Smoking Cessation Counseling in U.S. Hospitals: A Comparison of High and Low Performers

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Abstract

- *Objective:* To identify differences between hospitals that consistently provide smoking cessation counseling to their patients and those organizations that do not with respect to counseling practices, perceived organizational barriers, and perceptions of hospital leadership.
- *Design:* Quantitative survey research.
- *Setting and participants:* 113 acute care hospitals selected as high or low performers based on smoking cessation counseling performance measure data submitted for inpatients admitted with acute myocardial infarction, heart failure, or pneumonia between 1 July 2002 and 31 March 2004.
- *Methods:* A 30-item, 2-part survey was developed to evaluate smoking cessation counseling practices in acute care hospitals. The first part of the survey was completed by the hospital's chief executive officer and included 3 items addressing perceptions related to smoking cessation counseling. The second part of the survey included 27 items and was completed by hospital staff. Items addressed documentation practices, counseling methods, training programs, evaluation practices, and perceived barriers. Fisher's exact tests were used to compare survey results of hospitals identified as high or low performers based on their smoking cessation counseling performance measure rates.
- *Results:* Statistically significant differences in counseling practices, perceived organizational barriers, and perceptions of hospital leadership were observed between hospital groups.
- *Conclusion:* Despite widespread knowledge of the harmful effects of smoking for acute myocardial infarction, heart failure, and pneumonia patients and the well-established benefits associated with smoking cessation counseling for these patients, more needs to be done to take advantage of hospitalization as an opportunity to provide smoking cessation counseling.

Smoking is a serious public health problem, with an estimated 440,000 Americans dying from diseases caused by smoking each year [1]. Smoking accounts for 1 out of every 5 deaths in the United States and is the most important modifiable cause of premature death [2]. The dangers associated with smoking, which have been acknowledged by researchers and health professionals for decades [3], are further exacerbated among patients with serious medical conditions such as cardiovascular or respiratory illnesses. Smoking has been shown to trigger coronary spasm, reduce the anti-ischemic effects of β blockers, and substantially increase the risk of mortality after acute myocardial infarction (AMI) [3–6]. Suskin et al demonstrated that quitting can reduce the risk of recurrent congestive heart failure or AMI within 3 years and can be as effective as certain drug treatments in patients with left ventricular dysfunction [4]. Smoking has been shown to be a contributing factor in many pneumonia cases, and the American Thoracic Society has identified it as a significant risk factor for pneumonia [5]. One study estimated that one third of observed pneumonia cases in adults would have been avoided if no one in the population had smoked [6].

In 1992, the Joint Commission on Accreditation of Healthcare Organizations introduced standards to make hospitals smoke-free, resulting in the nation's first industry-wide ban on smoking in the workplace [7,8]. This initiative provided a window of opportunity or teachable moment in which clinicians could provide smoking cessation advice, counseling, and tools for many hospitalized patients, as smokers would have to quit during their inpatient stay [9]. Since that time, a number of studies have demonstrated that providing smoking cessation counseling during hospitalization significantly increases the chance that patients will quit smoking following their inpatient stay [2]. AMI patients, for example, who receive even brief smoking cessation advice from their

physicians are more likely to quit than those who receive no counseling at all [10]. The smoking cessation literature clearly documents the effectiveness of a wide range of treatments, from brief clinician advice to specialist-delivered intensive programs, including pharmacotherapy [2,3,11]. These programs have been shown to be cost-effective relative to other commonly used disease prevention interventions and medical treatments [2,12,13].

Despite the documented benefits of smoking cessation and documented efficacy of smoking cessation counseling, many hospitals fail to consistently provide smoking cessation counseling to inpatients. In fact, based upon performance measure data from 3400 accredited hospitals that regularly submit data to the Joint Commission, AMI, heart failure, and pneumonia patients who have been identified as smokers (as of March 2004) received smoking cessation counseling only 83%, 68%, and 64% of the time, respectively. While this is a significant improvement over rates from 2 years earlier (65%, 40%, and 34%, respectively), there is still room for improvement [14]. The Joint Commission data are consistent with statistics reported by the Agency for Healthcare Research and Quality in its 2003 National Healthcare Quality Report. The report cited a 42% smoking cessation counseling rate for hospitalized AMI patients as evidence of the failure to consistently provide preventive care to inpatients [15].

