



# Peak Performance

## *A Breath Therapy Program To Promote Occupational Performance*

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### SUMMARY

Poor breathing habits are so ingrained that clients may not realize the effect they have on their ability to participate in valued occupations.

The average healthy person breathes more than 20,000 times per day. Most of us take our breath for granted and give little thought to the mechanisms involved, unless respiration is severely impaired. Yet many breathe inefficiently, especially those experiencing pain and disability.

Breathing is a dynamic process that changes according to the needs of the activity. There is no single *right* way to breathe. Our breathing adjusts to support the diverse challenges of our life—pushing a vacuum requires a different kind of breathing than wiping a countertop; donning socks and shoes requires a different kind of breathing than talking with a friend. Yet inefficient, habitual breathing patterns limit the ability of our body to make these adjustments.

Inefficient breathing can be driven by a variety of factors. Our posture, past injuries, mental stress, emotional responses to life events, disease, and culture all have an impact on our “habit” of breath. These patterns are unconscious, and even though our current way feels familiar and “right,” it may not necessarily be the most efficient way to breathe at any particular moment.

As our breath becomes more adaptive, we tend to feel calmer and expend less effort, due to physiological changes in the body. Almost immediately, the balance of oxygen and carbon dioxide levels in the blood are modified, promoting healthier cellular metabolism and neurological changes.<sup>1</sup> Other studies have indicated that breath work can be used effectively to address coronary heart disease,<sup>2</sup> hypertension,<sup>3,4</sup> chronic

pain,<sup>5,6</sup> migraine headaches,<sup>7</sup> asthma,<sup>8</sup> epilepsy,<sup>9</sup> menopausal hot flashes,<sup>10</sup> and panic attacks.<sup>11</sup>

Occupational therapy interventions are designed to “foster engagement in occupations and to support participation in life” (p. 618).<sup>12</sup> Within our practice we address performance patterns, which “refer to habits, routines, and roles that are adapted by an individual as he or she carries out occupations or daily life activities” (p. 612)<sup>12</sup> and activity demands, which “affect skill and eventual success of performance” (p. 613).<sup>12</sup> Migliore described an occupational therapy intervention for three outpatients with chronic obstructive pulmonary disease in which “the occu-

pational therapy focused on teaching patients how to reduce and manage their dyspnea while performing light to moderate effort activities such as bed making, gardening, sweeping floors, and stair climbing” (p. 644).<sup>13</sup> Occupational therapy practitioners’ unique understanding of occupation and daily life activities provides the foundation to weave a breath-focused intervention into day-to-day function to facilitate learning and the integration of “habits that support performance in daily life” (p. 623).<sup>12</sup>

### COMMON INEFFICIENT BREATHING PATTERNS

On any given day in the clinic, it is not uncommon to see a variety of breath-holding patterns that impede functional progress. Most common is *chest breathing*, where the abdomen is inappropriately contracted, constricting the movement of air to the upper chest. With this breathing pattern the shoulders rise and fall as the secondary muscles of inspiration (scalenes, sternocleidomastoid, trapezius, and pectoralis minor) work to make up for the relatively immobile diaphragm. When

these secondary muscles work full-time, the person will eventually experience chronic tension and discomfort in the neck, upper shoulders, and back. This pattern can also impede the healthy functioning of the digestive organs, elicit a chronic state of hyperarousal, and stimulate the sympathetic nervous system. This can be experienced as anxiety, “butterflies in the stomach,” and muscular tension.

In *paradoxical* or *reverse breathing* the diaphragm lifts up during inhalation and drops down during exhalation. This pattern is the reverse of normal “textbook” breathing and, when habitual, is very inefficient. Like chest breathers, reverse breathers eventually experience neck, shoulder, and upper-back tension; digestive problems; and anxiety; and they “often encounter great difficulty learning movement, feeling clumsy and uncoordinated because their most basic pattern of movement (breathing) is completely upside down” (p. 76).<sup>1</sup>

*Hyperventilation* is characterized by quick, rapid breathing and often goes undetected unless it is in its extreme, acute form. The causes can be

organic (i.e., to compensate for kidney dysfunction), physiologic (i.e., when running a race), emotional (i.e., due to fear or anger), or habitual.<sup>14</sup> When it is habitual, people breathe quickly regardless of the activity. Over-breathing reduces carbon dioxide levels in the blood (respiratory alkalosis), and this metabolic shift from acid to alkaline alters a panoply of cellular chemical reactions.

