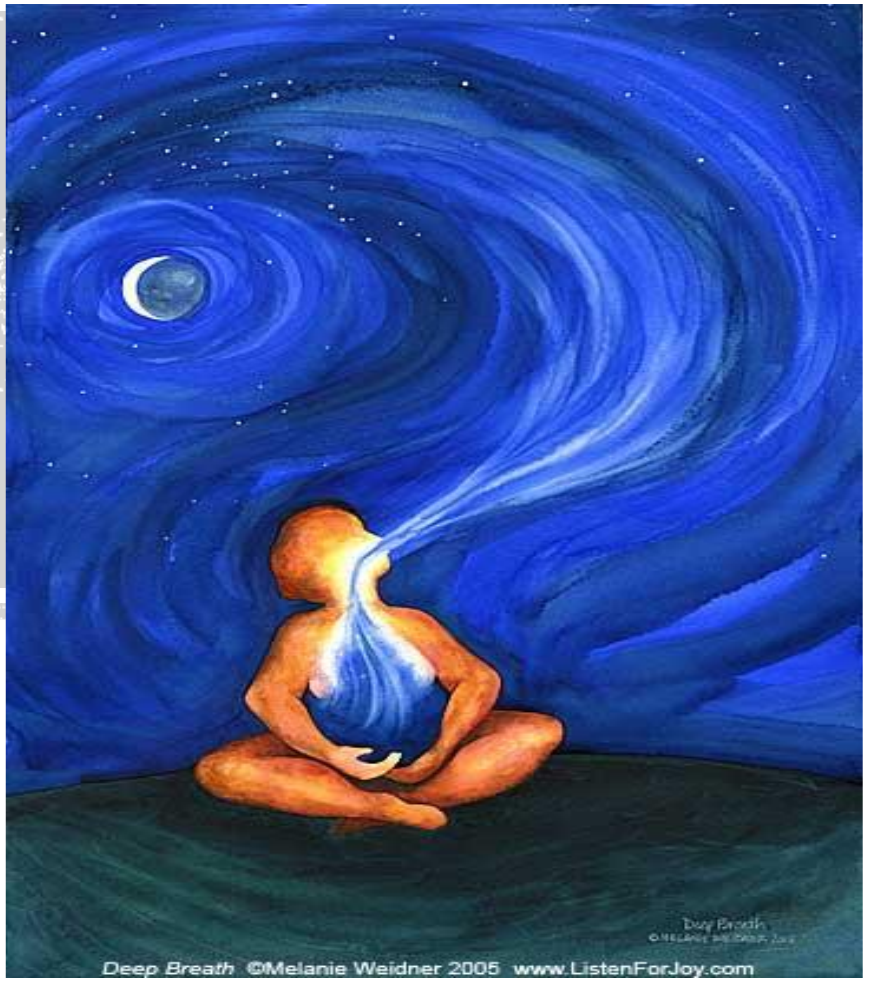
BREATHLESSNESS MANAGEMENT



Małgorzata Krajnik

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UNIWERSYTET
MIKOŁAJA KOPERNIKA
W TORUNIU
Collegium Medicum w Bydgoszczy

MAIN POINTS

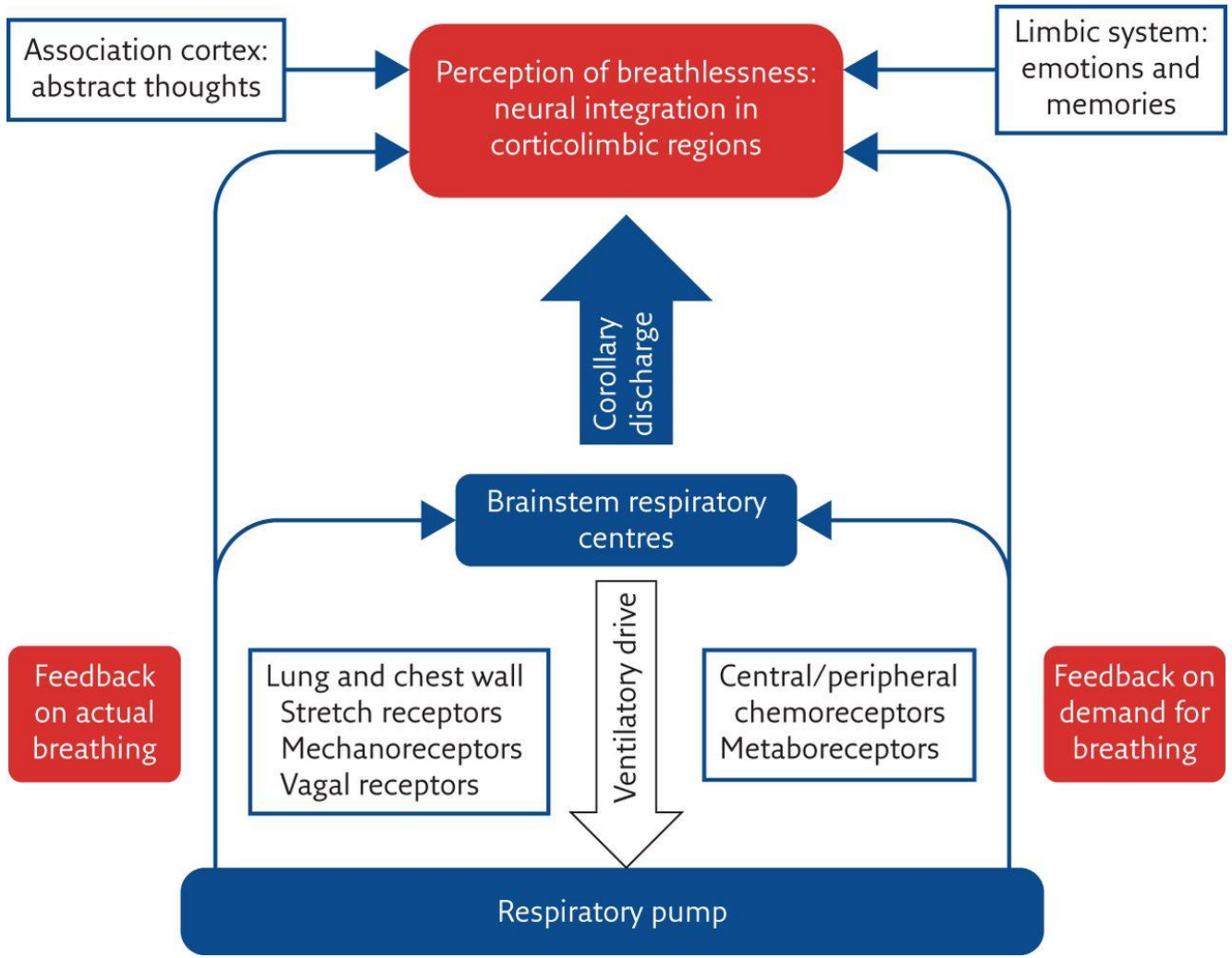
1. • Why patient suffers from breathlessness?
2. • Assessment of breathlessness
3. •Breathlessness management

DEFINITION

- Breathlessness is "a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary".

