CHEST®

State of Practice: Evaluation of Patients Presenting With Chronic Dyspnea

VOLUME 2, ISSUE 1

CHEST Clinical Perspectives™

Introduction

Dyspnea is a common symptom affecting as many as 25% of patients seen in the ambulatory setting. It can arise from many different underlying conditions and is sometimes a manifestation of a life-threatening disease.[1] Dyspnea is a term used to characterize "a subjective experience of breathing discomfort that is comprised of qualitatively distinct sensations that vary in intensity. The experience derives from interactions among multiple physiological, psychological, social, and environmental factors, and it may induce secondary physiological and behavioral responses."[2]

A number of professional societies, including the American College of Chest Physicians (CHEST), the American Thoracic Society (ATS), and the Canadian Thoracic Society (CTS), recommend that clinicians assess and record dyspnea severity and rely upon patient reports to inform dyspnea management.[2-4] CHEST and CTS guidelines specifically speak to patients with advanced heart or lung disease.[3,4] The 2012 ATS statement provides the most detailed information regarding dyspnea as an independent symptom, including neurophysiological mechanisms, sources of sensory afferent

information, qualities of dyspnea, cerebral processing of dyspnea, opioid modulation of dyspnea, connecting pathophysiology to neural mechanisms in the dyspneic patient, dyspnea measurement and evaluation, and treatment.[2]

While chronic dyspnea is universally recognized as being prevalent and one of the symptoms associated with a variety of pulmonary disorders (eg, asthma, COPD, interstitial lung disease [ILD], pulmonary arterial hypertension [PAH]), it's not clear how and to what extent pulmonary specialists factor in dyspnea in the detection, diagnosis, and treatment of pulmonary diseases.

BACKGROUND AND PURPOSE

In this *Clinical Perspectives* issue, CHEST is undertaking primary research with pulmonologists to understand their approach to evaluation of patients presenting with chronic dyspnea. This is the first in a series of *Clinical Perspectives* issues addressing chronic dyspnea to understand how clinicians evaluate the symptoms and factor them into their differential diagnosis of pulmonary, cardiovascular, or other diagnoses. The objectives of this research are to:

- Understand the frequency with which dyspnea is specifically evaluated.
- Assess the extent to which different tools are used to assess and document chronic dyspnea.
- Identify the extent to which patients' descriptions of their symptoms are considered when making a diagnosis.
- Determine where dyspnea resides within the hierarchy of patient complaints.
- Identify diagnostic approaches to evaluating dyspnea and the establishment of an underlying diagnosis.

METHODOLOGY

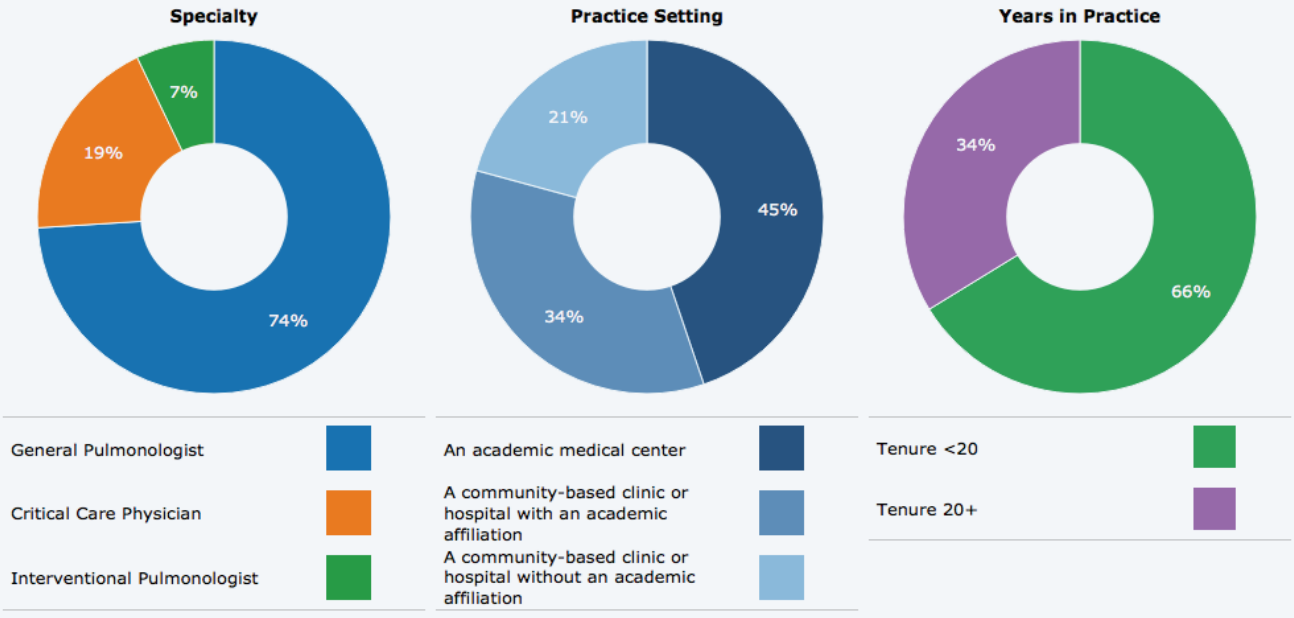
CHEST conducted an online survey with a sample of n=154 pulmonologists randomly selected from the CHEST constituent database. Respondents were sent a link to the survey from CHEST, and data were collected April 26-May 7, 2018.

Descriptive statistics were used to assess distributions of the data across important behavioral variables. Inferential statistics were used to assess differences in descriptive and behavioral measures, which were cross-tabulated with patient volume and practice setting data. Depending on data type, a 2-tailed independent samples *t* test and a chi-square test were used to test for statistical significance ($P<.1$ considered statistically significant).

RESPONDENT PROFILE

The majority of the respondent base is composed of general pulmonologists (74%). Slightly more than half of respondents (55%) are practicing in community-based settings, either in a general community hospital (21%) or a community-based tertiary care center (34%). The respondent base comprises an even mix of clinicians by tenure, with 66% of respondents in post-fellowship practice for less than 20 years. Most respondents say they are seeing patients with ILD in their private practice and taking responsibility for diagnosis and treatment (68%). Smaller shares of respondents either work out of a dedicated ILD clinic (19%) or refer to one (13%).