Given the negative impact of smoking on AMI, heart failure, and pneumonia patients and the benefits associated with smoking cessation counseling, it is important to understand more about why some hospitals excel and other hospitals fail to consistently provide cessation counseling to their patients. Through the use of smoking cessation counseling performance measure data and targeted survey data, we sought to identify differences among hospitals with respect to counseling practices, perceived organizational barriers, and perceptions of hospital leadership among those hospitals that consistently provide smoking cessation counseling to their patients and those organizations that do not. The same differences were also investigated among hospitals that demonstrated various degrees of improvement in their smoking cessation counseling rates over a 21-month period.

Methods

Participants

Hospitals were identified for inclusion in the study using standardized performance measure data submitted over 7 quarters (1 July 2002 to 31 March 2004). The 3361 hospitals submitting smoking cessation counseling data to the Joint Commission for at least 1 measure (AMI, heart failure, or pneumonia) were ranked according to their performance on each measure. Average ranks were calculated for hospitals collecting data on more than 1 smoking cessation counseling measure. Hospitals were sorted with respect to average mea-

sure rank, and 300 hospitals from the top and bottom ranks were identified. This effectively eliminated hospitals with discrepant ranks (high performance on 1 measure and low performance on another measure). Hospitals were then resorted by each hospital's total number of cases over the 7 quarters, and hospitals with fewer than 20 cases were excluded from the study. A total of 185 hospitals (110 high rank and 75 low rank) remained and were included in the initial sample. These hospitals were mailed a survey package, including a cover letter to chief executive officers (CEOs) instructing them on what part of the survey to answer and what part to forward to staff. The letter also indicated that the completion of the questionnaire was voluntary, that participation had no influence on accreditation, and that individual performance results would not be released. It was requested that both parts of the survey be returned separately in postage prepaid envelopes. This step was taken to allow the CEO and hospital staff to independently respond to questions.

Measures

Since 1999, the Joint Commission has solicited input from a variety of stakeholders, including clinical professionals, hospitals, consumers, state hospital associations, and medical societies, about potential focus areas for an initial set of standardized hospital performance measures. Four initial focus areas were identified by disease/condition: AMI, heart failure, pneumonia, and pregnancy and related conditions. Advisory panels were convened to identify sets of measures in these areas that, when viewed together, permit a robust assessment of the care provided in a given focus area. Stakeholder engagement was actively sought, which helped to shape the specifications for the initial measure sets. These sets were tested during an 18-month, 83-hospital pilot project to evaluate the reliability, feasibility, usefulness, and costs associated with the implementation of standardized measures [16].

Within the AMI, heart failure, and pneumonia measure sets are identically defined measures that address the provision of smoking cessation counseling to adult patients in each of the 3 populations. The measures target all patients aged 18 years or older with a history of smoking cigarettes anytime during the year prior to hospital arrival. Rates are calculated based on the number of patients receiving some form of smoking cessation counseling (documentation of any direct discussion with the patient, brochures, handouts, videos, referral to smoking cessation resources, and/or prescription for a smoking cessation aid) prior to discharge. Patients who were transferred to another hospital, were transferred to hospice care, left against medical advice, or expired during the stay were excluded from the population, since the hospital may not have had an opportunity to provide these patients with appropriate counseling. It is an

expectation, therefore, that all the patients who are included in the measure population should receive smoking cessation advice/counseling [18]. Since 1 July 2002, in order to comply with the Joint Commission's hospital accreditation requirements, accredited hospitals have submitted monthly data on these standardized performance measures to the Joint Commission on a quarterly basis.