(*The American Thoracic Society 1999*)

Genesis of breathlessness

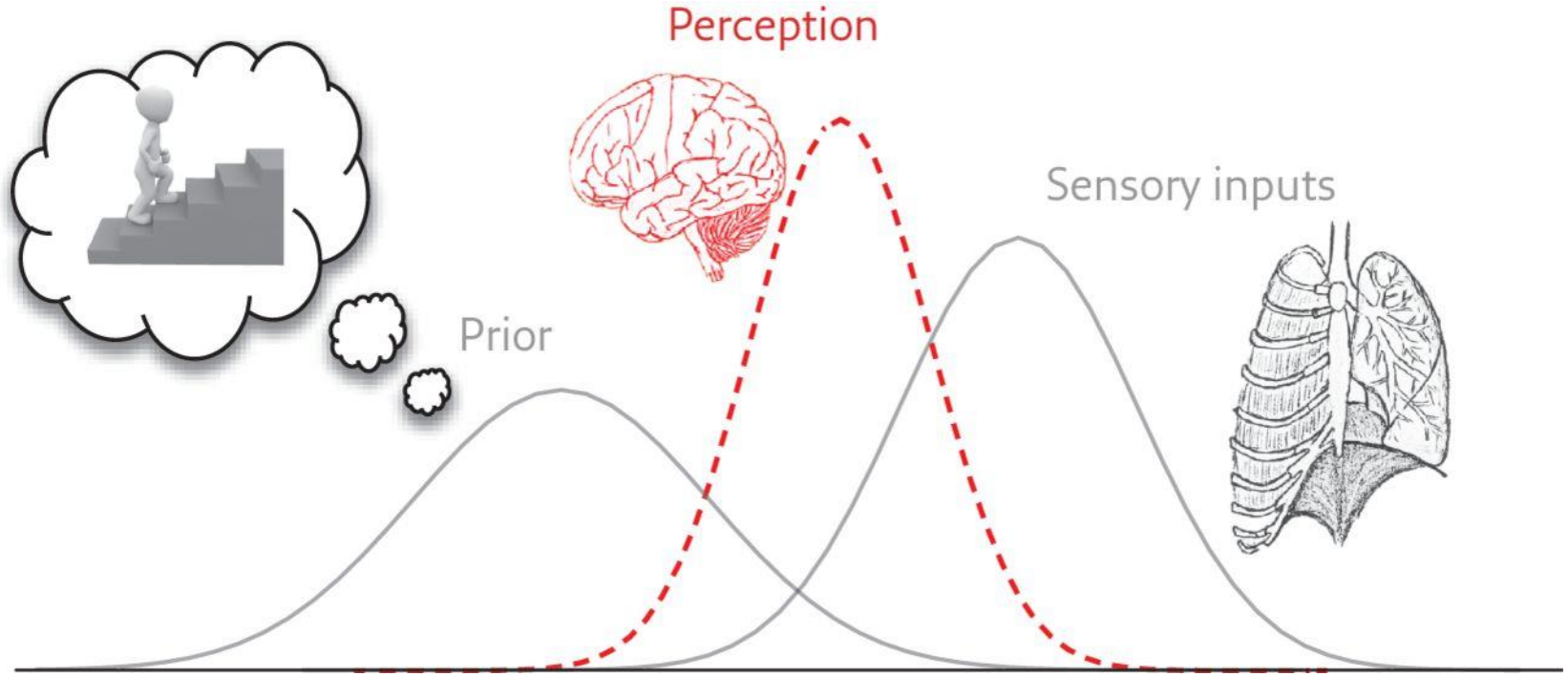


Sara Booth, and Miriam J. Johnson Breathe 2019;15:198-215

Impact on sensory pathway (peripheral factors)

Impact on central perception (f.ex. Relief of other unpleasant symptoms as pain: Ekstrom et al. Support Care Cancer 2016;24:3803-11)

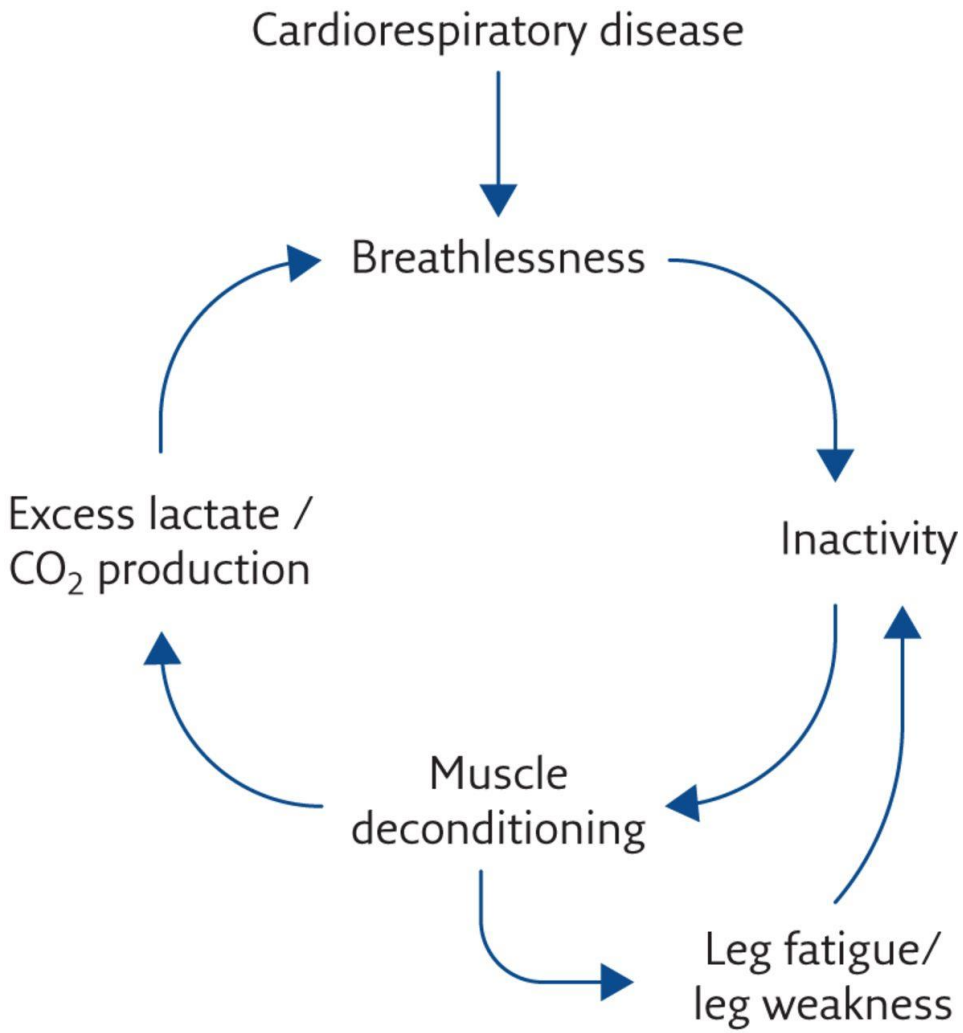
Perception of breathlessness – the Bayesian brain hypothesis



Impact on brain „prediction” (by replacing old cognitions and perceptions and learning more efficient breathing techniques)

Faull OK, Marlow L, Finnegan SL, et al. Chronic breathlessness: re-thinking the symptom. Eur Respir J 2018; 51: 1702238 m

The spiral of disability



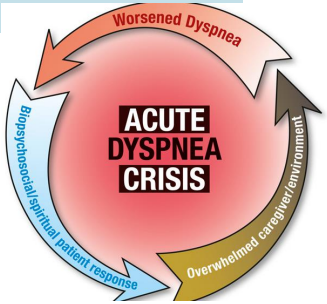
Improving peripheral generators of breathlessness (muscle deconditioning, inactivity, social isolation)

Sara Booth, and Miriam J. Johnson Breathe 2019;15:198-215

Episodic breathlessness

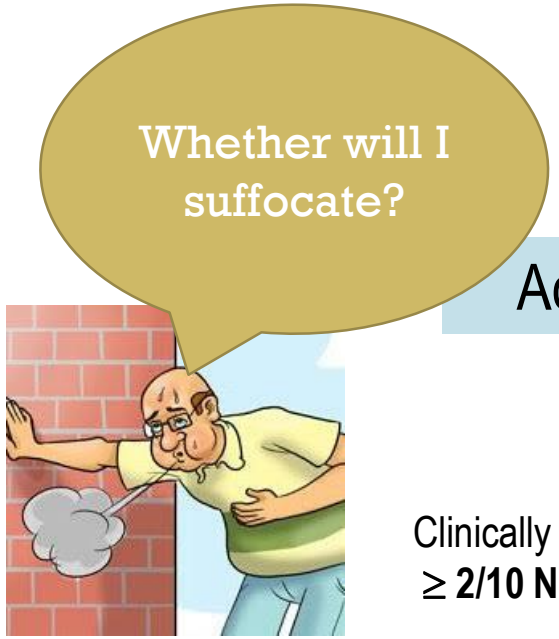
Dyspnea crisis

Ann Am Thor Soc 2013;10:S98-106



Acute-on-chronic

J Pain Sympt Manage 2019;57:e4



Acute breathlessness

Clinically significant difference:
≥ 2/10 NRS lub ≥ 20/100 mm VAS

Chronic breathlessness

Chronic breathlessness syndrome
breathlessness that persists despite optimal treatment of the underlying pathophysiology and that results in disability