Hyperventilation can manifest in a myriad of symptoms such as headache, dyspnea, numbness, light-headedness, chest pain, palpitations, fatigue, rapid pulse, visual disturbances, stomach pain, muscle pain, cramps, anxiety, insomnia, and impairment of concentration and memory.<sup>1,14</sup>

### PEAK PERFORMANCE

The Peak Performance curriculum outlined in this article is designed to facilitate the rehabilitation of clients recovering from diverse conditions, including neurological, orthopedic, or cardiopulmonary issues; chronic pain; and injury. The format is intended to be experiential and explorative, rather than prescriptive, and includes seven lessons. Each Peak Performance session starts with an explanation of pertinent anatomy and a logical, psychophysiology-based rationale for the lesson. This didactic portion prepares the group for the experiential component. The lessons can be taught as part of an individual treatment session or in a group format and arranged in any sequence, as each lesson stands by itself.

Helping participants develop an awareness of their current habit for breathing lays the foundation for change. To facilitate this awareness, a handout is given with the following questions:

To help identify your current breathing patterns and habits, how do you breathe when you are dressing, showering, walking, cooking, cleaning, eating, exercising, talking, and watching television? During the activity, are you holding your breath at any point? Are you struggling for breath or is it adequate for the activity you are performing? Is there a noticeable difference between the length of the inhalation and exhalation? Is your breath



**The goals of the program** are to maximize engagement in occupation by

- (a) improving the efficiency of respiration to conserve energy and therefore engage more fully in meaningful activities;
- (b) improving coordination and ease of movement; and
- (c) decreasing anxiety to manage pain, facilitate motor learning, and learn new information.

fast or slow? Does your breath feel smooth and even or is it jerky and uneven? Is your posture influencing the quality of your breath?

This internal focus is encouraged throughout the program so participants will begin integrating what they have learned within the context of day-to-day activities. The goals of the program are to maximize engagement in occupation by (a) improving the efficiency of respiration to conserve energy and therefore engage more fully in meaningful activities; (b) improving coordination and ease of movement; and (c) decreasing anxiety to manage pain, facilitate motor learning, and learn new information.

## PEAK PERFORMANCE LESSONS

The lessons presented in the program are meant to serve as a foundation from which a breathing program can be developed. There are many other approaches, especially from yoga and qigong, that can be incorporated into a breath therapy program. A complete account of three lessons are presented, with a brief overview of the remaining sessions.

### Lesson 1: Why Zebras Don't Get Ulcers

This title comes from a book by Robert Sapolsky titled *Why Zebras Don't Get Ulcers: An Updated Guide to Stress, Stress-Related Diseases, and Coping*.<sup>15</sup> In this lesson, participants learn a breath- and word-focused meditation as a means to improve the quality of their breath. This strategy helps quiet the mind and decreases habitual muscle tension and stress, thereby promoting the client's ability to attend to critical features of the environment and to learn new information (i.e., cues to facilitate motor learning, hip precautions), and it provides a nonpharmaceutical intervention for managing pain.

### Discussion

The discussion begins with the question "why don't zebras get ulcers, and what does this have to do with breathing?" After a wide variety of answers, the following scenario is presented. Zebras grazing in the field are in a relaxed state. When a lion appears there is shift physiologically, from the rest and digest mode to the flight or flight mechanism

## FOR MORE INFORMATION

### Case Report: Improving Dyspnea Management in Three Adults With Chronic Obstructive Pulmonary Disease

By A. Migliore, 2004. *American Journal of Occupational Therapy*, 58, 639–646.

### Functional Performance in Older Adults (2nd ed.)

By Bette R. Bonder & Marilyn B. Wagner, 2001. Philadelphia: F. A. Davis. (\$53.95 for members, \$71 for nonmembers. To order, call toll free 877-404-AOTA or shop online at [www.aota.org](http://www.aota.org). Order #1219-MI)

### Occupational Therapy With Elders: Strategies for the COTA (2nd ed.)

Edited by S. Byers-Connon, H. L. Lohman, & R. L. Padilla, 2004. St. Louis, MO: Mosby, Inc. (\$47.95 for members, \$68 for nonmembers. To order, call toll free 877-404-AOTA or shop online at [www.aota.org](http://www.aota.org). Order #1394-MI)

### Using Environments To Enable Occupational Performance

By L. Letts, P. Rigby, & D. Stewart, 2003. Thorofare, NJ: Slack. (\$35.95 for members, \$51 for nonmembers. To order, call toll free 877-404-AOTA or shop online at [www.aota.org](http://www.aota.org). Order #1376-MI)

of the autonomic nervous system, enabling the zebras to go quickly from a blissful state to running at full speed. If the zebras outrun the lion and survive, they go back to grazing peacefully and the rest and digest mechanism is reengaged. For many people, the ability to disengage the fight or flight mechanism quickly is not so easy.

