

## CHAPTER 7

# Stress

Adaptability and resistance to stress are fundamental prerequisites for life, and every vital organ and function participates in them.

—HANS SELYE (1950, p. 1383)

As should be clear by now, paying attention to the body is the most immediate way to practice mindful awareness. Whatever your immediate circumstances may be, bringing attention to the breath or to some other attribute of the body has the effect of anchoring attention in the present moment. A common alternative to being in the here and now is to become lost in thought, to engage in mental time travel by projecting ahead into an imagined future or a recollected past. When we do that, present moments pass by largely unappreciated or un-lived. This tendency is especially prominent when emotional distress dominates awareness, amplified by a sense of vulnerability reflecting the impact of future- and past-oriented feelings such as apprehension, fear, regret, or remorse. The distress associated with such feelings is intensified by the realization that no steps can be taken that will directly influence the objects of their focus. Nothing can be done to alter what has already occurred, and as far as the future is concerned, we can only await its arrival.

An analogy to music is useful here. A piece of music unfolds moment-by-moment; we never hear it all at once. The “musical present” is a small slice of time constantly moving forward from beginning to end. No matter how complex the music in terms of the number of instruments or performers required to realize it, the notes only blossom a few at a time. Moment by moment, a note (or group of notes) is replaced by another, in an ongoing flow. Most of the time, the sense of coherence we derive from listening results from mental efforts to give it form and structure, either replaying in our mind a segment that’s already past, or awaiting with

eager anticipation a pattern of notes yet to come. The anxiety that many performers experience stems in part from a tendency to dwell on past mistakes or think about challenging upcoming passages, both of which shift attention out of the present moment where notes are continually emerging, a few at a time.

In this chapter and the next, we consider three common clinical conditions: Stress, anxiety, and depression. Each has been the focus of extensive clinical research, not only within the perspective of mindfulness-based psychotherapy, but also in the domain of exercise science. Increasing evidence suggests that both mindfulness practices and exercise can contribute significantly to alleviating distress accompanying all three conditions. Research on mindfulness for stress reduction, exemplified by the MBSR program (Kabat-Zinn, 2013), is extensive and is not reviewed in this chapter. Less familiar to most clinicians, however, is research on stress from the perspective of physical activity and exercise, and thus it will be covered here. My intention is to integrate mindfulness and physical activity in a clinically relevant way by proposing mindful *movement* as a vehicle for teaching clients the value of movement not only in therapy but in everyday life. Integrating physical activity into clinical treatment can be facilitated by teaching clients to engage in simple movements well within their capabilities. Doing this may help reactivate the body's innate potential for physical activity that may have become dormant due to illness or disuse. The combination of slow, simple movements and focused attention can help span the gap between sedentary behavior and physical activity by fostering conscious awareness of movement as it occurs. Such awareness encourages confidence in one's abilities. Here's an illustration of how a therapist might engage a client who is ambivalent about becoming more active:

CLIENT: I know I should exercise more. My doctor says it will help manage stress. But it just seems like one more stress I have to deal with, even if it's supposed to be good for my health.

THERAPIST: I agree, who needs more stress? Maybe we could look at it another way. What if we forget the word "exercise" and use a different word, like "movement"? For instance, walking could be exercise, but really, it's just a form of movement, something we do all the time.

CLIENT: Yes, but how will that help reduce stress?

THERAPIST: Fair question. For one thing, it can help clear your mind, even if it's only for a few minutes. Also, the word "exercise" can create stress—thinking about doing it every day, "working out," sweating—sounds too much like work. So if we just focus

on doing something simple, something that feels good, you can decide for yourself whether or not to do more. Just take things one day at a time.

## Starting the Journey

You can start a mindful movement practice without resorting to structured exercise protocols, especially at the outset. In fact, it's a good way to ease into exercise, especially if you're not used to being active. Many people view current exercise guidelines as beyond their capabilities, despite considerable latitude in their implementation. For example, the ACSM recommends 30 minutes of moderate-intensity physical activity most days of the week, (totaling 150 minutes), in bouts of at least 10 minutes duration (American College of Sports Medicine, 2014). Although 30 minutes per day may not seem like much, people are often either reluctant or unable to commit to an ongoing program involving this sort of day-in, day-out dedication. They may assume for various reasons (too old, out of shape, not disciplined enough, etc.) that they won't benefit from exercise, so they don't bother starting. The fact that traditional exercise programs emphasize future goals is an important point of contrast with mindful movement. Rather than focusing on the future, mindful movement directs attention toward present-moment activity, with the intention of highlighting awareness of sensations that are associated with healthy activity. Starting and proceeding slowly, with small incremental progressions, mindful movement can gradually lead to a sense of mastery that may foster willingness to investigate activities of the intensity, duration, and frequency associated with more typical exercise programs. The focus needs to be on movement *as it occurs*, moment by moment, not on anticipated benefits that take time to obtain.

Helping people connect with their innate capacity for movement in order to experience the simple pleasure of embodied mindfulness is one of the most useful ways for clinicians to encourage physical activity. A key reason for teaching mindful movement is to help prevent physical activity from being a source of stress, rather than a means to alleviate it. Prescribing *exercise* to help clients manage stress can seem like another stressor, because the word is so strongly associated with effort ("working out"), pushing yourself ("no pain, no gain"), and regimentation ("5 days per week, 30 minutes per day"). When you eliminate these constraints, clients are freed up to move as they choose, an important consideration for anyone just beginning to become physically active. With a simple activity such as walking, one can downplay competition or goal attainment and instead focus on the nature of the experience itself, which is key to this approach.