Respondent Profile



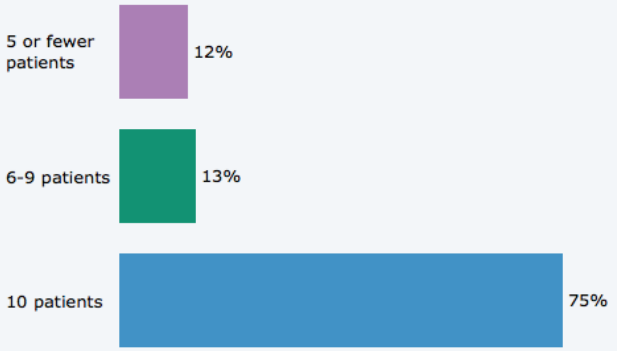
EVALUATION OF SYMPTOMS

Respondents do not always assess the severity and characteristics of dyspnea

While most respondents (75%) seek to determine the severity and characteristics of dyspnea in all patients who present with dyspnea where there is no pre-existing diagnosis, assessment of the characteristics and severity of dyspnea drops to 60% when patients have a pre-existing condition. Only 60% of respondents conduct an assessment 100% of the time. The frequency of assessment did not vary by practice setting (academic vs community) or by years in practice since fellowship.

Determination of Severity of Dyspnea without Pre-existing Diagnosis

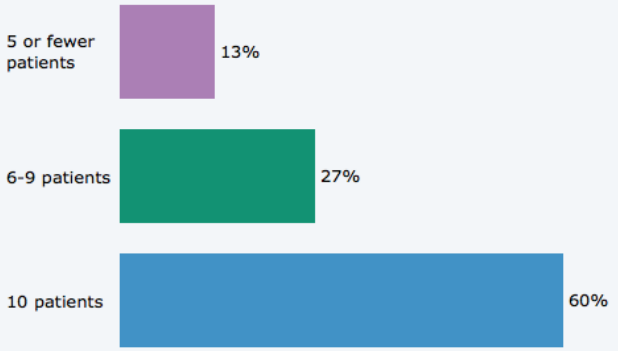
(% of patients evaluated among the last 10 seen without pre-existing diagnosis)



Q: Thinking of the last 10 patients who presented with dyspnea where there was no pre-existing diagnosis, in how many of those patients did you seek to determine the severity and characteristics of their dyspnea?

Determination of Severity of Dyspnea with Pre-existing Chronic Dyspnea Diagnosis

(% of patients evaluated among the last 10 seen with a pre-existing diagnosis)



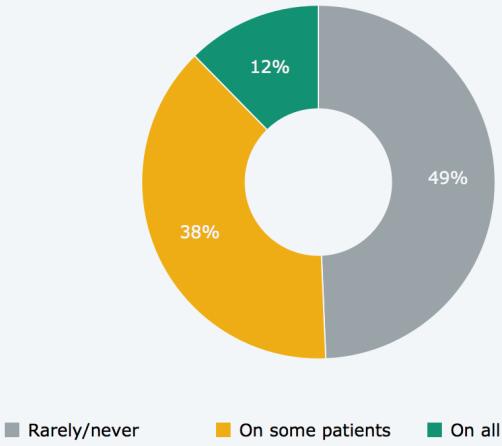
Q: Thinking of the last 10 patients who presented with chronic dyspnea where there was a pre-existing diagnosis, in how many of those patients did you seek to determine the severity and characteristics of their dyspnea?

Formalized dyspnea assessment tools are not widely used.

Respondents do not utilize a validated tool to assess the nature and severity of dyspnea in nearly half of all patients that present with dyspnea. Only 12% of respondents use some type of assessment tool on all patients who present with the complaint of dyspnea and less than half (38%) use such a tool for at least some of their patients.

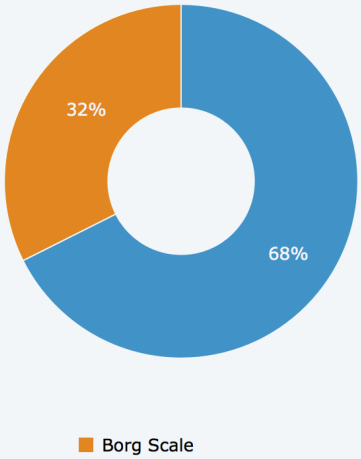
Among respondents who reported use of dyspnea assessment tools, the Modified Medical Research Council (mMRC) dyspnea scale is used most frequently (68%), followed by the Borg scale (34%).

Use of Assessment Tool to Establish Respiratory Discomfort



Q: When a patient presents with dyspnea, how frequently do you use some type of assessment tool to establish the nature and severity of the patient's respiratory discomfort?

Assessment Tool Used Most Frequently

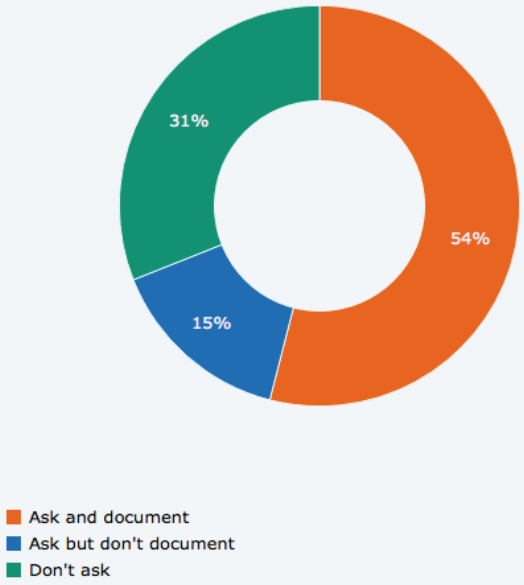


Q: Which assessment tool do you use most frequently?

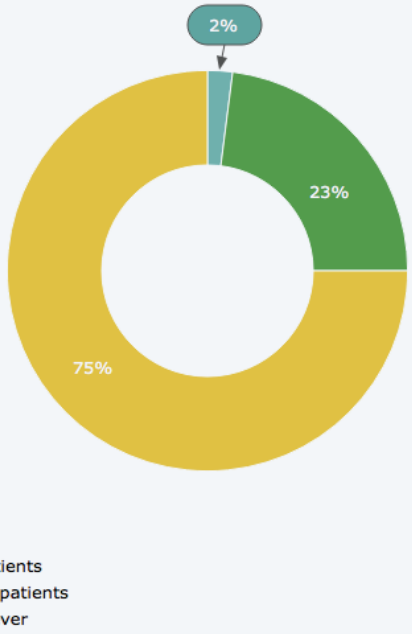
Almost one-third of respondents do not ask patients to rate the severity of their dyspnea.

The majority of respondents (69%) routinely ask patients presenting with chronic dyspnea to rate the severity of their symptoms. Among those respondents, 54% say they routinely document these ratings. However, asking patients to rate the severity of their dyspnea does not appear to be a substitute for the use of a formalized assessment tool. Almost one-third (31%) of respondents do not ask patients to rate the severity of their symptoms. These respondents are also highly unlikely to use an assessment tool, with 75% reporting that they rarely/never use such tools.