The discussion focuses on how excessive mental tension can perpetuate breathing pattern disorders, pain, and the stress response, just as inefficient respiration can cause an increased stress response, pain, and mental tension. In this way, breath is the bridge between the mind and the body. Breath awareness can help anchor the mind into the present moment and have a global positive impact on health. Most of our mental stress (which in turn amplifies muscle tension, pain, and illness) stems from our dissatisfaction with some aspect of the past (if only I had not had this stroke!) and from worrying about the future (I know I'll never get back to where I was...). Meditation is an effective way to practice breaking that cycle by quieting the mind and bringing us into the present.<sup>16</sup> The ability to temporarily "turn off" the mental chatter is not only important to health,

but it can foster our ability to learn new information and be more present in our communication with other people.

## Exploration

The breath-focused meditation is explored first. Participants are asked to sit upright and, if possible, slightly forward in the chair. Those who are unable to assume or maintain this posture can rest against the chair. The group is directed to focus on their breath by sensing and feeling the movement of the air as it goes in and out, and to keep their focus on this movement. Participants are then told "when the mind wanders (not *if* but *when*), gently bring the focus back to the breath and we will continue to breathe in this way for 4 minutes." During a short discussion that follows, participants describe their experience and what if any changes they feel. Most often they report feeling relaxed, having a clearer focus, and experiencing less physical discomfort.

We next explore the term *focused meditation*. We offer this alternative because some people find it easier to stay focused on a word rather than on their breath. Instead of keeping one's awareness on the breath, the focus shifts to saying the word "one" internally with every exhalation.<sup>17</sup>

## Lesson 2: Respiratory Sinus Arrhythmia

*Respiratory sinus arrhythmia* refers to the physiological changes in blood pressure and heart rate that occur throughout the respiratory cycle—while we inhale our blood pressure and heart rate increase, and while we exhale they decrease. Respiration can occur automatically, but it can also be controlled. In this lesson participants learn that they can modify their respiratory rate to better support activity demands, along with strategies for extending the exhalation.

### Discussion

This session begins with participants counting the number of times they exhale in 1 minute. These numbers are compared with average respiratory rates for women (13–14) and men (12–13). Many participants report respiratory rates of more than 20, which leads to a discussion of the potential conse-

quences of rapid breathing, and the health benefits of improved respiratory control (i.e., lowered blood pressure and heart rate, more efficient breathing, improved adaptive potential).

### Exploration

An effective strategy for regulating breathing is to synchronize a gentle, easy movement with the breath. Participants start by resting their hands on their thighs. On the inhalation they are instructed to slowly begin opening and horizontally abducting their arms, letting the chest open, spine extend, and head roll upward. The movements should be made within an easy comfortable range. On the exhale the movement is reversed, with the arms moving back toward the thigh, and the chest closing as the spine and head gently round down. The breath and arm movements should be continuous, and participants should breathe at their usual rate. After the arm movements comfortably match one's current respiratory rate, the next step is to match the breath to a slower movement, then lastly to a faster movement. If a participant has physical limitations, any number of variations can be offered; for example, matching the breath to opening and closing a hand or gently rocking the head up and down.

The next phase of the lesson is to extend the exhalation through two methods: (a) exhaling through a straw and (b) through pursed lips. After practicing each method, participants count the number of times they exhale, using either approach, for 1 minute. The results are usually dramatic, with most people falling within or close to "normal" respiratory rates and reporting that they feel more relaxed and "present."

### Lesson 3: The Pelvic Clock

The pelvis is anchored by the spine and femurs. When we breathe, a kinetic chain of movement occurs throughout the body. This movement is often restricted by chronic tension held in any number of muscles. This lesson focuses on initiating movement from the pelvis to help participants identify and release habitual holding patterns and promote more efficient breathing and functional movement.

### Discussion

The discussion begins with participants observing a life-size skeleton that is seated in a chair. After identifying the pelvis, spine, ribs, and femurs, the pelvis is rolled forward and back, and then left and right, while participants describe the observed movements. This demonstration highlights how movement in one part of the body influences movement throughout the body, and how habitual muscle tension in any one place (i.e., abdomen, intercostals, throat, neck, back) impedes movement and the quality of our breath. The connection to functional movement is made by demonstrating how the pelvis rolls forward for activities such as reaching forward, sit-to-stand, and transfers. As we don or doff shoes and socks the pelvis rolls back, and when we reach to the left or right outside our base of support (e.g., to retrieve items from a cabinet), the pelvis shifts and the ribs expand in the direction of the reach.