## Stress: Scientific Research

“Stress” can be an elusive concept. Like the weather, everyone talks about it, but different meanings exist. Everyday use of the term links it to tension, strain, and physiological activation, which can be acute or chronic. Work-, school-, and family-related stressors are common examples of this form of stress. This meaning of stress has no direct classification in the current edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) diagnostic system (American Psychiatric Association, 2013), where it is associated only with traumatic events in posttraumatic stress disorder and acute stress disorder. Absence of a clinical diagnosis for reactions to stressors of a nontraumatic magnitude reflects recognition that they are an inevitable part of everyday life, rather than symptoms of a disorder.

Stress is distinct from both anxiety and depression in that it has been the focus of extensive laboratory research using induction procedures intended to simulate real-world challenges. Our contemporary clinical understanding of stress is rooted in the research of endocrinologist and physician Hans Selye (1907–1982), whose studies of stress in laboratory animals led to the discovery of a physiological reaction tied to the body’s alarm system known as the general adaptation system, or GAS (Szabo, Tache, & Somogyi, 2012). In one of his later papers (Selye, 1976), Selye defined stress simply as “the nonspecific response of the body to any demand made upon it” (p. 137). But it also has stimulus properties, inherited from its origins as an engineering term denoting a load—stress—imposed on structural components like steel beams.

Despite our tendency to conceive of stress as a by-product of fast-paced contemporary society, Selye in fact proposed that it has accompanied our evolution as a species. Common ancestral sources of stress, among them prolonged physical labor, unprotected exposure to the elements, and predatory dangers, either singly or in combination contributed to a state of energy depletion marked by exhaustion. And although many of these early stressors have been eradicated in many parts of the world, new ones, largely generated by psychological factors, have taken their place: the pressure of deadlines, interpersonal tensions, financial worries, and the like.

Selye proposed that the stress response has three phases in the GAS: activation (or alarm), resistance, and exhaustion. The alarm phase involves an immediate, energetic physiological reaction to a stressor that can only be sustained for a limited time. Continued exposure to stress results in time-limited resistance in which the body activates the immune, neurohormonal, and nervous systems, the latter via activation of both the sympathetic nervous system and hypothalamic-pituitary-adrenal axis. These

two systems respond to stress in a way that has a high energy cost and cannot be sustained indefinitely. Unremitting stress eventually causes a state of exhaustion, resulting in increased vulnerability to a host of opportunistic pathological conditions. Hypertension, ulcers, heart disease, diabetes, and obesity—signature chronic diseases of our time—are among the many medical conditions associated with dysregulation of the stress system (Chrousos, 2009; Chrousos & Gold, 1992). Selye lay the groundwork for research leading to the discovery of the critical, diverse roles played by glucocorticoids (especially cortisol, a steroid hormone secreted by the adrenal cortex) in stress reactivity (Sapolsky, Romero, & Munck, 2000).

Subsequent to Selye's groundbreaking work, the concept of "allostasis" gained favor, a term that refers to "stability through change" (McEwen, 1998). Whereas "homeostasis" refers to narrowly regulated biological equilibrium within controlled environments, "allostasis" denotes a more comprehensive pattern of adaptation to the constant changes of daily life. However, "allostatic load," the gradual wear and tear on the body can result from chronic adaptation. McEwen (2007) emphasized the key role of the nervous system in coordinating elements of the stress response, which include cardiovascular, immune, and cognitive processing centers.

Fortunately, simple physical movement can temporarily alleviate stress. Have you ever noticed how being physically active when you're feeling stressed can be restorative? Box 7.1 is a mindful walking practice involving a path you create that includes some stairs to climb. You can use and share this practice with clients *provided there are no health contraindications in doing so*. Most people who routinely climb stairs have never viewed the experience as an opportunity to practice mindful movement or, for that matter, to obtain significant health benefits.

## Cognitive Factors and Stress

The fact that cognitive factors contribute to stress reactivity clearly differentiates contemporary models of stress from Selye's original work, which was based on animal studies. The transactional model of stress (Lazarus & Folkman, 1984) proposed that stress results from an imbalance between perceived situational demands and resources needed to cope with it. According to this model, aside from catastrophic events that are inherently stressful (civilian disasters and war, for example), stress results when day-to-day challenges are interpreted (a cognitive process termed *primary appraisal*) as overtaxing perceived resources (*secondary appraisal*). Lazarus and Folkman's conceptualization has stimulated considerable clinical research, and the appraisal process in particular has attracted attention as a potential beneficiary of mindful awareness (Garland, Gaylord, & Park,

**BOX 7.1. Walking and Climbing**

Create an indoor walking route that includes a combination of stairs and hallways that are easily accessible. Whatever you come up with can be modified at any time, so don't hesitate to start simply, perhaps a loop that involves climbing and descending a flight of stairs at each end of a hallway, starting and ending at the same place.

Begin making your way slowly and deliberately, one step at a time. Your mind may already be jumping ahead to the stairs along the route, and if so just bring attention back to the body and the experience of movement. Notice, for example, the transfer of weight from one leg to the other as you take each step. Is your gait smooth or irregular? Steady or unsteady when moving slowly? Be aware of contacting the floor with each step as you take it, noticing what part of the foot touches down first. Continue in this manner until you come to the stairs and, moving at a natural pace, climb (or descend) to the next level, using a handrail for balance as needed. Notice as you do sensations that arise from what amounts to lifting or lowering the weight of the body a few inches, moving at a pace that does not prolong this process. If you are accustomed to using stairs, this process is highly automated and does not require conscious control, any more than walking. When you reach the top (or bottom) of the flight of stairs simply continue walking, perhaps slowing the pace a bit and resuming focus on the experience of taking each step. Continue in this manner until you come to the stairs returning to your starting point, navigating the transition from walking on a level surface to moving up or down at your customary pace. And now, continue walking mindfully, returning to your starting point, without hurrying or rushing.

