcare utilization and costs, and better health outcomes (Martin et al. 2012; Plastaras et al. 2013).

Massage, movement, and mindfulness based approaches are most often sought by patients who have given up on, not seen improvements from, or are otherwise unsatisfied with biomedical approaches to chronic pain treatment (Clarke et al. 2015; Berman 2003). Allopathic practitioners typically have little knowledge of these less than mainstream approaches and therefore do not refer patients for care. This situation can be exacerbated by prejudice against these approaches, which is often attributed to lack of evidence. There is limited research on the effectiveness of many complementary practices, particularly an overall lack of randomized clinical trials—the gold standard in

biomedical research. However, there is a wealth of clinical evidence that complementary approaches can be extremely helpful for the treatment of pain, based on patient experiences in real-life clinical practice. Research on these approaches is increasing each year, and funding for larger studies is imperative, given the positive clinical evidence for many complementary approaches. Whole systems research, based on real world practice parameters, is particularly important and this identified need has prompted a growing evidence base on the effectiveness of complementary approaches (Tick 2014).

Contents

This book was designed to provide in-depth information on safe and effective complementary approaches for pain treatment. It is our hope that biomedical providers will be encouraged to support their patients to seek and use these evidence-informed approaches in this climate of integrated care.

Audience

Our audience is twofold: the focus is on biomedical providers with the intent to ease the integration of massage, movement, and mindfulness into pain care. Complementary providers will also find this book an essential resource: an effective networking tool for participating on interdisciplinary health-care teams. Both biomedical and complementary providers will find this text valuable for patient education, presenting research findings, providing theoretical constructs behind approaches to pain, and detailing the patient experience.

Structure

The first three chapters of the book provide an overview of integrative health care, describe the current science and understanding of pain, and detail theories to address pain. Chapters 4–16 detail massage, movement, and mindfulness-based approaches—the history of the discipline, the clinical reasoning for treating pain, the patient

encounter—demonstrating how the approach helps patients manage their pain and live fuller lives. Rather than classifying pain by diagnosis, such as fibromyalgia, the book focuses on pain symptoms and the ways in which pain is experienced by individual patients.

Included in Chapters 4–16 are Research Sidebars. These merge relevant scientific information with the clinical expertise shared by the authors. These highlight basic science research—emerging advancements in understanding mechanisms—and other sidebars summarize clinical outcomes relevant to the massage, movement, or mindfulness approach.

Interview Sidebars incorporate comments gathered from Patient and Practitioner Interview Questionnaires. Authors were asked to distribute the questionnaires to patients and referring providers. Answers illuminate the patients' experience of these complementary approaches, and offer providers insights into the value of working with complementary providers. The results are limited by small and convenient sampling; authors likely distributed these to satisfied patients and referring providers with good working relationships (see Tables 1 and 2 for results of questionnaires).

The final chapter, Pathways to Integrative Clinical Care, provides communication guidelines for building and participating on effective interdisciplinary care teams. We believe that communication is the most important tool to promote shared decision-making and implement a patient-centered approach to integrative pain management.

The Approaches

According to a 2015 report from the Centers for Disease Control (CDC), among the most commonly used complementary approaches are: yoga, Tai Chi, and Qi Gong; chiropractic or osteopathic manipulation; meditation; and massage therapy (Clarke et al. 2015). This informed our inclusion/exclusion criteria. We chose to stay within our own scope of practice

and focus on approaches that are commonly used by patients, have solid, emerging evidence, but are less supported by biomedical providers. In keeping with the massage, movement, and mindfulness (MMM) theme, we intentionally omitted spinal manipulation (only massage-type osteopathic techniques are included), needling (only Traditional Chinese Medicine (TCM) bodywork is included), energy work, mental health, and nutrition/supplements. Even so, there are many other modalities and disciplines within MMM, such as Alexander Technique, Shiatsu, and Watsu (water massage), that are equally effective, and we hope biomedical providers will consider these when referring patients to MMM approaches for pain management.

In particular, this book presents in-depth descriptions of a variety of massage-based disciplines (scar massage, lymphatic drainage, structural integration) and a few approaches that massage therapists integrate into practice (osteopathic techniques, functional taping, Tui Na, and Trager). Movement practices have a variety of approaches to care—active, passive, and interactive—and apply these practices in both classroom and individual settings. We included a sampling of the most common approaches: active (yoga, Tai Chi/Qi Gong), and two that incorporate passive, active, and interactive approaches (Trager and Feldenkrais Method). Mindfulness and awareness practices are interwoven into every approach, and we have a chapter dedicated to the evidence for and applications of each.

Paramount in every chapter is a focus on patient-centered care. Each author emphasizes the importance of addressing the whole person from a biopsychosocial perspective. For example, the literature states that massage is primarily biomechanical in nature yet, in practice, attention to mental, emotional, and spiritual needs are evident (Fortune and Hymel 2015).

Patient participation outside the treatment room or classroom is also emphasized. The IOM (2011) lists promoting self-management of pain as one of

the critical steps to improving care. Berman asserts that complementary therapies “give people more ways to help themselves—to reduce or cope with not only pain but also other aspects of chronic conditions such as anxiety and stress, or to change to more healthy lifestyles” (2003).

Authors

The drive to expand options for care is a true expression of patient-centeredness: “There appears to be no one treatment that is best for all patients” (Maiers et al. 2012). The authors selected to contribute to this book are all experts in their disciplines, practicing in various countries around the world, treating patients with complicated health issues. We prioritized contributors that are actively practicing, in order to focus on sharing clinical expertise in treating pain. Many authors are trained in multiple modalities within their discipline, and a good number are professionals in multiple disciplines. For example, there are eleven authors practicing under massage licenses, three others with massage training but working under another license (a nurse, a medical doctor, and an osteopath). All are cross-trained in various modalities. Other authors have received biomedical academic degrees first, and later sought training in massage, movement, and mindfulness disciplines.

How to Use the Book

Because of the diversity of approaches included in this book, and the cross-disciplinary audience, definitions of some terminology will be helpful:

- **Patient vs. client:** these terms refer to the same individual. We allowed authors to pick the term that they use in clinical practice.
- **Complementary provider:** this term refers to all providers who offer the approaches described in this book. Many terms exist to describe massage, movement and mindfulness based professionals. We chose this term to illustrate the value of integration. When one approach complements another, there is good integration.

- Biomedical provider: this term includes all allopathically trained medical providers whose training is rooted in mainstream health care.

The descriptions in this book are more in-depth than the typical paragraph written in other integrative healthcare references, making this text a useful resource beyond the primary audiences mentioned above. Patients who are actively engaged in their care and are empowered to be advocates for themselves may benefit from reading these descriptions. Interdisciplinary care team members who may not have a solid understanding of the approaches included might also find this book useful.