Routinely Ask Patients to Rate Severity of Their Shortness of Breath and Document



Use of Assessment Tools Among Respondents Who Don't Ask for Patient Ratings of Their Dyspnea



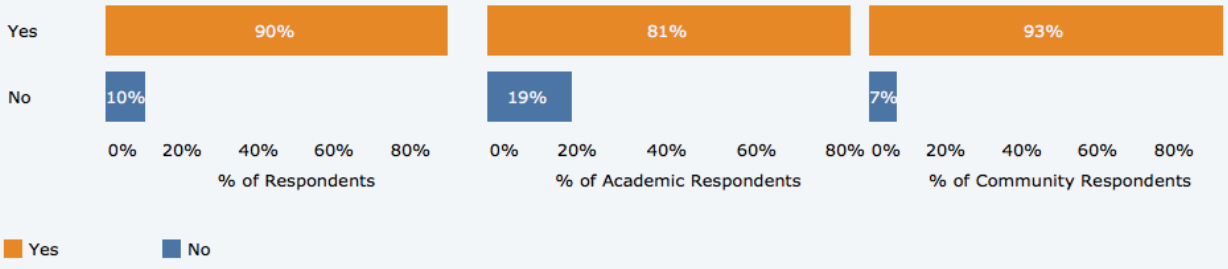
Q: Do you routinely ask your patients with chronic dyspnea to rate the severity of their shortness of breath?

Q: Do you routinely document these ratings?

Respondents appear to be sensitive to the language patients use to describe their dyspnea.

The vast majority (90%) factor the specific language that patients use to describe their symptoms into their diagnostic process. Community-based practitioners (93%) are even more likely to do this than their academic colleagues (81%).

Factor in Language Used by Patients

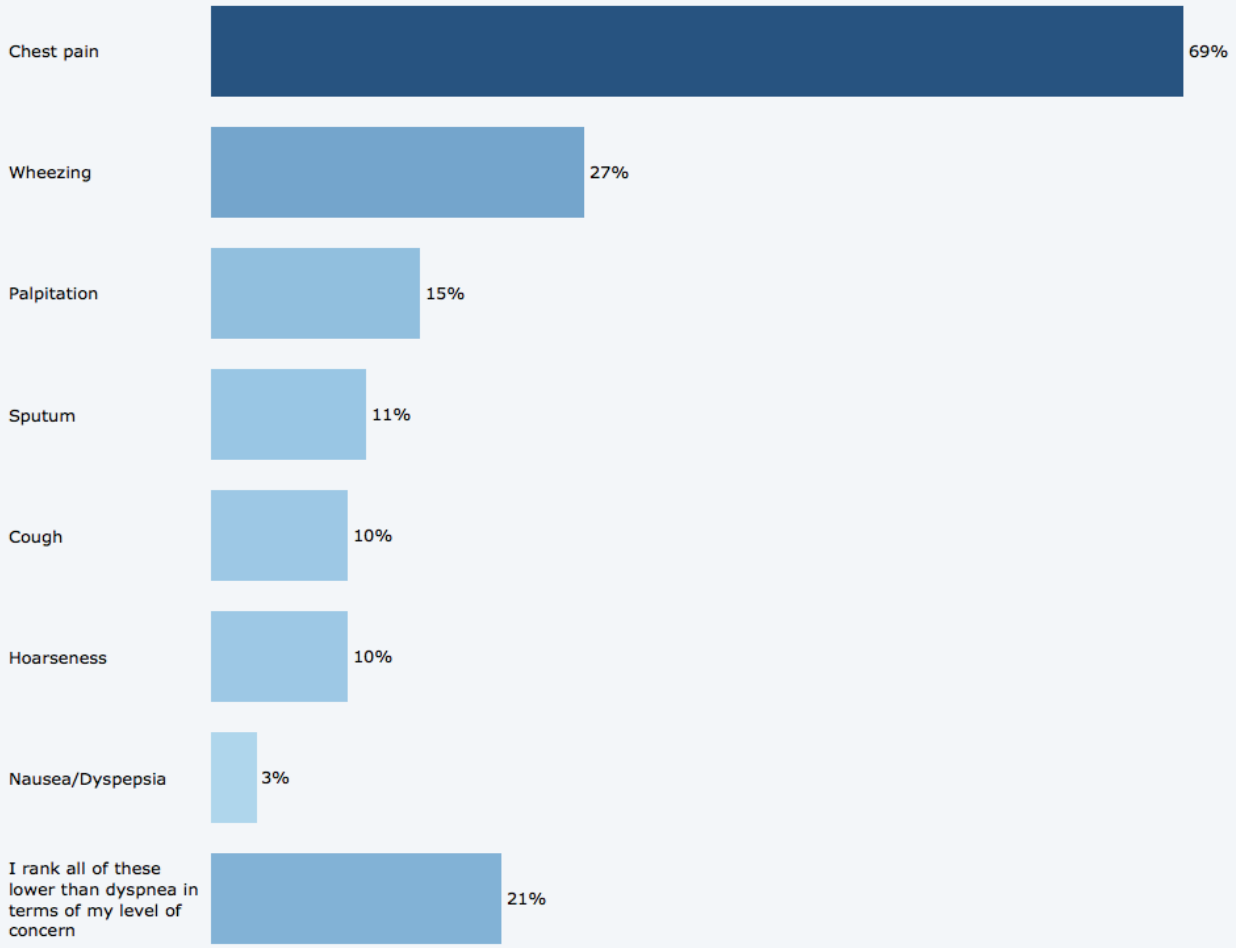


Q: Do you factor in the language patients use to describe their dyspnea as part of your diagnostic process?

Dyspnea is ranked highly relative to other patient complaints.

With the exception of chest pain (70%), most respondents rank dyspnea ahead of other patient complaints (wheezing, palpitation, cough, sputum, hoarseness, and nausea/dyspepsia). A fourth (26%) rank wheezing as being further up the hierarchy, and 21% say that none of the symptoms presented are more important than dyspnea.

