

## FEATURE

# Whole-Body Breathing III: Clinical Application/Implementation

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*This article is the third in a three-part series on whole-body breathing. The author proposes a process model, in which breath training, muscle relaxation, and lifestyle changes are customized as the therapist explores the patient's response to initial interventions. This process model is useful for many cases in medical practice, where clear and specific causes cannot be identified for symptoms and no clear treatment is known. The article provides a case history of a 38-year-old man who sustained whiplash injuries in a motor vehicle accident and subsequently developed cardiovascular problems (congestive cardiomyopathy). Subsequent cardiac rehabilitation proceeded poorly, but he responded positively when the whole-body breathing approach was added, with improved ejection fraction and improved tolerance for activity. This case study illustrates the process of adjusting interventions to the individual's condition.*

### Introduction

The approach of whole-body breathing (WBB) follows a number of principles that allow for dealing with a high level of uncertainty and complexity in the etiology of complaints. The process model assumes unpredictability of the effect of an intervention—in other words, a low level of specific relationship between treatment modality and treatment response and a high level of complexity (Dixhoorn, 2008a). This fits in with the concept of “whole-body” involvement of breathing, which takes a systems view of breathing as a starting point and equally assumes multiple determinants and multiple effects of breathing. On the other hand, the whole-body involvement of breathing approach allows one to search for and test the presence of functional or dysfunctional patterns of breathing. This model includes many interventions that assess the patterns of functional breathing throughout the whole body, from the head to the feet. In evaluating the interventions, the therapist considers the “first-person reality,” that is, the subjective experience of the client, to be as important as objective, third-person observations and measurements.

Thus, the first treatment goal is to achieve a “global meaningful change,” meaningful for the client and assessed

in terms of the clients experience. This aim is incorporated in a model of self-regulation of tension, which integrates the usual forms of self-regulation and completes it by adding passive, internal self-regulation (Dixhoorn, 2008b). The latter consists of first-person realities: the observations by the conscious subject of his own living system. Together, they constitute a strategy to search for effective treatment components: The clinician is open to any outcome and any possible treatment modality and cooperates on equal terms with the self-observations of the client. This approach is useful, therefore, in situations where clear causes or determinants of complaints are lacking; where the identified causes are insufficient to explain the complaints fully; and in situations where there is no specific and effective treatment protocol.

Whenever there is a clearly identified cause for symptoms, undisputed by different clinicians, or there is a known effective treatment, then that should be the treatment focus. However, according to Wilson and Holt (2001), these situations are not as common in health care as one would wish. In most cases in medicine, the likelihood of identifying specific causes to explain the symptoms is low and etiology is complex. Nevertheless, medical practice still generally assumes the model of a specific, linear relationship between complaints and cause, and between treatment and effect. Often linear relationships and expected treatment effects are assumed, therefore, even when the factual basis is too small to explain the complaints fully.

The process model provides an alternative option. It allows one to be unsure and yet follow a rational treatment goal. One tries to increase internal self-regulation of tension. If this is successful and the complaints respond, there is a meaningful change; the patient is motivated to continue the treatment; and the complaints can be, at least partly, ascribed to dysfunctional tension and insufficient tension regulation. If, on the other hand, the complaints do not respond to increased tension regulation, there is reason to look for specific reasons (stressors) that may be causative and that block a positive response. These stressors should be dealt with by external self-regulation tactics. Thus, the

etiology of the complaints can be differentiated. This is particularly useful in primary care, where many complaints have unknown etiology and are assumed to be functional, and in complex clinical cases with multiple contributing factors. The following case history illustrates the utility of the WBB approach in a complicated situation, where the causes of complaints are multiple and partly unclear.

### Case History

A 38-year-old man, divorced and with two daughters, employed full time in an administrative function, participated in an outpatient rehabilitation program following a car accident 2 years earlier. He had persistent complaints in the head and neck, reported difficulty concentrating, and was diagnosed with a whiplash injury. During the rehabilitation period his physical condition was tested and turned out to be low. Moreover, he became increasingly tired and short of breath. An experienced cyclist, he could no longer cover his usual distances. In October 2007 he was referred to a cardiologist, who found a low cardiac ejection fraction (23%–27%). He was diagnosed with congestive cardiomyopathy (without clear cause), received medication, and started visiting the nurse practitioner for heart failure regularly to adjust medication. After some time he was referred to participate in the cardiac rehabilitation program. This was in February 2008.