Each of the chapters describing clinical encounters can be used as a stand-alone educational tool if a provider needs information on a particular approach. However, the front information (Chapters 1–3) and the culminating chapter (Chapter 17) are important for all providers who wish to integrate patient-centered approaches to treating people in pain.

Summary

To date, biomedical providers do not have a comprehensive tool that describes useful, substantive information about complementary care, merging research, clinical expertise, and information about current healthcare opportunities. This reference text is written by complementary providers, giving the reader inside perspectives on the clinical encounter, helping the biomedical provider understand the important role of massage, movement, and mindfulness in managing pain, and illuminating the patients' desire for human connection and interaction over pills to treat their pain.

Thus, a text that blends current mainstream understanding of pain and integrative treatment wisdom gives both biomedical and complementary providers an effective reference tool for making informed healthcare referrals for people experiencing complicated pain conditions.

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Overview of integrative health care and pain

Introduction

Pain is a universal human experience. It is also a singular motivator for people to seek attention and care: to help determine its origins and meanings, as well as to help alleviate its ravages. The longer pain persists, the more disabling or frightening it is, the greater the suffering it causes, the greater the range of possible treatment and coping resources people are likely to seek as they pursue relief. Throughout the developed world, conventional medical care has in recent decades been supplemented—and sometimes even replaced—by other diagnostic and therapeutic choices for treating and managing pain; and the more refractory an individual's pain is to medical treatment, the likelier it is that the sufferer will explore and multiply other avenues of aid.

There is presently a large-scale, international movement toward integration of conventional medical approaches to pain treatment and management with other modalities originating outside the medical domain. Each country has its variants of social and political responses to this growing phenomenon known as **Integrative Medicine** or **Integrative Health Care**, but many of the general issues that arise are common to all. To illustrate, this chapter takes the United States as an example of the potential benefits, tensions, and vigorous debate that characterize the rise of integrative approaches to pain.

Integrative Health Care in the United States

Chronic pain is the primary reason that patients in the United States seek treatment from integrative healthcare clinics (Abrams et al. 2013). To fully understand and critically assess the current state of the field of integrative pain management and to strategize for its immediate and longer-term future, it is important to get a sense of the short

(30–40 years), epistemologically complex, and politically fraught history of complementary—and subsequently, integrative—approaches to health care in the USA.

Alongside the “official,” conventional, biomedical system, people have always had recourse to numerous other modalities for maintaining and restoring health (Hufford 1995; O'Connor 1995). Irrespective of recognition from the conventional system we have, from the perspective of popular usage (i.e. what people *actually do* to take care of health concerns), long had *de facto* healthcare pluralism. This has been true of minor ailments, life-threatening illnesses, and chronic or debilitating conditions such as severe or persistent pain. Until very recently—since about the mid-1990s—the response of **conventional medicine** to other healthcare modalities has typically been one of alarm that proponents and users of nonbiomedical healing modalities might be causing themselves harm, either directly, as a primary consequence of the practice in question, or indirectly, by delaying their presentation for conventional care while sampling other approaches.

In part, this medical concern was predicated on the unexamined assumption that people selected *either* the conventional healthcare pathway, *or* some alternative(s) to that pathway, in a pattern of serial usage. We now know that is rarely the case; rather, the pattern is virtually always one of simultaneous use of healthcare resources from various pathways (Eisenberg et al. 1993; Hufford 1995; O'Connor 1995; Astin 1998). The alternative pathways, about which relatively little was known in the conventional medical setting, were presumed, by comparison to “officially” accepted practice, to be inferior at best and dangerous or even deadly at worst, irrespective of the conditions they were being used to treat. The long-held

general assumption in professional and academic thought was that use of such therapies was largely found among socially “marginal” populations: people who for reasons of poor education, recency of immigration to the USA (implicit: particularly from non-anglophone countries), lack of acculturation to the USA “mainstream,” poverty or other lack of access to the conventional system, either didn’t *know* any better or couldn’t *do* any better (Hufford 1995). We also now know this is incorrect: rather, the majority of complementary and alternative medicine (CAM) use is found among the college-educated middle class (Cassileth et al. 1984; Eisenberg et al. 1993; O’Connor 1995; Astin 1998; Barnes, Bloom, and Nahin et al. 2008.)

Among the general public, a lively interest in all manner of popular healthcare movements, modalities, and practitioners continued to grow exuberantly from about the 1960s onward, and information about these resources abounded in the popular press, then as now. Large numbers of ordinary folks were confident in using their own experiences or those of trusted others to decide what modalities to try and to assess whether the things they tried produced any apparent benefit. People used a basic problem-solving approach to health disruptions (Hufford 1995), particularly those that presented impediments to functioning, ability to work, or enjoyment of everyday life.

Chronic conditions including pain and debilitating diseases were particular candidates, partly because they were often refractory to conventional treatment, partly because their seriousness called for “trying anything,” and partly because many people seemed to find benefit from the nonbiomedical interventions they tried. Most were using alternative options alongside conventional medicine, hoping to derive from each what it did best. At the same time, popular movements in health foods and nutrition became part of a growing grass-roots interest in prevention, health promotion, and wellness—a holistic state of health and

well-being encompassing body, mind, emotions, and (for many) spirit, much further-reaching than the mere absence of disease. This kind of “high-level wellness” was not addressed in conventional medicine, so its support structures and services at the time were almost entirely to be found along alternative pathways, even well after the late-1970s introduction into conventional medical education and practice of the then-revolutionary **biopsychosocial** model (Engel 1978).

Defining a New Area of National Research Interest

By the early 1990s, governmental assessments of “unorthodox” or “unconventional” therapies began to be carried out in earnest. The Congressional Office of Technology Assessment examined unconventional cancer therapies in 1990 (US Congress 1990). In 1992, under the sponsorship of Senator Tom Harkin (D, Iowa, himself a proponent of certain nonbiomedical therapies), Congressional legislation appropriated \$2 million, a very modest sum, for the establishment within the National Institutes of Health (NIH) of an Office for the Study of Unconventional Medical Practices (Marwick 1992a, 1992b). Proponents and practitioners of nonbiomedical therapies, included as members of an ad hoc advisory committee assembled to plan the research agenda for this new entity, unsurprisingly objected to this name.