Complaints Ranked Higher Than Dyspnea in Terms of Level of Concern



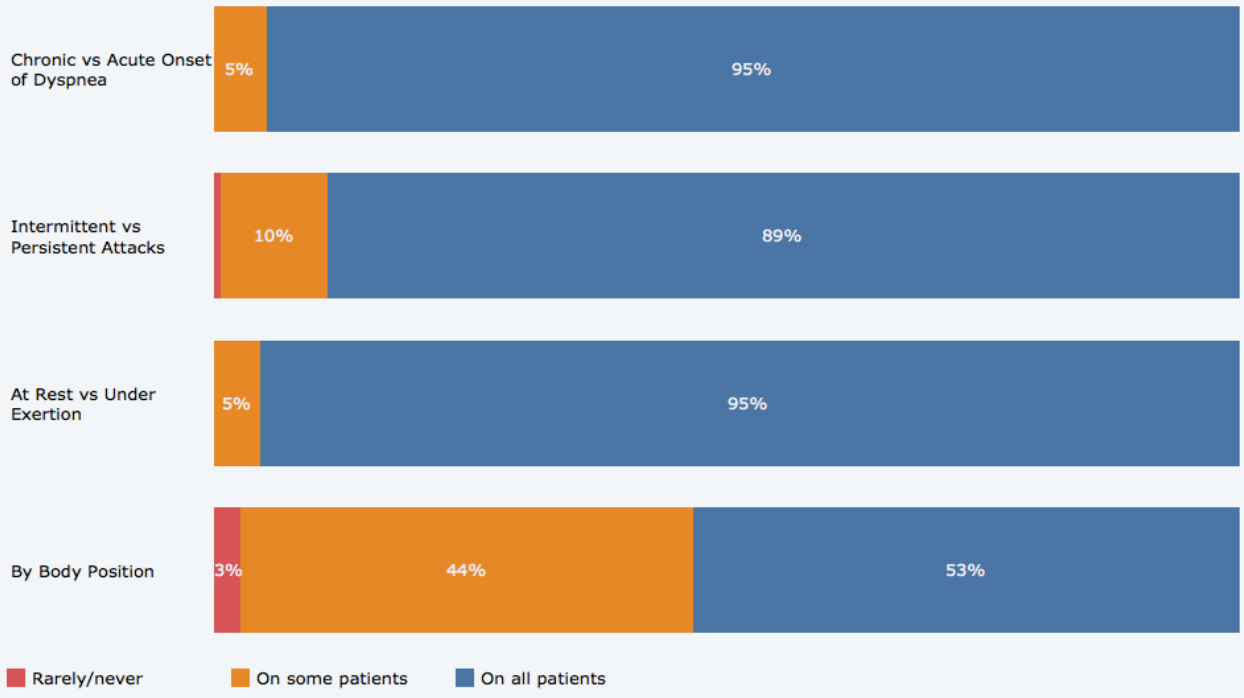
Q: From the following list of complaints, which ones do you rank HIGHER than dyspnea in terms of your level of concern?

Approach to Evaluation of Dyspnea and Underlying Diagnosis

Characteristics of dyspnea are universally considered.

In assessing dyspnea, nearly all respondents consider a variety of factors in their evaluation, including chronic vs acute onset (95% consider it in all cases), intermittent vs persistent attacks (89%), and at rest vs under exertion (95%). Body position is less likely to be considered; only 53% of respondents weigh this factor on all patients.

Frequency in Considering the Following Factors While Assessing Dyspnea



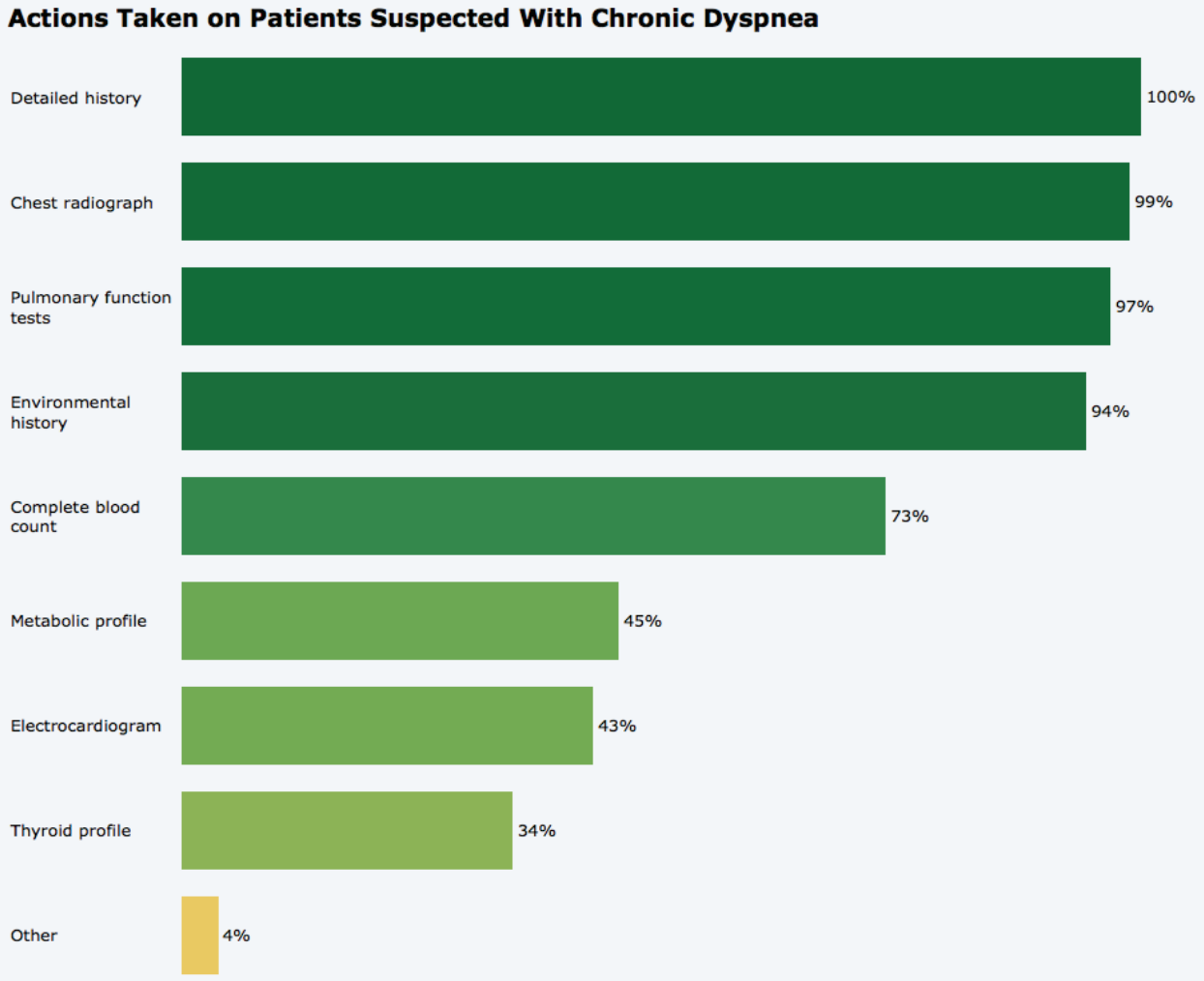
Q: How frequently do you consider the following factors when assessing dyspnea?

