

# The technique of breathing

9. Jahrestagung der DGBfb, Bad Kreuznach, 30-31 oktober, 2009

Dr JJ van Dixhoorn, MD PhD  
Kennemer Hospital, Haarlem  
Centre for Breathing therapy,  
Amersfoort

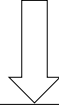
## The 'technique' of whole body breathing

- Includes context of breathing and not only breathing per se: a system's view (multimodal approach)
- Focuses on individual response, rather than intervention per se: process oriented
- Values subjective, first-person reality equivalent to objective, third-person reality: model of selfregulation
- Distinguishes margin for internal self-regulation from dealing with external determinants

Jan van Dixhoorn, Whole-Body breathing,II: a systems-based process model for relaxation training. Biofeedback, 2008; 36-3, 104-108

A system's view

**Mental tension state**



**Respiration  
as dependent variable**



**Physical tension state**

**Mental tension state**



*Time components*

**Respiration**

**I  
N  
D  
I  
C  
A  
T  
O  
R**

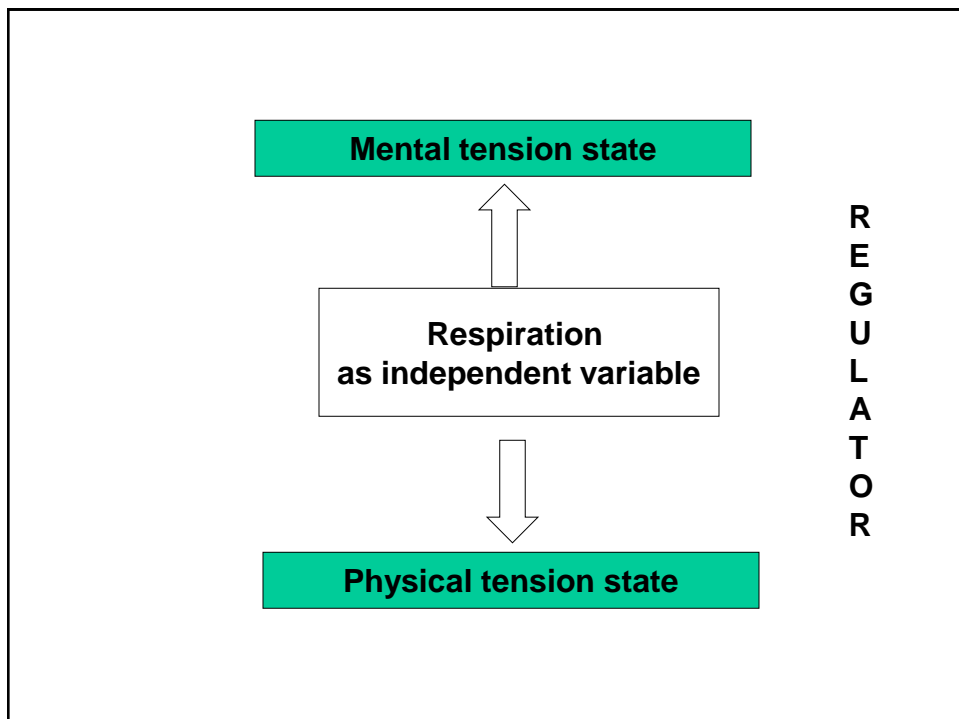
*Volume components*



**Physical tension state**

## Primary function of breathing in selfregulation is its indicator role

- *Responsive* to changes in mental and physical state, posture, movement, effort, sound production, image, thought, touch, emotion, etc
- *flexible*: adapts to different states, and supports them without drawing attention
- ***variability is positive***