### Exploration

Participants are asked to imagine that they are sitting in the middle of a clock. When the pelvis rolls forward (anterior pelvic tilt) that is the 12:00 position, and when the pelvis rolls back (posterior tilt) that is the 6:00 position. Tilting the pelvis to the left (lateral tilt) is 9:00 and to the right is 3:00.

Participants start by rolling their pelvis toward 12:00 while inhaling and exhaling as they move back toward the center of their clock. The cue to move within a comfortable, easy range is given. Participants are directed to notice that as the pelvis shifts forward the spine lengthens, the space between the ribs expands in front and shortens in back, and the head tilts gently upward. Anyone having difficulty feeling the movement is instructed to make the movement even smaller and easier.

The next movement is toward 6:00, and participants are instructed to exhale as they roll back and inhale as they return to the clock's center. This time participants are cued to notice that as the pelvis shifts backward the spine rounds, the ribs close in front and open in back, and the head rolls down.

Then both movements are put together with the cue to inhale while

rolling toward 12:00 and exhale while moving toward 6:00, continually sensing and feeling the movements of the pelvis, spine, ribs, neck, and head.

The next step is to move the pelvis toward 3:00. Participants are directed to notice the asymmetrical pattern of movement when their pelvis shifts right: how the ribs expand on the right side and shorten on the left, and the head laterally tilts to the left. When moving toward 9:00, the reverse pattern of movement occurs. Participants are instructed to inhale and exhale in a manner that feels comfortable and easy.

This lesson usually takes place over two sessions because many people require time to "let go" of habitual tensions and begin to feel the kinetic chain of movement. After the pelvis-to-head connection is made, participants report a positive change in the quality of their breath and an ease and freedom of movement.

### Lesson 4: Breath—A Moving Experience

Breath is about movement. Lesson 4 focuses on the mechanism of breathing (movements of the diaphragm, its attachments, the exchange of gases, and the role of the secondary muscles) and factors inhibiting efficient breathing (posture, culture, pain, emotion, and habit). It also addresses how muscles, tendons, joints, and organs are influenced by our breath because these also affect our breathing.<sup>18</sup> The experiential component helps participants understand the natural oscillation of their breath reflected in movement throughout their body.

### Lesson 5: The Inner Tube

When the primary muscles for respiration are efficiently engaged, most of the movement is in the lower abdomen. When the secondary muscles are most active, the upper chest moves more. Participants are asked to imagine a triangle superimposed on their trunk, with the base of the triangle closest to the ground. This represents abdominal breathing, which provides postural stability and a sense of being grounded.<sup>19</sup> Chest breathing is represented by having the triangle turned with the apex pointing down—with this pattern there is less postural stability. This lesson helps participants experience and allow

more movement throughout the “base of the triangle”—in the belly, sides, and lower back—by imaging an inner tube placed in their lower abdomen. Verbal cues are given to initially direct the breath to different compartments of the inner tube and eventually to inflate and deflate the whole tube.

### Lesson 6: Core Connection— Awareness Builds Stability

Back pain impedes function and is often caused by inefficient coordination between muscles of the trunk and pelvis. Improved breathing patterns can facilitate lumbopelvic stability by coordinating movements of the diaphragm, pelvic floor, and transverses abdominus. In this lesson, participants learn to isolate and then coordinate these muscles, thereby improving trunk stability, respiration, and function.

### Lesson 7: Biofeedback

When clients find the appropriate rate and quality of breath, a measurable relaxation response is elicited. A simple and inexpensive way to measure this psychophysiological response is thermal biofeedback with hand thermometers. With relaxed breathing, blood flow to the skin increases, which in turn elevates hand temperature. Participants see that by manipulating their breath, they are also changing blood flow patterns.

## PUTTING THE PIECES TOGETHER

To truly integrate the Peak Performance lessons, the occupational therapist needs to incorporate the strategies into daily intervention sessions. For example, if a client is breathing rapidly and expresses feeling anxious during a cooking activity, the therapist can guide him or her to use pursed lip breathing to slow the respiratory rate and decrease anxiety. If a client has difficulty breathing and fatigues quickly when performing lower-body dressing, the therapist can use the pelvic clock to promote an easier posterior pelvic tilt and reduce muscular effort, thereby allowing more efficient breathing. If a client with a hip replacement is unfocused and having difficulty learning hip precautions using adaptive equipment, a word- or breath-focused meditation can be used to help improve focus.

After a client has experienced more efficient movement of the diaphragm in Peak Performance, the occupational therapist and occupational therapy assistant can use verbal cues or gentle tactile cues to promote diaphragmatic breathing to promote occupational performance.

