



Dysfunctional (yet functional) breathing pattern disorders

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Overview

- Definition and overview
- The ‘too hard basket’
- Typical and atypical signs and symptoms
- Assessment tips
- Treatment – multifactorial approach
- Who to refer to and how?
- Useful tips, apps and resources
- Take home messages

Breathing pattern disorders/dysfunctional or disordered breathing

“Breathing which is unable to perform its various functions efficiently for the needs of the individual at that time”

Courtney R. (2009). The functions of breathing and its dysfunctions and their relationship to breathing therapy. International Journal of Osteopathic Medicine 12(3), 78-85

Common definitions

Hyperventilation

- Breathing in excess of metabolic needs
(Chaitow, Bradley & Gilbert, 2014)

Hyperventilation syndrome (ie collection of symptoms)

- Chronic condition associated with habitual over-breathing and somatic or psychological symptoms
(Hough, 2017)

Breathing pattern disorders / dysfunctional breathing/breathing dysfunction

- Display divergent breathing patterns and have breathing problems that cannot be attributed to a specific medical diagnosis
(Kiesal et al. 2017)

The too hard basket

- **Breathing is:**
 - “a complicated dynamic process” and “a delicate balance” between systems (Ley, 200, 2 p. ix/x)
- **Inappropriate breathing can result from multiple sources**
 - Causes include altered:
 - Mechanics
 - Physiological/chemical
 - Psychological states
 - Combination of one/two/all
- **What does it look like?**
 - Dominant apical breathing pattern
 - Altered inspiratory/expiratory ratio
 - Noisy breathing /? multiple sighs
 - ? Poor voice quality

- **Assessment is crucial**
 - Misdiagnosis is expensive (Chaitow, 2002)
 - Increases anxiety of patients/clients
- **Management is multi-dimensional**
 - Common aim to promote wellness
 - Requires a repertoire of tools and approaches
 - Cannot separate psychology from physiology and mechanics
- **A significant burden to individuals and healthcare providers**
- **Growing numbers in youth and children**

“A diagnosis begging for recognition” (Magarian, 1982)

Historical perspective

- Ancient Greece
 - ‘hysterical suffocation’
- 1864 American Civil war
 - ‘muscular exhaustion of the heart’
- 1914 First World War
 - ‘Soldiers heart’
- 1988 ‘Designer jeans syndrome’

- **BPDs can present:**
 - Acute, chronic, or acute on chronic
 - Can exist in isolation or on a background of other conditions
 - However there is no organic disease process
- **BPDs can:**
 - Mask ‘A’ problem
 - Amplify ‘A’ problem
 - Be ‘THE’ problem

Typical and ‘atypical’ symptoms

- **Chest pain**
- Tight feelings in chest
- Palpitations
- Feeling tense / anxious
- Feeling confused
- Blurred vision
- Dizzy spells
- Tingling fingers
- Stiff fingers or arms
- Tight feelings round mouth
- **Bloated feeling in stomach**
 - Rumination / aerophagia
- **Faster or deeper breathing**
- **Short of breath**
- **Unable to breathe deeply**
- **Undue breathlessness on exertion**
- **Altered voice**
- **Fatigue**
- “**performing not at my best**”
- “**... just not feeling right**”

Prevalence in adults

- General population: 5-11% (Thomas, 2005)
- Female :male ratio: 7:2
- Children/youth:
 - 27% children with exercise-induced asthma found to have exercise-induced BPD (Seear et al., 2005)
- Asthma: 30% - 83%
 - Children: 5% of referrals to paed/youth asthma clinic had BPD (de Groot et al., 2013)
 - Children/youth: 18.6% of non-asthmatics and 55% of asthmatics identified as having BPD (Gridina et al., 2013)
- USA GP practices/surgeries: 10%