Eur Respir J 2017; 49: 1602277

Clinically significant ddifference:
≥ 1/10 NRS lub ≥ 10/100 mm VAS

MAIN POINTS

1. • Why patient suffers from breathlessness?
2. • Assessment of breathlessness
3. •Breathlessness management

Identify causes

Describe (clinical characterization)

Beginning, other symptoms, „pattern" of episodes; physical activity (previous and present); anxiety (in relation to episodes); how carers react to episodes; what breathlessness means to the patients; impact of breathlessness on activity, social life etc; additional burden on family; what is effective; how drugs work; how the patient copes;

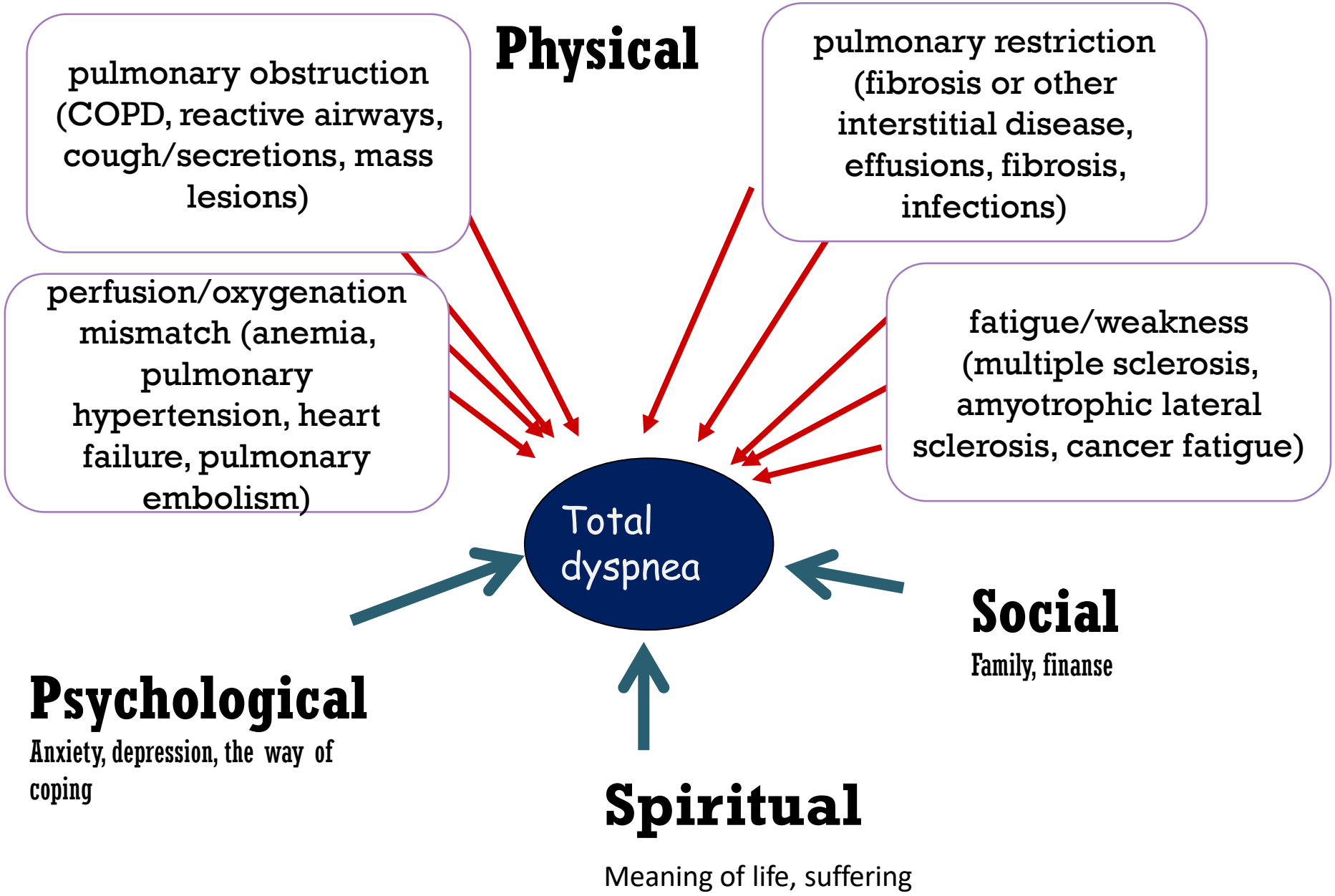
Subjective assessment

Intensity (NRS)

Unpleasentness (NRS)

Impact of breathlessness

Objective assessment


Physical
pulmonary obstruction (COPD, reactive airways, cough/secretions, mass lesions)
pulmonary restriction (fibrosis or other interstitial disease, effusions, fibrosis, infections)
perfusion/oxygenation mismatch (anemia, pulmonary hypertension, heart failure, pulmonary embolism)
fatigue/weakness (multiple sclerosis, amyotrophic lateral sclerosis, cancer fatigue)
Total dyspnea
Psychological
Anxiety, depression, the way of coping
Social
Family, finanse
Spiritual
Meaning of life, suffering

Identify causes

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Unpleasentness (NRS)

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Objective assessment

EPISODES

Episodic breathlessness - severe worsening of breathlessness intensity or unpleasantness beyond usual fluctuations in the patient's perception
(Simon et al., 2013)

- N=70 pts with breatlessness in PC
- 39% - dyspnea at rest (but 20% at rest + episodic)
- 61% - dyspnea only as episodic
- Within the pts with episodic dyspnea:
  - 68% pts < 5 episodes/d
  - 88% episodes last < 10 min
- On average, breakthrough episodes occurred 5–6 times per day and lasted less than 5 minutes,
- Relation to fatigue, insomnia, anxiety, low well -being

Reddy et al. J Palliat Med. 2009;12(1): 29-36

Episodic breathlessness

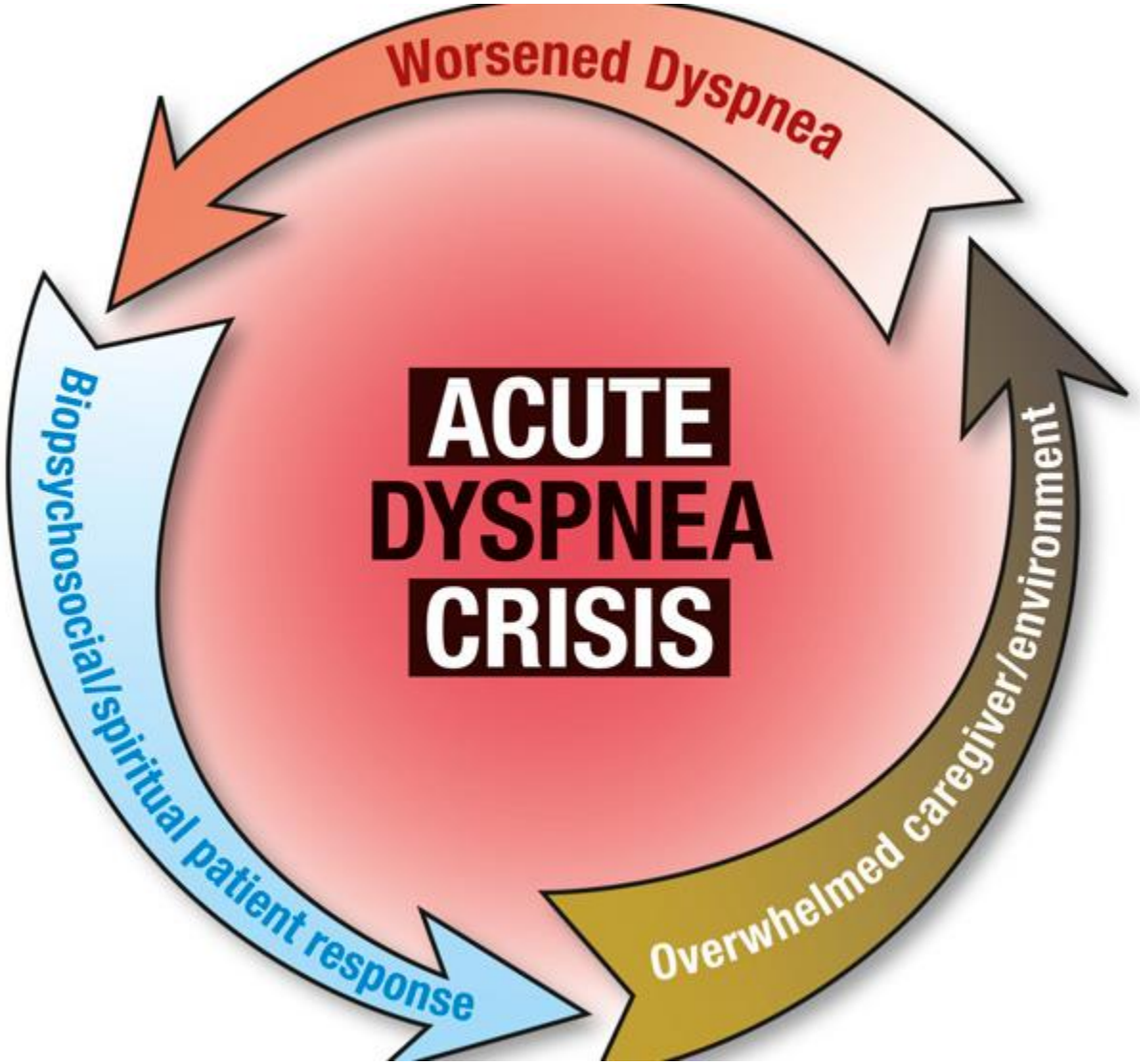
- Mercadante et al. Epidemiology and Characteristics of Episodic Breathlessness in Advanced Cancer Patients: An Observational Study. J Pain Symptom Manage 2015 Sep 28. pii: S0885-3924(15)00480-7.