Instrument

To evaluate hospital practices associated with smoking cessation counseling, a 2-part questionnaire was developed specifically for the study. Initial drafts of the questionnaire were constructed from a review of literature. Specific questions related to assessment, documentation, counseling practices, and commonly identified barriers were included. For example, the Agency for Healthcare Research and Quality clinical guideline on treating tobacco use and dependence [2] outlines a 5-step approach (the 5 As) for clinicians to introduce smoking cessation to patients: **A**sk if the patient uses tobacco; **A**dvise the patient to quit; **A**ssess the patient's willingness to make a quit attempt; **A**ssist the patient in making an attempt to quit; and **A**rrange for follow-up contacts to prevent relapse. These steps were incorporated into questions addressing the assessment of smoking status and hospital counseling practices. The literature review similarly shaped additional questions that addressed staff education practices, which clinicians are providing counseling, institutional commitment to smoking cessation, and other topics.

The questionnaire was reviewed by content experts at the Smoking Cessation Leadership Center at the University of California San Francisco and pilot tested in 3 hospitals. Each hospital completed the questionnaire and provided written feedback on the questionnaire's organization, clarity, and content. The questionnaire was revised and again reviewed by staff at the Smoking Cessation Leadership Center.

The final version of the questionnaire consisted of 2 parts. The first part was a 3-question survey to assess the CEO's perceptions of smoking cessation counseling. The 3 questions were: (1) What role do you believe hospitals should play with respect to helping their patients quit smoking; (2) In the context of setting organizational goals, what priority do you place on providing smoking cessation counseling to patients; and (3) To what extent have the resources your hospital has committed to providing smoking cessation counseling been well invested. CEOs were asked to respond using a 10-point rating scale.

The second part of the questionnaire was designed to be completed by a hospital staff member (identified by the CEO) who was familiar with actual smoking cessation counseling practices in the organization. This 27-item instrument contained both open- and close-ended questions addressing topics such as assessment of a patient's smoking status, hospital

counseling practices, documentation practices, training, resources, and evaluation of hospital staff. A copy of the survey may be obtained by contacting the corresponding author.

Statistical Analysis

Data were analyzed in 3 phases.

<u>Phase 1</u>. The first phase was designed to examine differences between high rank and low rank hospitals. Survey questions were summarized within both performance groups and compared using Fisher's exact test.

<u>Phase 2</u>. The second phase was designed to assess the relationship between CEO perceptions and responses to staff survey items. Hospitals were categorized by CEO perception using the 3 perception questions on the CEO section of the survey. For each of the 3 questions, hospitals were designated as high perception (above the median) or low perception (below the median) and then compared according to response to individual survey items and, when appropriate, according to frequency of responses for "check all that apply" survey items (ie, total number of "check all that apply items" identified). Staff survey questions were summarized by CEO perception group and compared using Fisher's exact test.

<u>Phase 3</u>. The final phase of analysis used longitudinal data to explore smoking cessation counseling performance measure trends (rate of improvement) in participating hospitals. The performance measure data were aggregated for each quarter for each of the 3 smoking cessation counseling measures, and the first quarter of data was used to calculate the baseline value. An analysis of covariance model was used for each measure. The rates were modeled with fixed effects for quarter, performance group, and the interaction of quarter and performance group with the baseline value as a covariate. Hospitals with baseline measure rates of 100% were excluded from the analysis to reduce the impact of ceiling effects.

Results

Response Rates

Of the 185 hospitals (110 high rank and 75 low rank) that received the survey, 113 (61%) completed both parts and were included in the analysis. Among survey respondents, the ratio of high rank to low rank hospitals was 76 (67%) to 37 (33%). The mean performance measure rates of high rank and low rank responding hospitals remained consistent with the mean measure rates observed in the initial sample. Demographic characteristics (average daily census, bed size, rural/urban location, teaching status, and American Medical Association resident status) and measure rates were compared across high and low rank hospitals and across the initial sample and survey respondents. The only discrepancy was a 12% increase in

Table 1. Demographics and Smoking Cessation Counseling Measure Rates of Participating Hospitals