There has been considerable tussling over terminology and definitions since the early use of objectionable identifiers. “Every definition reflects a particular worldview and is formulated as part of a specific agenda (consciously or unconsciously)” (Boon et al. 2004, 50). “Many constituencies participate in [this] discourse ... and each has viewpoints and interests to advance, often for disparate – and sometimes mutually exclusive – ends” (Committee on Definition and Description 2007). The new NIH office opened formally in 1992 as the Office of Alternative Medicine (OAM). The term “alternative medicine/therapies” was fairly rapidly amended

Overview of integrative health care and pain

to “complementary and alternative medicine,” as being a more accurate descriptor (although arguments about it still persist). This usage also suited a particularly American propensity for pronounceable acronyms (CAM), and this shorthand form quickly became the common collective term for the many pathways and resources for health care “with origins outside of mainstream medicine” (Briggs 2014). The OAM was reconfigured as the National Center for Complementary and Alternative Medicine (NCCAM) in 1998; and in December 2014, it announced a new name change, to the National Center for Complementary and Integrative Health (NCCIH), stating “[t]he intent of an integrative approach is to enhance overall health ..., prevent disease, and alleviate debilitating symptoms such as pain and chemotherapy-induced nausea, among others” (nccam.nih.gov/news/press/12172014; accessed December 17, 2014).

Wake-up Call

In 1993, a group of academic medical researchers published in the *New England Journal of Medicine* the results of a survey, begun in 1991, to seek the patterns and prevalence of use of “unconventional medical therapies” in the United States (Eisenberg et al. 1993). Their findings indicated that roughly one-third of the American public used CAM therapies, a much higher percentage than had been anticipated, and that the majority of CAM users were “nonblack” (*sic*), more educated, and had higher incomes. The profile of all CAM users neatly corresponded with that of Cassileth and colleagues’ 1984 profile of users of CAM therapies for cancer, completely contradicting the “marginality” theory. Eisenberg and colleagues (1993) found that the “vast majority” of CAM users used CAM therapies together with conventional medicine to treat the same conditions, and, of those, the substantial majority did not discuss their CAM usage with their medical doctors.

In my own ethnographic research in the early to mid-1990s, CAM users reported that they did

not discuss this with their MDs for one or more of three main reasons: (1) they did not expect their MDs to be knowledgeable about CAM therapies or to be able to offer advice within that realm; (2) they expected their MDs to be hostile to or dismissive of CAM therapies, and perhaps even to speak disapprovingly to them or laugh them off; or (3) they respected their MDs and did not wish to offend them by implying, through their use of additional therapeutic modalities, that there was anything “wrong” with their medical treatment; they were simply seeking the rest of what they needed from other sources (O’Connor 1995).

What most galvanized the medical establishment about that 1993 report, however, were two particular findings: (1) the enormous number of annual visits to CAM providers (425 million in 1990, outnumbering all visits to primary care providers in that year by 37 million); and (2) total expenditures on CAM therapies of approximately \$13.7 billion, of which some \$10.3 billion came from out-of-pocket, non-insurance-covered costs (Weil 2000). This single article, published at a time when biomedical and governmental interest was already piqued, provided a stunning wake-up call that something very important was going on in “the patient population,” and that this popular groundswell had very real significance for the health of the public, for conventional medicine, and for healthcare economics and policy. This realization quickly stimulated interest in learning more about what was available within the great diversity of CAM disciplines, and whether/how it might be possible to invite these modalities and practitioners (or at least selected ones) into a new conversation with a biomedical profession that had heretofore largely shut them out.

Enter Integrative Medicine

When differing worldviews meet and attempt to establish, as it were, diplomatic relations, one option is *accommodation*, in which each paradigm becomes modified and expanded by taking on some new characteristics or qualities introduced

fingernail or toenail growth, and keratinization of the skin. The etiology of these symptoms is largely unknown.

Responses to Pain

We cannot be more sensitive to pleasure without being more sensitive to pain.

Alan Watts

Regardless of what the trigger might be, when we encounter a stimulus that causes pain, a limited number of things can happen. The fastest response to pain is a reflex action: a stimulus (a hot iron) encounters some skin. Rather than waiting for the scent of burning flesh to reach our nose, we are wired to withdraw from this dangerous and painful trigger. The stimulus activates nerve endings in the skin (transduction); the message is transmitted via sensory neurons to the dorsal root ganglia, and in the spinal cord neurons synapse with both the ascending tract, and with motor neurons at the same level. These transmit the instructions to contract the appropriate muscles in our hand and arm, and we pull away from the iron before much damage can accrue. This is an example of a relatively simple withdrawal reflex. Others can be much more complex, with sensory input and motor responses occurring at multiple levels, but all below our consciousness; we become aware of the stimulus and our responses after they have already taken place.

Pain sensations do not always create a withdrawal reflex. Tissue damage can develop without an initially dangerous trigger (think of a sunburn, for example, or overworking our muscles so that we're sore the next day), and in the best of these circumstances we experience functional nociceptive pain, which is simply the first step of going through a healthy healing process.

When the situation is long-term and frequently repeated, we may become vulnerable to more serious dysfunction and ultimately to painful central sensitization. Conditions ranging from fibromyalgia

syndrome to migraine headaches to chronic pelvic pain syndrome for men and women have been described using this model.

What we have described here is a worst-case scenario by which an injury causes changes to nervous system structures, and because of those changes, the sensation of pain becomes self-perpetuating and chronic. The chronification of pain is a leading challenge in healthcare delivery, as our ability to intervene in these processes is limited at best.

The Body and the Mind are NOT Separate Entities

Fear is pain arising from the anticipation of evil

Aristotle

In our culture we place great value on the power of human cognition, sometimes at the expense of how we view the more primitive experience of sensation. Eighteenth-century philosopher Rene Descartes suggested that our ability to doubt our own existence is, in fact, proof that we exist; this is the origin of the "I think, therefore I am" philosophical argument (see Sidebar 2.6). Notice that our existence is demonstrated by thinking, not by our perception of feeling. The saying is not, "I sense, therefore I am." This foundation for Western philosophy and identification of consciousness (which has roots far deeper than Descartes) has given rise to an assumption that what happens in our brain is both separate from and superior to what happens in our body.

Sidebar 2.6

One wet, stormy day in Paris a hungry Rene Descartes visited his favorite restaurant and very much enjoyed a bowl of cassoulet. He ate it to the very dregs. When his server asked him if he would like some more, he paused for a moment and considered. "I think not," he replied. And he disappeared.

This is a false paradigm.

Our physical experiences of pleasure and pain, of hunger and satiety, of energy and fatigue, all have influence on our mood, our cognition, and our ability to function intellectually. Likewise, our emotional state drives many of our motor behaviors. Our posture is a reflection of our habits, and these are influenced by many emotional responses. To suggest that our body and our brains can somehow function separately or be valued differently is a mistake. One of the most important connectors in the loops between the brain and the body is the limbic system.

