

# Routine Dyspnea Assessment on Unit Admission

Is it feasible for nurses to quantify and document this important prognostic marker?

**OVERVIEW:** Dyspnea assessment is valuable in diagnosis, prognosis, symptom management, and targeted intervention, and in the allotment and management of patient care resources. The assessment of dyspnea, like that of pain, depends on patient self-report. Expert consensus panels have called for dyspnea to be measured quantitatively and documented on a routine basis, as is the practice with pain. But little information is available on how to measure and record dyspnea ratings systematically. Consequently, the prevalence of dyspnea in hospital settings may be greater than is generally recognized, and dyspnea may be insufficiently managed. This article describes a pilot study that sought to test the feasibility of measuring dyspnea as part of the initial patient assessment performed by nurses within several inpatient units of a large urban hospital.

**Keywords:** dyspnea, dyspnea assessment, initial patient assessment, nurse education

Dyspnea, which is defined by the American Thoracic Society as “a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity,”<sup>1,2</sup> is an important prognostic indicator of adverse outcomes, including death. In a study of nearly 18,000 patients undergoing cardiac stress testing, the risk of death from any cause was higher among patients with dyspnea than among those without.<sup>3</sup> A five-year, prospective, multicenter Japanese study of 227 patients with chronic obstructive pulmonary disease (COPD) found that the level of dyspnea was a stronger predictor of five-year survival than forced expiratory volume in one second (FEV<sub>1</sub>), a test long regarded as the gold standard for predicting outcome and measuring COPD severity.<sup>4</sup> A health-related quality of life study involving 216 patients undergoing treatment for esophagogastric cancer

demonstrated that a 10-point poorer dyspnea rating prior to surgery was associated with an 18% higher risk of death within the five-year follow-up period.<sup>5</sup>

Despite the prognostic value of dyspnea, little is known about its general prevalence in hospitalized patients. The few large-scale studies that address dyspnea incidence within hospitals have focused on seriously ill patient populations with limited life expectancy, in whom dyspnea rates ranged from 39% to 100%.<sup>6-11</sup> In addition to their narrow focus, these studies are limited by the ad hoc methods used to measure dyspnea and by dyspnea scales that are not clearly defined.<sup>7,9,11</sup> Furthermore, although these studies assessed dyspnea after hospital admission, none examined the presence of dyspnea prior to or on admission, or investigated the feasibility of implementing a nurse-administered dyspnea assessment for all inpatient admissions. Most, in fact, used research staff



Photo by Thomas Northcut.

to obtain dyspnea assessments and did not test systems that integrate dyspnea measurement and documentation into the work flow of clinical staff.

Because dyspnea can be an independent predictor of life-threatening illness, its early assessment provides an opportunity to optimize care, improve symptom management, triage patients to an appropriate level of care, and adjust allocation of clinical resources. The assessment of dyspnea for such purposes requires that a validated, quantitative tool be applied

- on a routine basis.
- in a manner that does not interfere with normal hospital care.
- by nursing personnel who understand its significance and appropriate use.

To that end, this article describes a pilot study we designed to test the feasibility of incorporating dyspnea measurement into nurses' initial patient assessment (IPA) on several inpatient units at Beth Israel Deaconess Medical Center, a large Boston hospital. We are using the feedback we received from participating nurses to better integrate the process into nursing work flow and to guide future efforts to implement dyspnea assessment on a larger scale throughout the medical center. Here, we discuss the degree of success

we achieved in our initial efforts, the challenges we faced, and the specific limitations of our pilot study that need to be addressed in future research.

#### METHODS

We conducted the pilot study between January 23, 2012, and March 9, 2012, limiting our investigation to four inpatient units—oncology, general medicine, cardiology, and surgery—that enabled us to obtain a broad, general sampling of patients. There were no exclusion criteria. A total of 1,028 patients were admitted to these units during the study period. Sample size was limited by practical considerations. Our objective was to have dyspnea assessments completed on admission for at least 500 of these patients—an achievable goal that we felt would provide a wide cross section of patients.