During cardiac rehabilitation, his condition gradually deteriorated. He was admitted repeatedly to the hospital, where he received diuretic medication, and there was reason to refer him to an academic medical center for assessment of possible heart transplantation. The ejection fraction remained the same. He continued regular interviews with a clinical psychologist to help cope with and accept his sudden invalid status, as well as conflicts with his ex-wife about their two daughters. His relationship with the cardiologist was poor, which increased his anger, uncertainty, anxiety, and discontent even more. His daily activity level decreased to a dramatic low, so that he could not cycle anymore and felt out of breath and exhausted after having walked 500 m. He would then need 1.5 hours to recover and walk back! It demoralized him and he gave up trying to improve his fitness. At one time (beginning of April) the medication of cardiac glycosides was, by accident, doubled in dosage, but there was no immediate improvement in his condition. The relaxation exercises that he received as part of the cardiac program had a positive effect, but only for a short while. He was unable to focus his attention at home sufficiently to practice the instructions with benefit. When the rehabilitation was evaluated in April, his mental condition remained very low, with minimal well-being and maximum sense of being an invalid (Erdman & Duivenvoorden, 1983),

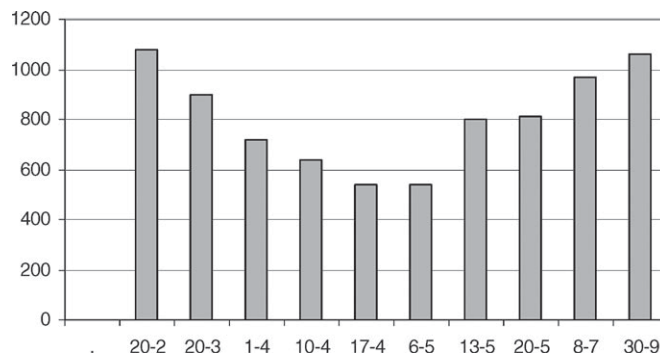


Figure. Total watts performed at exercise sessions.

and his performance during exercise continued to deteriorate (see the Figure). The Figure shows exertion, measured in watts. This was the basis for referring him for an individual treatment with breathing and relaxation therapy.

### First Session

In the beginning of May, I saw the patient for the first time. He was a big fellow, quite heavy as well, with a somewhat brooding and somber look on his face. His head stood anterior of his body, a bit oblique, the shoulders were protracted, and breathing was quick and shallow, mainly thoracic. He felt “charged” or “wired” to me—someone to deal with prudently. I decided to start by assessing his response to attempts at elevating his chest, in an indirect way. “Functional upper-thoracic breathing” (Dixhoorn, 2007) implies that chest-bone elevation during inhalation helps to flatten cervical lordosis, which results in both a more functional posture and breathing. Ideally, one may stand more upright, the head is more posterior, the shoulders are less protracted, breathing is more free, inhalation deepens, and respiration rate decreases.

I asked him to stand in front of a wall, with the palms flat against it at the height of his shoulders and with arms stretched, elbows bent slightly sideways. In this position, one stands right on the feet, not leaning on the hands, and looks straight ahead. Thus, the upper body is relatively more upright. We took some time to have him experience this posture. A sequence of movements in this position tests the ability to extend the spine and elevate the chest. I asked him first to bend and straighten the arms, which results in leaning forward and back again, a number of times and to pay attention to the shift of weight in his feet. The feet should remain flat on the floor and the calf muscles stretch. He tired rather quickly and we stopped, letting the arms hang down and rest. Then, the same movement was repeated; this time I asked him to feel whether any movement was perceptible in the shoulder blades. I placed my hands on the shoulder blades to enlarge sensory feedback and he could

feel that they came closer together when bending the arms, separating again when the arms were straightened. I asked him to continue the movement, without my hands, but still feeling the shoulder movement. After some time, we rested and then tried the third part of the instruction. Until now, his head and neck had remained still when bending forward, thus he was looking relatively downward. I asked him to continue looking straight ahead when bending, thus lifting the head up a little. He could not do this very well. As soon as the head tilted backward, “everything went black” for him. Thus, we stopped the instruction and I asked him to notice whatever change struck him. He walked up and down and said that he felt “more centered,” as if he was standing a little bit more upright and in particular less oblique in the spine. This response was positive, but limited to his posture; there was no change in the sense of breathing.

