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Physicians in Nursing Homes: Effectiveness of Physician Accountability and Communication

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Abstract

Objectives—To develop a measure of the perceptions of nursing home (NH) Directors of Nursing (DON) on the adequacy of physician care and to examine its variation as well as its construct validity.

Design—A nationwide cross-sectional study with primary data collection

Setting—2043 NHs surveyed August 2009 – April 2011

Participants—Directors of Nursing (DONs) and NH Administrators responded to questions pertaining to their perceptions of the care provided by physicians in their NH.

Measurements—Ten items were used to create three domains: medical staff attentiveness, physician communication, and staff concerns about physician practice. These were combined into an overall summary score measure called “Effectiveness of Physician Accountability and Communication” (EPAC). EPAC construct validity was ascertained from other DON questions and from a complementary survey of NH Administrators.

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RESULTS—The established EPAC score is the first measure to capture specific components of the adequacy of physician care in NHs. EPAC exhibited good construct validity: more effective practices were correlated with greater physician involvement in discussions of Do-Not-Resuscitate orders, the frequency that the Medical Director checked on the medical care delivered by attending physician, the tightness of nursing home's control of its physician resources, and the DON's perception of whether or not avoidable hospitalizations and ER visits could be reduced with greater physician attention to resident needs.

Conclusion—As increased attention is given to the quality of care provided to vulnerable elders, effective measures of processes of care are essential. The EPAC measure provides an important new metric that can be used in these efforts. The goal is that future studies could use EPAC and its individual domains to shed light on the manner through which physician presence is related to resident outcomes in the NH setting.

Keywords

physicians; nursing homes; care processes; performance; communication

Introduction

In 2011, there were approximately 1.4 million Americans living in nursing homes (NHs) on any given day.¹ Due in part to assisted living facilities and other community based alternatives, NH residents as a population are sicker and have more care needs than in years past.² The medical model, adopted from hospitals, is the dominant model for thinking about the delivery of care in this setting. In this model, the physician is at the center of diagnostic and therapeutic decision making. Indeed, NHs, like hospitals, are complex organizations in which many healthcare professionals, including physicians, nurses, and aides, must work together to deliver care. Unlike in hospitals, however, there is little actual physician presence in most NHs^{3, 4}, but when they are present, literature suggests they do or should have an impact on the quality of care provided and family satisfaction.⁴⁻⁹ The mechanisms by which physicians' involvement in NH care reflects on quality of care, however, remain unclear.

In seeking to assess quality in the hospital setting, Donabedian proposed causal links between how health care structure impacts care processes which eventually influence health care outcomes.¹⁰⁻¹² Over the years, this hospital framework has been borrowed and applied to the NH setting. A number of structural characteristics of NHs such as size, ownership, chain membership, and NH resources and processes of care such as medical treatments offered and specialized care settings have been examined for their relationship with quality outcomes.¹³⁻¹⁸ While conceptual frameworks relating to hospital care are potentially useful to the study of NHs, a framework focusing on the physician's role in the NH setting had been lacking until recently when the Donabedian framework was adapted by Shield and colleagues⁶ to the delivery of medical care in the NH environment. Labeled the Medical Staff Involvement Model, the authors define communication and coordination of care as the two most important processes within the NH setting. Breakdowns in communication and coordination raise the potential for confusion, errors, and poor care delivery. This is in agreement with other research that has demonstrated that interdisciplinary coordination of

care in the hospital is critical for achieving cost and quality outcomes,¹⁹⁻²³ and that quality provider relationships are crucial for achieving coordination.²¹

