

Nature and Evaluation of Dyspnea in Speaking and Swallowing

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ABSTRACT

Dyspnea (breathing discomfort) is a serious and pervasive problem that can have a profound impact on quality of life. It can manifest in different qualities (air hunger, physical exertion, chest/lung tightness, and mental concentration, among others) and intensities (barely noticeable to intolerable) and can influence a person's emotional state (causing anxiety, fear, and frustration, among others). Dyspnea can make it difficult to perform daily activities, including speaking and swallowing. In fact, dyspnea can cause people to change the way they speak and swallow in their attempts to relieve their breathing discomfort; in extreme cases, it can even cause people to avoid speaking and eating/drinking. This article provides an overview of dyspnea in general, describes the effects of dyspnea on speaking and swallowing, includes data from two survey studies of speaking-related dyspnea and swallowing-related dyspnea, and outlines suggested protocols for evaluating dyspnea during speaking and swallowing.

KEYWORDS: Breathing discomfort, air hunger, exertional dyspnea, respiratory disease

Learning Outcomes: As a result of this activity, the reader will be able to (1) define dyspnea and describe its qualities, its emotional impacts, and how it is measured; (2) discuss what is known about dyspnea during speaking and swallowing; and (3) describe how to evaluate clients with suspected speaking-related dyspnea and swallowing-related dyspnea.

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Dyspnea (breathing discomfort) is a surprisingly common problem. It has been estimated that one-fourth of the general population over the age of 40 years,¹ one-fourth of outpatients,² and nearly half of seriously ill patients admitted to hospitals³ suffer from dyspnea. At best, dyspnea causes mild discomfort, and at worst, it results in unimaginable suffering. When severe, dyspnea may be accompanied by a feeling of impending death.^{4,5}

As speech-language pathologists, we sometimes encounter clients who experience dyspnea in association with organic or psychogenic conditions. With careful questioning and sensitive testing, we may find that a client's dyspnea worsens during speaking, swallowing, or both. In the pages that follow, we provide a general overview of our current understanding of dyspnea and its physiological bases, offer an update on what is known about dyspnea during speaking and swallowing (including the results of two survey studies we have conducted), and suggest some strategies for evaluating dyspnea.

AN OVERVIEW OF DYSPNEA

Dyspnea is a general symptom that can be caused by a diverse range of pulmonary, cardiac, and neural conditions and can also be experienced without any apparent organic cause.⁶ It is generally defined as "breathing discomfort that consists of qualitatively distinct sensations that vary in intensity"⁷ (p. 322) and, like pain, is a subjective experience. Recent work has shown that dyspnea shares certain features with pain,⁸ including commonalities in underlying cerebral mechanisms.⁹⁻¹¹ Dyspnea may actually be a more powerful stimulus than pain^{12,13}; that is, when asked to choose one over the other, pain is often preferred over dyspnea. As with pain, dyspnea is not the same across people or situations, but varies in quality and emotional impact. Also, as with pain, its intensity can be measured using a variety of rating scales.

QUALITIES OF DYSPNEA

Although, historically, dyspnea was viewed as a unitary symptom, recent work has revealed that it is not. Like pain,¹⁴ it can have different

subjective qualities. When people are asked to describe their breathing discomfort, they tend to use a wide range of words, phrases, and analogies.^{15,16} Research involving clients with dyspnea, as well as healthy participants exposed to dyspnea-causing stimuli (such as high levels of inspired carbon dioxide or heavy exercise), show that dyspnea can be manifested in at least three qualities: *air hunger*, physical *work/effort*, and *chest/lung tightness*.^{17,18} Studies of participants' spontaneous language and their descriptive word choices have shown that these qualities can be evoked separately by different stimulus conditions and that they appear to arise from different neurophysiological sources.^{16,19-22} Identifying these qualities and their probable sources can be important in understanding breathing problems associated with activities of daily living, such as speaking and swallowing.