	No. of Hospitals	Average Daily Census*	Average Bed Size*	% Rural Hospitals*	% Teaching Hospitals*	% AMA Resident Hospitals*
Initial sample	185	177.3	269.9	25	12	29
High rank	110	171.6	266.9	24	11	30
Low rank	75	185.5	274.2	27	14	29
Surveys received	113	169.9	258.3	27	12	28
High rank	76	171.7	260.5	26	10	26
Low rank	37	166.1	253.6	30	16	32

	Average Smoking Cessation Counseling Measure Rates (7 quarter aggregate)		
	AMI Measure (no. of cases)	Heart Failure Measure (no. of cases)	Pneumonia Measure (no. of cases)
National rate	0.74 (176,720)	0.54 (166,519)	0.49 (194,182)
Initial sample			
High rank	0.92 (4962)	0.85 (10,883)	0.82 (13,630)
Low rank	0.38 (3614)	0.17 (4432)	0.15 (7368)
Surveys received			
High rank	0.91 (4490)	0.86 (8083)	0.82 (10,312)
Low rank	0.5 (1930)	0.19 (2177)	0.16 (3909)

AMA = American Medical Association; AMI = acute myocardial infarction.

*Data aggregated from the American Hospital Association, Healthcare QuickDisc, Winter 2003.

the mean measure rates of respondents on the AMI smoking cessation measure. No other differences were observed between groups (**Table 1**). Of the 113 participants who completed the staff section of the survey, 96 identified their educational degree (3 associates, 51 bachelors, 37 masters, 2 MDs, and 6 PhDs). Seventy respondents identified themselves as nurses.

Due to the large number of statistical analyses performed for the high/low rank hospitals and for the CEO perception categorization (a total of 206 comparisons), the number of statistically significant results that might be expected by chance alone at the $P < 0.05$ level was calculated to be 12. This was compared with the total number of statistically significant results that were actually observed: 33. Because the number of statistically significant results observed far exceeded the number of statistically significant results that would have been expected by chance, no statistical adjustment to P values reported for these analyses was deemed necessary.

High Rank versus Low Rank Hospitals

Hospitals with high smoking cessation counseling measure rates and those with low measure rates were compared by individual item response. Whenever appropriate for "check all that apply" survey items, hospitals were also compared by frequency of responses (ie, number of "check all that apply items" identified). Among the 27 items included on

the hospital staff survey, statistically significant differences between high rank and low rank hospitals were observed on 8 items ($P < 0.05$). Results for selected questions are presented in **Table 2**. No statistically significant differences between high rank and low rank hospitals were observed with respect to the types of questions used to assess smoking status, where (in the medical record) smoking status or smoking counseling is documented, topics addressed during counseling, knowledge of telephone quit lines, barriers to providing smoking cessation counseling, use of staff inservices on cessation counseling, or the practice of evaluating the impact of smoking cessation counseling.

Among the 3 CEO questions, CEOs from high rank organizations tended to rate the value of their investment in smoking cessation counseling resources more positively than did CEOs from low rank hospitals (F = 4.78; $P < 0.05$). The mean CEO rating of hospitals in the high rank group was a full point higher than that of hospitals in the low rank group (high $\bar{x}$ = 6.9, SD = 2.1; low $\bar{x}$ = 5.9, SD = 2.6). In contrast, there were no statistically significant differences between high rank and low rank hospitals in terms of CEO perceptions of the role that hospitals should play in helping patients quit smoking (high $\bar{x}$ = 7.9, SD = 2.0; low $\bar{x}$ = 7.4, SD = 2.3) or in CEO perceptions of smoking cessation counseling as an organizational priority (high $\bar{x}$ = 7.3, SD = 2.4; low $\bar{x}$ = 6.9, SD = 2.3).