Recent studies have related improved care outcomes to physician presence in the NH, medical director certification, NH medical staff organization characteristics, and nurse-physician communication.²⁴⁻²⁹ A recent systematic evidence review of 27 randomized control trials examining interdisciplinary interventions in US NHs between 1990 and 2011 found that successful interventions (i.e., those associated with positive resident outcomes) reflected the importance of the primary role of physicians and/or pharmacists as well as team communication and coordination.³⁰ A study of staff perspectives on avoidable hospital transfers of NH residents indicates that staff perceive missed opportunities before or after the onset of symptoms, gaps in communication, and the lack of (or adherence to) advanced directives and end-of-life care to be among the most common reasons that avoidable or potentially avoidable transfers take place.³¹ In another study of preventable (avoidable) hospitalizations of NH residents in New York state, training of nursing staff on how to communicate effectively with physicians about a resident's condition showed the strongest association with preventable hospitalizations after controlling for other factors.³² These studies begin to highlight the importance of understanding effective processes of care surrounding NH communication and coordination among medical and nursing staff.

Researchers in Nova Scotia, Canada, have recently developed a research agenda to examine a new long-term care facilities model called “Care by Design” that would focus on a dedicated physician role in the NH and an interdisciplinary team approach to care.³³ However, few NHs rely on staff physicians in the United States. Rather, care to residents is often just a small part of a physician's overall practice and actual time spent by physicians in NHs is minimal.³ Therefore, in order to maximize their time spent in the NH setting, the quality and content of their interactions with other NH staff, residents, and families is particularly important to try to understand and quantify.

The purpose of this paper is to suggest an approach to studying the function of physicians in NHs through NH DONs’ perceptions of the adequacy of physician involvement. Drawing upon the findings of the smaller randomized and state-based studies described above, we focused our attention on coordination and communication within the NH. Using a nationally representative sample of NHs in the continental United States, we developed and tested a measure that quantifies a concept we labeled the “Effectiveness of Physician Accountability and Communication” (EPAC). The goal is that future studies could use EPAC and its individual domains to shed light on the manner through which physician presence is related to resident outcomes in the NH setting.

Methods

Data and Samples

NH Administrators and DONs were surveyed using two separate instruments as part of a Program Project (P01) funded by the National Institutes of Health, entitled (*Shaping Long-Term Care in America*). The research protocol was approved by the (Shaping Long-Term Care in America) IRB and the use of data from the Centers for Medicare and Medicaid

Services was approved under a Data Use Agreement. NHs to be surveyed were selected using a stratified sample design. Survey completion took place between August 2009 and April 2011, and surveys for both the Administrator and the DON were sent to each selected NH. A universe of 14,703 NHs was identified consisting of all Centers for Medicare and Medicaid Services (CMS) certified NHs that a) were located within the 48 contiguous states; b) had 30-499 beds; c) were not part of previous pilot surveys or cognitive interviews; and d) had fewer than 20% beds in AIDS or pediatric units. Among these, 4,149 NHs were randomly selected for the study and 4,035 (97%) were deemed eligible upon further inspection. Adjusting for the complex stratified sampling frame, the NHs that answered one or both surveys are representative of the U.S. NH population (Shaping Long-Term Care in America).³⁴

The EPAC measure was created from questions in the DON survey. We received 2,165 completed DON surveys (54% response rate). However, because the surveys were designed for the overarching P01 to inform several separate studies relevant to long term care, to maximize participation rates overall several NHs were given shortened versions of the DON survey after repeated attempts to collect information using the full surveys were unsuccessful. These 122 NHs were dropped from this analysis because the shortened version did not contain the items necessary to measure EPAC, resulting in a starting study sample of 2,043. Compared to those that remained in the sample, NHs with shortened surveys were more likely to be for-profit but did not differ on other NH characteristics such as facility size, chain status, presence of nurse practitioners/physician assistants, resident payer mix or total direct care hours per resident-day (results not shown).

Several measures were used to examine the validity of EPAC. Four measures were taken from the DON survey. The remaining six were created from items in the Administrator survey. Fifty-five percent (2,215) of eligible NHs completed Administrator surveys. Forty-two percent of eligible NHs completed both surveys (1,693 NHs). Therefore, validation of EPAC using these latter measures is based on the smaller sample of NHs with both eligible DON and Administrator surveys (n=1,593). Compared to those that remained in this smaller sample, NHs that dropped out were more likely to be for-profit and have more residents paid for by Medicaid.