The Limbic System

The limbic system is a collection of structures deep in the brain that includes the hypothalamus, the hippocampus, and the amygdala. The hypothalamus, readers may recall, is essentially the mediator of many of our homeostatic processes. It does this in an immediate way through the autonomic nervous system, and in a slower, longer-lasting way through the endocrine system. The hippocampus is a structure mainly understood to assist in the formation of memories, and the amygdala is a center for the interpretation of emotion (Weinberg and Krebs ND).

When the limbic system is activated, a response is translated through the motor fibers of the autonomic nervous system. When that reaction is triggered by a perceived threat, our stress response system is recruited.

Stress Response Systems: Hormonal Reactions

Through the limbic system we delineate between the need for two connected-but-distinct stress response loops. The SAM (sympathetic adrenal medulla) axis refers to the activation of the adrenal medulla and the secretion of catecholamines, epinephrine, and norepinephrine: the hormones that regulate immediate, short-term, high-grade, *WE'RE ALL GONNA DIE NOW* stress. It has special

impact on heart rate and respiratory rate, two mechanisms that help to determine our ability to fight or to run away. The HPA axis, by contrast, refers to the hypothalamus–pituitary–adrenal connection that leads to the secretion of cortisol from the adrenal cortex. This hormone helps us to mobilize our resources to respond to long-term, low-grade, *hold-on-grit-your-teeth-here-it-comes* stress.

Stress Response Systems: Motor Reactions

The limbic system also connects to the basal ganglia and cerebellum for the translation of a stress response into a behavioral response (see Sidebar 2.7). This can impact our breathing, our muscle tone, our posture, and the efficiency of movement (which, ironically, can influence our risk for injury and more pain). In the context of pain, therefore, the limbic system determines our emotional and behavioral responses to a threatening situation. Through electrical and chemical messages it influences our mood, our attention and cognitive function, and our ability to take action—or not—on our own behalf.

Sidebar 2.7 Emotional Body Language

Our state of mind and emotion influences every nuance of our motor behavior, even if we don't pay attention. Emotional body language (EBL) refers to the motor expression of emotions, through posture, gestures, and facial expression. Humans innately respond to the EBL of others.

Much of this motor function relies on basal ganglia and the secretion of dopaminergic neurotransmitters. One of the distinguishing features of Parkinson's disease, in which parts of the basal ganglia fail and dopamine is not adequately available, is the "Parkinson's mask": a phenomenon in which a person's facial muscles become rigid and unable to convey expression or EBL (Weinberg and Krebs ND).

Many of us live in an ongoing state of perceived threat, and this leads to pain-promoting behaviors such as collapsed shoulders, teeth grinding, shallow breathing, and increased general muscle tension. In turn, the physical experience of being in this state can reinforce and prolong the long-term sense of threat or stress. In this way, we can enter a particularly vicious circle of pain, stress, motor responses that cause pain, ad infinitum. Add the other stress-related responses that influence blood pressure, heart rate, and immune system function, and it is not a stretch to track the relationship between pain, stress, and generalized disease.

Manual Therapies and Pain

To truly laugh, you must be able to take your pain, and play with it!

Charlie Chaplin

What can a manual therapist do in the context of pain? If this sensation is related to triggers that are mostly transmitted via the skin, don't we, even with the best intentions, simply risk exacerbating an already bad situation? Fortunately, usually not.

One way to think about debilitating pain is that it is cumulative: enough small things must be wrong to add up to one large, complicated thing. But if that is true, then some of those small things (peripheral generators) can possibly be undone. If some of the contributors to pain can be addressed, then the partnership between a manual therapist and a hurting client yields a virtuous circle: reduced pain leading to improved mood and function, leading to reduced pain-promoting behaviors, and even better function, ad nauseam. The finding that massage has a generally positive effect in the context of many pain-experiencing populations (Abdulla et al. 2013; Gelinis et al. 2013; Somani, Merchant, and Lalani 2013) supports this hypothesis.

The challenge then becomes finding how to unlock the altered patterns.

Pain is not just a stimulus or a response, but both together. Hence successful pain practitioners need, oddly, to have a willingness to play in their work. We must guess at the primary drivers of pain ... This approach is greatly aided by a three-dimensional visualization of fascial planes as they relate to nerve trunks and interwoven branches as they transverse throughout the tissues of the body. At the same time, it's important to consider the manifold influence of the central nervous system, often conditioned by years of input. The brainstem, thalamus, limbic system must constantly question the therapist's friendliness, trying to ascertain how much protective stasis is warranted. The more we can convince central and peripheral nervous systems of our essential benevolence, the more the client becomes our ally in the hard-but-rewarding work of creating a pathway toward pain relief. (Michael Hamm, massage therapist)

Manual therapists have a unique role to play with our clients who live in pain: what other healthcare provider is in a position to offer such prolonged, undivided attention?

Pain can be terribly lonely and isolating. Most interventions, however sympathetic, just check in and check out: "Here's a pill, here's an exercise, here's a suggestion, maybe this will help?" But we manual therapists really want to know: exactly how does it hurt, exactly where? Does this touch "reach" it, or that touch?

It's rare for a massage therapist to be able to fix pain altogether, which can be frustrating, but we can always, always at least recognize it: lay hands on it and be with it. Nobody else in the healthcare world really does that. When the pain alters mood, as it so often does, the fact that we are willing to be there and stay there with a patient can be profoundly moving and important. (Dale Favier, massage therapist).

The most important take-away ideas about central sensitization and chronic pain are these:

- The pain is common, real, and not imaginary.
- The pain was triggered by some event outside the CNS.

Massage therapy today is a health care and wellness profession (Dryden and Moyer 2012). The practice of massage has a patient-centered focus, intended to support therapeutic goals. The major characteristics of contemporary massage therapy are based on touch and movement (Tappan and Benjamin 1998); massage therapists gather information to assess and judge the state of physiological and pathological conditions and parameters. This is called “palpation” (Chaitow 1997). Viola Frymann (1963, 1) wrote: “The first step in the process of palpation is detection, the second step is amplification, and the third step must therefore be interpretation. The interpretation of the observations made by palpation is the key which makes the study of the structure and function of tissues meaningful.”

Sidebar 4.2 Patient Interviews

Authors in this book were given patient interview questionnaires and asked to distribute them among patients/clients in their practices. The results are interspersed throughout the chapters.

When asked, “Have your condition or symptoms or ability to function changed since receiving care?”, a 54-year-old woman living with chronic pain for 20 years, replied: “I have never felt the same level of pain as I did before treatment, so I feel more in control of it. It’s also reassuring that a massage therapist can locate areas of pain and work on making them better, whereas, for instance, a GP might not appreciate the level of pain or understand where it’s coming from (i.e. it’s all in your head!).”

When asked, “What information helped you decide to go to complementary treatment sessions or classes?”, she replied:

“I had already tried most conventional treatments and some other complementary ones. As I was working through a list of things to try, it was pure luck that I found the treatment that helped long-term. The practitioners are highly skilled and professional and treat their clients with respect.”