- 921 patients with advanced cancer, 29.3% (n = 269) suffering from breathlessness: 49.8% of pts with breathlessness (n=134) were treated with drugs due to chronic dyspnea
- Among breathless patients - 70.9% (n = 188) suffered from episodic dyspnea; mean intensity of episodes of 7.1 (SD 1.6).
- Mean time of untreated episodes - 19.9 min (SD 35.3); 41% of patients received medication to decrease episodic breathlessness
- Majority (88.2%) of episodes were evoked by physical activity

definition *Thoracic Society:*

"sustained and severe resting breathing discomfort that occurs in patients with advanced, often life-limiting illness and overwhelms the patient and caregivers' ability to achieve symptom relief."

[*Mularski et al.An Official American Thoracic Society Workshop Report: Assessment and Palliative Management of Dyspnea Crisis. Ann Am Thorac Soc 2013;10: S98–S106]*



Mularski et al. Ann Am Thorac Soc 2013;10: S98–S106

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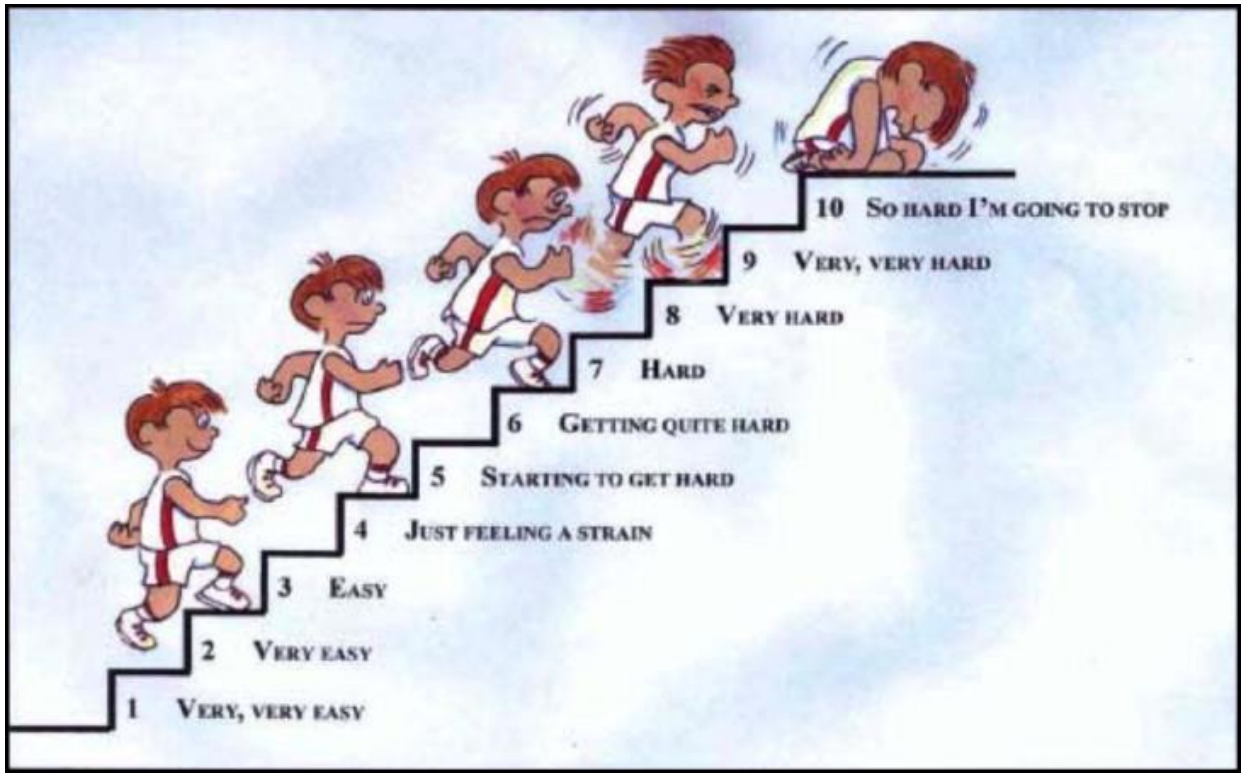
MEASUREMENT OF DYSPNEA INTENSITY

- Standard single-item ordinal scales such as the visual analogue scale (VAS), numerical rating scale (NRS, e.g., 0 [no breathlessness] to 10 [worst possible breathlessness])

- Clinically, a straightforward standardized scale (e.g., 0–10 NRS) alone or as a part of a longer symptom list (e.g., ESAS) is likely best.

- As most dyspnea is intermittent, assessment involves questioning both the patient's current symptom burden and experiences over the last 24 hours („Mean" and „Worst").

Schweitzer C, Marchal F. Dyspnoea in children. Does development alter the perception of breathlessness? Respiratory Physiology & Neurobiology 2009;167:144-153.



THE PICTORIAL CHILDREN'S EFFORT RATING TABLE (YELLING ET AL., 2002).

Identify causes

Describe (clinical characterization)

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HOW PATIENTS DESCRIBE DYSPNEA?

- *I feel…* That I am smothering
- My breathing requires effort
- I cannot take a full breath
- I feel that my breath stops
- My chest feels tight
- I cannot get enough air
- I feel that I am suffocating
- My breathing is fast
- I cannot stop thinking about my breathing