And as you complete this practice, pause for a moment and reflect on the effect of giving yourself the simple gift of movement that awakens the senses and gives the body an opportunity to do what it does so well, what it *needs* to do on an everyday basis, in order to sustain health and well-being.

*Check-In:* Notice how much you rely on texting or e-mail when communicating with others, especially when they're nearby. Face-to-face contact typically enhances the quality of interpersonal relationships, and you can extend the benefit by using the opportunity to be physically present to get up and move.

2009). As originally proposed by Kabat-Zinn (1990), moment-by-moment awareness can help de-automate habitual, stress-amplifying thought patterns that otherwise tend to become fused with harmful physiological reactions. An update of the transactional model was proposed by Salmon, Sephon, and Dreeben (2011), providing a roadmap for further research concerning the extent to which mindful awareness may contribute to both near- and long-term positive health outcomes. Like the transactional model, this updated version views stress as the result of how we appraise and mobilize resources to cope with everyday life events. It adds to this a continuum of response options ranging from nonmindful (reactive, judgmental) to mindful (responsive, focused, nonjudgmental).

These two models of stress can fruitfully be applied to exercise. After all, physical activity taxes the body physically, a form of stress. But unlike unexpected or unwelcome stress, exercise is intentional, deliberate, and time-limited. Moreover, our bodies are built to handle physical stress, and in fact generally thrive on it. This is an example of positive secondary appraisal because it encourages voluntary exposure to the stressor and reinforces confidence in our intrinsic physical capabilities. Bringing moment-by-moment attention to the experience of exercise further reduces the likelihood that it will be perceived as stressful. Exercising mindfully is liberating because you can alter what you are doing on a moment's notice, even introduce an element of play. (Do you remember what it was like to play? Can you recall running around, climbing trees, and chasing your friends around the neighborhood?)

### **Stress-Reducing Effects of Exercise**

Research on the stress-reducing effects of physical activity and exercise reveals that physical activity, especially at higher intensity levels, is a stressor that taxes the body's capacity for physiological adaptation. Dienstbier (1989, 1991) proposed that exposure to manageable physical stressors involves a "toughening" process, whereby stress reactivity is gradually reduced but is still capable of immediate activation in response to true emergencies. This view of stress reactivity is consistent with Selye's contention that stress has adaptive properties. He used the term "eustress" to characterize "good" stressors—exercise among them—that promote physiological resilience.

The work of Selye and Dienstbier is reflected in the cross-stressor adaptation hypothesis, (Sothmann, 2006), which proposes that adapting to stress in one modality (such as exercise) helps control stress in other domains (for example, performing in public). In part, this is due to becoming comfortable with sensations of physiological arousal that

are common to both. In addition, one effect of aerobic training is that it reduces cardiovascular and neuroendocrine reactivity (habituation), while sharpening responses to *novel* stressors (sensitization), suggesting healthy physiological flexibility (Sothmann et al., 1996).

### PAUSE AND REFLECT

Many musicians and others who perform in public value exercise for its stress-reducing properties. The physiological arousal associated with performing can trigger anxiety and even panic. If you're prone to maladaptive arousal or anxiety during public speaking or in other performance settings, you've surely noticed how the physical symptoms are similar to when you're exercising. Regular physical activity seems to lower overall physiological reactivity, reducing distress associated with performing in public.

A simple explanation for the stress-reducing effect of exercise is that both resting heart rate (Boutcher & Landers, 1988) and blood pressure (Kelley, Kelley, & Tran, 2001) are reduced.

This reduction increases the range over which heart rate can vary in response to acute stress, referred to as heart rate variability, or HRV. Reducing heart rate and blood pressure also protects against cardiovascular disease and overall mortality in both patients with heart disease and nonpatient populations (Caetano & Alves, 2015).

HRV is a key factor in stress resilience. High HRV enables the cardiovascular system to respond flexibly and efficiently to stressors of varying intensity (Boutcher, Nugent, McLaren, & Welman, 1998). Heart rate normally increases with physical exertion or stress, and decreases substantially during rest; the greater the variability the better. Under stress, activation of the sympathetic nervous system increases, elevating heart rate and other correlates of arousal. As stress diminishes, control shifts to the parasympathetic nervous system, resulting in a restorative state of low activation. You can experience a form of HRV just by inhaling and exhaling. Sit quietly for a few minutes and follow the movement of the breath as you breathe in and out. Breathing in, your heart rate will increase slightly; breathing out, it will decrease. This effect, the respiratory sinus arrhythmia (RSA), is used to great benefit in relaxation training and yoga breathing practices. You can slow your heart rate and heighten a sense of relaxation by prolonging the exhalation to the point where, at its conclusion, there is a brief pause before the next inhalation occurs.

Yet another contribution to the stress-buffering effect of exercise involves increased production of the neurotransmitter serotonin. Physical activity appears to stimulate neuroplasticity in brain regions that produce

serotonin, which has both antidepressant and antianxiety effects (Greenwood & Fleshner, 2011). The authors of this review summarized the beneficial effects of exercise on stress, including (1) constrained activation of the sympathetic nervous system; (2) reduced stress hormone production in response to mild stressors; (3) prevention of stress-induced immunosuppression; and (4) reduced incidence of anxiety and depressive disorders.