## **Regulator role of breathing: voluntary modifying**

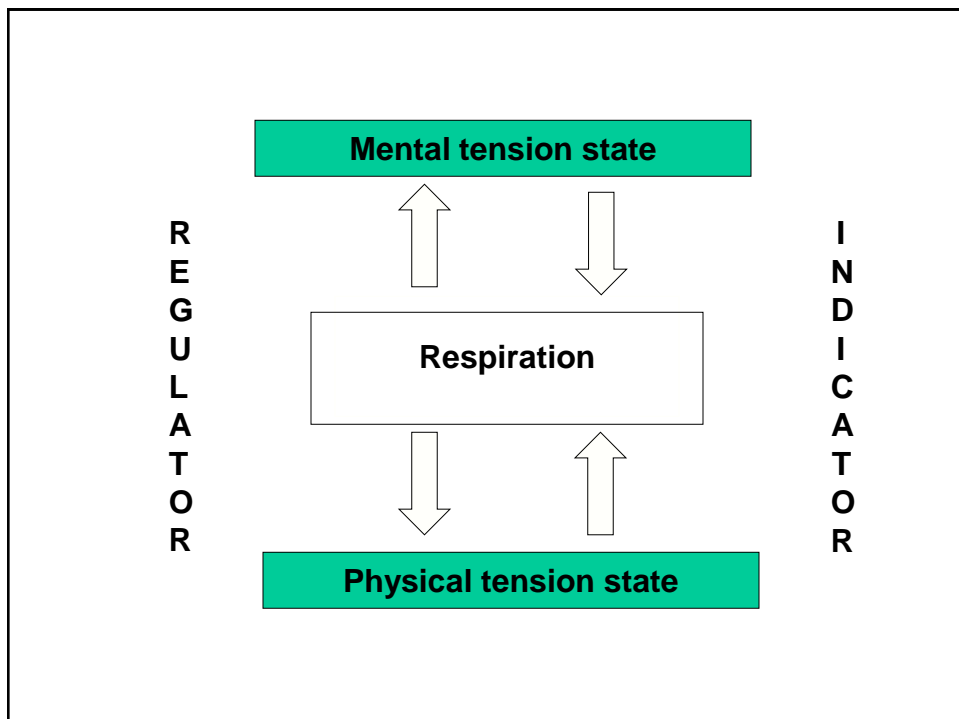
**Frequency, pauses: pacing respiration**

**Depth: larger, smaller tidal volume**

**Distribution: abdominal, chest, back**

**Quality: smooth, effortless**

**Direction: inhale up, down, sideways**



## Consequences of system's view

- Breathing instruction includes specifying attention and posture; that has effect by itself and by eliciting a respiratory response (bredin)
- Often ignored in protocols, but may cause 'novice adverse effects' (choliz)
- Attribute an effect to respiration or tension reduction? (meuret; abdominal breathing)

Jan van Dixhoorn 'Whole-Body breathing: a system's perspective on respiratory retraining', in P. Lehrer, R Woolfolk en W. Sime, 'Principles and practice of stress management', Guilford Press, New York, 2007, p. 291-332

## Basic protocol: respect indicator role

- Regulate temporarily, stop regulation and observe response. Compare with before regulation and be open to any change: attention, mood, body, breathing.
- Find the system's response to regulation: a small, stable shift is better than acute effect
- Instructions to regulate breathing are *not* a model for normal, natural breathing
- A limited or adverse response may be due to inappropriate instruction or to limiting determinants