Table 2. Statistically Significant Differences Between High Rank and Low Rank Hospitals

Survey Item	Low Rank Hospitals, *n* (%)	High Rank Hospitals, *n* (%)	*P* Value
Frequency with which smoking status is evaluated (80%–100% of patients evaluated)	28 (76)	74 (97)	0.001
Use of prescriptions for smoking cessation aids other than nicotine replacement therapy (eg, bupropion, nortriptyline)	6 (17)	28 (38)	0.045
Use of referral to support groups	8 (23)	33 (45)	0.035
Frequency with which smoking cessation counseling is documented (documented for 80%–100% of patients)	12 (34)	61 (82)	< 0.001
Smoking cessation counseling documented in a specific location in the medical record	26 (74)	69 (93)	0.011
Staff uses American Cancer Society as a resource	18 (51)	55 (74)	0.028
Staff uses American Heart Association as a resource	16 (46)	51 (69)	0.034
Hospital allows physicians to write exceptions to the hospital's smoking policy	20 (61)	28 (38)	0.038
Staff usually solicits the assistance of patient family members as part of the smoking cessation counseling process	1 (3)	13 (18)	0.033
Hospital smoking cessation counseling practices can serve as a model for other hospitals	6 (27)	23 (53)	0.065
Total number of counseling methods identified*	159 (35)	391 (42)	0.009
Total number of resources identified*	126 (19)	222 (26)	< 0.001

*Total number of responses to a "check all that apply" type question. Percentage represents the proportion of total responses divided by the total number of possible responses × 100.

CEO Perceptions and Survey Items

Among the 3 CEO perception questions, perception of return on investment was the only item that produced consistent differences among survey items. Hospitals with CEOs in the high perception group (*n* = 62) were significantly more likely to formally evaluate the effectiveness of counseling and to hold staff inservices on smoking cessation counseling than were the low perception group (*n* = 51) (*P* < 0.05). They were also significantly less likely to view lack of training or lack of resources as a barrier to the provision of counseling (*P* < 0.05) (**Table 3**). In contrast, the other 2 CEO perception questions (ie, hospital's role in helping patients to quit smoking and hospital's identification of smoking cessation as an organizational priority) were not associated with differences on survey items. These CEO perception questions were frequently scored high by participants (median response, 8/10 for the first 2 questions and 7/10 for the CEO perception of return on investment question).

Rate of Improvement

For each smoking cessation counseling measure (AMI, heart failure, and pneumonia), the rate of change over time (slope) was calculated over the 7 quarters of data collected. The **Figure** illustrates the measure rates observed over the course of the study for high and low performers. Among the hospitals included in the study, the rate of change was statistically significant across all 3 patient populations: AMI (+2.2% per quarter; *P* < 0.001), heart failure (+3.5% per quarter; *P* < 0.001), and pneumonia (+3.4% per quarter; *P* < 0.001). There was no statistically significant difference among the rates of change observed for high rank and low rank hospitals.

Discussion

On average, high rank hospitals and low rank hospitals provided smoking cessation counseling to patients at dramatically different rates in the AMI (91% versus 50%), heart failure (86% versus 19%), and pneumonia (82% versus 16%) populations. Given the differences in measure performance between groups, it is encouraging that survey results revealed a number of statistically significant differences in perceptions and processes between these groups. High rank hospitals were more likely to indicate that they consistently identified and documented the smoking history of patients and consistently documented attempts to counsel those patients. The medical staff from high rank hospitals tended to use a greater number of counseling methods, and in particular referred patients to support groups and provided prescriptions to smoking cessation aids (eg, bupropion, nortriptyline) more frequently. Staff at high rank hospitals consistently relied on a greater number of resources to assist them in smoking cessation efforts, and they were specifically more likely to reference the American Cancer Society and the American Heart Association for information.