Research support for the cross-stressor adaptation effect has accumulated over the years, beginning with a meta-analysis by Crew and Landers (1987). This study investigated the effect of aerobic conditioning on various short-term stressors, including challenging cognitive tasks, watching stressful films, and exposure to startling events like immersing one's hand in ice water. The authors concluded that aerobic conditioning positively affects cardiovascular reactivity to laboratory stressors, marked by a strong initial response and rapid recovery.

### Research in Clinical Practice

What's the clinical relevance of research on the stress-reducing effects of exercise? After all, laboratory stressors—such as immersing your arm in a tub of ice water—seem pretty far removed from everyday life. And you are not likely to deliberately expose yourself to shocking, disturbing films unless you have a particular taste for this genre. It turns out that some of the most convincing evidence that exercise reduces stress comes from studies using highly trained, healthy athletes. In studies by Rimmel and colleagues (2007, 2009), endurance athletes and untrained but healthy volunteers were exposed to a potent laboratory stressor, the Trier Social Stress Test (TSST; Kirschbaum, Pirke, & Hellhammer, 1993). The TSST involves giving a briefly rehearsed speech and performing mental arithmetic before an audience (stone-faced personnel in white lab coats) while being videotaped, preceded by a 10-minute “anticipatory” period. The task reliably increases both cortisol (a potent stress hormone) and heart rate. Compared to the untrained individuals, the athletes were significantly less reactive to the TSST in terms of both cortisol and heart rate responses. They also reported less anxiety.

It's understandable that this research would focus on healthy, often athletic individuals, because they have traditionally been the focus of research in exercise science. For years there was little overlap between clinical psychology and research on high-level human performance, but the gap is narrowing, as we will see. First, however, a broad perspective on clinical exercise research is in order.

First, most clinical studies involve supervised group exercise, a powerful source of social support and accountability. Clinicians working

with clients who are depressed, anxious, or stressed face the challenge of encouraging physical activity on a one-to-one basis, without the benefit of broader social support (unless a partner, spouse, or friends can be recruited). Second, research studies tend to selectively recruit participants who meet specific inclusion and exclusion criteria. This practice tends to limit application of results to individual clients with complex psychological and medical presentations. Finally, exercise programs in research studies are often prescriptive in nature, specifying expected values for target heart rates, exertion level, and other performance characteristics. In clinical practice, such specificity is neither recommended nor necessary, since few clinicians have the necessary training to prescribe exercise. Instead, a mindfulness-based perspective on exercise teaches clients how to attend to the moment-by-moment experience of movement, without regard to meeting physical fitness goals. Still, research is not irrelevant to clinical practice, as we know from the enthusiasm behind the evidence-based practice movement.

### **Exercise and Cardiovascular Fitness**

A good example of clinical exercise research involves investigation of cardiovascular responses to stress. Psychologist James Blumenthal and his colleagues at Duke University have documented the beneficial effects of exercise on classic stress-related conditions including heart disease, Type A behavior, and negative emotions. Blumenthal's work is interdisciplinary, applying systematic principles of exercise testing and conditioning to widespread, challenging medical and psychological conditions. This line of research can be traced to early research on the relationship between negative emotions and risk of heart disease and the classic Type A personality (Roseman et al., 1975).

In both periodic reviews of the topic (Blumenthal & McCubbin, 1987; Edenfield & Blumenthal, 2011; Fillingim & Blumenthal, 1993) and laboratory studies conducted over many years (Blumenthal et al., 1988; Blumenthal et al., 1997; Blumenthal et al., 2016), Blumenthal and colleagues compiled convincing evidence that cardiovascular conditioning improves physiological reactivity not only during exercise, but during stressful cognitive tasks as well. For example, one of their early studies (Blumenthal et al., 1990) compared the effects of aerobic versus strength training on cardiovascular reactivity. Male participants with Type A characteristics (such as impatience, anger, and irritability) were randomly assigned to either 12-week aerobic or 12-week resistance-training programs. Pre- and postprogram assessments included graded treadmill testing to measure oxygen uptake ( $VO_2$ ) as well as cardiovascular (heart rate, blood pressure) and neuroendocrine (epinephrine, norepinephrine) reactions to a

stressful cognitive task, mental arithmetic. Aerobic training consisted of walking or jogging with at least 70% of maximal heart rate reserve during three 1-hour sessions per week, whereas resistance training involved two 1-hour sessions per week using strength-training machines. Compared to strength training, aerobic conditioning significantly increased oxygen uptake level and more rapid postexercise recovery, a marked improvement in cardiovascular fitness. Moreover, follow-up stressful cognitive testing found aerobic training to be associated with significantly lower heart rate and blood pressure reactivity. Results of this study illustrated the positive cross-over effect of aerobic conditioning on mental stress reactivity and were subsequently replicated with pre- and postmenopausal women (Blumenthal et al., 1991).

Another study from this era (Blumenthal et al., 1989) focused on cardiovascular training, this time with older but healthy men and women. Participants randomized to a 4-month aerobic training program significantly improved their aerobic fitness and cognitive performance, compared to those either on a waitlist or in a yoga program. Concerning psychological changes, the authors commented that “participants in the two active treatment groups perceived themselves as improving on a number of psychological and behavioral dimensions” (p. 147). This suggests there is something about movement *per se* that is psychologically beneficial that has little to do with the intensity of the physical activity. Isn't it interesting that such divergent forms of activity can have comparably positive effects on subjective well-being? Of course, different mechanisms may be at work, for example mental and physical relaxation in the case of yoga and improved cardiac fitness in the case of aerobic training. But either way, the end result is psychologically beneficial.

