Evaluating tools that can be used to measure and manage breathlessness in chronic disease

Questionnaires help nurses to complete a thorough assessment but they need to be carefully selected to ensure they are appropriate to specific patient groups.

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Questionnaires used to assess breathlessness are usually research tools, which means that data on their value in assessing patients’ symptoms in clinical practice is minimal. This article examines the questionnaires available and discusses their strengths and weaknesses to help nurses make informed choices about which breathlessness questionnaire is most suited to their practice.

Breathlessness is a subjective experience and nurses are actively involved in its assessment and non-pharmacological management.

Clinical assessment of this symptom includes history taking, assessing vital signs and breath sounds. Using a validated questionnaire may help nurses to complete a thorough assessment.

The American Thoracic Society (1999) defines breathlessness as “a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity. The experience is derived from interaction among multiple physiological, psychological, social and environmental factors and may induce secondary physiological and behavioural responses”. This definition provides a comprehensive overview of the physiological mechanisms involved in patients’ perception of breathlessness and emotional reactions to it. Assessments should include all these factors.

The causes of breathlessness are listed in Table 1.

CLINICAL MEASUREMENT OF BREATHLESSNESS

Clinical measurement using a questionnaire can help nurses to achieve a number of goals. It can provide them with baseline information about how individuals perceive their illness. Information from a questionnaire also provides a benchmark to assess patients’ perception of whether their condition is improving or deteriorating. Documenting this in case notes provides sources of information for other nurses and the multiprofessional team.

Breathlessness questionnaires can be completed at hospital during an acute illness and can also be used to assess patients at home. In the latter, nurses can use a questionnaire alongside observation to assess how people function in their own environment. They can then compare patients’ subjective views with their observations. This supports a holistic approach to care delivery, whereby patients’ social circumstances can be assessed and referrals made to the multiprofessional team to support them at home (Department of Health, 2008).

USING BREATHLESSNESS QUESTIONNAIRES

Breathlessness is a subjective experience, and as such its assessment is complex and must rely on patients self reporting (Yorke, 2008). Because of these complexities, the development of breathlessness questionnaires can take several years and should involve an experienced multiprofessional team.

Nurses need to consider a number of issues when choosing a questionnaire to assess breathlessness:

- What patient population was used to develop the questionnaire? Most breathlessness questionnaires have been developed using people with chronic obstructive pulmonary disease (COPD).
- It is important to ensure that items in a questionnaire relate to the experience of this symptom in other groups;
- What aspect of breathlessness does the questionnaire explore? The symptom is a multidimensional experience and it affects many aspects of patients’ lives. It causes distress and anxiety, limits activity and independence, and has a negative impact on quality of life. There is currently no
questionnaire incorporating all these; it may be necessary to use more than one to collect all the relevant information or decide on which aspect is most pertinent to patients and their care regimen;

● Does the questionnaire measure breathlessness in response to activities? People who are breathless are often unable to perform daily activities. Many questionnaires reflect this and measure breathlessness in relation to tasks that cause it. This is an important matter to consider in cases where a questionnaire is used to assess the symptom in hospital and information is then transferred to the community where the type and level of activity is likely to be different. In these circumstances, it may be necessary to reset patients’ baseline.

● How is the questionnaire administered? Most are developed so patients can complete them independently, although sometimes they may need help with this. If this is the case, nurses must read the questionnaire to patients exactly as it is written. This approach also enables questionnaires to be completed over the telephone.

For a questionnaire to be useful in clinical practice it needs to be quick and easy to apply and able to detect changes in an individual patient. If nurses are to be able to evaluate the potential usefulness of a questionnaire, they need to be familiar with the concepts of validity and reliability, which are described in Table 2.

A number of questionnaires report patients’ experience of breathlessness and those commonly used are outlined below.

**Single item scales**

The visual analogue scale (VAS) (Gift, 1989) and the Borg scale (Borg, 1982) contain only one item and patients respond on a scale, normally from 0 (no breathlessness) to 10 (maximal breathlessness). They can be adapted to measure different aspects of the symptom, such as “bother caused by breathlessness”, “distress due to breathlessness” and “uncomfortable breathing”.