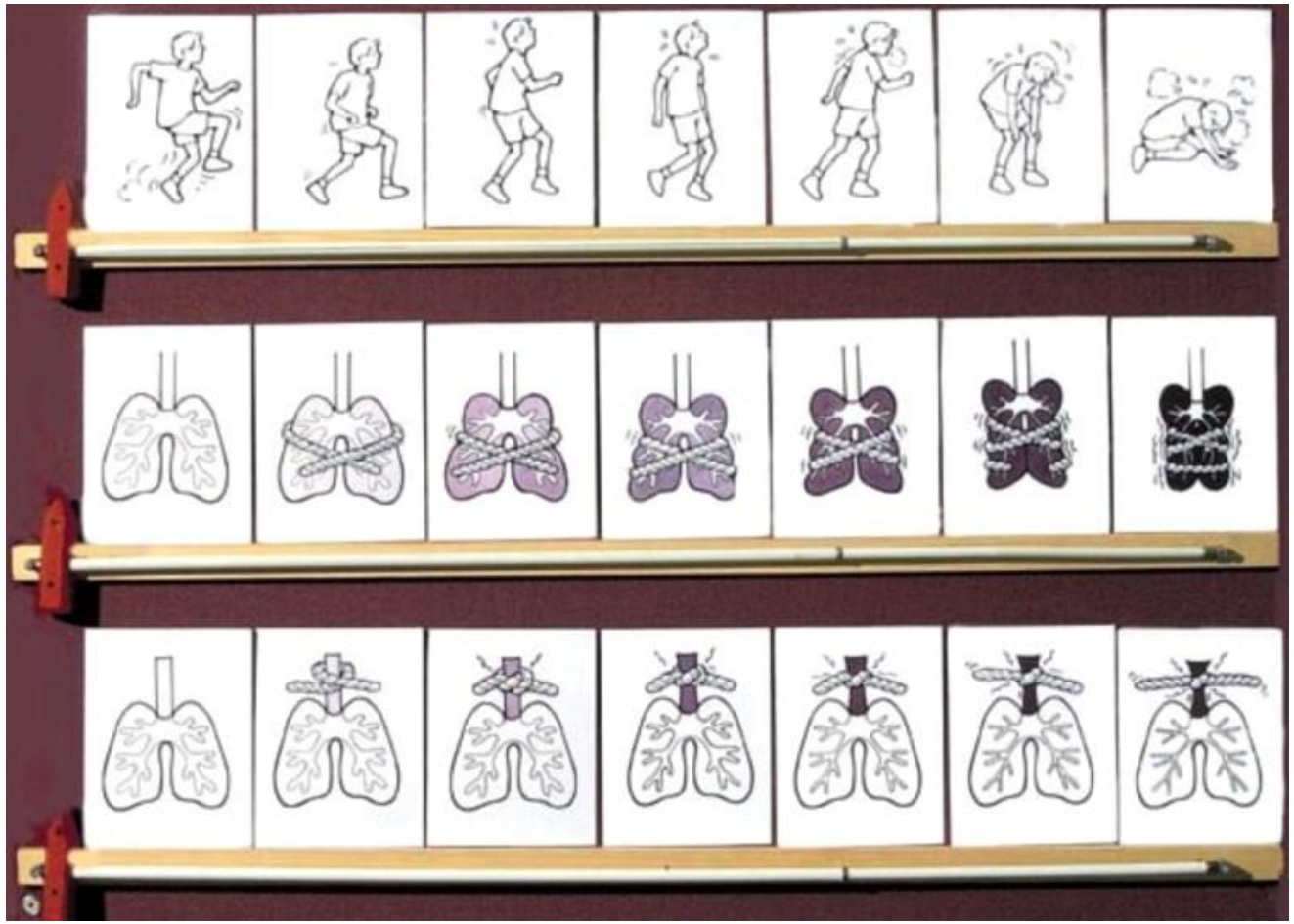
[Kamal et al. J Palliat Med. 2011; 14(10): 1167–1172].

SI (Sensory qualities)

- „Air hunger”: often in heart failure; chemoreceptor stimulation;
- „Sense of excessive work of breathing”: in muscle weakness or cachexia
- „Tightness”: often in bronchospasm; asthma;

LANSING R ET AL. RESPIRATORY PHYSIOLOGY & NEUROBIOLOGY 167 (2009) 53-60

SCHWEITZER? RESPIRATORY PHYSIOLOGY & NEUROBIOLOGY 2009;167:144-153.



Dalhousie University Scale (dzieci > 8 lat) (McGrath et al. 2005)

YORKE ET AL. QUANTIFICATION OF DYSPNOEA USING DESCRIPTORS: DEVELOPMENT AND INITIAL TESTING OF THE DYSPNOEA-12. THORAX 2010;65:21-26.

Table 2 Principal components analysis with varimax rotation of the 12-item set

Item	Component 1 "Physical"	Component 2 "Affect"
My breath does not go in all the way	**0.811**	
My breathing requires more work	**0.715**	0.333
I feel short of breath	**0.713**	0.313
I have difficulty catching my breath	**0.696**	0.320
I cannot get enough air	**0.688**	0.398
My breathing is uncomfortable	**0.653**	0.456
My breathing is exhausting	**0.578**	0.479
My breathing makes me feel depressed		**0.834**
My breathing makes me feel miserable		**0.821**
My breathing is distressing	0.357	**0.725**
My breathing makes me agitated	0.488	**0.658**
My breathing is irritating	0.508	**0.530**

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Management – what has been proven in cancer patients metaanalysis/systematic review

Non-pharmacological interventions and systemic opioids

HATELY ET AL. PALL MED. 2003;17:410-417

- **Non-pharmacological interventions delivered by nurses to the advanced lung cancer patients:**

- Psychoeducation (organization of a day/activities/rest/prevention of exhaustion)
- Walking aids
- Breathing trainings
- Relaxation
- Opening window, fresh air
- Support in coping (cognitive inteventions/what is helpful?/acceptance/positive thinking)

After 4 weeks number of pts suffering from breathlessness several times a days decrease from 73% to 27%.

BOOTH ET AL. NONPHARMACOLOGICAL INTERVENTIONS FOR BREATHLESSNESS. CURR OPIN SUPPORT PALLIAT CARE 2011;5:77-86

- Proven non-pharmacologivcal interventions:
  - Flow of cold air directed to face by hand held fan
  - Walking aids
  - Neuromuscular electrical stimulation.
- Respiratory exercises, position, relaxation, support for carers, education - helpful

In addition – chest wall vibration in COPD
Bausewein et al. Cochrane database of Systematic Reviews, 2011.

Fan

http://m.lanacion.com.co/2017/07/29/cuidado-los-perros-calor/

FAN

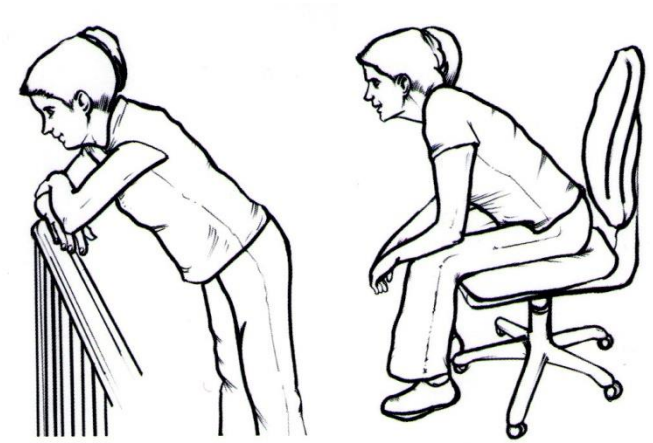
Swan F et al. Airflow relieves chronic breathlessness in people with advanced disease: An exploratory systemic review and meta-analysis. Palliat Med. 2019;33:618-33.

Yu S et al. Fan therapy for the relief of dyspnea in adults with advanced disease and terminal illness: a meta-analysis of randomized controlled trials. J Palliat Med. 2019; Oct1.

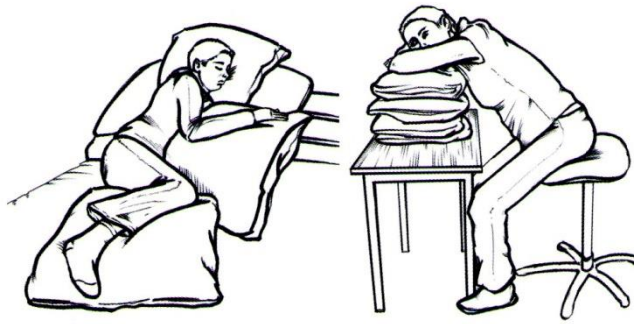
5 studies, 198 patients; fan therapy – relief of breathlessness immediately and 10 min after intervention;

Johnson et al. Magnetoencephalography as a neuroimaging method in chronic dyspnoea: a feasibility study. Eur Res J 2014:44 (Suppl. 58):670.

Booth. Curr Opin Support Palliat Care 2015;9:206-211
Should be considered as a one of the first interventions in the management for patients without/with mild hypoxemia, with chronić breathlessness at rest or mild exertion; Also – in the management plan for episodic breathlessness



Commonly used forward lean positions



Commonly used positions for breathlessness at rest

The Cambridge BIS Manual, 2011

Pharmacological treatment

Jennings et al. Opioids for the palliation of breathlessness in terminal illness. Cochrane Database Syst Rev 2001;(4):CD002066

Barnes et al. Opioids for the palliation of refractory breathlessness in adults with advanced disease and terminal illness. Cochrane Database of Systematic Reviews 2016.

26 studies, 526 patients

„There is some low quality evidence that shows benefit for the use of oral or parenteral opioids to palliate breathlessness, although the number of included participants was small. We found no evidence to support the use of nebulised opioids".