## CONCLUSION

Inefficient breathing patterns limit our clients' ability to fully engage in day-to-day activities. Therefore, helping them learn efficient breathing habits is an important component of any intervention strategy and clearly within the domain of occupational therapy. As noted in the *Occupational Therapy Practice Framework: Domain and Process*, performance patterns are “patterns of behavior related to daily life activities that are habitual or routine” (p. 623).<sup>12</sup> Some habits are “useful,” promoting performance and life satisfaction, whereas some are “impoverished” or “dominating” and interfere with function.<sup>12</sup> The Peak Performance curriculum outlined in this article provides occupational therapists with strategies that can help their clients discover “useful habits” for breathing, thereby helping them to manage pain and anxiety, conserve energy, improve coordination, and engage more fully in meaningful occupations and activities. ■

## References

- Farhi, D. (1996). *The breathing book: Good health and vitality through essential breath work*. New York: Henry Holt.
- Shannahoff-Khalsa, D. S., Sramek, B. B., Kennel, M. B., & Jamieson, S. W. (2004). Hemodynamic observation on a yogic breathing technique claimed to help eliminate and prevent heart attacks: A pilot study. *Journal of Alternative and Complementary Medicine*, 10(5), 757–766.
- Elliot, W. J., Izzo, J. L. Jr., White, W. B., Rosing, D. R., Snyder, C. S., Alter, A. et al. (2004). Graded blood pressure reduction in hypertensive outpatients associated with use of a device to assist with slow breathing. *Journal of Clinical Hypertension (Greenwich)*, 6(10), 553–561.
- Fahrión, S. (1986). Biobehavioral treatment of essential hypertension: A group outcome study. *Biofeedback and Self-Regulation*, 11, 257–278.
- Carlson, C. R., Bertrand, P. M., Ehrlich, A. D., Maxwell, A. W., & Burton, R. G. (2001). Physical self regulation training for management of temporomandibular disorders. *Journal of Orofacial Pain*, 15(1), 47–55.
- Luna-Massey, P., & Peper, E. (1986). Clinical observation on breath patterns and pain relief in chronic pain patients. *Proceedings of the Seventeenth Annual Meeting of the Association for Applied Psychophysiology and Biofeedback* (pp. 82–84). Wheat Ridge, CO: BSA.

- Brown, J. M. (1984). Imagery coping strategies in the treatment of migraine. *Pain*, 18(2), 157–167.
- Bingol Karakoc, G., Yilmaz, M., Sur, S., Ufuk Altintas, D., Sarpel, A., & Guneter Kendirli, S. (2000). The effects of daily pulmonary rehabilitation program at home on childhood asthma. *Allergologia et Immunopathologia*, 28(1), 12–14.
- Panjwani, U., Selvamurthy, W., Singh, S. H., Gupta, H. L., Thakur, L., & Rai, U. C. (1996). Effect of sahaja yoga practice on seizure control & EEG changes in patients of epilepsy. *Indian Journal of Medical Research*, 103, 165–172.
- Freedman, R. R., & Woodward, S. (1992). Behavioral treatment of menopausal hot flushes: Evaluation by ambulatory monitoring. *American Journal of Obstetrics and Gynecology*, 167(2), 257–278.
- Bonn, J. A., Readhead, C. P., & Timmons, B. H. (1984). Enhanced adaptive behavioral response in agoraphobic patients pretreated with breathing retraining. *Lancet*, 9, 665–669.
- American Occupational Therapy Association. (2002). Occupational therapy practice framework: Domain and process. *American Journal of Occupational Therapy*, 56, 609–639.
- Migliore, A. (2004). Case report: Improving dyspnea management in three adults with chronic obstructive pulmonary disease. *American Journal of Occupational Therapy*, 58, 639–646.
- Porth, C. (1994). *Pathophysiology: Concepts of altered health states*. Philadelphia: Lippincott.
- Sapolsky, R. M. (2004). *Why zebras don't get ulcers: An updated guide to stress, stress-related diseases, and coping* (3rd ed.). New York: Henry Holt.
- Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York: Dell.
- Benson, H., & Klipper, M. (1975). *The relaxation response*. New York: Harper Torch.
- Speads, C. (1995). Ways to better breathing (excerpts). In D. H. Johnson (Ed.), *Bone, breath and gesture: Practice of embodiment* (pp. 36–49). Berkeley, CA: North Atlantic Books.
- Middendorf, I. (1990). *The perceptible breath: A breathing science*. Paderborn, West Germany: Junfermann-Verlag.

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