




# Dysfunctional (yet functional) breathing pattern disorders



**Sarah Mooney**

Private Practitioner, NZ Respiratory and Sleep Institute  
Physiotherapy Advanced Clinician, Counties Manukau Health  
Senior Lecturer, AUT University



# 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’

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- **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%

# Assessment tips

## 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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