Table 3. Statistically Significant Differences Between Hospitals with High and Low Chief Executive Officer Perceptions of Return on Investment

Survey Item	Low Perception, n (%)	High Perception, n (%)	P Value
Frequency with which smoking cessation counseling is documented (documented for 80%–100% of patients)	26 (54)	47 (77)	0.014
Smoking cessation counseling documented in a specific location in the medical record	37 (77)	58 (95)	0.008
Smoking cessation counseling resources relied on by staff			
U.S. Department of Health & Human Services	3 (6)	18 (30)	0.003
Smokefree.gov	1 (2)	9 (15)	0.040
Other	8 (17)	23 (38)	0.019
Hospital holds staff inservices on how to provide smoking cessation counseling	4 (8)	24 (39)	< 0.001
Hospital formally evaluates the value/usefulness of staff inservices	3 (7)	16 (27)	0.010
Hospital formally evaluates the effectiveness (patient quit rates) of smoking cessation counseling efforts	4 (9)	17 (29)	0.013
Barriers to providing smoking cessation counseling at your hospital			
Lack of training/expertise on how to address the subject	21 (45)	15 (25)	0.042
Lack of training/expertise on resources available to help patients	20 (43)	11 (19)	0.010
Hospital smoking cessation counseling practices can serve as a model for other hospitals	6 (27)	23 (53)	0.065
Total number of counseling methods identified*	213 (34)	344 (44)	< 0.001
Total number of barriers identified*	221 (33)	212 (25)	0.001
Total number of resources identified*	79 (16)	266 (27)	< 0.001

*Total number of responses to a "check all that apply" type question. Percentage represents the proportion of total responses divided by the total number of possible responses × 100.

Many of these specific differences might be generically categorized as differences in culture. Hospitals that consistently provided counseling seem to take smoking cessation counseling more seriously than low performers. They document more consistently, employ more counseling methods, and access more resources. This difference in culture may be most profoundly illustrated by the refusal to allow physicians to write exceptions to the hospital's no smoking policy for their patients. In fact, the results of this study are consistent with the findings of Emmons et al in a 2000 study of organizational characteristics and the adoption of workplace smoking policies; leadership characteristics, in particular, had a significant impact on smoking policies [18].

Predictably, hospitals with CEOs who had a high perception of return on investment were statistically significantly more likely to accurately document smoking cessation counseling, employ a greater number of counseling methods, and view themselves as models for other hospitals—all characteristics common to hospitals with high smoking cessation counseling rates. High rank hospitals were more likely to have CEOs who believed that the resources they spent on smoking cessation counseling had been well invested. This finding may indicate a need to educate health care executives

on the variety of ways to approach smoking cessation counseling programs, as research has demonstrated that programs are generally considered to be cost-effective [18,19].

Hospitals in the high CEO perception group were also more likely to formally evaluate the effectiveness of counseling. Without inferring cause and effect, it seems reasonable to assume that the perception of return on investment would be related to the experience of evaluating the effectiveness of that investment. As one might also expect, hospitals with high CEO perceptions of return on investment identified fewer barriers to providing smoking cessation counseling than did hospitals with a low CEO perception of return on investment. One interesting discrepancy between high performing hospitals and those with high CEO perceptions of return on investment was related to the training of hospital staff. Training, as represented by staff inservices, appeared to be more closely linked to CEO perception than to actual performance on the measures. Hospitals in the high CEO perception group were more likely to hold staff inservices on smoking cessation counseling. No such relationship existed between high rank and low rank hospitals.