The Borg scale also has descriptors anchored to specific numbers on the scale. For example, 2 is anchored by the description “slight” and 7 by “very severe”. They are useful to determine the immediate effect of an intervention for managing breathlessness.

### TABLE 1. CAUSES OF BREATHTRESSNESS

<table>
<thead>
<tr>
<th>Acute causes</th>
<th>Chronic causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute airways obstruction</td>
<td>Chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>Interstitial lung disease</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>Chronic heart failure</td>
</tr>
<tr>
<td>Acute respiratory distress syndrome</td>
<td>Asthma</td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>Anaemia</td>
</tr>
<tr>
<td>Flail chest</td>
<td>Renal failure</td>
</tr>
<tr>
<td>Pulmonary embolus</td>
<td>Neuromuscular dysfunction</td>
</tr>
<tr>
<td>Asthma</td>
<td>Psycogenic</td>
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</table>

**Medical Research Council Dyspnoea Scale**

The MRC Dyspnoea Scale (Fletcher, 1960) is the most commonly used instrument to assess which physical tasks induce breathlessness. It is a five grade scale ranging from 0 (none – not troubled with breathlessness except with strenuous exercise) to 5 (very severe – too breathless to leave the house). Patients choose the most relevant description.

Although widely used, the MRC scale may not be sensitive enough to detect small but potentially relevant clinical/day to day changes in breathlessness (Ries, 2006). Nonetheless, it is useful for detecting changes over time and in response to long term therapies such as pulmonary rehabilitation.

**Baseline Dyspnea Index and Transitional Dyspnea Index**

The Baseline Dyspnea Index (BDI) and Transitional Dyspnea Index (TDI) (Mahler et al, 2004) were developed to provide a more comprehensive assessment of breathlessness.

The BDI evaluates three dimensions – functional impairment, magnitude of effort and magnitude of task – at a single time point. In other words, it measures the extent of the task and how much effort is required.

It rates patients’ breathlessness in each of these domains on a scale from 0 (no impairment) to 4 (severe impairment). A companion scale, the TDI, is used to monitor changes from baseline over time and can be used to assess the impact of therapeutic interventions (Ries, 2006). The BDI/TDI is likely to provide useful information about patients’ conditions on a day to day basis.

**University California-San Diego Shortness of Breath Questionnaire (SOBQ)**

Originally designed as a screening tool for pulmonary rehabilitation, the SOBQ comprises 24 activity related items that assess associated breathlessness over the previous week (Eakin et al, 1998).

In addition, patients are requested to rate additional questions relating to fear of harm from over-exertion and shortness of breath. Since the SOBQ contains 24 items, its usefulness in everyday clinical practice is limited.

### TABLE 2. CONCEPTS FOR ASSESSING THE VALIDITY AND RELIABILITY OF QUESTIONNAIRES

<table>
<thead>
<tr>
<th>Concept</th>
<th>Explanation</th>
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<tbody>
<tr>
<td>Validity</td>
<td>Validity refers to whether an instrument measures what it purports to measure</td>
</tr>
<tr>
<td>Face validity</td>
<td>The questionnaire appears to measure the concept of interest. Determined through patient and clinician feedback</td>
</tr>
<tr>
<td>Construct validity</td>
<td>The questionnaire correlates (relates) with other associated measures</td>
</tr>
<tr>
<td>Internal reliability</td>
<td>The extent to which individual items in a questionnaire scale measure the same construct</td>
</tr>
<tr>
<td>Test-retest reliability</td>
<td>A measure is considered reliable if the results provided are stable over different time points</td>
</tr>
<tr>
<td>Evaluative ability</td>
<td>The questionnaire is sensitive to change within each patient. It can evaluate change (for example, visual analogue scales and Dyspnoea-12)</td>
</tr>
<tr>
<td>Discriminative ability</td>
<td>A discriminative instrument can define the patient population in terms of the severity of the variable being measured. It can place patients into groups (for example, MRC dyspnoea grade)</td>
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Chronic Respiratory Questionnaire
Guyatt et al (1987) developed an interviewer administered questionnaire, the Chronic Respiratory Questionnaire (CRO), comprised of 20 items focusing on four dimensions of breathlessness: breathlessness, fatigue, emotional functioning; and patients’ feeling of control over the condition.