The term *air hunger*, introduced by Wright and Branscomb²³ and brought into common usage by Banzett and colleagues,²⁴ is generally viewed as synonymous with feeling "breathless," "short of breath," "starved for air," and "an uncomfortable urge to breathe." Air hunger arises when there is hypoventilation (that is, when the level of ventilation is insufficient to meet the metabolic drive to breathe). This perception is believed to emanate from a complex series of neural events.²⁴⁻²⁶ A simultaneous corollary discharge from the medullary centers ascends to the cortical sensory areas and is thought to be responsible for the sensation of air hunger. This ascending discharge can be inhibited by mechanoreceptor input from the chest wall and lungs (especially from pulmonary stretch receptors) in response to increased size and speed of breathing movements. This accounts for the fact that under usual circumstances, when the achieved ventilation is appropriate to meet the metabolic demand, there is little or no air hunger. This also explains how certain changes in breathing pattern help to relieve air hunger, including increased tidal volume,^{4,9,10,27-31} increased breathing frequency,^{30,32} increased minute ventilation,^{19,30,32} and increased end-expiratory and end-inspiratory levels.³¹

Dyspnea can also take on the quality of physical *work/effort* (i.e., physical exertion),

sometimes referred to as exertional dyspnea. Words and phrases such as hard work to breathe and effortful breathing have been used as synonyms for the dyspnea of work/effort. The perception of work/effort is associated with the increased muscular work of breathing required for producing large and/or fast breathing movements (i.e., high minute ventilation) and when breathing against high resistive loads.^{19,32–35} Neurophysiological mechanisms underlying these work/effort percepts differ from those of air hunger. Work/effort percepts appear to arise from two sources.¹⁹ They may arise from chest wall muscle mechanoreceptor activity (activity that signals change in muscle length and tension), such as occurs with large and fast breathing movements. They also may arise from corollary discharge from cortical motor centers (i.e., copies of cortical motor commands are that sent to cortical sensory areas and are perceived).^{33,35,36} The dyspnea of physical work/effort can be reduced or eliminated when breathing patterns are adopted that minimize the intensity of these respiratory signals; these include breathing with smaller tidal volumes,¹⁹ lower breathing frequencies,³² lower levels of ventilation,³² reduced resistance to airflow,³⁴ smaller end-expiratory and end-inspiratory levels,^{31,34} and less exerted effort.³⁵

A third quality of dyspnea is often referred to as *chest/lung tightness*. This quality appears to be most closely linked to asthma^{20,22} and probably arises from stimulation of pulmonary receptors secondary to active constriction of the airways. Chest/lung tightness can also be associated with other medical conditions that produce bronchoconstriction.

These three dyspnea qualities—air hunger, work/effort, and chest/lung tightness—have been extensively researched and are generally viewed as being distinguishable from one another, although they can occur together in different combinations. For example, as the severity of asthmatic bronchoconstriction increases, sensations of air hunger and work/effort may be added to the existing sensation of chest/lung tightness.¹⁸ There are other dyspnea qualities that are less well researched and understood, one of which is *mental effort* (or concentration). Because this dyspnea quality

has been found to be associated with speaking under conditions of high respiratory drive, it is mentioned below in that context.

EMOTIONAL IMPACT OF DYSPNEA

As is true for pain, dyspnea can be an emotional experience.^{17,37} In both healthy people and those with diseases, dyspnea can be accompanied by a variety of emotional states such as anxiety, fear, panic, frustration, worry, distress, nervousness, and anger.^{16,38–40} For example, when experiencing air hunger, healthy participants and those with pulmonary diseases noted that they were “anxious, worried,” “panicky,” that “it was frightening,” and “it was scary.” As with pain, the kind and degree of emotions can vary, depending on the conditions and circumstances producing the dyspnea and on the person’s response to the experience. Also, the quality of the dyspnea influences the experience; for example, air hunger is perceived to be more unpleasant than physical work/effort.^{19,38} These emotional responses comprise a separate and measurable aspect of the dyspnea experience and can vary independently of the general dyspnea intensity.^{17,38,41,42} For example, a healthy person who is exercising heavily and a person with pulmonary disease who is trying to walk up stairs may have the same intensity of air hunger, but the emotions they experience could be quite different. The emotional dimension of dyspnea is important to evaluate because it is likely to motivate changes in behavior and have a lasting impact on quality of life.

MEASUREMENT OF DYSPNEA INTENSITY

Quantitative measures of dyspnea intensity are often obtained with rating scales that are easy to use, valid, and reliable.^{43–46} These scales are typically used to rate the intensity of the general dyspnea experience (e.g., breathing discomfort) and/or the particular qualities of dyspnea (e.g., air hunger, work/effort). They usually consist of a scale ranging from “none” to some extreme (e.g., “The most I can imagine”) with different types and numbers of rating steps.⁴⁷ Visual analog scales allow continuous ratings along the scale, and numerical and verbal category

scales provide ratings at a limited number of ascending steps defined by numbers (e.g., 0 to 10) or words (e.g., none, slight, moderate, strong). Sometimes words are added to numerical or analog scales to improve consistency of ratings across and within raters.^{48,49} In practice, these different scales usually give comparable estimates of dyspnea intensity.⁴³ The more important consideration in their use is whether the person clearly understands what experience is to be rated and the range of intensity defined by the anchoring end points of the scale.