**Measures.** The electronic IPA at our acute care facility is a functional health pattern assessment, review of systems, and plan of care that is completed within the first eight hours of hospital admission. Because the IPA in use at the time of this study did not incorporate a routine, standardized dyspnea assessment, we developed a quantitative dyspnea assessment tool to be included in the IPA, enabling us to measure the

**Figure 1.** The dyspnea assessment tool used in the pilot study.

<b>1. Within the last day, have you been short of breath?</b>						
<b>Grade 1</b>	<b>Grade 2</b>	<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>	<b>Grade 6</b>	<b>Grade 7</b>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Only when exercising strenuously	Hurrying or walking up slight hill	Walking 15 minutes on level ground	Walking 3 minutes on level ground	Undressing	Eating or talking	At rest
<input type="radio"/>						<input type="radio"/>
Unable to respond						
<b>2. How would you rate your breathing discomfort right now?</b>						
<b>None</b>						<b>Unbearable</b>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0	1	2	3	4	5	6
						7
						8
						9
						10
<input type="radio"/>						<input type="radio"/>
Unable to respond						
<b>3. Has your shortness of breath gotten worse (or better) in the last week?</b>						
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Much better	Better	About the same	Worse	Much worse		
<input type="radio"/>						<input type="radio"/>
Unable to respond						

prevalence and determine the predictive value of dyspnea in our facility's general patient population. In addition to the existing respiratory assessment, which helped nurses evaluate use of oxygen at home, use of inhalers, lung sounds, the quality of respiration, and respiratory effort, the new assessment tool called for nurses to ask and record patient responses to three subjective questions (see Figure 1). The tool was derived from three scales, the first two of which have been validated in assessing dyspnea:

- the Medical Research Council (MRC) breathlessness scale<sup>12,13</sup>
- a 0 to 10 numeric scale for measuring breathing discomfort, several forms of which have been validated for measuring dyspnea in both healthy and clinical populations<sup>14-17</sup>
- a Likert scale comparing current dyspnea with that experienced the week prior to admission<sup>18,19</sup>

The MRC scale is widely used to capture information about recent exertional dyspnea.<sup>12</sup> When used to predict survival in outpatients with COPD, it was found to be more discriminating than FEV<sub>1</sub>.<sup>4,13</sup> Since the five-grade MRC scale does not address dyspnea at rest, we modified it for use in an acute care setting (in which patients are typically assessed at rest) by adding two grades, one related to dyspnea at rest and one to dyspnea while eating.

The numeric rating scale asks patients to rate their breathing discomfort at the time of the interview on a scale from 0 ("none") to 10 ("unbearable"). Numeric scales, which have been used for years to assess pain, are now widely used to assess the intensity of dyspnea. They are simple, easy to administer, and easily understood by patients.

Current and regularly occurring dyspnea are different constructs.<sup>15</sup> We felt it would be meaningful

to compare dyspnea experienced at the time of the interview with that recalled from the previous week (representing “usual” dyspnea), because a worsening in dyspnea from baseline could suggest deterioration in status. Likert scales are commonly used to measure perceived change in dyspnea and breathing symptoms over time.<sup>18-20</sup>

**Procedures.** After identifying the four nursing units to be included in the pilot, we obtained support

- the importance of dyspnea assessment.
- the tool’s effect on the nurse’s ability to assess dyspnea.
- the tool’s ease of use.
- the patients’ understanding of the assessment questions.

In addition, a series of nursing focus groups were conducted to obtain additional feedback using open-ended questions.

## Our findings support that a three-question dyspnea assessment tool, such as the one we tested, can be integrated into the IPA used on hospital inpatient units.

for the study from the nursing leadership on those units. For ease of use, we had initially hoped to incorporate the new dyspnea assessment tool into the electronic IPA. Because the pilot study was limited to four inpatient units, however, we were unable to amend the electronic IPA, which serves the entire medical center. For the purpose of this study, we developed a paper version of the tool and obtained hospital approval to ask nurses on the four units to use the paper form in conjunction with the electronic IPA.