The basis of therapy is the application of massage techniques with intent and utilization (Baskwill 2011). Utilization is the selection of techniques in response to the therapeutic needs of the patient and the practitioner’s intent to create beneficial change (Porcino et al. 2013). Though some massage can sometimes involve the learning of “recipes,” or manualized protocols, by which to treat patients, massage *therapy* must include clinical reasoning skills (LeMoon 2008), and a patient-centered approach to individualizing care. This means that the massage therapist adapts to the environments, scenarios, and presentations of the patient (Andrade and Clifford 2001).

The individual utilization and variability of different massage treatments was recently

Sidebar 4.3 Research

Majchrzycki and colleagues (2014) investigated the effects of **deep tissue massage (DTM)** combined with non-steroidal anti-inflammatory drugs (NSAIDs) in the treatment of low back pain. The intervention included DTM alone, and DTM with NSAIDs: both groups had significant decreases in pain, suggesting that the most effective intervention tactic is DTM. The study authors went further to clearly define DTM as: “a form of massage used with ‘the understanding of the layers of the body and the ability to work with tissues in layers to relax, extend, and unlock the persisting, incorrect tensions, in the most effective and energy-efficient manner’. Therapists working with this type of massage aim to change the soft tissues structure ... The knowledge of anatomy of locomotor systems and the understanding of layer structure of tissues including fascia and muscles are needed. The therapist affects the tissues gradually until they respond with relaxation ... The therapist affects the muscle belly as well as the tendon-to-bone attachment, trying to soften the tendon and to influence receptors of muscle extension (Golgi organs of tendons)” (Majchrzycki, Kocur, and Kotwicki 2014, 5).

researched by Porcino et al. (2011), investigating 791 Canadian practitioners. The research revealed that therapists used a combined-methods design which was influenced by the training they received, the number of techniques they were trained in, expertise, and the practice descriptors. Porcino and colleagues conclude that: "Practitioners individualize each patient's treatment through a highly adaptive process. Therefore, treatment provision is likely unique to each practitioner" (2011, p. 1).

Theoretical Approaches to Pain Management

In recent years, there have been developments in our understanding of the complexity of chronic pain. The standard medical treatment of chronic pain, however, is still hampered by inadequate personalization and by pharmacological side effects. Massage researchers propose that the total experience of a massage can have a complex physiological, mechanical, and psychological effect (Moyer, Rounds, and Hannum 2004; Field, Diego and Hernandez-Reif 2007). Although no single theory explains the complex response that is subjectively reported with massage therapy, mechanisms that have been suggested to facilitate, or are proposed to promote, the effects of massage on the experience of pain include the following items.

Touch

Massage is a direct contact with the skin. The skin is the largest organ of the body and has been shown to have an active interface with the endocrine, immune, and central nervous systems (Brazzini et al. 2003). Touch in humans has been shown to increase social bonds, decrease stress, and increase cooperative behaviors and relaxation (Uvnäs-Moberg 1997; Uvnäs-Moberg, Arn, and Magnusson 2005; Morhenn, Beavin, and Zak 2011; Rapaport, Schettler, and Bresee 2012). The relaxation brings about positive hormonal changes in

cortisol levels, reducing inflammatory processes, increasing oxytocin, and calming the mental state, which can all have a positive impact on pain and the individual perception or expression of pain (Esch, Frichione, and Stefan 2003). MRI scans during a single session Swedish massage show an up-regulation in activity in areas of the brain that are specifically related to pain relief: the subgenual anterior cingulate cortex and the retrosplenial posterior cingulate cortex (Sliz et al. 2012). These areas are the targets for treating persistent chronic pain using deep brain stimulation (Kringelbach et al. 2007). This is a correlation that requires further research, but indicates that touch has more than just peripheral effects on tissue.

Improved Sleep Cycle

Massage therapy is often sought as a treatment for pain and sleep difficulties. Getting the right amount of sleep reduces pain perception and contributes to an individual's health and capacity to be positive in their approach to life (Sunshine et al. 1996). Insufficient sleep can lead to a lowering of mental and physical capacity or focus, which impacts the capacity of coping and resilience, and a reduced capacity to recover from sickness and stressful situations, which promotes inflammatory process and pain sensitivity (Richards, Gibson, and Overton-McCoy 2000).

Social Rejection and Pain

Eisenberger et al. (2006) showed that the **neural correlates** for pain and social rejection are expressed in the same brain region in the **anterior cingulate cortex (ACC)**. Massage therapy might often be doing more than just providing localized soft tissue relief and may also be satisfying social and mental health benefits while managing pain symptoms. It might be that the interpersonal patient-practitioner rapport that is achieved during massage therapy reduces activity in the ACC, creating a residual decrease in the experience of pain, although this hypothesis is yet to be tested.

Interactive movement practices: the Feldenkrais Method®

Introduction

The *Feldenkrais Method*® of somatic education offers a student-centered approach to learning movement that enhances posture and balance, and reduces pain of both physical and emotional origin. While people of all ages and abilities come to the *Feldenkrais Method* to improve a variety of functions, pain is the primary motivator (Buchanan, Nelsen and Geletta 2014). *Guild Certified Feldenkrais Practitioners*™ (also known as *Guild Certified Feldenkrais Teachers*®) provide a supported, safe, and secure environment for students (or clients) to learn patterns of postural support and mobility. Once students feel comfortable, change in acute and chronic pain patterns become possible. *Feldenkrais* practitioners believe that small, slow, gentle movements bypass habitual pain patterns and re-establish or improve functional abilities that enhance students' participation in personal and professional activities of daily living.

Overview of the Feldenkrais Method

The *Feldenkrais Method* assists people to connect with their natural ability to move, think, sense, and feel. The method incorporates elements of developmental, organic learning to facilitate organization of a whole, integrated self-image. Central to successful outcomes for *Feldenkrais* students is their active participation during lessons, with application into daily life. *Feldenkrais* practitioners assist students to experience postural clarity and discover their innate capacity to improve balance (Feldenkrais 1985, 1996).

Posture and balance include how one orients and organizes within the current environment and in relationship to the field of gravity for potent action. Feldenkrais stated: "posture relates to action, and not the maintenance of a given position. Acture would perhaps be a better word for it" (Feldenkrais 1985, 108). Balanced posture or acture

is foundational to the *Feldenkrais Method* and is relevant in all orientations, including standing, sitting, and lying. Part of the *Feldenkrais* process is learning to continually find clarity in acture, recognize the absence of effort and resistance, and discover the ability to reverse action and breathe easily. Inefficient acture reflects demands on the person that interfere with moving effortlessly in any direction at any time.