Another way to measure dyspnea intensity is through the use of quality-of-life questionnaires⁵⁰⁻⁵² that ask people to recall their dyspnea in various life situations. Interestingly, information gathered from questionnaires and other forms of recall and self-report differ from that obtained by direct observation and laboratory testing.⁵³⁻⁵⁵ Indirect estimates may underestimate dyspnea intensity because they also reflect adaptive behavioral strategies taken to avoid or reduce the dyspnea.

DYSPNEA DURING SPEAKING AND SWALLOWING

Speaking and swallowing can unmask or exacerbate dyspnea because they require that the usual tidal breathing pattern be changed to meet certain demands. For speaking, higher expiratory pressures must be generated and expiration must be slowed; similarly for swallowing, higher pressures must be generated and expiration must cease momentarily. These modifications to the usual breathing pattern can create breathing discomfort, especially in people who are already experiencing a higher-than-normal drive to breathe. In turn, breathing discomfort can cause people to alter their usual speaking and swallowing behaviors in an attempt to satisfy competing demands.

Dyspnea during Speaking

Although speaking is usually effortless, it can be taxing when the metabolic drive to breathe is higher than usual. This is something almost every healthy person has experienced when struggling to speak while exercising vigorously or while acclimating to a higher elevation. This

struggle occurs because the optimal breathing pattern for maintaining adequate ventilation is different from that required for fluent and normal-sounding speech.

Much of our understanding of speaking under high respiratory drive conditions has come from studies of healthy adults who are exercising or breathing gases containing abnormally high levels of carbon dioxide.⁵⁶⁻⁶² These studies have shown that both speaking and breathing are modified, presumably to balance the demands of the two competing drives (speaking and breathing). Specifically, speaking under high respiratory drive (compared with speaking under normal respiratory drive) is characterized by greater ventilation, larger tidal volumes, fewer syllables per breath, greater expiratory flow during speaking, nonspeech expirations, and more frequent inspirations at nonlinguistic junctures. Despite these modifications, breathing is still not the same as it would be if no speech were being produced. That is, when a person is allowed to breathe without having to speak under conditions of high respiratory drive, expirations are faster, beginning and ending lung volumes are smaller, and overall ventilation is greater than they would be if the person were not speaking.

Speech breathing under high respiratory drive is accompanied by conscious perceptions of dyspnea. In a study by Hoit et al,⁶² these perceptions were broken down into different dyspnea qualities and it was discovered that all participants experienced, to various degrees, several different qualities, including air hunger, physical exertion (physical work/effort), and mental effort. Mental effort reflected the concentration required to balance the simultaneous demands of breathing and speaking.

Although we have learned a great deal by exposing healthy people to temporary conditions of high respiratory drive, the study of people with chronic disease may be more clinically relevant. This is because acute bouts of laboratory-induced dyspnea may differ from experiencing continual dyspnea in the behavioral manifestations and the quality and intensity of the dyspnea. A few studies have examined speaking-related dyspnea in individuals with chronic diseases. For example, Loudon et al⁶³ observed that participants with asthma were

“short of breath” when performing a standard speaking task. Similarly, Lee et al⁶⁴ noted that participants with lung diseases (asthma, emphysema, and sarcoidosis) experienced dyspnea while speaking and that the severity was related to the demands of the speaking task. Hodgev et al,⁵¹ using a questionnaire, found that individuals with chronic obstructive pulmonary disease (COPD) reported experiencing the greatest “breathlessness” when speaking during exercise compared with speaking at rest or exercising while not speaking.

Dyspnea during Swallowing

As with speaking and breathing, there is competition between swallowing and breathing. Whereas speaking interrupts breathing primarily by reducing the rate of expiration, swallowing requires a period during which breathing must cease altogether.