Before the start of the study, nurses were educated through small group discussions, posters, and a computerized presentation with didactic material. Topics included the rationale for and value of the dyspnea assessment, the assessment method, and the proposed use of study outcomes (to develop future treatment algorithms, for example). Nurses were instructed to ask patients the three dyspnea-related questions and to record their answers on the paper form, which would become part of the patient’s medical record.

At the conclusion of the pilot study, nurses were asked to evaluate the process and the dyspnea measurement tool, addressing such issues as

### RESULTS

A review of scanned medical records showed that nurses used the new dyspnea assessment tool to assess 651 of the 1,028 patients (63%) admitted to the four participating units during the study period. Excluded from our analysis were 365 patients whose medical record included no dyspnea assessment form, nine patients for whom no scanned medical record was found, and three patients who “refused” to answer the assessment questions. In a small number of cases (fewer than 1%), scanned medical records were unavailable, usually because the IPA had been completed on a unit not participating in the study, or the records were being kept on the unit for a quality assurance review.

**Incomplete responses.** More than half (388) of the 651 dyspnea assessment forms the nurses used contained incomplete responses. Nurses noted that patients were “unable to respond” to one or more questions on 42 (6%) of the forms. In 165 (25%) of the forms, one or more questions were left blank, and in 181 (28%), a handwritten “N/A” response was given for one or more questions (see Table 1). Because “N/A” could be used as an abbreviation for “not applicable,” “not available,” or “no answer,” we were

**Table 1.** Incomplete Patient Responses to Assessment Questions

Question	Blank <sup>a</sup>	N/A <sup>a</sup>	Unable to Respond
Within the last day, have you been short of breath?	71	48	27
How would you rate your breathing discomfort right now?	32	18	4
Has your shortness of breath gotten worse (or better) in the last week?	62	115	11

<sup>a</sup> Blank and “N/A” responses may indicate that the patient could not understand the question, the nurse could not understand the patient’s response, or the patient had a “comfort measures only” order in place, in which case a detailed exam was unwarranted.

unable to determine the reasons the questions had not been answered—whether, for example, the patient did not understand the question, the nurse did not understand the patient’s response, or a “comfort measures only” order was in place, in which case a detailed exam was unwarranted.

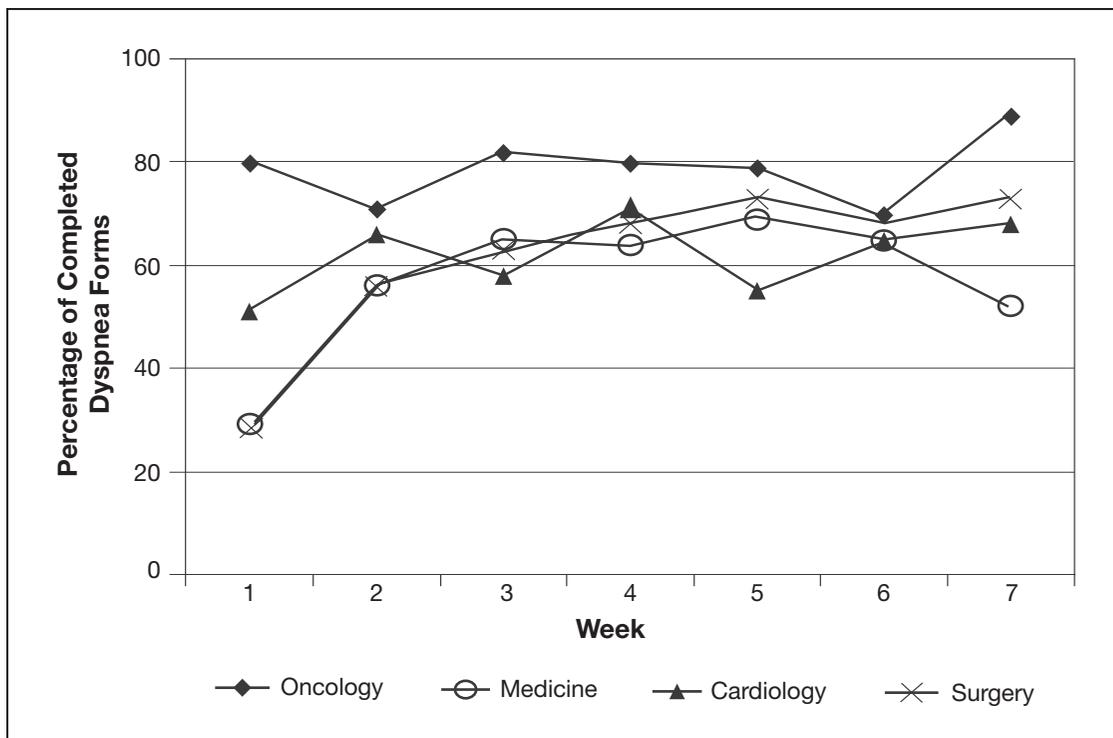
## Overall nurse utilization of the tool was 63%.