Central mechanisms:

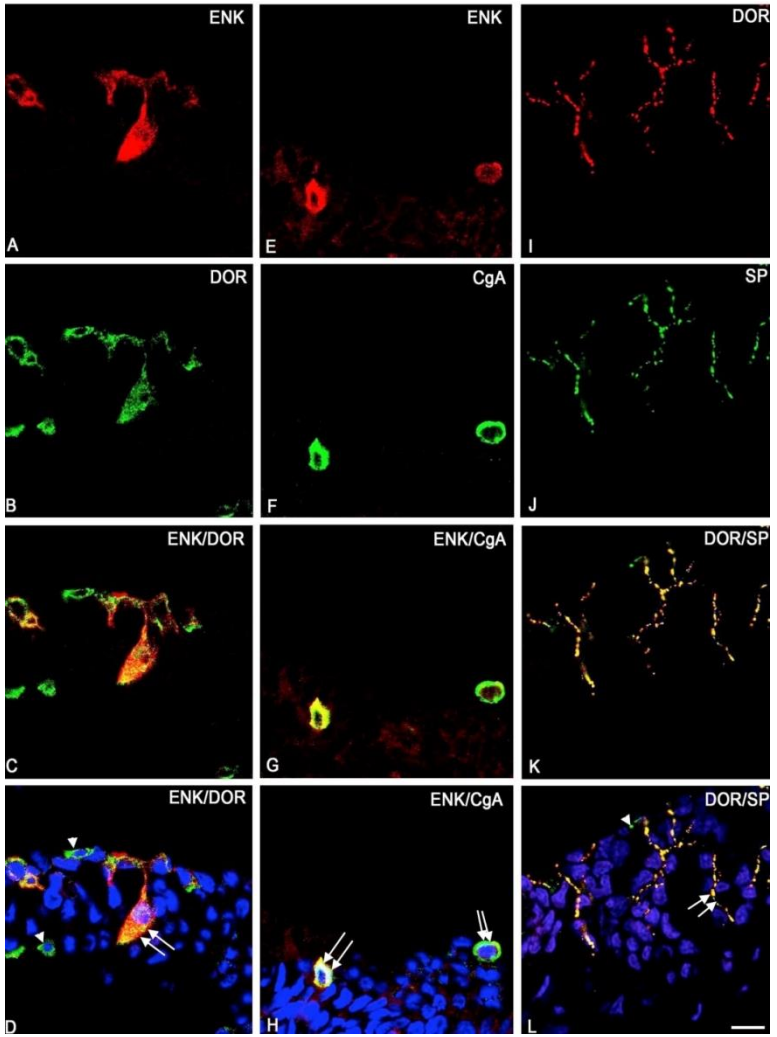
Decreasing respiratory drive (↓ ventilatory response to hypercapnia, hipoxemia, and exercise, decreasing respiratory effort and breathlessnes); impact on rythm generation; Improvements are seen at doses that *do not* cause respiratory depression.

Altering central perception (↓ *air hunger*)

Decreasing anxiety

Peripheral mechanisms:

Altering activity of peripheral opioid receptors (on PNECs nad C nerve fibres in bronchial epithelium; submucosal glands; macrophages and cancerous cells)



Krajnik, Schäfer, Sobanski et al. Human Pathology 2010;41:632-42.

Opioids for cancer patients with chronic refractory breathlessness

1. In opioid-naive cancer patients – test dose (often - 2,5 mg; other – less or more) p.o. morphine in immediate release preparation

2. Decision – depends on assessment of efficacy; (if ≥ 2 doses/24h, consider starting regular morphine (by titration)

3. Titrate the dose.

4. If stable controlled – consider rotation to controlled-release preparation + rescue doses

5/ Other centres (Australia) – start from modified release morphine (as 10 mg every 24 hours)

6. In „opioid-tolerant'': depends on the current dose given for pain,
for example (PC Formulary 7).:

- divide the 24h dose given for pain by 6 (e.g. morphine 60mg/24h ÷ 6 = 10mg q4h);
- start with p.r.n. doses equivalent to 25% of what would be the q4h analgesic dose (e.g. 10mg ÷ 4 = 2.5mg); this may suffice especially in those with less intensive breathlessness at rest
- if necessary, increase p.r.n. *(if needed)* dose to 50% of the q4h analgesic dose (e.g. 10mg ÷ 2 = 5mg)
- if frequent p.r.n. doses are needed, consider if the regular background opioid dose should be increased accordingly.

7. In breathlessness due to advanced COPD initial dose often is lower

8. If patient is having difficulty with oral medication, in the last days or hours → convert oral morphine to the SC route (sometimes IV) (24hr oral morphine dose divided by 2-3) and give as continous infusion; remember about :as needed doses'' (in case of IV – „as needed dose'' should be very carefully titrated starting from 1-2 mg IV)

8. In renal failure – modify dose or choose different opioid (which one?)

9. If severe anxiety increases breathlessness and non-pharmacological management and morphine are not efficient-consider benzodiazepine anxiolytics

Mahler et al. American College of Chest Physicians Consensus Statement on the Management of Dyspnea in Patients With Advanced Lung or Heart Disease. *CHEST 2010; 137(3): 674 – 691*

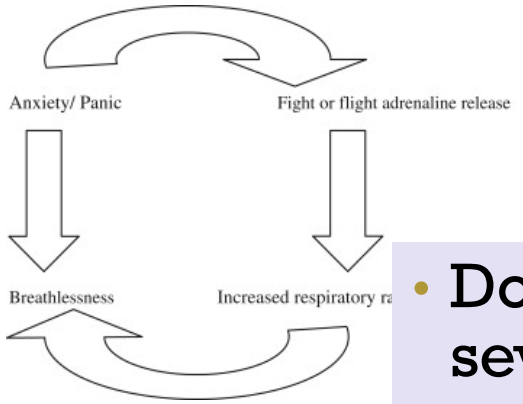
***Pneumonol Alergol Pol* 2012;80(1):41-64.**

Zalecenia Polskiego Towarzystwa Chorób Płuc dotyczące opieki paliatywnej w przewlekłych chorobach płuc

Reccomendation of Polish Respiratory Society for palliative care in chronic lung diseases

OTHER PHARMACOLOGICAL TREATMENT

- Benzodiazepines ?
- Other anxiolytics and antidepressants ?
- Oxygen
  - *Abernethy et al.. Lancet. 2010:376:784-93*
- Others



BENZODIAZEPINES IN BREATHLESSNESS IN PALLIATIVE CARE

- Do not relieve breathlessness per se. Safety concern in very severe COPD.
- Indication – severe anxiety increasing/exacerbating breathlessness in palliative care, if opioids and nonpharmacological treatment are not effective; f.ex. in the last days of life for patients with distressing breathlessness at rest with anxiety – combined use with opioid
- Example of dosage:
  - midazolam - f.ex. in dying starting from 1-1,5 mg s.c. prn and if needed – as CSI in small doses such as 5–10 mg/24 h
- Check in Summary of Product Characteristics (SPC) for midazolam how to give it as CSI

How to cope with the episodic breathlessness?

Ritual for crises

Action plan for Challenging Anxious Thoughts and Unpleasant Body Symptoms

- I have had this feeling before – I know it will go away soon.
- I am going to going to get into a position that I know helps me recover from breathlessness.
- I am going to use my fan and concentrate on breathing out.
- There is nothing to be frightened of – I really am ok.
- I can do this – I am doing it now.

(After you have recovered from feeling anxious or more breathless, remember to look back on the event and say 'I did it. Next time I will not have so much to worry about.')