When a healthy person drinks a single sip of liquid, the typical breathing-swallowing pattern is expiration-swallow-expiration. That is, after a tidal inspiration, a brief expiration occurs, then a swallow (during which breathing stops), followed by continued expiration.^{65–69} The period during which breathing stops (called the apneic period) typically lasts less than 1 second though it can last up to several seconds,^{65,70–74} and has been shown to increase with age.⁷⁵ This apneic period is accompanied by a closing of the larynx to protect the airway as the bolus is propelled through the pharynx to the esophagus. During sequential swallowing, the breathing and swallowing pattern is much more complex and is characterized by a series of apneic periods followed by various combinations of inspirations and expirations.^{76,77}

Given that swallowing involves obligatory breath-holding, it seems reasonable to predict that swallowing might increase the drive to breathe and cause an associated dyspnea, especially after several sequential swallows. Lederle et al⁷⁷ tested this prediction in a group of healthy young adults. They found that ventilation increased immediately after a swallowing sequence (compared with ventilation before the swallowing sequence), suggesting that the drive to breathe rose as a result of sequential swallowing. In addition, their par-

ticipants reported slight dyspnea (specifically, ratings of air hunger and physical exertion), especially following the drinking of a relatively large glass of water. If healthy people experience even a mild dyspnea during sequential swallowing, it seems almost certain that those with respiratory compromise would as well. Support for this can be found in a recent study showing that participants with COPD were more apt to inspire following a swallow than their healthy counterparts.⁷⁸

Survey Studies on Dyspnea Associated with Speaking and Swallowing

Although dyspnea is rarely mentioned in the speech-language pathology literature, the problem of dyspnea associated with speaking and swallowing disorders is likely to be more prevalent than most people realize. Such dyspnea can be unmasked if clients are asked the right questions. The results of two survey studies, one on speaking and one on swallowing, have provided evidence for this.

SPEAKING-RELATED DYSPNEA STUDY

We conducted a survey to determine if individuals with a variety of diseases (and healthy individuals) experience dyspnea associated with speaking (speaking-related dyspnea). To recruit participants, we attended support group meetings and interviewed 36 individuals, 20 men and 16 women, age 23 to 89 years, who reported the following primary diagnoses: Parkinson disease (10), pulmonary disease (8), multiple sclerosis (6), cardiac disease (5), spinal cord injury (4), and amyotrophic lateral sclerosis (3). We also interviewed 12 healthy individuals, seven men and five women, age 56 to 89 years. The survey was conducted as a one-on-one interview and consisted of questions such as “Do you ever have problems with your breathing when speaking loudly?” and “Do you ever have problems with your breathing when speaking for a long time?” If the respondent answered affirmatively, follow-up probes (e.g., “Tell me more about that”) were used to elicit more information. We used the phrase “problems with your breathing” or “breathing problems” in hopes that it would capture a broad range of dyspnea qualities.

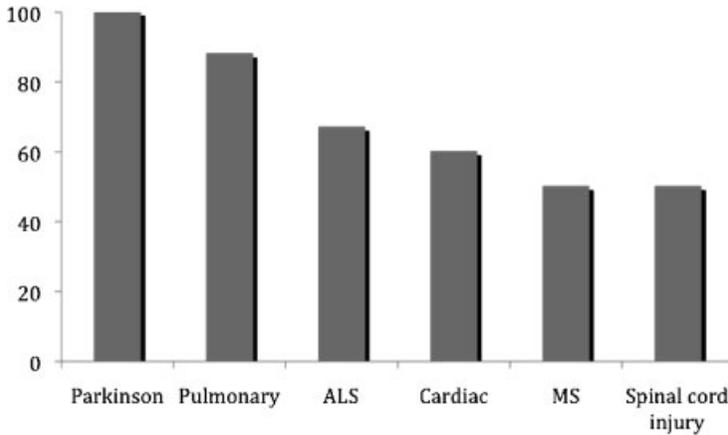


Figure 1 Percentage of respondents (of the 27 who reported breathing problems while speaking) by disease category who reported breathing problems while speaking. ALS, amyotrophic lateral sclerosis; MS, multiple sclerosis.

Our results showed that none of the healthy respondents experienced speaking-related dyspnea, except under circumstances in which such dyspnea would be expected (e.g., during heavy exercise, at high elevations). By contrast, 27 of the 36 respondents with disease (75%) reported having problems with breathing while speaking (range of 50 to 100% across diagnostic categories), as shown in Fig. 1.

The frequency of breathing problems varied across speaking conditions, as illustrated in Fig. 2. Breathing problems were reported least frequently for speaking while sitting and most frequently for speaking while performing physical activity. Breathing problems were also frequently associated with speaking for a long time, speaking on the telephone, and speaking while feeling emotional.

Respondents who reported breathing problems while speaking were asked to indicate whether or not any of the following terms applied to what they experienced (definitions were provided): *air hunger*, *physical work*, and *mental effort*. Results showed that air hunger was the most commonly reported (72%), followed by physical work (61%) and mental effort (56%).

Of the respondents who reported breathing problems while speaking, 74% indicated that they altered their speaking behavior because of their breathing problems. Specific examples are given in Table 1 and include quotations indicating that respondents limited their participation in speaking activities.