#### PAUSE AND REFLECT

Having taught both yoga and fitness training, I have seen this pattern countless times. Yoga participants leave class deeply relaxed and comfortably fatigued. I attribute this to a combination of mindful awareness and physical exertion that, though not aerobically taxing, is nonetheless strenuous. This is because it involves continual movement from one pose to another, as well as strength to maintain poses for varying amounts of time. In contrast, though aerobic training is also tiring; it tends to be more invigorating than relaxing. People can develop intense loyalties to either type of activity; I routinely recommend cultivating both.

A subsequent study of patients with heart disease showed that reduced stress reactivity is not dependent on aerobic conditioning (Blumenthal et al., 1997). Four months of either aerobic training or a cognitive behavioral

stress management program reduced risk of subsequent heart attacks, leading the authors to conclude that nonmedical interventions—including but not limited to exercise—are potentially beneficial to these patients.

Overall, research by Blumenthal and colleagues has demonstrated that aerobic conditioning provides a reliable means of reducing cardiovascular stress reactivity. Conditioning seems to increase the efficiency with which the cardiovascular system responds to changing demands, reacting strongly when needed, recovering quickly, and maintaining a relatively low level of activation during periods of low stress.

### **Exercise and Immune Function**

In addition to the positive impact of physical activity on stress hormone and cardiovascular adaptation, immune system reactivity is affected as well (Walsh et al., 2011). For example, a study by LaPerriere et al. (1990) assessed the effect of exercise on immune response to receiving a confirmatory diagnosis of HIV infection. Healthy, asymptomatic gay males were tested for HIV using an early diagnostic procedure that necessitated a 5-week waiting period for results. During this time, participants either worked out or remained sedentary, following a baseline assessment of fitness, immune, and psychometric measures. Seventy-two hours prior to notification of results, participants were retested, then they were tested again 1 week postdiagnosis. Depression, anxiety, and decreased natural killer cell counts were prominent in HIV-positive participants who had not exercised. In contrast, HIV-positive participants who exercised had test results comparable to those who tested negative in both groups. A subsequent literature review suggested that exercise may boost levels of a critical immune system component, particularly during early stages of the disease (LaPerriere et al., 1997).

These are encouraging results, backed up by two subsequent Cochrane literature reviews (O'Brien, Nixon, Glazier, & Tynan, 2004; O'Brien, Nixon, Tynan, & Glazier, 2010) which endorsed use of both resistance (strength) and aerobic exercise for HIV-positive adults. However, the 2010 review reported high drop-out rates in studies reviewed, suggesting that exercise is only beneficial when sustained over time (Warburton, Nicol, & Bredin, 2006b). On the other hand, there is also evidence that even brief periods of activity can boost immune system response. In one study, the effects of a yoga session on stress reactivity was assessed in groups of either experienced or novice practitioners (Kiecolt-Glaser et al., 2010). Novice practitioners realized a 41% gain in a key immune component (serum interleukin, IL-6) after a single yoga session (experienced practitioners were less reactive to the stressor), a significantly greater improvement than the response to either treadmill-walking or no-activity control conditions.

## From Sedentary to Active: A Continuum

The prospective studies of exercise and stress reviewed above are prescriptive, with particular emphasis on cardiovascular fitness as a means to stress reduction. However, as beneficial as this training may be, it does come at a cost in terms of the time, energy, and persistence needed to improve fitness. Mindful movement is intended to help patients or clients navigate the transition from sedentary to active gradually, with care and attention centered on present-moment experience. The emphasis is on cultivating awareness of what people are capable of doing, reflecting that “sedentary” and “active” are endpoints on a wide continuum composed of essentially infinite gradations, and pointing out the intrinsic value of each step along the way. For example, although “walking” and “running” sound like very different activities, they are in fact two points on a continuum. Both involve upright posture and movement of the arms and legs in a coordinated rhythm; the difference lies in how fast you are moving.

Regardless of where you would like to be on the continuum, there are many points of interest to explore along the way. Very slow walking, for instance, brings to awareness the many adjustments made by the body to remain upright while moving. So does shifting weight from one leg to the other so you can take a step; keeping one leg straight while bending the other knee so that the foot clears the ground, swings forward, and contacts the ground slightly in front of the rest of the body; and repeating this sequence over and over while moving from place to place. This is the essence of walking meditation—bringing moment-by-moment attention to very slow movement. Of what value is slow walking? The value is in the focused, present-moment attention for one thing—it is the difference between driving through a neighborhood and walking through it—you see and experience so much more when walking. Slow walking may also evoke feelings of gratitude for this seemingly simple capability—what a privilege it is to be able to move.

William is a client with a history of job-related stress of several months' duration. Deadlines were taking a toll on him and he wanted to reduce some of the stress he was carrying.

**THERAPIST:** One thing that's clear from our previous conversations is that right now regular exercise isn't a realistic option, given your work schedule. In fact, it would probably just add to your stress. Just thinking out loud here, what about a short interval or two during the day to get up and move?

**WILLIAM:** That seems more realistic than driving to the gym, but what am I supposed to do?

THERAPIST: Lots of possibilities, but I'd suggest we expand your mindfulness repertoire to include simply walking, with awareness. You know, just like focusing on one breath at a time when we do breathing meditation—pay attention to just walking.

WILLIAM: OK, but I don't see how this will help me get in shape.

THERAPIST: Right, that's really not the purpose, it's more about keeping attention focused in the present and learning how your body responds to movement. The more you do this, the more you'll begin to sense what works best for you in becoming more active. Keep in mind our focus right now is on reducing stress, rather than getting in shape. That will gradually happen over time if you're patient.