**Utilization patterns.** Although overall nurse utilization of the tool was 63%, use varied with the study week, day of the week, and particular unit.

While usage on the oncology unit remained strong and relatively steady throughout the pilot, usage on the other three units showed steady but less dramatic improvement, with the general medicine unit demonstrating a slight decline in use during the final week (see Figure 2 and Table 2). In addition, we observed unit-specific variability related to weekend admissions. For example, utilization on the oncology unit on weekends was dramatically lower than during the week, with mean rates of 47% and 44% on Saturdays and Sundays, respectively, compared with between 76% and 87% on weekdays.

Because the focus of this study was the feasibility of measuring dyspnea on patient admission, we did not correlate diagnoses, outcomes, and dyspnea ratings. Admitting diagnoses varied, with most patients admitted for chemotherapy and other cancer-related treatments, congestive heart failure, or pneumonia.

**Figure 2.** Nurse utilization of dyspnea assessment forms per unit over the seven-week pilot study.



**Table 2.** No. of Admissions and Rate of Nurse Adherence in Completing Dyspnea Assessment Forms per Unit

Unit	Admissions	Completed Forms	Adherence, %
Oncology	209	164	78
Medicine	324	186	57
Cardiology	355	218	61
Surgery	140	83	59
<b>Total</b>	<b>1,028</b>	<b>651</b>	<b>63</b>

**Table 3.** Summary of Nurse Responses to Pilot Evaluation

1. Do you think it is important to assess for dyspnea?	<b>Yes</b> 92%	<b>No</b> 8%		
2. Has the tool improved your ability to assess for dyspnea?	<b>Yes</b> 21%	<b>No</b> 79%		
3. Would you like to see an algorithm developed for treatment of dyspnea?	<b>Yes</b> 50%	<b>No</b> 43%	<b>Unsure</b> 7%	
4. Would it be useful to have a place in the nursing note to assess dyspnea daily?	<b>Yes</b> 16%	<b>No</b> 79%	<b>Unsure</b> 5%	
5. How would you rate the dyspnea assessment questions as far as ease of use?	<b>Very difficult</b> 0%	<b>Difficult</b> 13%	<b>Easy</b> 48%	<b>Very easy</b> 39%
6. How would you rate the patients' understanding of the questions?	<b>Not understood</b> 0%	<b>Poorly understood</b> 33%	<b>Understood</b> 43%	<b>Very clearly understood</b> 24%
7. How many patients did you assess for dyspnea?	<b>&lt;10</b> 63%	<b>10–20</b> 22%	<b>20–30</b> 4%	<b>&gt;30</b> 11%
8. Themes of nurse comments:				
<ul style="list-style-type: none"> <li>• There should be an “opt out” for patients who only experience dyspnea on exertion.</li> <li>• The Medical Research Council scale is not useful in assessing patients who neither exercise strenuously nor routinely walk for three minutes on level ground.</li> <li>• Current dyspnea assessment practices are sufficient.</li> <li>• Assessing for dyspnea is more important if it relates to the admission diagnosis.</li> <li>• The assessment tool does not adequately describe patients who are treated for dyspnea in the ED prior to admission to the unit.</li> <li>• Dyspnea assessment is important but not in the absence of dyspnea.</li> <li>• Dyspnea assessment helps to guide treatment and provides detailed prognostic and diagnostic information.</li> </ul>				