The final item on the survey was “Has anyone ever asked you questions like this before

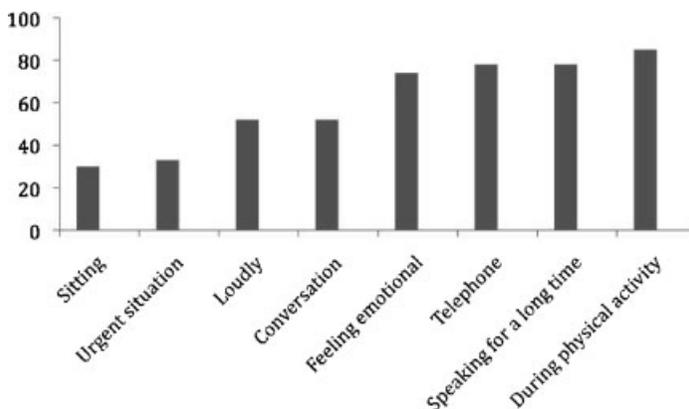


Figure 2 Percentage of respondents (of the 27 who reported breathing difficulty while speaking) who reported breathing problems when speaking in these situations.

Table 1 Representative Comments Regarding the Way Respondents Altered Their Speaking Behavior Because of Breathing Discomfort

“If I slow down, it’s easier to talk on the telephone.”

“When teaching the class, I talk for a few sentences, then stop and wait a minute or two in order to breathe since I’m out of breath.”

“Sometimes I stop in the middle of a word.”

“I’ve given up preaching, singing, and any extended reading because of my breathing difficulties.”

“I can’t breathe and talk at the same time so I stay quiet.”

“My wife says I talk on a need-to-speak basis.”

(that is, about breathing difficulty during speaking)?” All respondents answered “No.”

Despite the preliminary nature of this survey study, its results are revealing and important. To begin, it is clear that speaking-related dyspnea is common, at least among people who participate in support groups for pulmonary, cardiac, and neural conditions. It seems reasonable to assume that speaking-related dyspnea would be even more prevalent in people with the same conditions who are not healthy enough to attend support groups. Further, speaking-related dyspnea causes people to alter the way they speak and/or limits their speaking activities. Finally, it appears that health care professionals, including pulmonologists and speech-language pathologists, are not asking their clients about their breathing comfort for speaking. The results of this survey have convinced us that speaking-related dyspnea is a significant clinical problem across several disease categories and is apparently not being evaluated or managed.

SWALLOWING-RELATED DYSYPNEA STUDY

This study was inspired by the clinical hunch that dyspnea is a potential contributor to dysphagia (disordered swallowing) in people with COPD. Dysphagia is known to be commonly associated with COPD⁷⁹; however, it was not known if people with COPD experience dyspnea when swallowing. To help us determine this, we developed a short questionnaire with five experiential questions, check boxes for situation-specific questions, and comments sections for respondents to provide additional information.

The questionnaire was completed by 146 people, 133 of whom reported having a diagnosis of COPD (36 to 88 years, with a mean of 66.5 years; 60 men, 71 women, 2 no response) and 13 who reported being healthy (42 to 82 years, with a mean of 62.1 years; 3 men, 10 women). Most of the questionnaires (115) were completed on a web-based survey (<http://fly2.ws/copd>), and the rest of them were completed on paper. The Web-based survey and paper survey yielded similar results, so they are combined in the discussion below.

Our results showed that none of the healthy respondents experienced breathing discomfort during eating or drinking. By contrast, 74% of those with COPD did. The 98 respondents with COPD who experienced breathing discomfort reported experiencing it often (36%), sometimes (44%), or rarely (20%). Most experienced it during the eating of a large meal (75%), followed by drinking a glass of water without stopping (37%), eating a small snack (32%), and drinking a sip of water (18%), as shown in Fig. 3. Examples of written comments about the nature of the breathing discomfort are given in Table 2.

When asked “Does breathing discomfort ever cause you to change the way you eat or drink?” 67% of the respondents with COPD answered “yes.” The most common change reported was “take smaller bites” (47%), followed by “eat less overall” (42%), “avoid walking while eating/drinking” (36%), “take frequent breaks while eating/drinking” (31%), “take smaller sips” (27%), “drink less overall” (20%), “avoid talking during a meal” (18%), “avoid certain foods” (16%), “avoid certain drinks” (9%), “only eat at certain times of day” (4%), and “only drink at certain times of day” (3%). Examples of written comments are given in Table 3.