Feldenkrais practitioners guide students through movement experiences that invite attention to, and sharpen awareness of, their present and potential actions. Students investigate habitual and familiar behaviors that are used, for example, to walk their neighborhood streets. They examine nonhabitual yet available behaviors that allow them to walk a new trail at a favorite park. They explore unfamiliar and undiscovered behaviors from which new skills emerge, such as walking on stilts through the park.

Feldenkrais practitioners teach the method in two complementary group and individual formats. They typically present *Awareness Through Movement*® (ATM) lessons to groups and provide *Functional Integration*® (FI) lessons to individuals.

Awareness Through Movement

Awareness Through Movement (ATM) lessons (see Figure 11.1) typically last 30–60 minutes, with a practitioner verbally guiding a group or individual through a movement exploration sequence. ATM utilizes a variety of positions including lying, sitting, or standing. Practitioners consider the current capabilities and pain levels of students and make accommodations so that seemingly impossible or difficult movements become possible and easy. They remind students to avoid pain and to perform movements within comfortable ranges. Movement sequences develop from simple to complex as students evolve their ability and awareness (Feldenkrais 1977, 1981).

Amherst training (Elinor Silverstein 2015, personal communication).

He returned to Israel for treatment, including the then novel surgery to reduce intracranial pressure. While convalescing, Feldenkrais used his own method to restore his speech and other functions (Elinor Silverstein 2015, personal communication). Many years before neuroscientists could document **neuroplasticity's** existence, Feldenkrais had incorporated it into his method and demonstrated it personally and with his students (Elbert et al. 1995; Feldenkrais 1977). He died in 1984 from the effects of his brain injury.

Models Based on the Teachings of Moshe Feldenkrais

Several individuals have developed somatic education approaches that are substantially grounded in Feldenkrais's teachings. The first was Thomas Hanna, who learned about the work of Feldenkrais in the early 1970s and integrated his studies with Feldenkrais into Hanna Somatic Education®.

A recent survey of US *Feldenkrais* practitioners revealed that 28.9% of responders held additional certification in one or more of these approaches (Buchanan et al. 2014). The top four approaches, beginning with the most frequent, were: Bones For Life® developed by Ruthy Alon, the Anat Baniel Method®, Sounder Sleep System® designed by Michael Krugman, and Child'Space® Chava Shelhav Method (Buchanan, Nelsen and Geletta 2014, unpublished data).

Theoretical Approaches to Pain Management

Feldenkrais wrote this overview of his approach. Although Feldenkrais wrote this over 30 years ago, it is highly relevant today. The major reason students pursue *Feldenkrais* lessons is to relieve pain, with back pain being the most common complaint (Buchanan et al. 2014). Feldenkrais succinctly outlined the distinctive features of his method and illustrated the observed effects of lessons on students.

*For many years I have been involved in working with people who have turned to me for help. Some complain of physical pain, others of mental anguish, and only a few ever speak of emotional troubles. I have some difficulty in explaining to my followers that I am not a therapist and that my touching a person with my hands has no therapeutic or healing value, though people improve through it. I think that what happens to them is **learning**, but few agree with this. What I am doing does not resemble teaching as understood at present. The accent is on the learning process, rather than on the teaching technique. After each session my pupils have a new sense of well-being: they feel taller, lighter, and breathe more freely. They often rub their eyes as if they have just woken from a sound and refreshing sleep. More often than not they say that they have become relaxed. The pain is always abated and often it is gone altogether. In addition, face wrinkles nearly always disappear, the eyes become brighter and larger, and the voice deeper and more resonant. The pupil becomes youthful again (Feldenkrais 1981, 7).*

He emphasized that his method to alleviate painful conditions is a learning approach to changing inter-related physical, mental and emotional components of an individual's behavior.

While collaborating with top scientists who were applying early general systems theory to develop defense systems, Feldenkrais utilized similar integrative thinking to synthesize his perspective on how maladaptive behaviors, including chronic pain, arose in humans. He argued that people often ignored pain and failed to adequately examine behaviors that contributed to their pain. He stated: "Normally, one learns from experience, by correcting earlier patterns of behaviour. When a person continues to use a stereotyped pattern of behaviour instead of one suitable to the present reality, the learning process has come to a standstill" (Feldenkrais 1996, 153). In essence, people learned to ignore and perfect their pain. From his perspective, individuals needed to pay close attention to

the behavior that created the pain, and change that behavior in order to change their pain. This is a learning process in which students must engage their attention, curiosity, and awareness under conditions that are safe, secure, and supportive.

One major implication of this approach is that students need to avoid pain and stop reinforcing it. Instead, in the *Feldenkrais Method*, practitioners encourage students to look for comfort and ease while doing movements with less effort and without provoking pain. For example, *Feldenkrais* practitioners guide students to move slowly while engaging flexor muscles to lengthen instead of stretching tight or overactive extensor muscles. The concern with stretching is the potential for stimulating pain receptors that increase extensors contraction and cause more pain. Students learn to habitually seek, notice, and appreciate actions that feel good instead of searching out those that provoke pain (Feldenkrais 1996).

Feldenkrais explicitly emphasized the interrelationships among sensing, feeling, thinking, and moving for understanding the organization of behavior and how to improve it through learning (Feldenkrais 1977, 1985, 2010). He believed changing behavior, or learning, was possible throughout life and that learning resulted in changes in the nervous system, including the organization of the brain. For example, Feldenkrais proposed that the cortical sensorimotor maps of the ring finger of the left hand of musicians would differ significantly from those of non-musicians (Feldenkrais 1977). Decades later, neuroscientists confirmed the existence of such neuroplastic changes in string players (Elbert et al. 1995).

One theoretical framework that encompasses neuroplasticity and the emergence of behavior from the interactions among multiple components—including cognition, perception, emotion, and action—is dynamic systems theory. This theory evolved from general systems theory and influenced the work of several developmental psychologists

and movement scientists. Thelen and Smith's 1994 book on dynamic systems caught the attention of several *Feldenkrais* practitioners who considered their theoretical presentation to epitomize the foundations of the *Feldenkrais Method* (Ginsburg 2010; Buchanan 2012).

At this time, there is little research specifically assessing the appropriateness of dynamic systems theory as a suitable framework for the *Feldenkrais Method*. However, there is a growing body of peer-reviewed literature supporting the effectiveness of *Feldenkrais* lessons for people with painful conditions (Chinn et al. 1994; Bearman and Shafarman 1999; Lundblad, Elert, and Gerdle 1999; Malmgren-Olsson, Armelius, and Armelius 2001; Smith, Kolt, and McConville 2001; Malmgren-Olsson and Bränholm 2002; Malmgren-Olsson and Armelius 2003; Kemp, Ersek, and Turner 2005; Schön-Ohlsson, Willén, and Johnels 2005, 2006).