During a 10-minute outdoor walk in a nearby park, William was initially instructed to focus on sensations accompanying placing and lifting the foot with each step, one at a time. Toward the end, he was invited to engage other senses, for example seeing buds emerging on nearby trees and smelling the faint fragrance of early spring flowers in the park.

WILLIAM: I feel better now; I like focusing on just walking and letting go of things at work. There's a walking path close to work. I could go there on break, just to de-stress for a while. Maybe sometime I could even jog a bit, just to see what that's like.

THERAPIST: Good attitude. Start with something basic, something manageable, and really savor the experience. Who knows where it will take you?

#### PAUSE AND REFLECT

When walking, notice your pace. What changes when you speed up a bit, for example? Notice how you pick up the feet a bit more quickly and shorten your stride slightly to cover more ground. Or maybe you *lengthen* your stride, taking bigger steps but keeping the pace the same. What effects does this have on balance? Does the rhythm of the pendulum-like movement of the arms change in some way to adjust to the speed with which the feet are moving? Repeat this experiment, only now slow down and pay attention to how the body responds. Smoothly transitioning from one pace to another is but one of our many remarkable movement-related capabilities.

Walking fast is efficient; you can get from one place to another relatively quickly. On the other hand, moving slowly offers an opportunity for

prolonged exploration of how the body operates. Coaches “break down” athletic performance using training films, running them in slow motion, analyzing often minute aspects of movements that contribute to athletic performance. Why not adopt the same exploratory attitude toward walking or other movements?

If you’ve had a heart attack and are given an exercise prescription to walk at a particular pace for a specified length of time, let the experience be one of active exploration, rather than just a routine to complete. Vary the pace and discover what effects this has on how the body adjusts and how you feel. Bring attention into the present moment and cultivate curiosity about the process of walking. Notice how breathing and heart rate change in response to varying the pace, and perhaps appreciate the fact that, despite having suffered damage, the heart is capable of rebounding and functioning as it should, delivering blood throughout the body, including to working muscles.

We can see from this illustration that whether or not someone is capable of sustained physical activity, even the most basic form of functional movement—walking—has intrinsic value as a point of focused attention, a chance to become acquainted with functional capabilities of the body, and an opportunity to express gratitude for being able to move in this manner. The benefit of movement at this level has less to do with decreasing physiological reactivity to stress than with activating mindful awareness in tandem with movement to anchor attention in the present moment. This is not intended to replace physical conditioning—you can always move further along the continuum, depending on your capabilities and capacity for training—but rather to illustrate a means of reducing stress by paying careful attention to your moment-by-moment experience.

Clinicians who recommend exercise for clients to alleviate distress generally work within a prescriptive framework. They give clients information about the benefits of exercise and refer them to a gym or training program, without fully appreciating how challenging it is to make such a radical change in behavior. More than 50% of those who start exercise programs quit within 6 months (Dishman, 1982). There are many reasons for this, including perceived lack of time, access to resources, changing priorities, and simply the fact that change involves conscious willingness to alter habitual patterns of daily life; most people find these patterns difficult to disrupt. Furthermore, many psychological disorders deprive clients of cognitive flexibility, physical energy, and motivational drive. The stress-reducing capability of exercise can be nullified if a program is overly demanding, in terms of either the time commitment or physical capabilities. Low-intensity activity offers the safest starting point for clients who are stressed, because it offers ample opportunity for careful, moment-by-moment assessment of how the body responds when physically

challenged. A study by Trivedi, Greer, Grannemann, Chambliss, and Jordan (2006) illustrates the challenge of sustaining motivation for physical activity. Seventeen patients with incomplete depression remission initiated a 3-month program of supervised and home-based exercise while continuing to take medication. Although significant reductions in both clinician- and self-rated depressive symptoms were reported, fewer than half of the participants completed the study.

## Helping Clients Establish a Practice

Exercise itself is a stressor, but it's a healthy one. It challenges body and mind by calling for behavior change, which is not necessarily easy. The process of becoming physically active involves getting used to the many sensations that accompany physical exertion, which for many clients can feel alien, or even anxiety provoking.

One helpful strategy for encouraging clients to be active is to do something that involves movement with them, such as walking. Rather than talking about exercise, just do something. You can process the experience afterward with questions like "What did you notice?," "Is your energy level different now than before we started?," and "Was there something in particular that you found especially pleasant or unpleasant?" The intention is to focus on the experience of movement in terms of thoughts and sensations it evoked, not to be a cheerleader or coach. The simple act of walking will evoke many different personalized reactions that offer fertile ground for investigation. A good friend with cancer and I went for long walks together as he was undergoing treatment. Apprehensive at first, he gradually warmed to the experience by paying careful attention to taking one step at a time. Formerly an accomplished athlete, he had to adjust his perspective and focus less on high-level skills and more on what it felt to move as treatment progressed. Feelings varied a lot—intense fatigue one day, high energy another, low motivation yet another time. He kept at it, and came to realize that, despite what he thought or felt about doing this, it had important meditative qualities that proved to steady him both during and following treatment. Current exercise guidelines recommend moderate-intensity activity because epidemiological data have found it to be associated with health-protective benefits. But there is no reason to necessarily start at this level, especially for clients who are not used to being physically active. The purpose of teaching mindful movement is to awaken interest and curiosity about being active, not to be a physical-conditioning coach. Let clients select their exercise pace, while emphasizing the value of slow movement. A sampling of research reveals that self-selected exercise intensity encourages participation. One

study (Rose & Parfitt, 2007) found that self-selected exercise intensity was associated with positive emotions in sedentary women. Overweight and obese adults also benefit from self-selected pacing, an important consideration because of how quickly they can reach an uncomfortable exertion level, even while walking slowly. Ironically, participants in one study walked more and expended more energy overall when choosing their own pace than those for whom an intensity level was prescribed (Williams et al., 2015). Self-paced activity is really helpful because it enables you to keep exertion at a level below a point (called the ventilatory threshold and explained in Chapter 5) where breathing rate increases noticeably, accompanied by a sense of strain (Williams, 2008).