The Cambridge BIS Manual, 2011

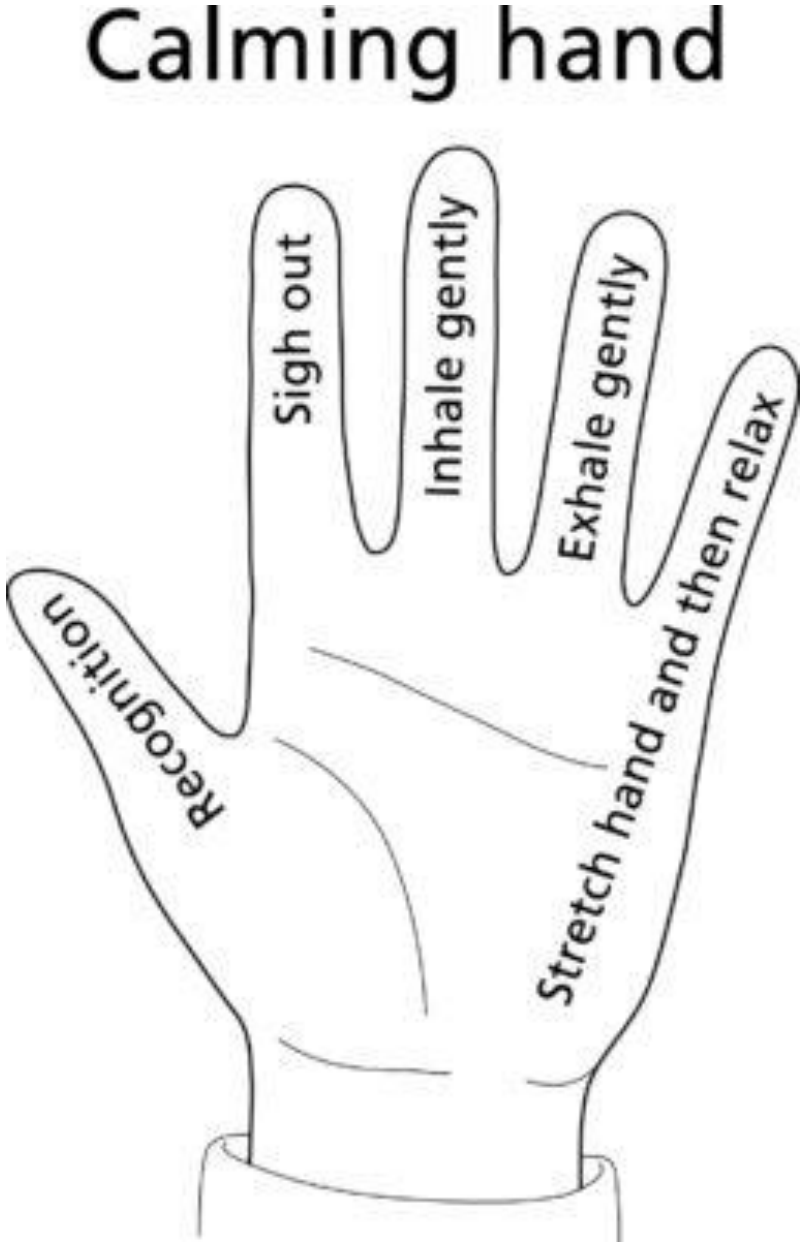
Breathlessness poem by Jenny Taylor

Be still. Be calm
Drop the shoulders
Slowly sigh Out….and….Out
Hear the sigh – Haaah…
Soft and quiet
Feel control returning
Peaceful and safe

http://www.jpaget.nhs.uk/media/263748/HE-12-Managing-my-Breathlessness-web-v1.pdf

Blagbrough M, Coulthard M. The Calming Hand. Oxford Textbook of Palliative Medicine. 4th ed. Oxford: Oxford University Press; 2010.

Johnson M et al. A randomised controlled trial of three or one breathing technique training sessions for breathlessness in people with malignant lung disease. BMC Med 2013:13:213



- **C** • Call for help
- **O** • Observe closely and assess dyspnea for ways to respond
- **M** • Medications to be tried
- **F** • Fan to face
- **O** • Oxygen therapy as previously found useful
- **R** • Reassure and use relaxation techniques
- **T** • Timing interventions to to reduce dyspnea. Reassess. Work together. Repeat.

Mularski et al. An Official American Thoracic Society Workshop Report: Assessment and Palliative Management of Dyspnea Crisis. Ann Am Thorac Soc Vol 10, No 5, pp S98–S106, Oct 2013

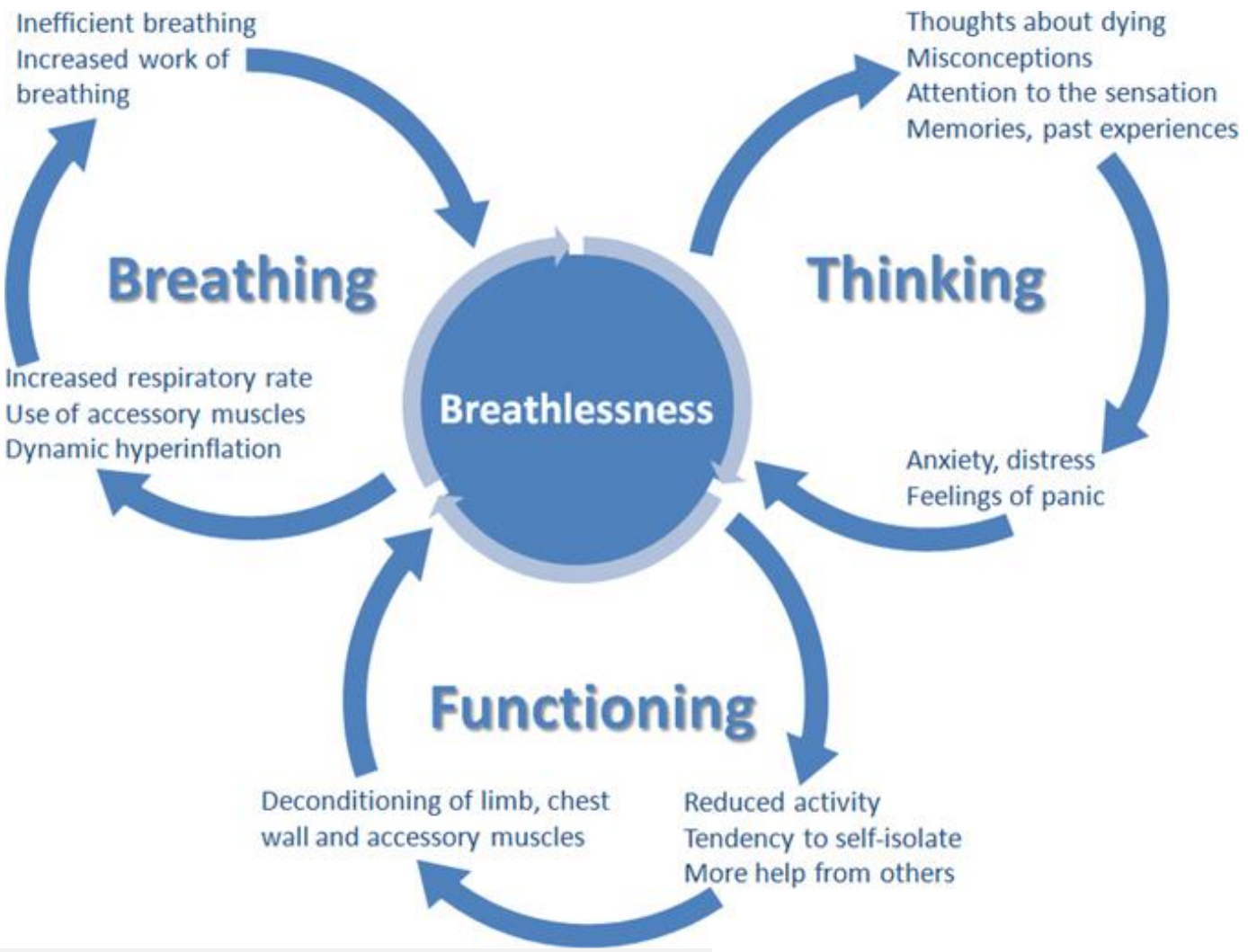
Caring for breathless patients

***Breathlessness Intervention Service* (BIS)** –UK model
Farquhar et al. BMC Med. 2014 Oct 31;12:194

BSS - Breathlessness Support Service (UK)
Reilly et al. Patients' experiences of a new integrated breathlessness support service for patients with refractory breathlessness: Results of a postal survey. Palliat Med. 2016 Mar; 30(3): 313-322