A self-administered version has since been developed (Schunemann et al, 2005). The breathlessness component asks patients to identify five activities that have induced a state of breathlessness within the previous two weeks. Severity is evaluated on a seven point scale. The breathlessness subscale can be considered for use on its own (Ries, 2006). This subscale could be used in practice.

BREATHLESSNESS AND QUALITY OF LIFE SCALES
Many questionnaires evaluate the overall impact of disease on patients’ quality of life. Respiratory disease specific QoL questionnaires may have subscales or components that assess the impact that breathlessness has on people’s QoL. Most QoL questionnaires are too long to be applied in practice. Although subcomponents of such questionnaires may relate specifically to breathlessness, it may not be possible to use this in isolation from the rest of the questionnaire. Nurses should evaluate carefully the instructions for using the QoL instrument.

ST GEORGE’S RESPIRATORY QUESTIONNAIRE
The St George’s Respiratory Questionnaire (SGRQ) (Jones et al, 1992) is a self-administered 76 item questionnaire that measures three domains: symptoms; activity; and impact of disease on daily life. Breathlessness is evaluated in terms of its impact on daily activities, for which there is a specific subscale called “activity”. It is also included in the symptom subscale, along with information on cough, sputum production and wheeze.

The SGRQ has been translated into more than 100 languages and is one of the most commonly used questionnaires for evaluating treatments in clinical trials. However, it is time consuming to complete, a special scoring system is required and it has little clinical application.

The Dyspnoea-12
A relatively new instrument, the Dyspnoea-12, measures breathlessness severity (Yorke et al, 2010). It was derived from the largest pool of breathlessness descriptors assembled and more than 300 patients were involved.

It provides an overall score for the direct effects of breathlessness, incorporating physical and affective aspects. The physical component includes items such as “my breathing requires more work” and “my breathing is exhausting”. The affective component relates to the emotional impact of breathlessness and includes items such as “my breathing is distressing” and “my breathing makes me feel miserable”. The score is calculated by adding up the responses for each item (0 for mild to 3 for severe). The total score ranges from 0-36, with 36 representing maximum severity.

The Dyspnoea-12 was developed using people with a diagnosis of COPD, heart failure or interstitial lung disease. This is a unique and important aspect, as some people have more than one condition. For example, it is not uncommon for those with COPD to have chronic heart failure as well, given that both conditions are associated with similar socioeconomic variables, especially smoking.

In addition, the Dyspnoea-12 does not depend on a reference level of activity, such as walking up stairs or taking a bath, or any specific type of activity. The reference frame “these days” reflects how people are experiencing breathlessness in their daily lives, as opposed to in response to a specific activity.

The Dyspnoea-12 is simple and quick to use and should be useful as an assessment tool in clinical practice.

CONCLUSION
Because breathlessness is multidimensional, many questionnaires have been devised in an attempt to capture all of its different aspects.

Most of those available were developed using people with COPD. Nurses need to consider carefully their application to other patient groups. Similarly, many questionnaires relate to activity limitation which, although an appropriate approach, may not be relevant to all patients, such as those who avoid activities due to fear of breathlessness and patients requiring palliative care. Questionnaires that appear to be clinically useful are single item tools and the Dyspnoea-12.

REFERENCES
Fletcher C (1966) Standardised questionnaire on respiratory symptoms: a statement prepared and approved by the MRC Committee on the aetiology of chronic bronchitis (MRC breathlessness score), British Medical Journal; 2: 1665.


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REFERENCES

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