Strong ownership drives an underlying diagnosis in patients with dyspnea.

Nearly half (48%) work in a multidisciplinary way with other specialists to diagnose the underlying cause of dyspnea. Community-based practitioners (52%) and experienced clinicians (65%) are even more likely to take this approach. Further, 38% would typically order tests for the evaluation of another organ system once pulmonary causes have been ruled out. Only 15% focus on pulmonary causes and then refer the patient out for other evaluation.

Almost all pulmonologists perform the same initial workup in patients with chronic dyspnea.

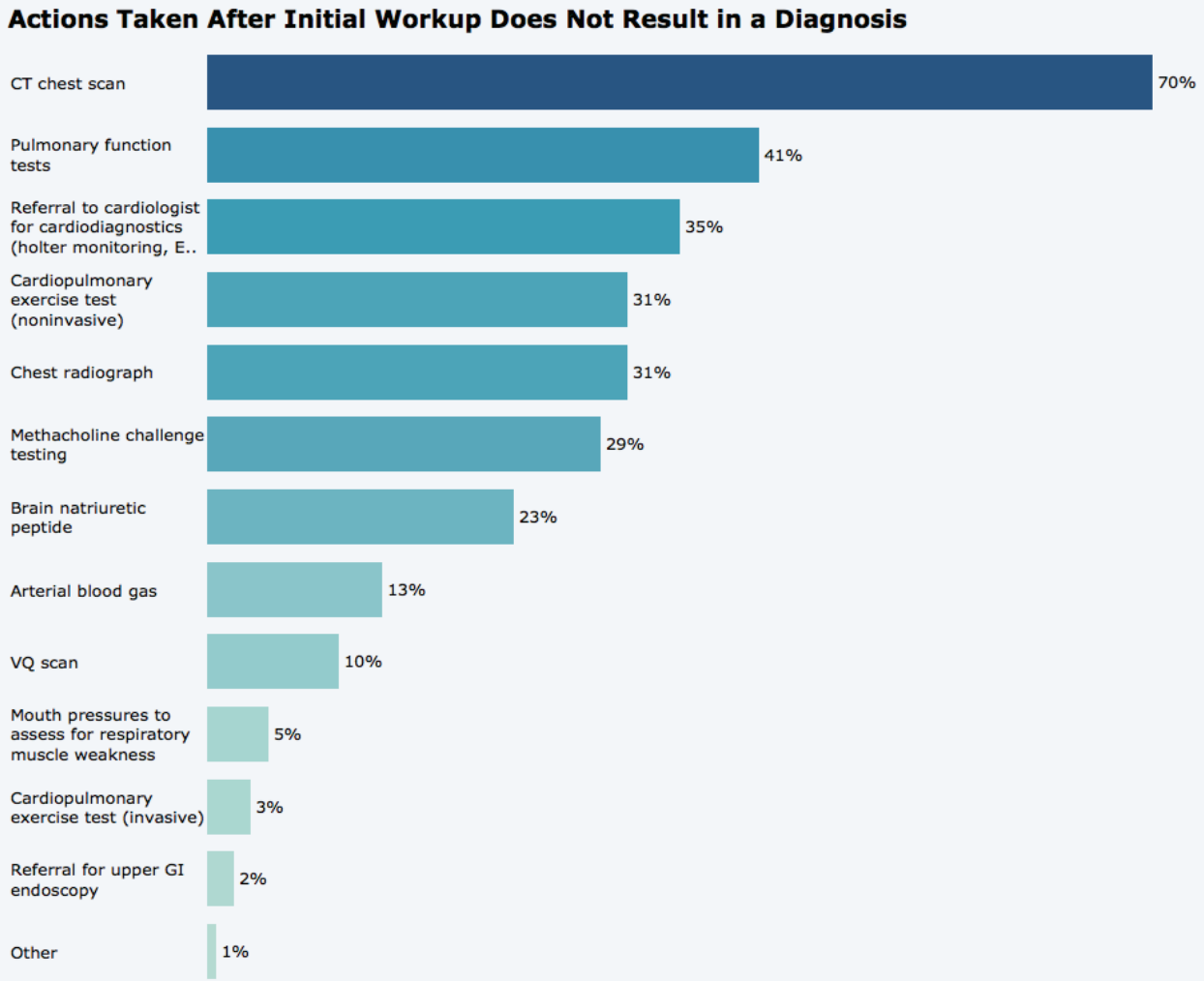
Respondents almost universally perform the same set of initial diagnostic actions in their workup of patients presenting with chronic dyspnea. All (100%) obtain a detailed history, and almost all obtain a chest radiograph (99%), pulmonary function tests (97%), and environmental history (94%). Complete blood count (73%), metabolic profile (46%), electrocardiogram (43%), and thyroid profile (35%) are ordered less frequently during the initial workup.



Q: In your initial workup of a patient who you suspect has chronic dyspnea without an underlying diagnosis, which of the following actions do you take?

CT scanning is the preferred next step if the initial workup does not provide an evident diagnosis.