NIJMEGEN QUESTIONNAIRE

- Non-invasive test AND easily administered
 - 16 items
 - 3 relate to respiratory symptoms;
 - 13 peripheral and central neurovascular or general tension (Mitchell, Bacon & Moran, 2016)
 - Items scored 0-4 ie 0=never; 4 = very often
- Scores > than 23/64 indicate/suggestive of BPD
 - Normal values of:
 - 10/64 in European studies and 5/64 in Chinese studies (Courtney, Greenwood et al. 2011)

Assessment

- Breath hold following normal exhalation
 - Normal: 32+ seconds
 - Most people with BPD < 12 seconds
- Altered posture
 - Tight trapezius muscle +/- trigger points
- Assessment of comorbidities
 - Respiratory, cardiac, ORL, psychological

Assessment

- **Observation and listening**
 - Blocked nose/mouth breathing
 - Dominant apical breathing pattern
 - Altered inspiratory/expiratory ratio
 - Excessive sighing
 - Altered voice quality
 - Running ‘out of puff’ when talking (or walking)

Breathing re-education

Progressive breathing retraining:

- Abdominal pattern and normal I:E ratio
- Optimal posture/ altered mechanics
- Integrated with:
 - Voice management /core stability
 - Activity / exercise / performance / sport
- Consideration for:
 - Other physiotherapy-specific therapy ie airway clearance techniques, inspiratory muscle training

Additionally

- **Consideration of other ...**
 - Co-morbidities
 - Neck/back pain, deep neck muscle tension and posture
 - Weak:
 - Abdominals
 - Back muscles
 - Pelvic floor muscles
 - Ergonomics
 - Fitness, activity & exercise
 - Relaxation
 - Mood and quality of life questionnaires
- Colleagues and skills ie psychologists, GPs, ORL etc

Who to refer to and how?

- **Public**
 - Out-patient Respiratory Physiotherapy Department
- **Private**
 - Auckland:
 - NZ Respiratory and Sleep Institute
 - Breathing Works
 - Susan Lugton, Moving Well Physiotherapy
 - National
 - The Lung Mechanic (Christchurch)
 - Buteyko Health New Zealand
 - BradCliff Practitioners
 - Physiotherapy NZ website (cardio-respiratory physiotherapy)
- **University**
 - AUT Integrated Clinic, North Shore
 - University of Otago physiotherapy clinics

Remember

Each physio/practice tends to have a slightly different focus, so like a good hairdresser or GP, patients need to find the best approach/person for them!

Useful resources (examples only)

Books (e-books/hard copy)

Self-help for hyperventilation (Bradley, D.)

Hyperventilation Syndrome: A Handbook (Bradley, D.)

Breathing Works for Asthma (Clifton-Smith, T.)

Web-based resources:

UK based physiotherapy resource (useful leaflets and videos):

<http://www.physiotherapyforbpd.org.uk>

UK based Breathe study (asthma) with useful videos:

<http://www.breathestudy.co.uk/>

Study: Physiotherapy breathing retraining for asthma: a randomised controlled trial. Bruton, A., et al., (2018), The Lancet. 6:(1), p19-28

Useful resources (examples only)

App-based resources (examples only):

- Breathing retraining: Breathe, Breathe+, Paced Breathing,
- Mindfulness/breathing: Stop, breathe, think (kids and adults), Smiling Mind
- Mindfulness: <http://www.freemindfulness.org/download>

Caution ...

- *Some resources ie apps/videos promote 'deep breathing' **NOT** normal quiet tidal volume breathing with correct inspiratory/expiratory ratio. For some people, this may amplify their symptoms.*
- *Nothing should replace a physiotherapy assessment!*

Take home messages

- People can be 'functional' but ...
 - have 'dysfunctional' breathing
- Symptoms can be global, specific or 'atypical'
- Typically investigations are 'normal'
- What to do:
 - Complete a Nijmegen Questionnaire
 - Watch for:
 - Nasal congestion
 - Apical / noisy breathing pattern
 - Excessive sighing/poor voice
 - Reassure
 - **Refer to physiotherapy**



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