Effectiveness of Physician Accountability and Communication (EPAC)

The development of EPAC drew upon findings from three studies preceding the DON survey. The first was a survey of family members of deceased NH residents^{7,35} focusing on communication and quality of care; the second study involved key informant interviews regarding NH physician nurse interactions⁶; and the third study involved in depth interviews with NH DONs and Administrators who were later excluded from eligibility for survey participation.³⁶ Based on the results of these studies and our theoretical understanding of the concepts we wanted to measure, our study team submitted several items to the survey development group of the P01 for inclusion in the DON survey. Because our items were competing for limited survey space with the items of three other studies under the umbrella of the P01, a subset of our proposed items was dropped in favor of similar items submitted by another research team. These items were theoretically very similar to the items that we

had submitted but had the added benefit of being previously validated for a different purpose. This resulted in some items used in our EPAC measure being coded on a four-point Likert scale while others were coded on a five-point scale. In addition, some responses were reverse coded prior to creating a composite score so that higher values were indicative of more positive processes of care.

In order to derive meaningful summaries of the survey questions, we conducted a principal components factor analyses with varimax rotation of 11 survey questions' Spearman correlations. We found that the items collapsed into three factors corresponding to the following underlying domains: *medical staff attentiveness*, *physician communication*, and *staff concerns about physician practice*. One item was dropped because it loaded fairly low and equally onto all three factors. This item was "How often are physicians responsive to nursing concerns about residents?". As a result, the domains were based on 10 survey items.

Medical staff attentiveness included four questions all scored on a 4-point Likert scale ranging from 1 ('Never') to 4 ('Always'). Each was asked of DONs in the context of when residents were at the end of life. They were "How often..." "...are physicians open to staff suggestions about care?"; "...do physicians make referrals for hospice?"; "...are residents' primary care physicians easy to contact?"; and "...do physicians write orders for the appropriate amount of pain medication?".

Physician communication summarized three survey questions. The first, "When residents are at the end of life, do physicians talk openly about the end of life with family members?" was measured on a 4-point Likert scale similar to above. The remaining two questions were measured on a 5-point Likert scale ranging from 1 ('None of the time') to 5 ('All of the time'). They included "How often do physicians communicate with other staff regarding the care of a resident?", and "How often do physicians communicate with family members regarding the care of a resident?"

Staff concerns about physician practice also included three questions, all of which were coded on a 5-point Likert scale ranging from 1 ('None of the time') to 5 ('All of the time'). They included "How often do you {DON} have to..." "... re-contact physicians because orders for medications are unclear?"; "... contact the Medical Director because of concerns about a physician's decision about treatment, or lack of treatment, for a resident?"; and "Does staff have difficulty reaching a resident's physician for advice about care for a resident?". In order to maintain higher responses indicating better processes, as in the previous two dimensions, we inverted the scoring of the responses so that 'None of the time' received a value of 5.

Because some items were scored on a 4-point Likert scale while others were scored on a 5-point scale, to ensure equal weighting of items within and across domains each item was standardized to have a mean of zero and a standard deviation of one before combining into concepts. Within each domain, to reduce the number of NHs dropped due to item missingness, only NHs that were missing on all items were dropped. Otherwise, each domain score was based on the average of non-missing items. Missingness for the three domains was very low ranging from 0.2% to 1.8%. We summed the values of the three

domains to create an overall EPAC score. For this final score, if any of the domains were missing then EPAC was set to missing. Overall, 63 (3.8%) NHs were missing a score and were dropped from further analysis. The NHs that were dropped did not differ significantly from those with a score on any NH characteristics examined (i.e., for-profit status, chain status, facility size, presence of nurse practitioners/physician assistants, payer mix, and total direct care hours per resident day).