When asked “Do you ever change the way you breathe while eating/drinking to reduce your breathing discomfort?” 52% of the respondents with COPD answered “yes.” Most reported that they “take deeper breaths” (37%) and only a few reported that they “take faster breaths” (5%) or “take deeper and faster breaths” (4%). Some of their written comments are given in Table 4.

In summary, our results show that most people with COPD experience breathing

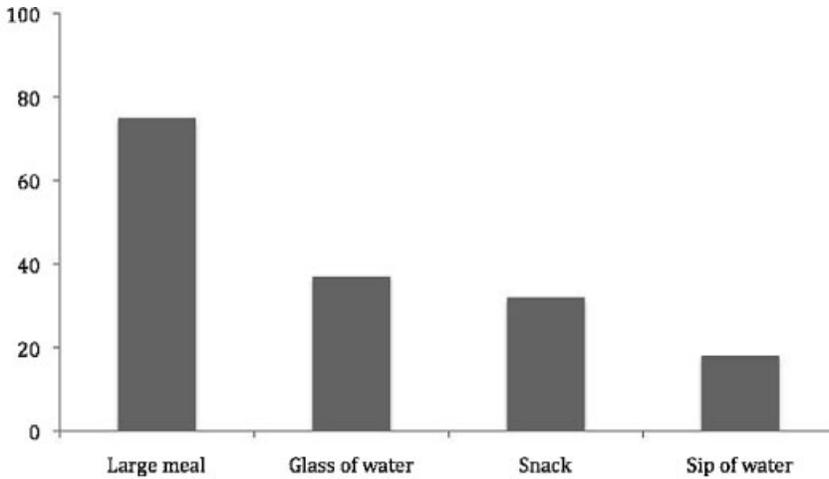


Figure 3 Percentage of respondents with COPD (of the 98 who reported breathing discomfort) who experienced breathing discomfort during these eating and drinking activities.

discomfort when they are eating and drinking, particularly when ingesting a large amount of food or liquid. They try to reduce breathing discomfort by eating and drinking less, taking more breaks, not walking or talking at the same time, and taking deeper breaths. Clearly, swallowing-related dyspnea is an important clinical issue for individuals with COPD and may be a contributor to the commonly encountered problem of dysphagia.

CLINICAL EVALUATION OF DYSPNEA

Although the research on dyspnea during speaking and swallowing is sparse, the research that

does exist, when combined with what is known about dyspnea in general, provides a basis for developing clinical evaluation protocols for use by speech-language pathologists. We offer suggestions for such protocols for speaking and swallowing. Each consists of three parts: informal observations, interview, and dyspnea ratings.

Evaluation of Speaking-Related Dyspnea

Informal observations begin with watching and listening to the client speak during casual conversation or during a case history interview. Some questions to help focus the observations are listed below.

Table 2 Representative Comments Regarding the Nature of the Breathing Discomfort Experienced during Swallowing

“Short of breath.”

“Kind of a tight sensation. Also very tiring.”

“Can’t breathe, coughing.”

“It feels like I’m drowning.”

“Mouth breather—cannot get enough air while eating.”

“I can’t breathe and eat at the same time.”

“As if I have to hold my breath as I eat.”

“Very difficult to breathe and chew at the same time.”

“Panicky, gasping for breath.”

“Suffocation.”

Table 3 Representative Comments Related to How Respondents Changed the Way They Eat or Drink Because of Breathing Discomfort

“I never drink a whole glass of water without stopping.”

“If I take too large a drink of water, I have to swallow it in increments.”

“I eat less when I’m having a difficult day.”

“I have to remind myself to slow down.”

“Eat less but more often.”

“I can’t talk while I’m trying to eat, it takes too much energy.”

“Better to eat small bites.”

“Soda pop will take your breath away.”

Table 4 Representative Comments Related to How Respondents Changed the Way They Breathe when They Eat or Drink

“One has to breathe then chew, etc.”

“I have to hold my breath when swallowing.”

“I have to stop and catch my breath.”

“Must take a breath in between.”

“Hold breath to swallow—then breathe—then take another bite.”

“I try to pay attention.”

“Breathe more through mouth.”

“Purse lip breathe.”

“I try to swallow only when I exhale.”

- Does the client inspire larger-than-normal breaths?
- Does the client inspire frequently, sometimes in the middle of phrases or words?
- Does the client appear to be working hard to inspire (e.g., noticeable activation of neck and upper rib cage muscles)?
- Does the client stop to take extra (non-speech) breaths between spoken breath groups?
- Does the client produce nonspeech expirations before or after utterances?
- Does the client look or sound “out of breath”?