Early on, Feldenkrais noted that people with challenging issues impacting the neck and back “maintain the cervical and lumbar curves rigidly in the same form, even during sleep. They wake up with a sense of tiredness and stiffness of the neck and spine which are only to be expected” (Feldenkrais 1996, 121). Recent research indicates that people with pain often have impaired sleep (Baliki et al. 2008). Disturbed sleep is also problematic because sleep is necessary for the removal of neurotoxic wastes from the brain that accumulate during wakeful activity (Xie et al. 2013). Another concern is the impact of insufficient sleep on learning. Sleep is useful both in preparation for learning activities, as well as afterwards for the formation and consolidation of memory and in support of neuroplastic activity (Walker 2008). Feldenkrais experientially understood the role of sleep on learning: “Students attempting these lessons should do one every evening immediately before going to sleep. Within a few weeks they will find a considerable improvement in all functions essential to life” (Feldenkrais 1977, 55). Additionally, an informal survey of *Feldenkrais* practitioners and

students indicated positive effects on sleep itself from *Feldenkrais* lessons (Buchanan 2014).

Recent neuroscience research has demonstrated that pain, besides interfering with sleep, has functional impacts on the brain beyond the perception of pain. For example, people with chronic back pain have changes in the prefrontal cortex that are associated with increased negative emotions (Baliki et al. 2006). They also develop altered cortical functional connectivity that decreases cognitive function and impairs attention. The longer the pain has been present, the greater the negative effects (Baliki et al. 2008).

In summary, the *Feldenkrais Method* is a distinctive, global learning approach that guides people

Sidebar 11.1 Research

In a recent rheumatology review of neck pain, the authors describe Feldenkrais as: “The core principle of Feldenkrais is to first improve one’s kinesthetic and proprioceptive self-awareness via guided practice sessions, and ultimately to transform unhealthy habits, movements, and postures into movement patterns that offer the individual greater comfort and ease during performance of physical tasks” (Plastaras et al. 2013, 2). This review describes a small but promising study on patient-reported outcomes, pharmaceutical and medical costs. The researchers found that 100% of patients reported some level of improvement in their headaches or musculoskeletal pain after Feldenkrais treatments. In addition to patients feeling better, pharmaceutical and medical costs were reduced by 40%. These authors continue to summarize benefits from the Feldenkrais approach for fibromyalgia-related pain: patients reported reduced pain, fatigue, and improved sleep. The authors conclude this section with: “... the favorable risk-to-benefit ratio and long-term cost-effectiveness should give physicians reasons to encourage active participation [in Feldenkrais]” (Plastaras et al. 2013, 3).

to change behaviors that cause pain, alter their self-image, and impair their quality of life. *Feldenkrais* practitioners have suggested that dynamic systems theory is an appropriate framework for explaining and understanding this method. While recent research seems to support the proposals that Feldenkrais made decades earlier about the influence of pain on physical, mental, and emotional aspects of people’s lives, more research is needed to clarify these connections.

Methodology

In this section, we present elements and techniques that are typically used in designing and providing *Feldenkrais* lessons. These components are applicable to the delivery of both ATM and FI lessons, and inform the behavior of both practitioners and students.

Assessment

A *Feldenkrais* lesson is as dynamic as the student, the day, and the pain complaint. For *Feldenkrais* practitioners, assessment begins with the initial communication with students and is continual throughout practitioner–student interactions. The initial session includes discussion of lifestyle activities, functional areas of limitation, and the effects of pain on activities. Practitioners learn why students seek lessons and what they desire to learn. These why and what questions are revisited every lesson.

As students share their story, we utilize all our senses to gather information to formulate learning opportunities. We notice how students are organized skeletally and how they move around the room. We consider their postural support and observe the dynamic relationships throughout their bodies. We observe the presence and location of restricted or excessive movements, which become focal points of learning. As a result of such movements, students may have formed compensatory movement patterns that interfere with efficient mobility and function; these, too, become themes for learning.

For example, we watch students walk, stand, or perform a task related to their professional or

encourage their patients to explore the options for integrating Western and Eastern medicines.

Case Study

Mary's story was published in the *New York Times* 2010. A 59-year-old, retired phone company employee from Massachusetts, Mary was one of sixty-six participants in a research study conducted by Tufts University in 2008. We measured the fibromyalgia impact questionnaire (FIQ) score between baseline and the end of the 12-week intervention. The FIQ is a well-validated multidimensional measure for participant-rated overall severity of fibromyalgia. It includes intensity of pain, physical functioning, fatigue, morning tiredness, stiffness, depression, anxiety, job difficulty, and overall well-being (Burckhardt, Clark, and Bennett 1991). The total score ranges between 0 and 100, with higher scores indicating more severe symptoms. After 12 weeks of Tai Chi intervention (condensed the 108 movement Yang style long form to ten forms), patients with fibromyalgia, a chronic pain condition, did significantly better in measurements of pain, fatigue, physical functioning, sleeplessness, and depression than a comparable group given stretching exercises and wellness education. Tai Chi patients were also more likely to sustain improvement 3 months later.

The therapy impressed Mary, who said that before participating in the 2008 study, "I couldn't walk half a mile," and it "hurt me so much just to put my hands over my head." Sleeping was difficult, and she was overweight. "There was no joy to life," she said. "I was an entire mess from head to foot." She had tried and rejected medication, physical therapy, swimming, and other approaches. "I was used to being treated in a condescending manner because they couldn't diagnose me: 'She's menopausal, she's crazy.' Before the study, I didn't know Tai Chi from a sneeze," said Ms. Petersen, who had diabetes and other conditions. "I was like, 'Well, OK, I'll get to meet some people, it will

get me out of the house.' I didn't believe any of it. I thought this is so minimal, it's stupid." After a few weeks, she said she began to feel better, and after 12 weeks "the pain had diminished 90 percent." She has continued Tai Chi, lost 50 pounds and can walk 3 to 7 miles a day. "You could not have convinced me that I would ever have done this or continued with this," she said. "I wouldn't say it's a cure. I will say it's an effective method of controlling pain."

At the 6-months follow-up, Mary continues to practice Tai Chi (five classes/wk, practice at home). Her pain relief from fibromyalgia is significant and she is experiencing improvements in related areas: more flexibility, range of motion, strength, improved energy, and no headaches in the last 2 months. Anxiety is no longer a problem and her sleep has improved and is more restful (6–7 hours). She has a more positive attitude, and her pain medications are significantly reduced. Her primary care physician for 7 years is so impressed with her improved condition, on all levels, that she asked Mary to share her story and offer hope to other patients with fibromyalgia.