Validating EPAC

Because there is no 'gold-standard' against which to formally validate EPAC, we tested several relationships that we hypothesized should exist between a NH's EPAC measure and other measures reported by NH DONs and Administrators. Drawing on the Medical Staff Involvement Model,⁶ we hypothesized that NHs with DONs reporting higher EPAC scores would also:

- be less likely to report that hospitalizations and ED visits could be avoided if physicians paid more attention to residents' changing health;
- be more likely to have meetings between staff and families;
- be more likely to refer appropriate residents to hospice on admission;
- have admitting physicians who would be more likely to clarify preferences regarding do not resuscitate orders (DNR);
- be more likely to have a direct role in the hiring/paying of their physicians;
- be more likely to have Medical Directors who more regularly check up on their physicians;
- be more likely to have greater overall control of physician resources;
- have lower turnover of Administrators and DONs; and
- be more likely to expect physicians to lead team meetings more often.

Measures for Validation

Four measures which were thought to reflect other processes of care within a NH were taken from the DON survey to compare to EPAC. These items were taken from separate sections than the items used to create EPAC. DONs were asked how many hospital or emergency department visits could have been avoided over the past three months if physicians paid more attention to the changing symptoms or health statuses of residents ('none', 'some', 'a lot'). Whether or not there were meetings between staff and family to explain the family's role in their loved one's care had three possible responses: 'yes', 'no', and 'working on it'. DONs were given the following vignette about a person near the end-of-life.

Mrs. Davis has been in your NH for 3 MONTHS. On admission, she was not ambulatory and was a total assist with feeding. She was admitted with advanced heart disease, osteoporosis, a right-hip fracture, and Alzheimer's. She takes oxycodone 10mg EVERY 6 HOURS for pain. In the LAST MONTH, you notice

that she is eating less, she has lost 10 pounds, and coughs when drinking. She no longer recognizes her family.

A series of questions followed the vignette. For this study, we used – “How often in your NH would a resident like Mrs. Davis be referred to hospice... [on admission]?” Responses were ‘never’, ‘sometimes’, ‘often’, and ‘always’.

Finally, DONs were given another vignette followed by a series of questions.

Mrs. Smith is a newly admitted 79 year old resident with colon cancer who has metastases to the liver and lungs. This cancer was diagnosed on a recent hospitalization and Mrs. Smith has been at your nursing home for 2 days. She has worsening shortness of breath and cough. There is no fever or chills. The pulse ox is 94% on 4 liters of oxygen.

After an initial set of questions, DONs were asked to assume that the hospital medical staff did NOT address code status, the goals of care, or the use of hospice with Mrs. Smith or her family. They were then asked the following question which we used in this study: “How likely is it that the admitting physician at your NH would clarify Mrs. Smith's preferences regarding a ‘Do Not Resuscitate’ order?” Responses included ‘not at all likely’, ‘somewhat likely’, and ‘very likely’.

Six additional measures were taken from the NH Administrator survey. The proportion of physicians salaried or contracted within a NH was derived from three questions. Administrators were asked to report on the number of physicians that currently provided primary care to residents in the NH. They were also asked how many were salaried by the NH and, separately, how many were paid by the NH through individual or group contracts. We combined the proportions salaried or contracted within a NH and grouped NHs into the following categories: none, between 0 and 25%, more than 25 and up to 50%, more than 50% but less than 100%, and 100%.

