

J. van Dixhoorn, Hyperventilation and dysfunctional breathing. *Biological Psychology*, 1997; 46: 90-91

The term Hyperventilation syndrome (HVS) refers to complaints which are associated with disturbed respiratory function, without organic pathology. Hyperventilating however refers to only one aspect of respiration: gas exchange. It is more realistic to conceive of respiration as a complex psychophysical system with multiple functions. Thus, the consequences of disturbance in respiratory function, or Dysfunctional Breathing (DB), should not be limited to those which are associated with inappropriate ventilation.

First, transport of air serves gas exchange and lung function, but has also a communicative function in a more behavioral sense: smelling and production of sound and voice. In some mammals it is a means for thermoregulation, possibly in humans also to some degree.

A second main respiratory function is musculoskeletal movement. Respiratory movements are volume changes of the trunk which act as pumping force to move gas in and out of the lungs, and also moves body fluids in general (e.g. venous return, lymph drainage, cerebrospinal fluid). This central pump provides also constant rhythmic motion to the organs and the spinal column. In addition, respiratory movement is involved in stabilizing the trunk for upright posture, walking and weight lifting.

A third main function of respiration is in connecting conscious awareness to the state of the body. Respiratory motion provides sensory information on the three dimensional space/volume of the body and of the environment in which the body exists. Such body awareness in turn stimulates respiration.

Complaints, associated with dysfunctional breathing, may originate from inadequate air transport (ventilation, smell, voice), from inefficient movement and from insufficient awareness of the body. For instance, dyspnoea, lightheadedness and agoraphobia may result from dysfunctional breathing, and not only from hypocapnia as the term HVS suggests. However, the tendency to hyperventilate may be stimulated by restricted movement in the trunk and spinal column, which the subject is unaware of.

DB refers to disordered respiratory *function*, which includes subjective awareness, and is in principle open for assessment with experimental tests. There is a need to develop tests for assessment of dysfunctional breathing. It consists of a variety of functional disturbances and may cause or be associated with a variety of complaints. Thus, DB syndrome will not be limited to a single clinical symptom pattern. The term "functional breathing complaints" could be used for respiratory complaints (dyspnoea) with insufficient organic explanation. They could be caused by DB, but also by mental or physical stress.

A wider view of respiratory function, beyond ventilation, provides a rational basis for treatment by breathing therapy and extends its indications. Breathing therapy is not limited to the influence on ventilation. It involves the restoration of functional mobility in the trunk and spinal column with respiration, the restoration of adequate respiratory response to body movement and reeducation of body awareness. For instance, the "initial dyspnoea" of patients with heart failure probably arises from inadequate coordination of movement and can be improved with breathing therapy.