## Functions of breathing

**Ventilation,  
lung function**

**Air passage**

**Communication  
Smelling, sound**

**Central pump  
Body fluids, HRV,  
Spinal column**

**Rythmic  
volume change**

**Posture,  
Walking**

**Tension  
Space  
internal**

**Body  
awareness**

**Safety, space  
environment**

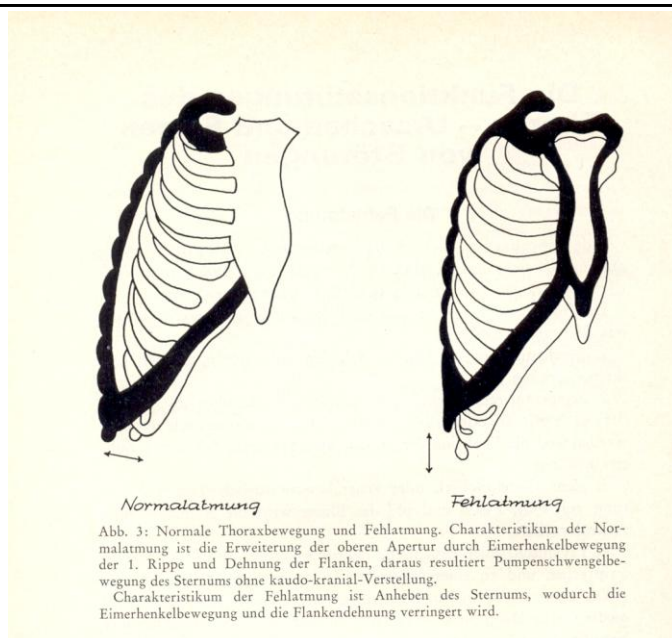
VanDixhoorn, 2001

## Functional or optimal breathing

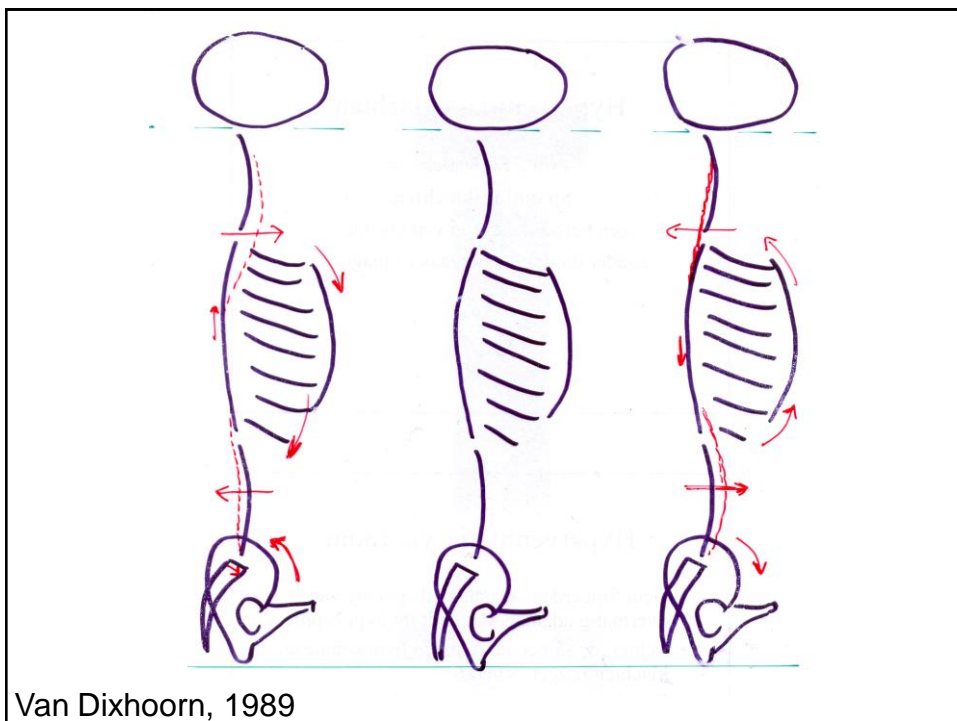
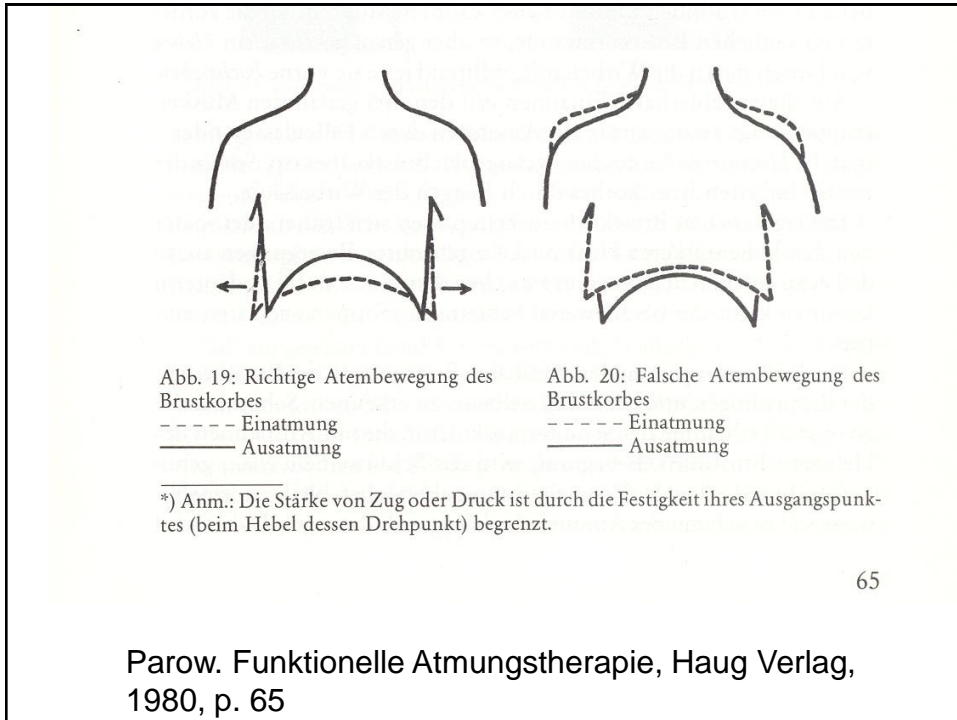
- Specific pattern? Rate and volume? NO
- Adequate ventilation? YES
- Adequate recovery from ventilatory stimulation? YES
- Flexible and variable? YES
- Expressive of state of individual? YES
- Attention disturbs it? NO
- Perceptible to subject? YES
- When movement quality is low and awareness is limited, how does one feel?