The second measure was how often the Medical Director checks up on the medical care delivered by each attending physician and had the following categories: ‘none of the time’, ‘some of the time’, ‘most of the time’, ‘all of the time’, and ‘Medical Director is the only physician providing care to residents’. The third measure was a comprehensive measure of NH Control of Physician Resources (NHCOPR), which combined aspects of the first and second measures, the credentialing characteristics of the NH, and the proportion of residents cared for by a community physician not under contract by the NH. NHCOPR has a range of 0 to 3, higher values indicating a NH's tighter structural control of the physicians serving residents in their NHs, and is described in more detail elsewhere (Shaping Long-Term Care in America).³⁷

Separate measures captured the number of NH Administrators and DONs that the NH had in the past two years. Finally, responses to how often physicians were expected to lead team meetings were collapsed into ‘none of the time’, ‘a little bit of the time’, and ‘some/most/all of the time’.

Statistical Analysis

A complex sampling design was used for survey administration. Strata were classified based on categories of profit-status, NH-type, bed-size, and percentage non-White residents according to data from the 2008 Online Survey Certification and Reporting (OSCAR) database of U.S. NHs. As a result, survey procedures in Stata were used throughout to adjust for the complex sampling design.³⁸ An exception is the presentation of the distribution of the summary EPAC measure in Table 1 and Figure 1. Here, due to the complexity of quantile estimation from a stratified survey sample³⁹ as well as the limitations of Stata, results are weighted, but do not take into consideration the stratification of the sampling frame. The bivariate relationships between EPAC and other NH processes are presented graphically and adjusted Wald tests were used to test differences between groups.

Results

Overall EPAC Score and Contributing Domains

Table 1 presents survey results pertaining to items present in the EPAC measure. For ease of interpretation, weighted means and standard deviations of individual items are presented prior to standardization. *Medical staff attentiveness* items ranged from a mean of 2.90 (SD=0.75) on a 4-point Likert scale for referrals to hospice to a mean of 3.23 (SD=0.74) for ease of contact. The overall domain had an internal consistency of 0.75 (results not shown). *Physician communication* scores ranged from a mean score of 2.8 (SD=0.79) on a 4-point Likert scale for whether physicians spoke openly about end of life care with the family, to 3.5 (SD=1.04) on a 5-point Likert scale regarding how often physicians communicated with other staff regarding the care of a resident. Internal consistency for this domain was 0.72. Finally, *staff concerns about physician practice* had the highest overall scores on a 5-point Likert scale, ranging from a mean of 3.43 (SD=0.75) for the need to recontact physicians because orders were unclear to 4.15 (SD=0.83) for the need to contact the Medical Director because concerns regarding the physician's decisions regarding treatment. Internal consistency was 0.65. For all domains, higher scores indicated better processes of care.

The final EPAC score is found at the bottom of Table 1, and its distribution in Figure 1. The measure uses 10 items and has an internal consistency of 0.83. Each individual item was standardized to a mean of zero and a standard deviation of 1 prior to creating three domain scores. Positive values indicate that the NH has better than average EPAC scores. Negative values indicate the NH has worse than average EPAC scores. Higher values reflect more effective processes of care.

Validation Measures and Bivariate Comparisons

Table 2 reports the sample distributions of the validation measures and the associations between EPAC and DON-reported NH processes are shown in Figure 2. Recall that the EPAC score contains both negative and positive values, with higher values reflecting more effective processes of care. Error bars reflect 95% confidence intervals. EPAC scores were significantly higher in NHs where DONs reported that no additional hospitalizations or emergency department visits could be avoided if physicians paid more attention to changing health needs of residents compared to NHs in which DONs reported that a lot or some could

be avoided. Compared to NHs with no such meetings, EPAC scores are significantly higher in NHs whose DONs report that they are working on, or already have, meetings between staff and families to discuss the needs of their loved ones. NHs whose DON reported that they would often or always refer a resident like 'Mrs. Davis' to hospice on admission have significantly higher EPAC scores than NHs who would only sometimes or never do so. Finally, EPAC scores are progressively and significantly higher in NHs in which DONs reported a higher likelihood of the attending physician clarifying DNR preferences upon 'Mrs. Smith's' admission, compared to NHs with a lower likelihood of doing so.