Conclusion

Overall, based on the current body of knowledge on the therapeutic benefits of Tai Chi/Qi Gong for pain and symptom relief, Tai Chi/Qi Gong training might provide an ideal form of exercise for individuals suffering from chronic pain. Our chapter not only offers a brief history and a theoretical conceptual overview of Tai Chi/Qi Gong, but also elucidates the methodology for implementing complementary and integrative approaches into clinical practice. Therefore, integrative approaches combine the best of conventional medicine and the wisdom of traditional Chinese medicine. These modalities might lead to the development of better disease-modifying strategies that could improve symptoms and decrease the progression of chronic pain.

Introduction

Body awareness is a complex construct at the interface of mind and body. Depending where it is discussed, whether in primary care medicine, behavioral science, health psychology, cognitive neuroscience, anthropology, massage therapy, physical therapy, body-oriented psychotherapy, martial arts, or in various mind–body approaches, we hear quite divergent views about it. Historically, it has commonly been associated with hypervigilance and hypochondriasis and thereby been viewed as a proxy for anxiety (Cioffi 1991; Porges 1993); however, conversely, it can be associated with mindfulness and discriminative attunement to subtle bodily cues and then it becomes a powerful tool in self-regulation. As one view describes it as maladaptive and the other as beneficial, there may still remain substantial confusion despite recent attempts at a more differentiated understanding of the body awareness construct (Mehling et al. 2009). We define body awareness as sensory awareness that originates from the body's physiological state, involving interactive processes (including pain and emotion), actions (including movement), and appraisal (as well as complex bottom-up and top-down neural activities) shaped by the person's attitudes, beliefs, and experience in their social and cultural context (Mehling et al. 2009). These top-down activities determine whether body awareness is maladaptive or beneficial.

Neurophysiology of Pain as it Relates to Body Awareness

From a neurophysiological viewpoint, body awareness includes both proprioception and interoception. **Proprioception** is the perception of joint angles and muscle tensions, of movement, posture, and balance. **Interoception** is the perception of all sensations from inside the body and includes the perception of physical sensations related to internal organ function such as heart beat,

respiration, satiety, and the autonomic nervous system symptoms related to emotions (Vaitl 1996; Cameron 2001; Craig 2002; Barrett et al. 2004). Many of these perceptions remain unconscious; what becomes conscious enters proprioceptive and interoceptive *awareness*, which involves higher mental processes such as emotions, memories, attitudes, beliefs, and behavior (Cameron 2001). Neuroscience has revealed how and in which areas of the brain interoception is processed and how it relates to emotion and pain (Bechara and Naqvi 2004; Critchley et al. 2004; Wiens 2005; Naqvi, Shiv, and Bechara 2006). In this chapter, however, we will emphasize the first-person phenomenology of massage and body therapy experiences, an area that is of yet not within the purview of current brain science.

Pain, particularly chronic pain, is a highly complex subjective experience with sensory discriminative, affective, and behavioral aspects, and distinguishable neural pathways for each. The last decades have provided important new insight into pain and the ways it is neurologically processed. Both pain in its *affective* component and interoception use identical neural pathways (Craig 2003a, 2003b) and converge in a cortex region of the brain that processes the physical and sensory aspects of emotions and their autonomic nervous system correlates (Craig 2003a). Pain as a bodily sensation is part of interoception and has intriguing parallels to emotions. As both pain and emotions have sensory, affective, and motivational-behavioral aspects and common neurological pathways, some neuroscientists now view pain as a "homeostatic emotion:" pain is a signal from the body that motivates behavior to maintain or restore the system's energetic balance and integrity, e.g. protect a wound or avoid potentially damaging situations. Pain—often quite dramatically—demands our attention, enters consciousness and, thereby, emerges as an experience we access through interoceptive body awareness.

Sidebar 16.1 Patient Interviews

In response to the question, “Have your condition or symptoms or ability to function changed since receiving care?” replies included:

- “I am far more knowledgeable about my health issues since I am afforded more time, expertise, guidance, and overall sensitivity as compared to most available practitioners within traditional UCMC medical environment. I also am alerted to less invasive and effective approaches outside of the realm of healthcare offerings. [Regarding how I feel about myself or my pain since receiving care:] I feel I am more in control of my health condition since I am more aware of my health issues. I am more proactive, have greater options as a result.”
- “I am in less pain and can resume many of my normal activities. In past years I have dealt with the pain as it was just part of what I had to do. I needed additional help and not shots for pain and spine. [Regarding how I feel about myself or my pain since receiving care:] I can function in day-to-day life without as much pain. I have slowly started to add activities back in my life—spin, hiking within moderation. I feel like I am getting my life back.”

Developmental Phenomenology of Body Awareness

How pain and body awareness interact and unfold for our patients has been beautifully described by Sally Gadow as a dialectic of self and body (Gadow 1980). In a first level or stage of that dialectic labeled by her “the lived body,” the body is taken for granted: we are unaware of it. The philosopher Drew Leder described the body in that first stage simply as “absent” (Leder 1990). We and our patients might live in this state before pain occurs and demands our attention. In a second level labeled “the objective body” by Sally Gadow, the body is experienced as opposed to the

self. We are forced to pay attention to the pain in our body. Body and self are in tension with each other or in a state of disunity, the body as the new object of our attention is “symptomatic” and patients experience functional constraints from pain. This state is the situation that brings patients into therapy, either with the medical system or with practitioners who use the approaches described in this book. None of us likes to pay attention to our pain; we experience it as an aversive stimulus that preferably is dealt with through distraction. When we seek to give pain our attention, often by asking another person, a loved one, or a professional to do so, the helping person or a practitioner is tasked to look at our body where it hurts, as we have a hard time focusing our attention on it ourselves. In a third developmental stage, if reached, labeled as “cultivated immediacy” (Gadow 1980), we then may experience a new relationship to the body characterized by acceptance and immediacy. We now accept that the body may have had its good “reasons” to start hurting, for example, when we had ignored our physical limits, believing we can do whatever we want. In a fourth state labeled “the subjective body,” the body may be experienced without objectification as a source of learning and meaning. In focus groups we have conducted with practitioners, they described the body experienced in that stage as endowed with “intelligence” and having an “innate tendency towards embodiment” (Mehling et al. 2011). The body then is no longer (a) just the means by which the self carries out its projects, or (b) the source of pain, constraints, and limits to the self’s goals, but rather an integral and equal part of the self and the locus of consciousness and subjectivity with its own perspective (Hudak, McKeever, and Wright 2007).

Relevance of Body Awareness for Body Therapy Approaches to Pain Management

Because everyday body awareness—in the way we understand it and defined it above—includes the filters and modifications from our deep beliefs, biases, expectations, and attitudes, it might play