The positive influence of supportive leadership has been well illustrated by the Veterans Health Administration. Their
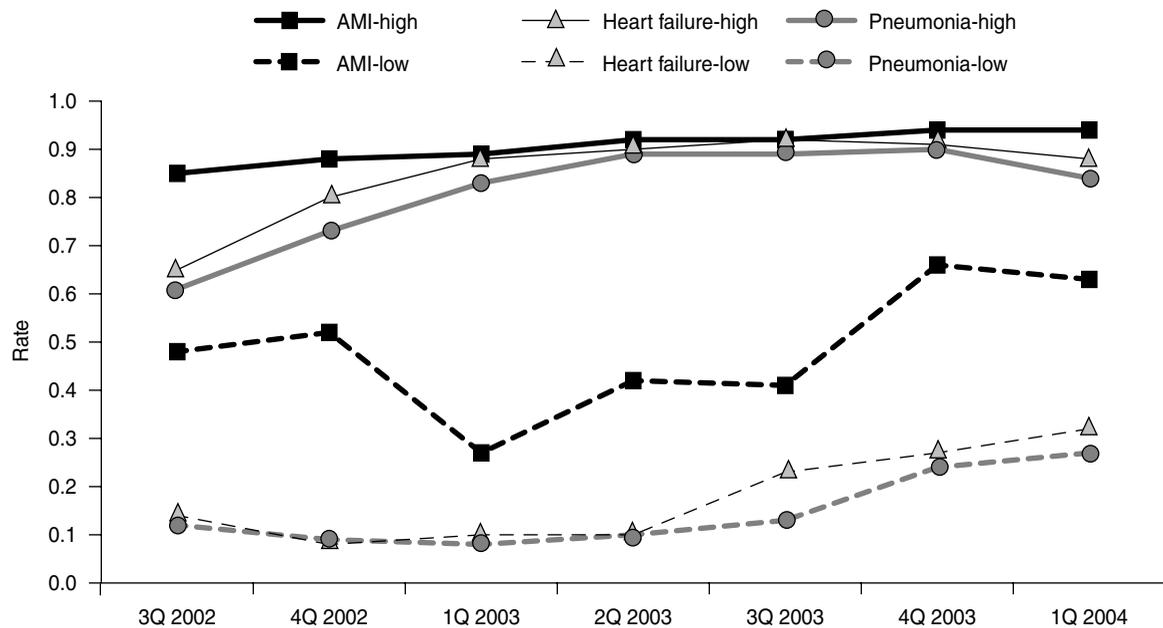
Figure. Smoking cessation counseling measure rates in high rank and low rank hospitals according to patient population: acute myocardial infarction (AMI), heart failure, and pneumonia.

system-wide mandate to evaluate each patient's smoking history and provide smoking cessation counseling led to a dramatic increase in the percentage of patients who received smoking cessation counseling [20]. This improvement was attributed to the top-down commitment and buy-in from leaders, not just commitment from caregivers alone [21].

The lack of statistically significant differences among hospitals with higher or lower baseline performance on the smoking cessation counseling measures was initially surprising. It is possible, however, that this analysis was confounded by the selection of the study sample. By including only high and low rank hospitals in the initial sample, it is likely that the "rate of change" variation was artificially limited. Future research should sample hospitals based solely on high/low rate of change criteria to eliminate this confounder.

This study is limited by a number of factors. First, the differentiation between high rank and low rank hospitals was based on self-reported performance data. It is possible that differences in smoking cessation counseling rates reflect differences in documentation practices, although the use of data submitted at 7 unique points in time over 21 months, and the slope of improvement observed help to diffuse those concerns. Similarly, survey results were also self-reported, and reflected the opinions and perceptions of the CEO and selected staff in each hospital. It is possible that these perceptions do not accurately reflect the actual practices in each hospital. Second, high and low performance ranks were based upon the measurement of a hospital's provision of any

form of counseling (any direct discussion with the patient, brochures, handouts, videos, referral to smoking cessation resources, and/or prescription for a smoking cessation aid) versus the failure to provide any such counseling. As such, the ranks do not account for differences in the type or intensity of smoking cessation counseling. Third, the reclassification of hospitals based upon responses on the CEO perception survey is confounded by the original ranking and selection of hospitals as high and low performers. It is not known how this confounder may have influenced the analysis. Finally, differences observed do not imply causation. Future research should examine how controlled interventions, addressing the differences observed in this study, might impact the performance of smoking cessation counseling practices in hospitals.

In summary, these data suggest that differences in counseling practices, perceived organizational barriers, and perceptions of hospital leadership are correlated with the provision of smoking cessation counseling. Despite the widepread publication of the harmful effects of smoking for AMI, heart failure, and pneumonia patients and the well-established benefits associated with smoking cessation counseling for these patients, more needs to be done to take advantage of hospitalization as an opportunity to provide cessation counseling.

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