Contemporary exercise lab practices make a strong case for self-paced physical activity, suggesting it is especially valuable because it allows control over physical sensations that are directly related to emotions. Physical strain is uncomfortable, and can trigger feelings of distress, anxiety, and even panic. Conversely, comfortable activity is intrinsically rewarding, giving rise to feelings of well-being.

From a mindfulness-based perspective, helping clients establish a solid foundation for being physically active emphasizes the importance of self-discovery through a process of experimentation and openness to experience. It's not a prescription, which is something you take until you feel better, but rather a long-term commitment to learning about the body's capabilities. When exercise is viewed as an intervention or prescription, there can be a tendency to perceive it as fixing something in need of repair. Much like going on a diet, the focus in prescriptive exercise is on attaining long-term goals, rather than learning to focus attention on present-moment experience. If, instead of ascribing to physical activity curative properties and administering it in prescribed dosages, we treated it as a fundamental human capacity to be fully incorporated into daily life and as an integral aspect of being fully human, I'm certain that clients would be more likely to embrace it.

Box 7.2 provides a simple exercise that illustrates how mindful movement makes it easy to focus attention on present-moment experience. Movement engages the senses, and in addition activates cognitive processes involved in navigating your way through the environment. Of course, an alternative to doing this would be to simply "sit with" the mental gyrations that contribute to the experience of stress, as is customarily done in sitting meditation. And this is certainly an option, although there are occasions when unremitting exposure to anxiety- or stress-provoking thoughts can feel overwhelming in their intensity, and it is helpful to have available other response options. Movement offers a different sort of experience that engages both sensory and motor capabilities and that for

**BOX 7.2. Responding to Somatic Signs of Stress**

Set aside a few minutes to be in a physical space that permits freedom of movement, such as a good-sized room. Begin by sitting quietly, on a chair or cushion, and allow attention to settle on the movement of the breath. Allow the eyes to close, if you feel comfortable doing so. Let yourself settle into a state of relaxed and open inner awareness, centered on the process of breathing, simply being here, in the moment, and bringing attention back to the breath each time it wanders off, over and over again.

And now, gradually bringing into conscious awareness an event or circumstance that is a cause of some stress in your life right now, choosing something that is not overwhelming but perhaps some nagging preoccupation that is never very far from consciousness anyway. For a few moments at least, allow yourself to dwell on any thoughts or images that enter awareness, being open to whatever it is about the experience that led you to label it as somehow stressful. Just allow whatever images come into your mind, without attempting to shape or otherwise elaborate on what you are experiencing. And now, expand awareness to include whatever sensations are arising in the body, as you reflect on the stressor. Notice, for example, the quality of the breath and whether or not it may vary in response to whatever you are imaging right now. Or perhaps there may be some tendency to move or shift position as you contemplate the source of stress. The body reacts to stress, but fortunately manifests it in ways that we can detect, if only we take time to watch and listen. And one response to signs of stress that is often helpful is to move, rather than dwell on either its source or manifestations.

So now, as you are ready, shift awareness away from the stressor which you have been contemplating, along with its effects on the body. Allow the eyes to open, and after a few moments coming to a standing position with full awareness of the process of making this transition from sitting to standing. And once you are standing upright, engaging the senses by taking in your surroundings and being fully present with where you are, right now, in the present moment. And after taking time to conduct this survey, begin walking, bringing full attention to the process of moving away from the chair and setting a course within the confines of the space you are occupying. Walk slowly, focusing attention on simply moving, placing one foot in front of the other. If you are in a room of any size, you might want to walk from one end to the other, on a path that minimizes having to navigate around obstacles. On the other hand, you could make your path less linear and more varied, to more fully engage the senses that provide

*(continued)*

moment-by-moment feedback regarding changes in the direction of movement. And after walking in either manner for a short period of time, find your way back to the chair and just sit quietly, with an attitude of kindness and compassion toward yourself. Focus attention inwardly, noticing any effect of this practice on the stressful event you were contemplating. Even if it returns, being able to temporarily redirect attention to the present-moment experience of movement may provide a new perspective and even some relief. Being able to recognize and respond—rather than react—to stressors is a powerful outcome of mindfulness practice.

**Check-In:** Mindful awareness is helpful in discerning stress “triggers” that can lead to a full-blown reaction. When something occurs that you experience as stressful, reflect not only on the somatic response to the event itself but also preexisting conditions that may have given rise to the stressor.

many people provides profound relief from cognitive turmoil. Making a conscious decision to direct attention from one domain of experience to another is a powerful aspect of self-regulation. The emphasis is on cognitive flexibility in choosing a course of action (or inaction), a reflection of an internal guidance system that organizes much of our behavior (Carver & Scheier, 1998).