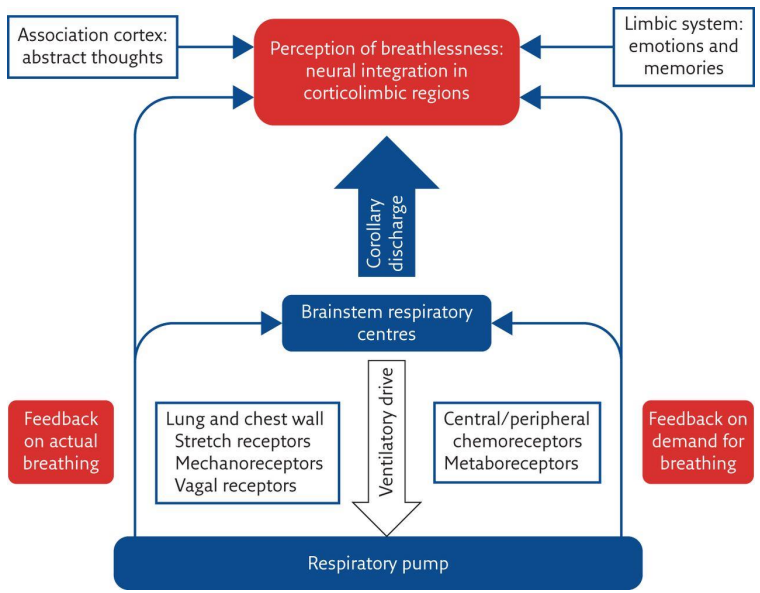
Brighton et al. Holistic services for people with advanced disease and chronic breathlessness: a systematic review and meta-analysis. Thorax 2019;74:270-281

Model BTF

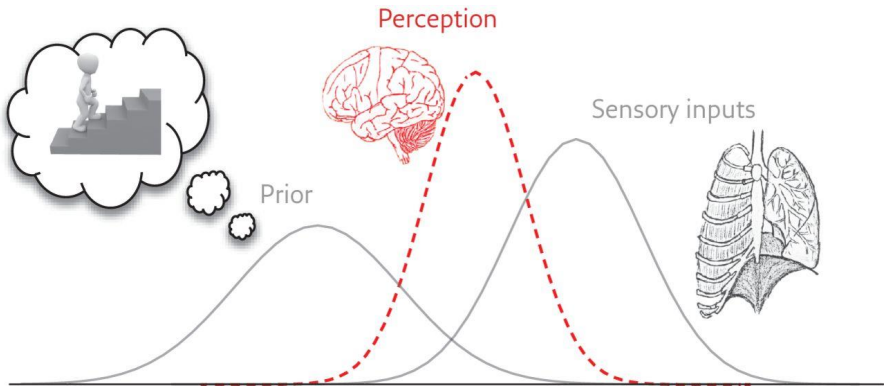


Spathis et al. NPJ Prim Care Respir Med. 2017;27:27

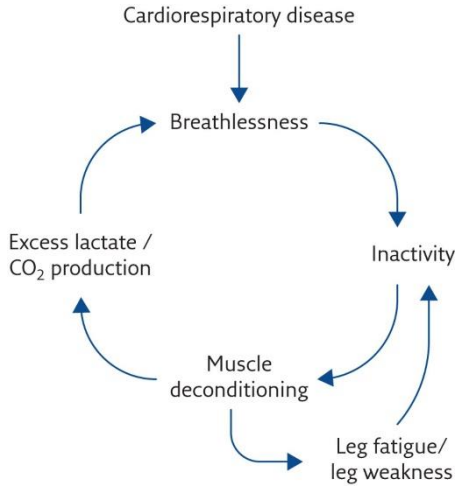
Patomechanism of breathlessness



Booth S & Johnson MJ. Breathe 2019;15:198-215

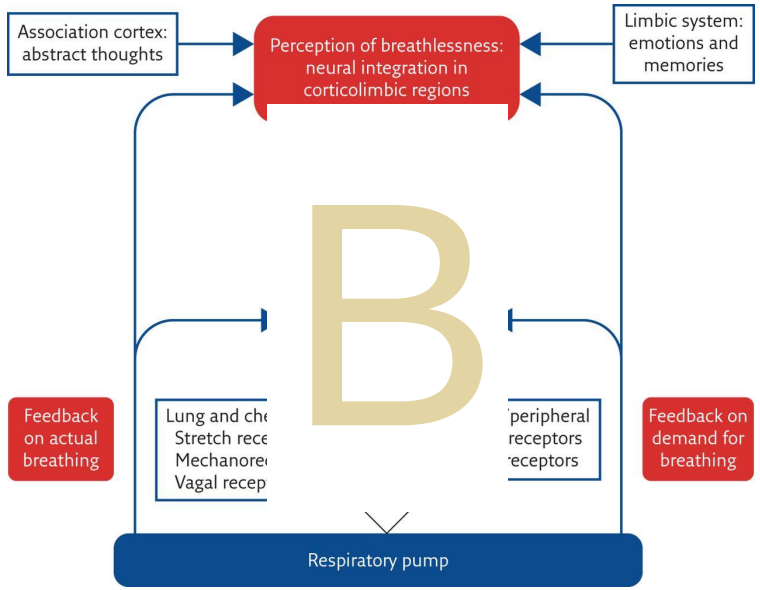


Faull et al. Eur Respir J 2018; 51: 1702238 m



Booth S & Johnson MJ. Breathe 2019;15:198-215

Holistic approach to breathlessness



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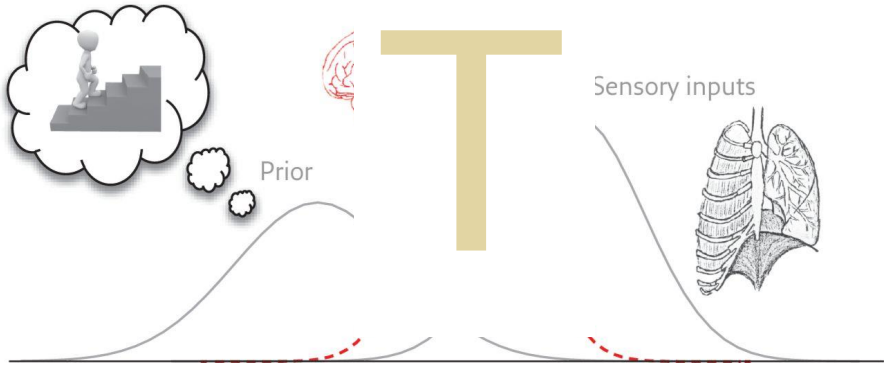

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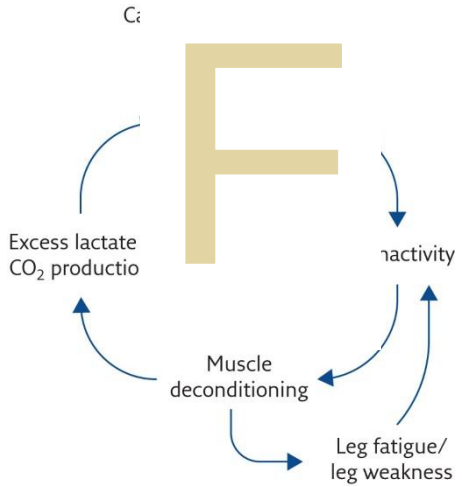

Booth S & Johnson MJ. Breathe 2019;15:198-215

Interwention	Predominant cycle of the BTF model	Evidence strenght	Practical comment
Pulmonary rehabilitation	Functioning	++++	
Hand-held fan	Breathing	+++	Evidence suggests this reduced breathlessness recovery time, supports exercise, increases self-efficacy.
Cognitive behavioural therapy	Thinking	++	
Breathing techniques	Breathing	++	
Inspiratory muscle techniques	Breathing	++	
Pedometer	Functioning	++	Pedometer training (as used by CBIS, increasing activity by 5% weekly from baseline)
Mindfulness based stress reduction	Thinking	++	8 weeks course
Relaxation	Breathing	++	
Walking aids	Functioning	++	Should be standard assessment for every breathless individual, also possibly affects thinking via confidence
Positioning	Breathing	+	
Acupuncture	Breathing?	+	.

Sara Booth, and Miriam J. Johnson. Breathe 2019;15:198-215

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The active identification and management of chronic refractory breathlessness is a human right

David C Currow,[1] Amy P Abernethy,[1,2] Danielle N Ko[3]

„Failure to enquire about, assess and properly treat chronic refractory breathlessness with opioids as outlined in specialist clinical guidelines is now substandard medical care and is also a breach of clinicians' ethical and legal duties to the patient".

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