## Optimal breathing in resting state

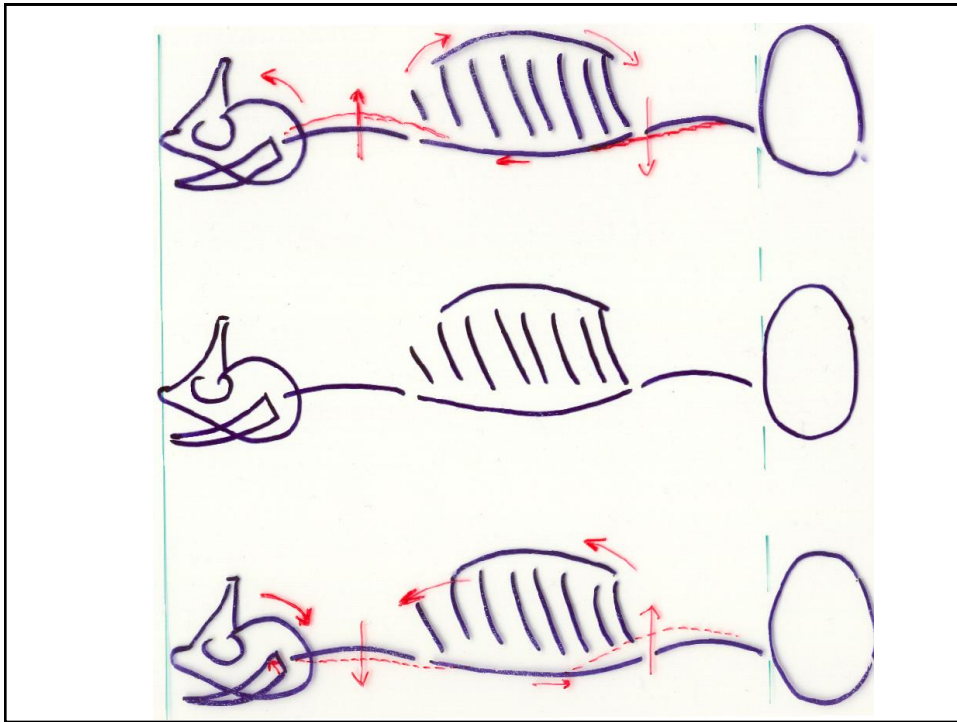
- Air passage: through nose, no sounds from throat or nose
- Movement: evenly distributed all over trunk, between first rib and pelvic floor, balance between chest and abdomen; volume changes involve spinal column
- Timing: unhurried, smooth transitions between in- and exhaling
- Pauses may occur, and lengthened without causing dyspnea



Bergsmann, Eder. Thorakale Funktionsstörungen,  
Haug Verlag, 1977, p. 32







ELSEVIER

Biological Psychology 46 (1997) 73–97

BIOLOGICAL  
PSYCHOLOGY

Abstracts of Papers Presented at the 3rd  
International Society for the Advancement of  
Respiratory Psychophysiology (ISARP) Congress