### **Interfacing with the Fitness Culture**

Clinicians can do more to help clients bridge the gap between psychotherapy and physical activity. Of course, it's helpful to recommend that clients make physical activity a part of stress management, but the benefit is even greater when you guide them through the process of making it happen. Mindfulness offers a way to accomplish this, by bringing focused awareness to movement patterns in the present moment—simple ones at first—that over time can be incorporated into more complex and challenging patterns of activity and, perhaps eventually, structured exercise. Starting with the body scan and then introducing simple movements is a sound way to teach awareness of the body. Doing this will help clients be more attuned to how their bodies respond to exercise programs when they begin working with personal trainers or other fitness personnel.

Responsibility for helping clients become *more* active can be left to these professionals who have little experience working with psychological issues, and who work in settings that are different from those in which

psychotherapy is conducted. Yet those fitness personnel who do have experience working with psychological problems may be hampered by not being able to form a collaborative working relationship with referring clinicians. To help with this problem, it's important for clinicians to become familiar with the fitness culture and how it shapes current views of what it means to be healthy.

The best way to familiarize yourself is to begin by taking an active role in developing a mindfulness-based approach to your own movement, physical activity, and exercise. Here we encounter one of the key challenges clinicians face in encouraging clients to venture into the world of health and fitness, one that is different from the shared, focused intimacy of the psychotherapy setting. Examining this challenge provides a helpful perspective from which to interpret research literature that can often be difficult to apply to work with individual clients.

I find that one of the most enjoyable—and important—aspects of introducing mindful movement to new yoga students or MBSR participants comes from encouraging an attitude of playful exploration. People who have been inactive for years or who because of injury or illness stopped being active often experience a sense of joy at discovering they are still capable of being active in some way. Some find their way to class from exercise programs they found too demanding or regimented. Others come looking for fresh ways to make physical activity a more integral part of everyday life. Almost everyone feels out of touch with their body, and is looking for a way to reconnect.

A special benefit of doing yoga is that it creates a positive disposition toward future sessions or home practice. Good fitness instructors know the benefit of this, and routinely allow time at the end of a training session or class to lower physical intensity during a “cool down” period. Settling into a state of profound stillness at the conclusion of a session of gentle movement is a unique experience, yet one that is attainable by virtually anyone.

Box 7.3 is a simple practice you can do if you spend time in the water. It is yet another way to bring present-moment awareness to a simple form of movement. Water can be an inviting medium for movement, especially for those whose physical infirmities may preclude even low-intensity activity. Being immersed in water can be an intensely stress-free experience.

## Summary

Clinical research examining the role of physical activity in both preventing and alleviating stress, anxiety, and depression supports its inclusion as part of a multifaceted approach to clinical practice. There are few things

**BOX 7.3. Floating**

*Note: I recommend listening to this narrative before entering the water, rather than while floating.* For this practice, you will need access to a body of water that's placid and at a comfortable temperature, perhaps a quiet lake or a pool you can visit after the early morning swimmers have completed their vigorous laps. If you are an active swimmer, you may nonetheless want to do this as a change of pace, an opportunity to simply release and let go, as a counterpoint to swimming in an effortful, goal-oriented way.

This practice involves lying in the water on your back in a supported way so you can just float without effort. If it's hard to stay afloat, then use a floatation device that keeps your face above water and supports the body even though it's partially submerged. The intention of this practice is to be restfully suspended in the water, not trying to get anywhere or achieve any particular result. Instead, simply lie on your back and allow the body to experience a sensation something like weightlessness where you can just let go and drift.

Water is almost never completely still, so you may be able to tune in to gentle rocking sensations of the small waves that ripple across the surface of the water. Notice as well any sensations associated with the breath, whether it's calm or turbulent, deep or shallow, fast or slow, not forcing it to conform to any particular rhythm or pace, but simply letting the body breathe. If your arms are in contact with the water, experiment briefly with sweeping them up and down like making snow angels, and notice how the water gently ripples over the skin as you do this. And at some point, try submerging the arms a little deeper into the water, which creates more resistance. Water creates more resistance than moving through air, and you may notice that the more forcefully you move, the greater the resistance you encounter. For now, however, just release and let go, content to simply drift. Allow attention to wander from place to place in the spirit of "choiceless awareness," a state of relaxed attention devoid of any sense of effort. And after a while, gently bring this practice to a close without hurrying, in a mindful, attentive manner.

**Check-In:** Water is a wonderful medium in which to release the weight and contours of the body. Releasing and "letting go" is a vital aspect of mindful awareness, whether in regard to physical tension or thoughts, ideas, memories, or anything else we tend to cling to.

one can do that can have such a beneficial effect on so many different forms of emotional distress, and stress in particular seems to have reached epidemic proportions. A thoughtful paper by Smith (2006) commented favorably on the efficiency of exercise in treating comorbid conditions, as well as its potential role in preventing emotional disorders in the first place. Given the ability of movement, activity, and exercise to alleviate so many different forms of psychological distress, it's natural to speculate about whether these conditions may arise, at least in part, from chronic, habitual *inactivity*. A central theme of this book is that movement is an inherent, vital capacity we possess, yet it is one that has become increasingly irrelevant over the past century or so as the need for heavy physical labor has diminished in many parts of the world. From this perspective, stress reactivity, anxiety, and depression could all be seen to some extent as symptomatic expressions of the disassociation of physical activity from daily life, creating an underlying predisposition to negative emotional states. Quite simply, it's stressful to be inactive.

#### PAUSE AND REFLECT

What are some of your personal stress “triggers”? Any aspect of life can be a source of stress, so there may be lots of candidates. Once you have identified two or three, consider the extent to which being physically active figures into your stress-management “toolbox.” If so, how is it helpful? How might you apply insights from your own experience to help in your work with clients? If not, can you think of some ways to connect movement with stress management in your own life?