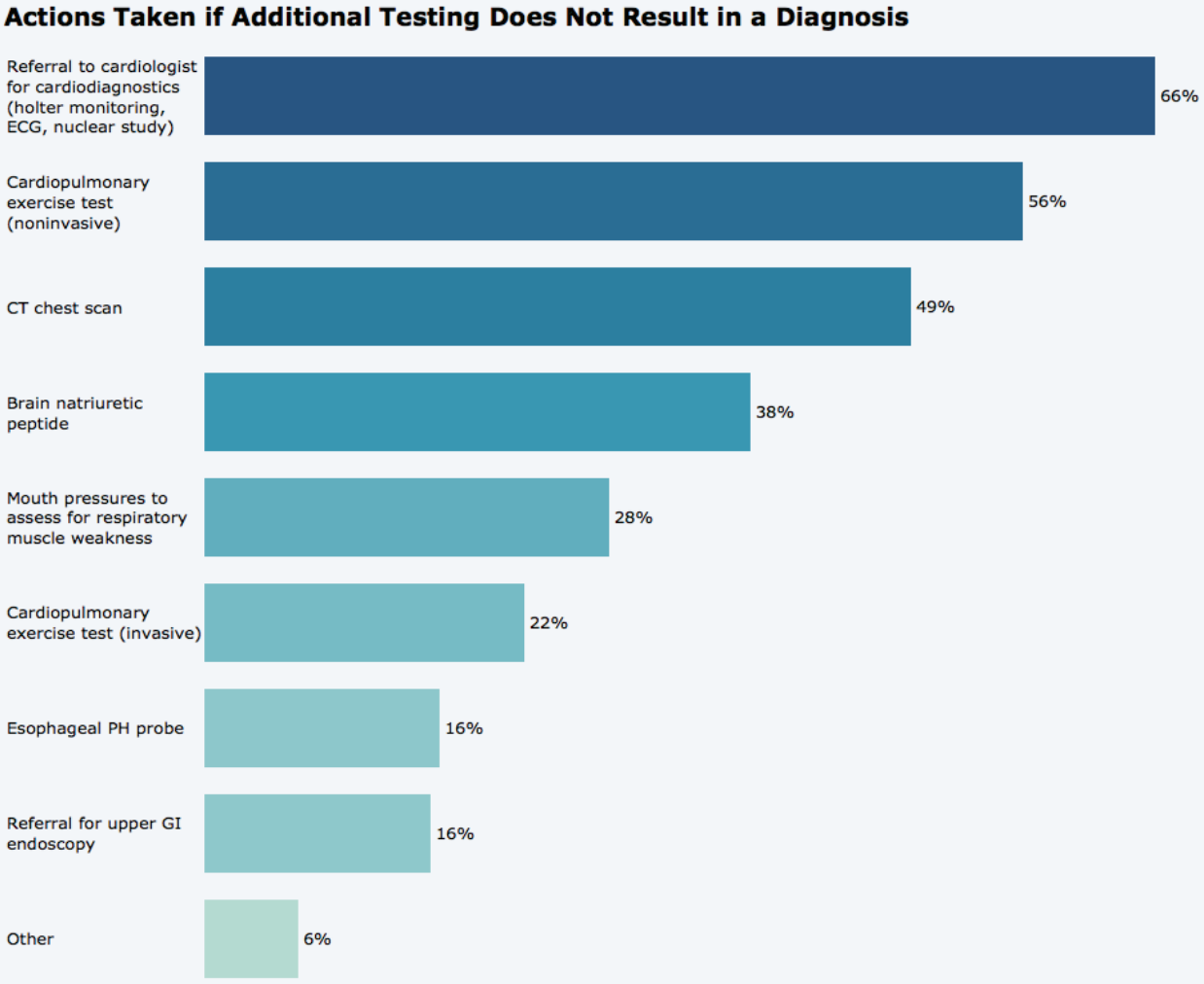
In the event that the initial workup does not result in an evident diagnosis, the most frequent next step is a CT scan of the chest (70%), followed by pulmonary function testing (41%), if not ordered as part of the initial workup. At this point, a number of respondents turn to cardiologic evaluation, either by ordering cardiopulmonary exercise testing (34%) or through referral to a cardiologist for cardiodiagnostics (35%). Other testing mentioned in follow-up to the initial workup include methacholine challenge testing (29%) and brain natriuretic peptide (23%).



Q: If your initial workup does not result in an evident diagnosis, which of the following actions do you take next?

Respondents frequently refer patients for cardiac evaluation in the absence of an evident diagnosis.

If a diagnosis is not evident after the initial workup and additional testing, most respondents turn to cardiologic evaluation, including referral for cardiodiagnostics (66%), noninvasive cardiopulmonary exercise testing (56%), and invasive cardiopulmonary exercise testing (22%). If not already ordered, chest CT scan (49%) and brain natriuretic peptide (38%) are ordered. Roughly, 30% consider mouth pressure to assess respiratory muscle weakness (28%) or referral for gastroenterologic evaluation (32%).

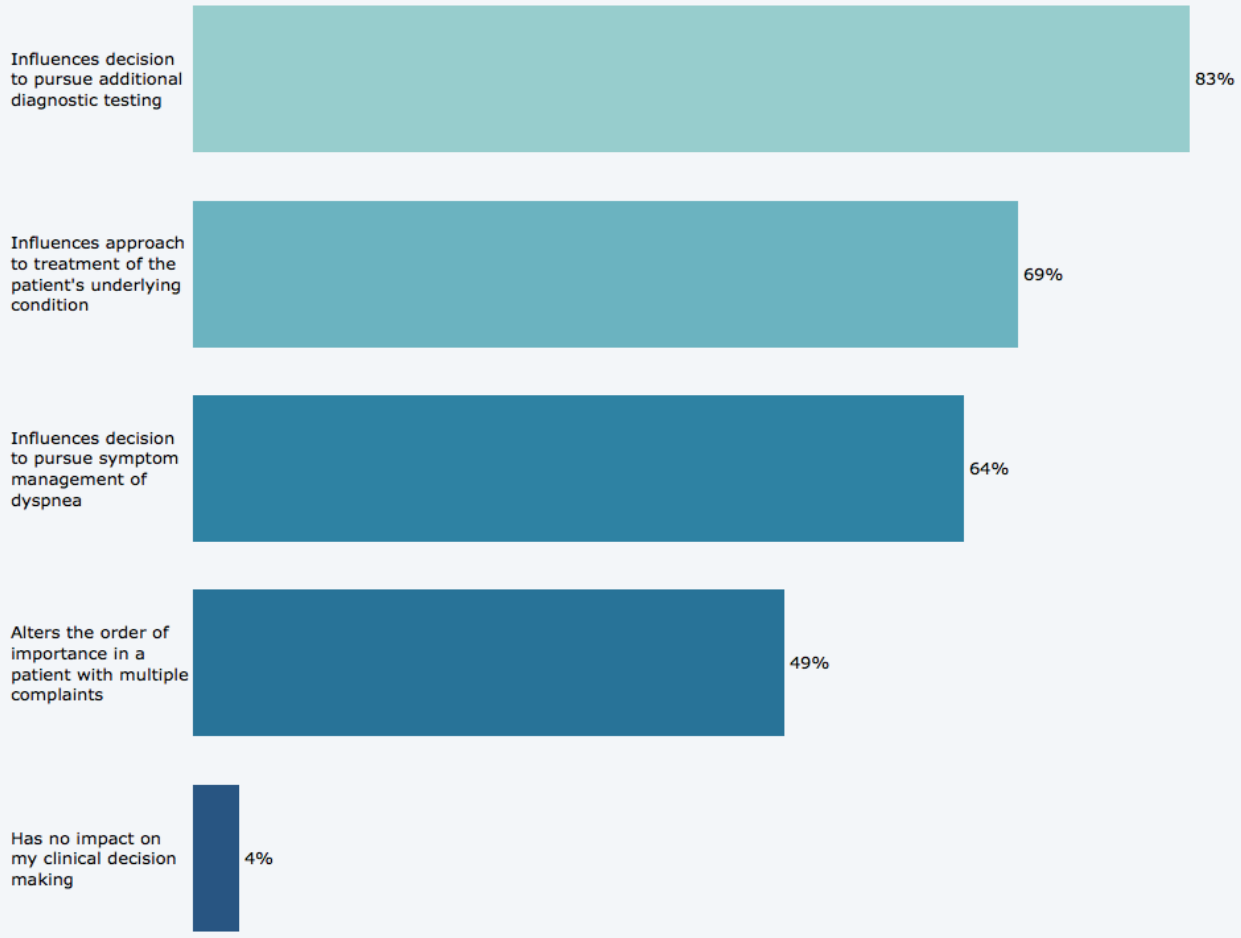


Q: If additional testing does not result in an evident diagnosis, which of the following actions do you take next?