### NURSE FEEDBACK

At the study's end, nurse participants were given the opportunity to evaluate the assessment tool on a paper evaluation form that permitted both quantitative and free-form responses. Table 3 summarizes the nurse responses. Of the nurses completing the evaluation, most (63%) had used the tool to assess between one and 10 patients; 22% had used it to assess 10 to 20 patients. Nurse comments indicated that the tool had several shortcomings. Nevertheless, 87% of respondents noted that it was “easy” or “very easy” to use.

The overwhelming majority of nurses participating in the pilot (92%) reported that they believe dyspnea assessment is important. Some (21%) indicated that the addition of a standardized assessment form had improved their ability to assess dyspnea, and 16% responded that it was useful to have a standardized instrument to record the daily dyspnea assessments.

In addition to the paper evaluations, clinical nurse specialists from the pilot floors and researchers from the medical center's dyspnea laboratory met

with nurses in small groups to encourage feedback. Many nurses reported that they were already using some method of dyspnea assessment but were not routinely documenting the results. Others said that, while dyspnea assessment is important, they saw no need to document the absence of dyspnea or to use this particular tool. Nurses asked why the dyspnea assessment tool comprised these specific three questions and expressed concerns about the utility of the MRC scale in assessing their patients, many of whom never exercise strenuously or walk up a hill, and some of whom never walk for 15 minutes on level ground.

Nurses also suggested that the tool's three questions be reordered to enable patients to first rate the most important item—“breathing discomfort right now”—allowing nurses to forgo further assessment if the patient is not currently experiencing dyspnea. And they suggested that the third question be changed to provide a better picture of the patient's dyspnea before coming to the hospital—by taking into account

that ED interventions may alleviate symptoms before the patient is admitted to a unit.

## DISCUSSION

Of the 1,028 patients admitted to the pilot units during the study period, 377 (37%) had no documentation of having had a dyspnea assessment in their IPA. The 63% adherence rate among participating nurses is comparable to rates reported for the documentation of pain assessment in hospitalized patients, which ranges from 63% to 83% in published studies.<sup>21-25</sup> The study most closely comparable to ours, in that it examined pain ratings on nurse-completed admission forms in a general adult hospital population, reported a rise in documentation from approximately 56% to 63% after the introduction of a year-long pain care improvement program.<sup>24</sup>

dyspnea above a certain level triggers explicit treatment or further investigation), its value might be better appreciated.

**Identified areas for improvement.** Our findings support that a three-question dyspnea assessment tool, such as the one we tested, can be integrated into the IPA used on hospital inpatient units. Review of our pilot data and nurse feedback highlighted several areas in which we could improve our educational program and fine-tune our assessment tool.

Since nearly all nurses providing feedback indicated that dyspnea assessment is important, we believe that nurses' reluctance to use the tool on an ongoing basis throughout a patient's hospitalization may be related to inadequate recognition of the value of documented, standard measures. From this we've concluded that one component of our educational program requiring

## Some nurses indicated that the addition of a standardized assessment form to the IPA had improved their ability to assess dyspnea.