The interview portion of the evaluation can be integrated into a case history interview or performed separately. A form to guide the interview is provided as Appendix A and includes a set of questions that are based on our current knowledge of what influences speaking-related dyspnea.

Dyspnea ratings should be done in conjunction with tasks that place a variety of demands on the client. For example, these might include sitting quietly without speaking (to determine if the client experiences dyspnea at rest, when not speaking), casual conversation (to determine if the client experiences dyspnea when allowed to rest between periods of speaking), reading aloud (to determine if speaking continuously for an extended period causes dyspnea), reading or counting at different loudness levels (to determine if loudness influences the intensity or quality of dyspnea), and any other speaking task that might be relevant to

the client (e.g., talking on the telephone, giving a lecture). When obtaining ratings, the term *dyspnea* should not be used; rather, ratings should be made using the descriptor or descriptors elicited from the client during the interview portion of the evaluation (e.g., “need more air,” “physical exertion”). Although the ratings can be done in a variety of ways, we recommend using a 0 to 10 scale where 0 is “none” and 10 is “the most imaginable.” People are typically accustomed to using a scale like this, so there should be little need for training.

Evaluation of Swallowing-Related Dyspnea

The evaluation of swallowing should be done in a way that is judged to be safe for the client. If the speech-language pathologist believes that the client does not have a safe swallow, the evaluation should be conducted by following appropriate protocols that may include instrumental measures. For the present purposes, we assume that the client has a safe swallow and is performing swallowing tasks that are part of his or her daily routine.

Informal observations can be made while the client drinks some water or other liquid either brought in by the client or supplied by the clinician. Such observations can also be made while the client eats something solid. Some questions to help guide the observations are listed below.

- Does the client inspire immediately after swallowing?
- Does the client stop oral preparation (hold liquid or food in the oral cavity) to take extra breaths?
- Does the client appear to be working hard to inspire (e.g., noticeable activation of neck and upper rib cage muscles)?
- Does the client stop to take extra breaths between swallows?
- Does the client appear to be “out of breath” following a series of swallows?

The interview portion of the evaluation can be included in the case history interview or done at another time. We have provided a form to guide the interview in Appendix B.

Dyspnea ratings are done in conjunction with swallowing tasks that place a variety of demands on the client. For example, these might include taking single sips of water, swallowing several times sequentially to ingest different amounts of water with the instruction “drink this all the way down without stopping,” eating food of different consistencies, and any other swallowing task that might be appropriate for the client. The descriptor or descriptors identified during the interview portion of the evaluation should be used (e.g., “urge to breathe”) rather than the term *dyspnea*. A scale ranging from 0 (“none”) to 10 (“the most imaginable”) is an easy and convenient rating scale to use for this purpose.

CONCLUSIONS

Dyspnea (breathing discomfort) is a serious clinical problem that can affect all aspects of a person’s life. Dyspnea can be experienced as air hunger, physical exertion, chest/lung tightness, and/or mental concentration, among other qualities or combinations of qualities. Its intensity can vary with disease severity, activity level, and emotional state. Dyspnea can be caused or exacerbated by physical activities, including speaking or swallowing. Conversely, it is common for someone to alter their usual speaking and swallowing behaviors to attempt to relieve their dyspnea. Because of this, it is important that speech-language pathologists evaluate the impact of dyspnea on speaking and swallowing in those clients who experience dyspnea or who are at risk for experiencing dyspnea, including those with neural, pulmonary, cardiac, or psychogenic disorders. The present overview and clinical suggestions are offered to assist speech-language pathologists in this endeavor.

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APPENDIX A Dyspnea and Speaking

Name: _____	Date: _____
Notes:	
Do you ever experience breathing discomfort when you are speaking? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, please describe what it feels like.	
Do any of the following descriptors fit your experience of breathing discomfort when speaking? (check all that apply) <input type="checkbox"/> Air hunger (need more air) <input type="checkbox"/> Tightness inside chest/lungs <input type="checkbox"/> Physical exertion (work to breathe) <input type="checkbox"/> Mental effort (concentration)	
Are there other descriptors that fit your experience better? If so, what are they?	
Do you experience any of the following emotions along with your breathing discomfort during speaking? (check all that apply) <input type="checkbox"/> Anxiety or panic <input type="checkbox"/> Frustration or anger <input type="checkbox"/> Worry or fear <input type="checkbox"/> Sadness or grief	
Are there other descriptors that better fit the emotions you experience? If so, what are they?	
Do you ever experience breathing discomfort when you are doing the following? (check all that apply) <input type="checkbox"/> Speaking during (or immediately after) physical activity <input type="checkbox"/> Speaking on the telephone <input type="checkbox"/> Speaking for a long time <input type="checkbox"/> Speaking in a group or crowd <input type="checkbox"/> Speaking loudly <input type="checkbox"/> Speaking while emotional	
<i>Is there anything else you'd like to tell me?</i>	