The presence of dyspnea influences clinical decision-making.

The presence of dyspnea primarily influences the decision to pursue additional diagnostic testing for a majority of respondents (83%). Smaller majorities indicate that awareness of the symptom influences their approach to treatment of the patient's underlying condition (69%) and the decision to pursue symptom management (64%).

Ways That Awareness of Dyspnea Affect Diagnosis



Q: In what ways does the awareness of dyspnea affect your diagnosis of the patient's disease?

Pulmonologists' attitudes towards dyspnea impact their assessment practices.

Cluster analysis identified three distinct pulmonologist subsets based on their attitudes toward evaluation of dyspnea.

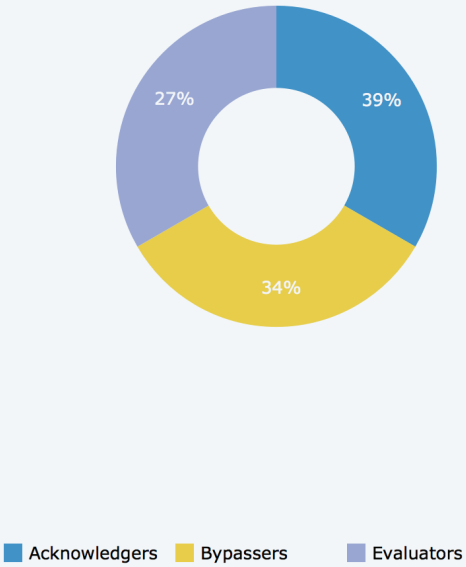
"Evaluators" (27%) consider evaluation of dyspnea to be a decisive factor in determining diagnosis; they are more likely than other subsets to evaluate dyspnea in patients who already have an underlying diagnosis, and they are less likely to treat patients empirically when they complain of dyspnea. As a result, they are more likely to report:

- Higher incidence of dyspnea evaluation
- Higher use of assessment tools
- Higher use and documentation of patient ratings of their dyspnea
- More comprehensive initial diagnostic evaluation, especially regarding the use of CBC, metabolic profile, ECG, and thyroid profile.

"Bypassers" (34%) don't consider dyspnea to be a decisive factor in diagnosis, are less likely to evaluate it in patients who already have an underlying diagnosis, and are more likely to treat patients empirically when complaining of chronic dyspnea. There is a demographic skew to this segment, with 74% of Bypassers reporting a practice tenure of less than 20 years. They are generally less likely to engage in most evaluative measures related to the characteristics and severity of the patient's dyspnea. In general, this segment tends to focus on ruling out pulmonary causes of dyspnea and then referring on to cardiology or some other specialty for additional evaluation.

"Acknowledgers" (39%) are similar to Bypassers in many ways, with one key exception—they are more likely to acknowledge that dyspnea can be a decisive factor in their diagnosis. This belief does not necessarily result in focused action—they do not appear to be any more likely to focus effort specifically on evaluation of the patient's complaint of dyspnea. Like Bypassers, they tend to take a focused approach on ruling out pulmonary causes and then refer to other specialists for additional evaluation.

Attitudes Towards Dyspnea and Impact on Assessment



Mean Agreement Score

	Acknowledgers	Bypassers	Evaluators
Greater weight on workup results than dyspnea complaint	3.4	3.7	3.1
Dyspnea rarely decisive factor in final diagnosis	1.8	3.8	1.9
Determining etiology of dyspnea necessary for diagnosis	4.6	4.4	4.8
Established etiology; less likely to evaluate dyspnea	3.6	3.6	1.9
Algorithmic approach to diagnosing etiology of dyspnea	3.7	3.6	4.0
Apply clinical judgment in evaluating dyspnea	3.9	4.1	3.9
Treat patients empirically when patient complains of chronic dyspnea	2.9	3.1	1.7

Score represents the mean level of agreement with each statement, where "5" means strongly agree and "1" means strongly disagree.

KEY TAKEAWAYS

1. Respondents consider dyspnea to be an important symptom, second only to chest pain among the patient complaints evaluated. However, despite the importance ascribed to the symptom, specific evaluation of the severity and characteristics in the presenting patient are often lacking.
2. Evaluation of dyspnea is far from universal, even when the patient has no pre-existing underlying condition to explain the presence of the symptom.
3. Actions specific to the evaluation of dyspnea symptoms, including the use of assessment tools, ratings, and chart documentation of these data, are also inconsistent.
4. A substantial core minority bypass formal and informal methods of symptom assessment when treating patients who present with dyspnea.
5. In general, there is evidence of an algorithmic approach to evaluation of dyspnea. However, there does appear to be a tendency to move into cardiologic evaluation if initial workup utilizing basic pulmonary testing methods does not yield an evident diagnosis.
6. In contrast to some of the emerging research on evaluation of dyspnea being optimally executed in multidisciplinary settings, only half of respondents say that they are taking this approach.
7. While all consider dyspnea to be among the more important patient complaints, attitudinal segments demonstrate that only a third of respondents are dedicated to emphasizing specific evaluation of the complaint, as opposed to proceeding directly to an algorithmic evaluation of the complaint.

DISCUSSION

Overall, the majority of pulmonologists (>70%) are doing very little to assess chronic dyspnea in most patients, and only half engage in multidisciplinary approaches to assessing dyspnea.

While pulmonologists universally regard chronic dyspnea as an important symptom and rank it only next to chest pain in terms of their level of concern, their practices regarding evaluation of dyspnea do not reflect what they say. A significant percentage does not perform any assessment of dyspnea, and the number is even higher in patients who already have a diagnosis that is associated with dyspnea. Surprisingly, this finding held true across all settings and the duration of practice. Among those who do evaluate dyspnea, the majority do not perform a thorough evaluation, do not use assessment tools (nearly half of patients who present with dyspnea do not undergo an assessment of the nature and severity of their discomfort by use of a formal, validated tool), and are more likely to assess only pulmonary parameters. In the absence of a diagnosis, these physicians quickly move patients along to another specialist for further evaluation – usually a cardiologist.