**Assessment opportunities.** A large number of nurses reported using the tool on fewer than 10 patients, although some assessed more than 30 patients. The opportunity to use the tool depended on the number of shifts each nurse worked and the number of patients each nurse admitted during the short pilot period.

**Unit variation.** Higher overall adherence on the oncology unit could be attributed to greater reinforcement and the presence of a clinical nurse specialist on the unit. The fact that the clinical nurse specialist and unit educator were available for support and reminders only on weekdays may explain why weekend adherence dropped on the unit. All four units demonstrated increased adherence over the course of the pilot, which is likely attributable to ongoing education.

**Documentation burden.** Concurrent with this pilot study, our institution rolled out a large number of patient safety initiatives, including a new nursing note on the medical-surgical units, a "quiet at night" plan, new fall prevention strategies, and reinforcement of patient identification principles for initiating telemetry. Multiple projects competing for the interest of clinicians and adding to nurses' documentation burden may account for some of the resistance to documentation. Seamless integration of dyspnea assessment into the established electronic IPA is likely to reduce the documentation burden. Additionally, if we link dyspnea assessment to specific patient care resources and dyspnea interventions (so that a patient report of

improvement is the topic of standardized, recorded assessments and how they can strengthen continuity of care, track and improve symptom management, and predict adverse events.

The nurses suggested revising both the content and the order of the questions in the tool. The dichotomy between the MRC scale and the actual experiences of the patients may explain why the first question on the tool elicited the greatest number of blank responses and "unable to respond" answers. We have since revised the tool to be better aligned with our inpatients' activities of daily living, using descriptors such as mowing the lawn or raking leaves as examples of "heavier activity" and eating, dressing, or preparing lunch as examples of "lighter activity." We have also added a question asking patients to rate any breathing discomfort they experienced within the 24 hours preceding hospitalization in the hope that this will capture patients whose dyspnea was alleviated through ED interventions.

The paper form used in the pilot alongside our electronic IPA interrupted work flow. Some of the missing documentation was likely completed but improperly filed. In the future, the dyspnea assessment tool will be incorporated into the electronic IPA to streamline work flow and capture all records.

Our revised dyspnea assessment tool will allow the nurse to omit the assessment of change in dyspnea over the past week if the patient is not currently experiencing and hasn't experienced dyspnea in the

previous 24 hours. The electronic version of the form will not allow nurses to skip questions.

**Limitations.** Our study was substantially limited by the use of a paper tool to administer the assessment. This likely reduced both utilization and appropriate filing of documentation. Moreover, the assessment tool was not designed for patients with limited English proficiency. This may explain why 33% of nurses rated their patients' understanding of the questions as "poorly understood." It could also have contributed to the high number of blank and "N/A" responses. Translation of the instrument into the most common languages in use in the hospital's catchment area will improve responses.

It appeared that a large number of patients, 115 of the 651 assessed (18%), answered "N/A" to the question assessing change in dyspnea over the past week. Nurses in the focus groups explained, however, that "N/A" was often entered when patients reported having dyspnea only during strenuous exercise and no dyspnea at the time of assessment.

A total of 430 patients (66%) in our pilot study reported having no dyspnea at the time of the assessment. Because our "dyspnea now" question asks patients to rate their dyspnea within hours of hospital arrival but after emergent treatment, the majority of patients who had dyspnea on arrival may have received ED treatment that improved their symptoms before their IPA was conducted on the inpatient unit.

## CONCLUSION

Dyspnea is a symptom that commonly distresses hospitalized patients, and it is also an important predictor of adverse outcomes. Our study suggests that a brief dyspnea assessment tool can be integrated into the nursing IPA on inpatient units. The measurement tool we developed is fast, noninvasive, and inexpensive. Nurse feedback revealed a need to revise the tool and to improve nurse education regarding the value of standardized, recorded dyspnea measurements. We are confident that these revisions, which we are undertaking with the support of senior nursing leadership before hospital-wide implementation, will improve ease of use and better our admission process. ▼

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