*Nijmegen, The Netherlands, August 26th and 27th,  
1996*

**15. Hyperventilation and dysfunctional breathing**

J. van Dixhoorn

*F van Blankenheimstraat 10, 3817 AG Amersfoort, The Netherlands*

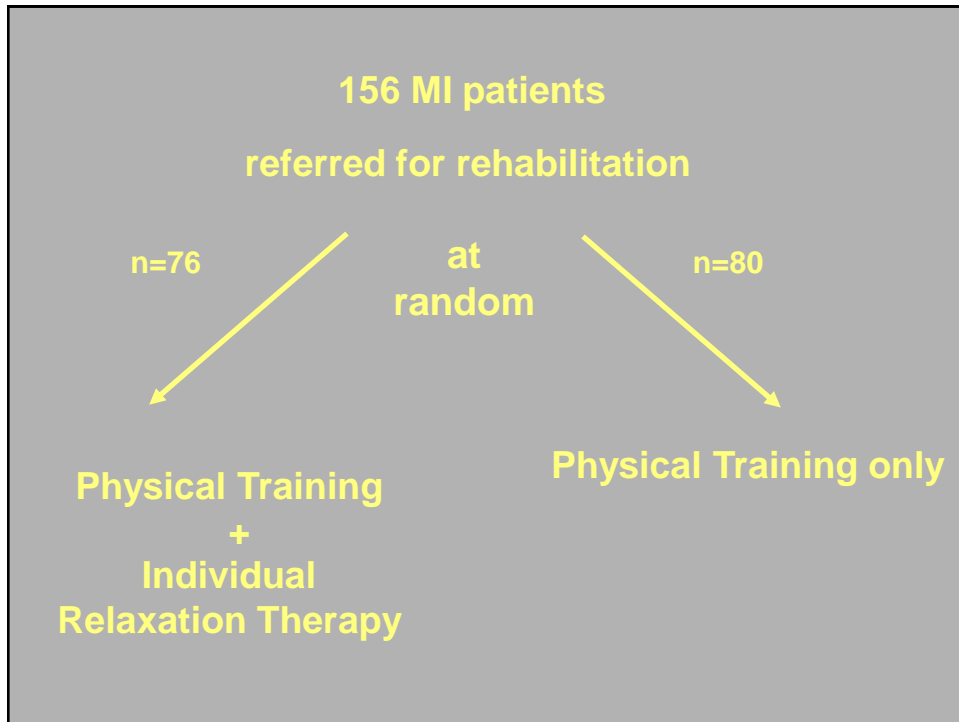
The term hyperventilation syndrome (HVS) refers to complaints which are associated with disturbed respiratory function, without organic pathology. Hyperventilating however refers to only one aspect of respiration: gas exchange. It is more



## Process oriented approach

- Offer a wide range of techniques, covering all modalities of internal selfregulation
- Leave the outcome open, observe and ask for changes in response to any technique
- Purpose is to find a technique that elicits a meaningful change: global goal
- Determine and interpret the nature of the change(s)
  
- J van Dixhoorn, Whole body breathing, II: a systems-based process model for relaxation training, Biofeedback, 36-3: 104-08, 2008

## Empirical evidence

- RCT of breathing & relaxation therapy in Myocardial infarction patients, largely confirmed in meta-analysis
  
- Patient series in primary care of > 1000 cases of medically unexplained symptoms
  
- Dysfunctional breathing movement as treatment mediator



**Review**

**Relaxation therapy for rehabilitation and prevention in ischaemic heart disease: a systematic review and meta-analysis**

Jan van Dixhoorn<sup>a</sup> and Adrian White<sup>b</sup>

<sup>a</sup>Kennemer Hospital, Haarlem, The Netherlands and <sup>b</sup>Department of General Practice and Primary Care, Peninsula Medical School, Universities of Exeter and Plymouth, Plymouth, UK.

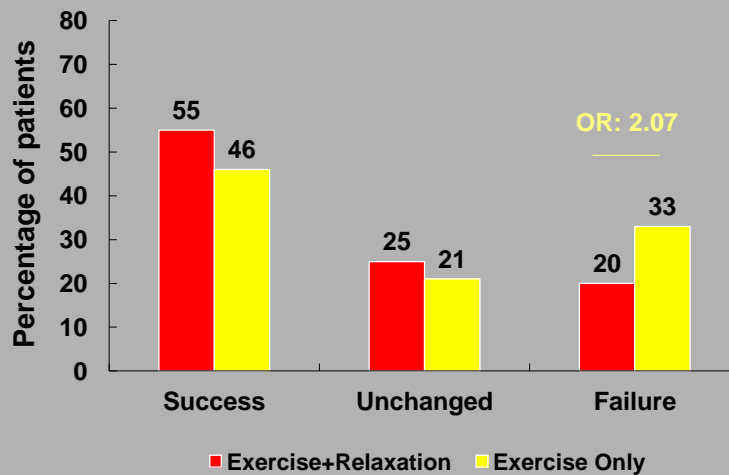
Received 24 September 2004 Revised 14 February 2005 Accepted 17 February 2005