The reasons for this are not clear; however, it may be that the medical literature does not recognize the importance of dyspnea as a symptom outside of a diagnosis. Most primary studies or surveys look at dyspnea within the context of practice patterns and management approaches for specific conditions (eg, COPD).[5] The CHEST guidelines focus on dyspnea associated with advanced lung or heart disease and the CTS guidelines on dyspnea in patients with COPD.[2,4] Dyspnea may not be viewed as an independent symptom but rather as part of a cluster of symptoms associated with specific diseases. Only the ATS statement focuses on evaluating the experience of dyspnea itself, without linking it to a specific condition.[2] The ATS statement on dyspnea notes, “The presence of dyspnea is a potent predictor of mortality, often surpassing common physiological measurements in predicting the clinical course of a patient,” and studies have demonstrated that patients with dyspnea have higher all-cause mortality, cardiovascular mortality, and cardiac revascularization than patients with typical and atypical chest pain.[2,5-9]

Additionally, there does not appear to be a validated, gold standard tool specifically for dyspnea that can be used in multiple settings (eg, primary care, pulmonology, cardiology, etc), and while some assessment tools can be very unwieldy, others are very brief. Barriers to utilizing assessment tools may be related in part to training, habit, and the overall burden of the documentation process.

In terms of initial workups, almost all pulmonologists in both academic and community settings obtain similar information, including a detailed history, a chest radiograph, pulmonary function tests, and environmental history.

Determining the etiology of dyspnea is critical to obtain an accurate diagnosis, and the presence of dyspnea primarily influences the decision to pursue additional diagnostic testing for a majority of respondents. However, the approach and extent to which they assess dyspnea differs depending upon their attitudinal classification as Evaluators, Bypassers, or Acknowledgers.

Evaluators (~27%) recognize the importance of dyspnea and act within that context; it impacts their initial workup, and they consider dyspnea to be a decisive factor in making a diagnosis. They do not look at dyspnea empirically and evaluate it even in patients who have an underlying condition associated with dyspnea.

Bypassers could be considered the opposite of Evaluators. They tend to look at dyspnea empirically and do not consider it a decisive factor in making a diagnosis. In patients without a diagnosis that is associated with dyspnea, they are less likely to evaluate dyspnea characteristics such as severity, and they tend not to evaluate dyspnea at all in patients with an underlying diagnosis. In this group, most were in practice less than 20 years, and their strategy appears to be to quickly rule out underlying pulmonary issues and move patients quickly to another specialist.

Acknowledgers are similar to Bypassers, with exception they acknowledge dyspnea could be decisive in making a diagnosis. Despite this awareness, they perform the same diagnostics and in the same order as Bypassers.

Key pulmonary and respiratory medicine groups have recognized the value of a multidisciplinary approach in assessing and managing patients with dyspnea, yet only half of pulmonologists have adopted this as an initial approach.[2,10,11] Pulmonologists initially take ownership when patients present with dyspnea and may move to a multidisciplinary or collaborative approach secondarily, when they are not able to determine the cause of dyspnea. Huang and colleagues[10] note that multiple referrals for dyspneic patients without an obvious primary etiology can be costly and frustrating to patients as they undergo repeated diagnostic testing while delaying treatment. In a study of more than 500 patients, they reported multidisciplinary assessment of dyspnea significantly reduced the time to diagnosis compared with “conventional” assessment approaches.

EDUCATIONAL OPPORTUNITIES

This survey identified a number of educational opportunities that could help improve dyspnea assessment practices.

- Improve awareness among physicians of the importance of dyspnea as an independent symptom, including advances in understanding the mechanisms and multifactorial nature of dyspnea and the impact of dyspnea on outcomes such as mortality and revascularization.
- Increase physician understanding of how to evaluate dyspnea and use validated assessment tools.
- Introduce physicians to multidisciplinary models of dyspnea assessment, such as the one used at Brigham and Women's Hospital, and highlight the value of engaging in this approach.

REFERENCES

1. Berliner D, Schneider N, Welte T, Bauersachs J: The differential diagnosis of dyspnoea. Dtsch Arztebl Int. 2016;113:834–45.

2. Parshall MB, Schwartzstein RM, Adams L, Banzett RB, Manning HL, Bourbeau J, et al; American Thoracic Society Committee on Dyspnea. An official American Thoracic Society statement: update on the mechanisms, assessment, and management of dyspnea. Am J Respir Crit Care Med. 2012;185(4):435-452.

3. Mahler DA, Selecky PA, Harrod CG, Benditt JO, Carrieri-Kohlman V, Curtis JR, 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.

4. Marciniuk DD, Goodridge D, Hernandez P, Roker G, Balter M, Bailey P, et al. Managing dyspnea in patients with advanced chronic obstructive pulmonary disease: A Canadian Thoracic Society clinical practice guideline. Can Respir J. 2010;18(2):69-78.

5. Bourbeau J, Sebaldt RJ, Day A, Bouchard J, Kaplan A, Hernandez P, Rouleau M, et al. Practice patterns in the management of chronic obstructive pulmonary disease in primary practice: The CAGE study, Can Respir J. 2008;15(1):13-19.

6. Berraho M. Dyspnea: a strong independent factor for long-term mortality in the elderly. J Nutr Health Aging. 2013;17:908–912.

7. Frostad A, Soyseth V, Andersen A, Gulsvik A. Respiratory symptoms as predictors of all-cause mortality in an urban community: a 30-year follow-up. J Intern Med. 2006;259(5):520-529.

8. Abidov A, Rozanski A, Hachamovitch R, Hayes SW, Aboul-Enein F, Cohen I, et al. Prognostic significance of dyspnea in patients referred for cardiac stress testing. New Engl J Med. 2005;353(18):1889-1898.

9. Argulian E, Agarwal V, Bangalore S, Chatterjee S< Makani H, Rozanski A, Chaudhry FA. Meta-analysis of prognostic implications of dyspnea versus chest pain in patients referred for stress testing. Am J Cardiol. 2014;113:559-564.

10. Huang W, Resch S, Oliveira RKF, Cockrill BA, Systrom DM, Waxman AB. Invasive cardiopulmonary exercise testing in th evaluation of unexplained dyspnea: Insights from a multidisciplinary dyspnea center. Eur J Preventive Cardiol. 2017;24(11):1190-1199.

11. Laviolette L, Laveneziana P; ERS Research Seminar Faculty. Dyspnoea: a multidimensional and multidisciplinary approach. Eur Respir J. 2014;43(6):1750-62.

2595 Patriot Boulevard
Glenview, Illinois 60026