Does breathing discomfort ever cause you to change the way you speak? Yes No

If yes, do you: (check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> Speak for shorter periods | <input type="checkbox"/> Avoid speaking on the telephone |
| <input type="checkbox"/> Speak in shorter sentences | <input type="checkbox"/> Avoid speaking during physical activity |
| <input type="checkbox"/> Pause more when speaking | <input type="checkbox"/> Avoid speaking to certain people |
| <input type="checkbox"/> Speak more slowly | <input type="checkbox"/> Use writing or gesturing instead of speaking |
| <input type="checkbox"/> Speak in a softer voice | |

Is there anything else you'd like to tell me?

Do you ever change the way you breathe to reduce your breathing discomfort while speaking?

Yes No **If yes, do you: (check all that apply)**

- | | |
|---|--|
| <input type="checkbox"/> Take bigger breaths when you speak | <input type="checkbox"/> Take more frequent breaths when you speak |
|---|--|

Is there anything else you'd like to tell me?

How often do you experience breathing discomfort while speaking?

- | | | | |
|--------------------------------|--|--|--|
| <input type="checkbox"/> Never | <input type="checkbox"/> Rarely (less than once per month) | <input type="checkbox"/> Sometimes (once per week) | <input type="checkbox"/> Often (daily) |
|--------------------------------|--|--|--|

Is there anything else you'd like to tell me?

APPENDIX B Dyspnea and Swallowing

Name: _____	Date: _____
Notes: 	
Do you ever experience breathing discomfort when you are eating or drinking? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, please describe what it feels like. 	
Do any of the following descriptors fit your experience of breathing discomfort when eating or drinking? (check all that apply) <input type="checkbox"/> Air hunger (need more air) <input type="checkbox"/> Tightness inside chest/lungs <input type="checkbox"/> Physical exertion (work to breathe) <input type="checkbox"/> Mental effort (concentration)	
Are there other descriptors that fit your experience better? If so, what are they? 	
Do you experience any of the following emotions along with your breathing discomfort during eating or drinking? (check all that apply) <input type="checkbox"/> Anxiety or panic <input type="checkbox"/> Frustration or anger <input type="checkbox"/> Worry or fear <input type="checkbox"/> Sadness or grief	
Are there other descriptors that better fit the emotions you experience? If so, what are they? 	
Do you ever experience breathing discomfort when you are doing the following? (check all that apply) <input type="checkbox"/> Eating a small snack <input type="checkbox"/> Eating/drinking and talking <input type="checkbox"/> Eating a large meal <input type="checkbox"/> Eating/drinking while (or immediately after) walking <input type="checkbox"/> Drinking a sip of water <input type="checkbox"/> Drinking a glass of water without stopping <input type="checkbox"/> Eating quickly	
<i>Is there anything else you'd like to tell me?</i> 	

Does breathing discomfort ever cause you to change the way you eat or drink? Yes No

If yes, do you: (check all that apply)

- | | | |
|---|---|--|
| <input type="checkbox"/> Eat less overall | <input type="checkbox"/> Only eat/drink at certain times of day | <input type="checkbox"/> Avoid certain foods/drinks |
| <input type="checkbox"/> Drink less overall | <input type="checkbox"/> Eat/drink slowly | <input type="checkbox"/> Avoid talking while eating/drinking |
| <input type="checkbox"/> Take smaller bites | <input type="checkbox"/> Take breaks while eating/drinking | <input type="checkbox"/> Avoid walking while eating/drinking |
| <input type="checkbox"/> Take smaller sips | <input type="checkbox"/> Eat/drink alone | |

Is there anything else you'd like to tell me?

Do you ever change the way you breathe to reduce your breathing discomfort while eating/drinking?

Yes No **If yes, do you: (check all that apply)**

- Take bigger breaths when you eat/drink Take more frequent breaths when you eat/drink

Is there anything else you'd like to tell me?

How often do you experience breathing discomfort while eating/drinking?

- Never Rarely (less than once per month) Sometimes (once per week) Often (daily)

Is there anything else you'd like to tell me?