**European J Cardiovascular Prevention and Rehabilitation, 12: 193-202, 2005**

## Effects on exercise testing directly after training

Training failure	↓
ST-depression	↓
Exercise heart rate	=

## Training Outcome, exercise testing

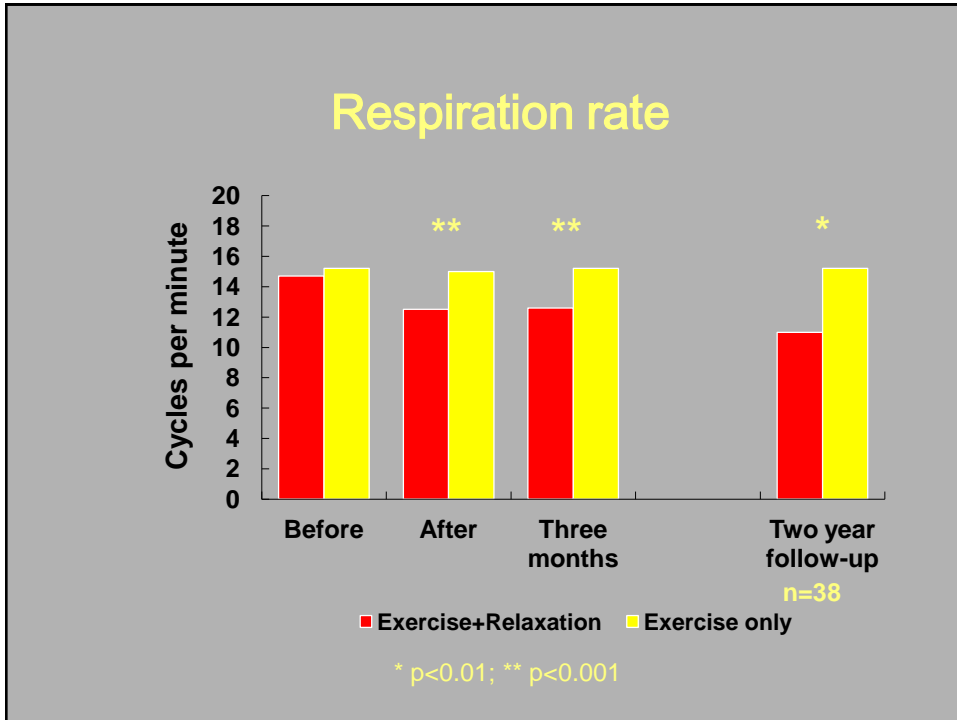


### Psychological Effects

<b>Anxiety</b>	<b>(↓)</b>
<b>Wellbeing</b>	<b>↑</b>
<b>Invalidity</b>	<b>(↓)</b>
<b>Displeasure</b>	<b>=</b>

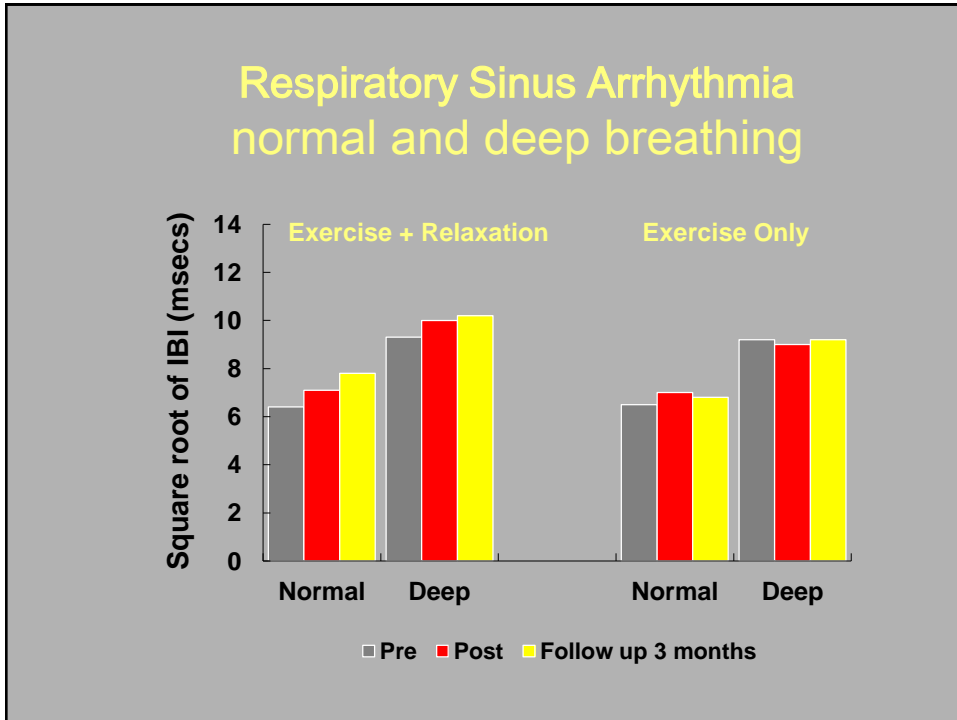
### Psychophysiological Effects

<b>Respiration rate</b>	<b>↓</b>
<b>Exhalation pause</b>	<b>↑</b>
<b>Pleasant body sensation rest</b>	<b>↑</b>
<b>Subjective age realistic</b>	<b>↑</b>
<b>EMG frontalis</b>	<b>=</b>



