

J. van Dixhoorn, Functional breathing is 'Whole body breathing'. *Biological Psychology*, 1997; 46: 89-90

The involvement of the whole body in respiration can be shown in several ways. One of them is by way of the skeletal structure. Skeletal movement patterns can be reliable tools in the assessment of the functionality of breathing, because the skeleton is a stable, inner reference for the individual neuromuscular control of movement, and because skeletal movement can be tested objectively.

When the spinal column is extended, in upright standing posture and in particular in the supine resting position, respiration involves a minute wave-like motion in the spine. The spinal column connects the ribcage with the head and the pelvis. Its potential for movement facilitates respiration. Inhalation is accompanied with a preference for slight lumbar lordosis and flattening of the cervico-thoracic junction. The opposite preference is present during exhalation. Therefore, small movements, initiated from the legs, arms or head are able to influence respiration indirectly. Also, the change in form of the ribcage during respiration is facilitated by a slight rolling movement of the chest, upwards during inhalation and downwards during exhalation. By contrast, dysfunctional breathing leads to less coordination between spinal column and the ribcage, pelvis and head.

When the spinal column is flexed, for instance in a slightly slump sitting posture, the above-mentioned connections are blocked. This is also the case when the subject lies prone. In that situation, the ribcage can not roll upward and the cervico-thoracic junction can not flatten during inhalation. Instead, the costo-abdominal circumference is expanded more and the lumbar lordosis flattens during inhalation. These two patterns of connecting respiration to the whole body oppose each other. Together, they allow the body to respond flexibly to different postural situations. Therefore, the degree that both patterns can be utilized is an important indicator of functional breathing and serves as a parameter of the success of breathing therapy.

Manual procedures are important in the assessment of whole body involvement of respiration, because the movements are small and consist of preferential directions, rather than actual gross motions. They are clearest when the subject is relaxed and is able to sense his or her body. Thus, their absence may indicate 1) a lack of body awareness, 2) the presence of a high tonus that accompanies a stress situation, 3) a dysfunctional breathing pattern per se.