Next I asked him to lie down on his back and placed both of my hands softly on the shoulders and clavicles. The area felt very tight, with almost no normal breathing movement. Usually, with inhalation the clavicles elevate slightly when the chest expands. When I tried to stimulate this by pressing down very lightly during inhalation, he felt tightness in the chest and short of breath. However, when I shifted my hands to a position under the spine, it was possible to push the upper thoracic spinal column upward with exhalation, which stimulates flattening of the chest. After this, his chest felt more open. He stood more upright and the instruction “standing in front of the wall” went better and easier. It was less fatiguing and the shoulders felt more relaxed. He was willing to try and practice it at home.

## Second Through Fourth Sessions

The rehabilitation therapists told me later that his whole demeanor had changed after the first session. He was more positive and relaxed, even smiling a little. They also noticed that he stood straighter. I saw him for four weekly sessions in May. After each session he felt better, could walk longer, had less shortness of breath, and recovered more quickly. He practiced regularly and each time felt more upright, less oblique, and more centered. In the second session, we repeated the standing instruction. This time I added the instruction to relax his abdomen and inhale when bending the arms. This was rather successful. In the supine position, I held his head for some time, which resulted in a clear relaxation of the neck and chest muscles: The shoulders dropped slightly and he experienced intense warmth in the neck. Breathing did not change. It remained quick and shallow (18–20 cycles per minute), without any natural pauses.

In the third session he reported noticing that coupling breathing to the instruction was difficult. He tended to exhale

when bending the arms, whereas I had asked him to inhale and relax the abdomen. Thus, functional breathing and chest elevation were still beyond his ability, but they were coming closer, because he had started noticing his own pattern. Thus, he was making more mental contact with that area of the body. It is interesting that the effect on his spine and posture generalized. The spine straightened, but at the same time, the head was more oblique and tilted to one side. He saw this in the mirror, and I could confirm his observation.

Altogether, the chest pain during activity decreased. He could walk longer and it took less time to recover from fatigue. Somehow, a meaningful change had occurred. This session, the standing instruction went better and breathing coupled naturally to bending (inhaling) and stretching (exhaling) the arms, although the last part (lifting the head to enhance chest elevation) was unpleasant. In the supine position, I asked him to notice his breathing in the abdomen by resting one hand on top of it. This time, pressure on the clavicles and shoulders during inhalation no longer induced shortness of breath, but felt pleasant and helped him to inhale. Again, my holding his head helped him to relax the neck and shoulders. At the end, the chest felt more free and the shoulders were hanging down, less protracted.

In the fourth session he clearly felt better, his physical condition was improved, the pressure on the chest and shortness of breath during exercise was much less, his morale had improved, and he was much more active. He could walk greater distances and needed shorter time for recovery. The ejection fraction had improved to 35%–40%. The rehabilitation training stopped and he would return only for an evaluation in July. He continued to practice daily the standing instruction, reporting the same changes as before. Abdominal breathing in the supine position helped him to fall asleep. We repeated what we did in the third session and made an appointment after 2 months. He changed cardiologists. The clinical psychologist noticed the improvements and observed that the patient was able to work on concrete goals: setting limits to what he wanted to do and respecting them, saying no to requests upon him, and expressing his anger verbally instead of physically.

## Evaluation and Follow-up

The Figure shows the course of his physical performance over time, indicating the energy expended. Until April there is a deterioration, which slowly reverses after the second session in May, progressing at the first evaluation of rehabilitation in July and continuing until the extra evaluation in September, when it is about equal to the beginning, in February. His mood had improved in July, with a little less sense of being an invalid but with a much greater sense of well-being. He

had started cycling again and could walk 2 miles without a break.

The fifth session was in August. The standing instruction had less effect; there was less difference afterward, as if he was already standing more centered. In the supine position the shoulders felt much less tense, but breathing remained quick and shallow. When pressure on shoulders and clavicles was added during inhalation, there was a clear expansion of the chest. Therefore, we repeated the standing instruction and added the last part: looking upward while bending the arms. He could do this for the first time, and afterward the neck felt freer. He reported that he planned to resume work soon. We made another appointment for the end of September, together with a final exercise session.