### Three months follow-up

Resting heart rate	↓
RSA resting	↑
Return to work	↑
Different coping style at work	↑



### One year follow-up

'I have changed'	↑
'It has been difficult time'	↑
'I am doing well'	=

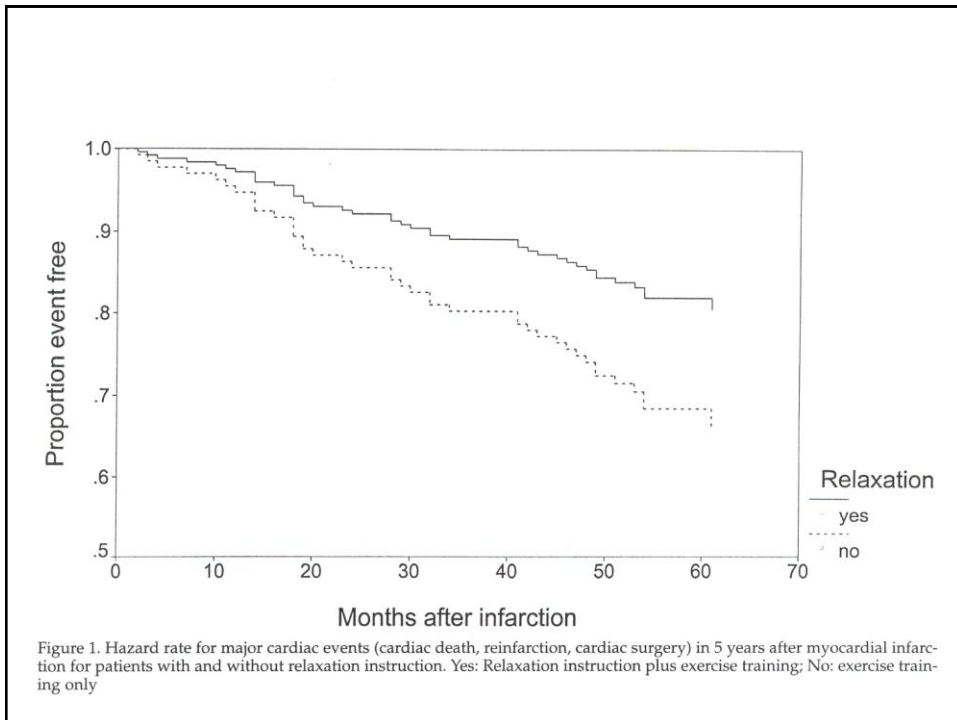
**2 - 3 years follow-up**

<b>Respiration rate</b>	<b>↓</b>
<b>Exhalation pause</b>	<b>↑</b>
<b>Breathing sideways</b>	<b>↑</b>
<b>RSA</b>	<b>=</b>