At the sixth session, in September, he reported that he had practiced the standing instruction regularly when he returned home from work, but had “forgotten” to add the last part (looking upward). When we practiced this in the session, his first tendency was to look upward with exhalation, showing that the pattern to contract the chest was still present. Coupling breathing in the opposite, functional way was possible but required much concentration. However, it clearly opened his chest and breathing became deeper. He felt very much upright. We planned an appointment after 1 month to evaluate the effects of increasing his work schedule (he was scheduled to resume a 75% time schedule).

By the seventh session, at the end of October, the cardiologist had found a much higher ejection fraction (50%–55%) and was amazed by this recovery. His work went well and concentration required less energy. The plan was to return full time the following month. He reported that he had practiced the standing instruction regularly, paying particular attention to the correct and functional combination. The effect each time was standing more straight, more centered and taller, the chest more open. He noticed that in general his breathing was slower, deeper, and more quiet. My observation confirmed that respiration was less thoracic and slower (12–14 cycles per minute). Looking back upon the effects of the relaxation therapy, he stated that a crucial change for him, from the first session, was to pay more attention to himself. He now feels more open to himself, more quiet, and more attentive to himself rather than to other peoples’ expectations or wishes. This has been a new attitude for him. Others also have commented that his behavior has greatly changed for the better.

### **What Happened?**

The first session marked a turning point and reversed the downward course in his condition. As he remarked at the end, and as the rehabilitation therapists noticed right away,

a clear change in mood and perspective occurred from that moment. His mood and condition improved, fatigue and shortness of breath decreased. Internal self-regulation of tension certainly occurred and there was a clear meaningful change. The frequent readmittances to hospital stopped. It is difficult and perhaps impossible to explain what happened, but it is certain that meaningful processes occurred, which contributed to his improvement. At least they facilitated the effect of the other treatments (counseling, exercise, and medication), which up to this moment had not been sufficient. In general, congestive cardiomyopathy has a bad prognosis; it is the most common reason for heart transplant. In his case, perhaps the cardiomyopathy was viral after all and recovered as part of a natural course, possibly aided by increased medication. However, this does not explain why it recovered from the moment breathing therapy started. Nor can one ascribe the change in mood and his openness to psychological counseling to doubling the dosage of glycosides.

Breathing and relaxation therapy brought his attention to himself and his inner experiences, and showed him ways to induce a clear and perceptible change within himself. Internal self-regulation and body awareness became realities. It is clear that an attentional shift (Dixhoorn, 2008b) and subsequent reduction of mental tension occurred, as well as a change in posture. Both were important to restore a sense of self-confidence, which may have helped to reduce his anxiety and worries about the future. The postural changes possibly helped to reduce the strain of the old whiplash injury, which had led to a severely dysfunctional pattern of breathing and movement. This case history clearly shows the utility of the instructions to assess the degree that a functional pattern was present. Gradually, the dysfunctional pattern responded and diminished, evidenced by his continuing observations of feeling more centered and the full elicitation of the functional pattern at the end. Thus, the knowledge of functional breathing enables one to use the instructions as a tool for feedback as well as for measurement. Several other instructions were given, but the two that are described here served him best. Breathing remained quick and shallow for a long time. Thus, the improvement cannot be ascribed to direct breathing regulation or training, as for instance in resonant breathing or very slow breathing (Lehrer et al., 2004) or inspiratory resistance training (Laoutaris et al., 2004).

From the beginning the shortness of breath responded favorably and he recovered more quickly from effort. This confirms the idea that these complaints were at least partly due to dysfunctional tension and not only the result of the cardiomyopathy. The dysfunctional tension may have



blocked the effect of the exercise sessions until the moment it started to reverse. The experience of improvement may have helped to change his idea and see the future with less anger and helplessness (cognitive restructuring) and with more acceptance, which was one of the themes of the psychological counseling. The heart glycosides were doubled in April, by accident, but the dosage was later maintained at the higher level because it seemed to have worked. Possibly the lack of rest, relaxation, and sound sleep had prohibited its positive inotropic effect on the heart. It was clear that his physical tension diminished. From the first through the last treatment he continued to enjoy the experience of deep relaxation.

Thus, all the processes of internal self-regulation that were described in the previous article were present. Sometimes there is a single factor that can be held responsible for treatment effect, but in most cases several processes occur simultaneously, and it is a challenge to the therapist to be open to any of them and use them in the treatment.

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