**5 years follow-up**

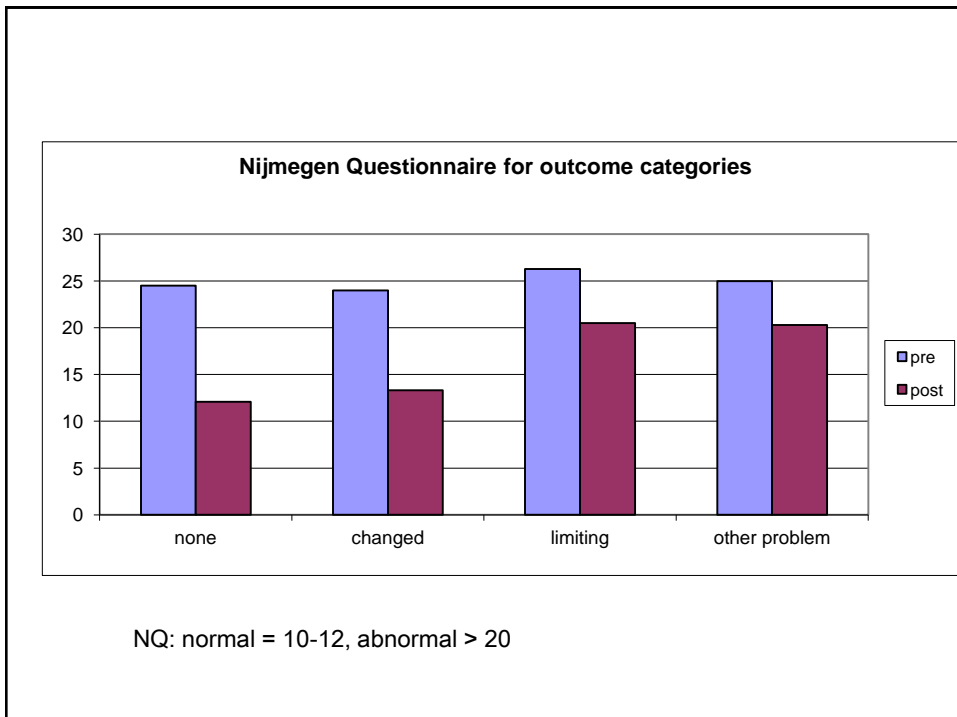
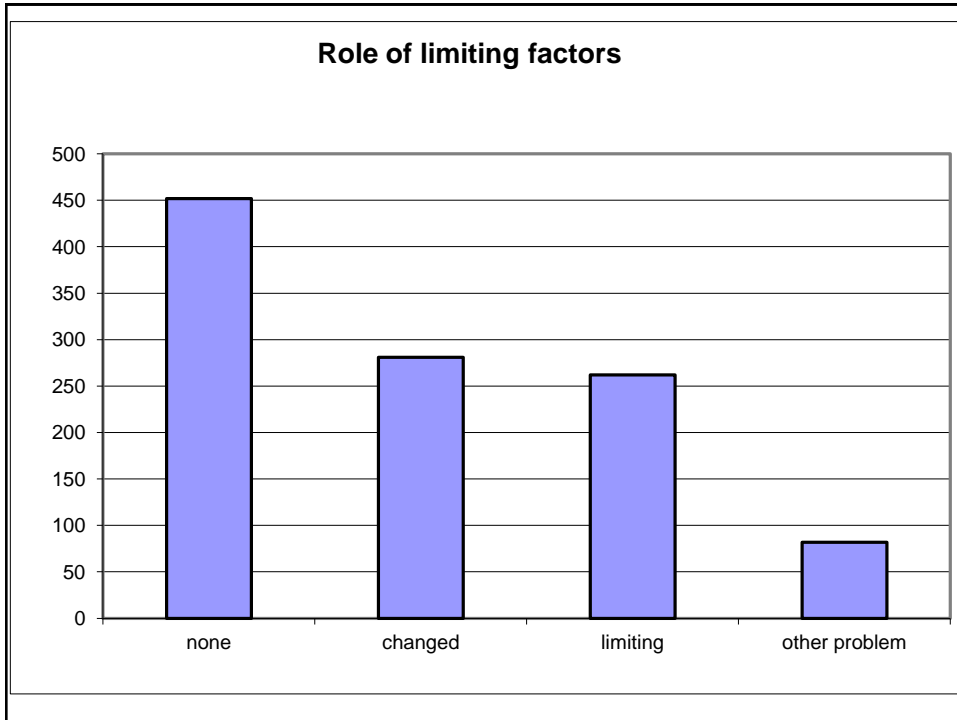
<b>Cardiac events</b>	<b>↓</b>
<b>Cardiological control</b>	<b>↓</b>
<b>'I am doing well'</b>	<b>↓</b>
<b>Daily functioning</b>	<b>=</b>
<b>Taking midday rest</b>	<b>=</b>





## Patient series

- Medically unexplained symptoms: tension and hyperventilation, sleep, headache, fatigue, anxiety, neck, shoulder and backache, burnout
- In primary care, (self)referred for breathing & relaxation therapy
- N=1082, internet survey of many therapists
- Outcome: are there factors that obstruct a positive effect of selfregulation and require other treatment: no, yes but changed, yes they limit, other problems
- Does Nijmegen Questionnaire confirm outcome



## Conclusion

- More than two-thirds of patients benefit fully from breathing therapy, do not require other treatment and normalize in NQ
- In about one quarter factors are present that require other treatment, and in a small group other problems dominated
- In these, NQ remains abnormal

## Websites

- Educational centre:  
[www.methodevandixhoorn.com](http://www.methodevandixhoorn.com)
- Registry:  
[www.ademtherapie-aos.org](http://www.ademtherapie-aos.org)
- Association of therapists  
[www.vandixhoornvereniging.nl](http://www.vandixhoornvereniging.nl)