The associations between EPAC and Administrator-reported NH processes are presented in Figure 3 for the subset of NHs that responded to both surveys. Compared to NHs that salaried or contracted fewer than 50% of their physicians, those that salaried or contracted all of their physicians had significantly higher EPAC scores. Compared to NHs in which the Medical Director never checked on the medical care delivered by attending physicians, NHs in which the Medical Director always checked had significantly higher EPAC scores. The summary NHCOPR measure also showed positive and significant association with EPAC such that NHs with average or tight control of physician resources had significantly higher EPAC scores compared to those with weak scores. Finally, NHs in which physicians are expected to lead team meetings at least a little bit of the time had significantly higher EPAC scores than NHs in which physicians were never expected to lead such meetings.

Discussion

In this study, we created and tested a measure of the concept of physician-centered processes of care within the NH. Specifically, our measure quantified the effectiveness of physician accountability and communication and staff concerns about physicians' attentiveness. The measure uses 10 items and has an internal consistency of 0.83. Positive values indicate that the physician in these NHs have better than average communication and attentiveness. EPAC showed good construct validity as exhibited by the relationship in the hypothesized direction of EPAC with several other DON and Administrator reported survey responses.

To our knowledge, this paper presents one of the first measures developed for NHs to examine the effectiveness of physician's role in the NH. By surveying DONs's perceptions it is possible to address more directly those processes that challenge staff in providing quality care. In addition, by using a nationally representative survey of NHs to develop the measure, EPAC should be broadly applicable. Another strength of the study design is that the majority of the measures used to validate EPAC were taken from a different survey with a different respondent than the survey and respondent used to develop EPAC itself, limiting any response bias that may occur when the same person is providing information for both the concept being created and the measures used to validate it.

EPAC has the potential to advance our understanding of how well physicians fit within the day-to-day workings of the NH. It measures not only nurse-physician communication, but also the DON's perception of the physician's attentiveness to NH staff, residents, and family members. Another strength of the measure is that it can be broken down into three distinct domains: medical staff attentiveness, physician communication, and concerns about

physician practice. Each of these domains in its own right showed good internal consistency (ranging from 0.65 to 0.75), and may be of unique interest to researchers. In a cursory look at the domains, we found that the relationships between the domains and the measures used for EPAC validation showed similar patterns to the overall EPAC score, though exceptions did occur. For example, unlike the overall EPAC measure, the concerns about the physician practice domain was not related to how often a resident would be referred to hospice on admission (results not shown).

EPAC shows much promise in evaluating the function of physicians in NHs, thereby elucidating the process of medical care in that setting. The next step is to use the measure to closely evaluate its relationship to resident outcomes such as hospitalizations, prescription drug use, and feeding tube use. Once more evidence is gathered on the effectiveness of the EPAC measure in assessing quality, it can be used to help management evaluate the effect of interventions intended to improve medical care. For example, a potential use of the measure is to test its association with the culture change movement that has become an important part of NH quality improvement in recent years.⁴⁰ We hypothesize that NHs that undergo culture change will also improve their medical care processes and this would be measurable through the EPAC measure. EPAC may also be useful in testing whether the recently developed Interventions to Reduce Acute Care Transfers (INTERACT) developed by Ouslander and colleagues improves physicians' attentiveness and communication within the NH.⁴¹

While there are many strengths, the study also has limitations. The EPAC score was derived from questions asked only of DONs. It does not reflect the perspective of other NH staff, in particular that of the medical director. In addition, the responses are based on the aggregate perception of physicians in a NH. Within each NH there is likely variation in the effectiveness of individual physicians. Moreover, in some NHs that have several units the perspectives of the nurse managers of the different units may differ. It may be that EPAC is more appropriately measured at the individual unit level within each NH.

We also point out that many of the measures used to validate EPAC were subjective in nature, however the aggregated relationships that we observed relied on many subjective responses, reducing the likelihood of systematic bias. The surveys used in this study were created by a team of leaders in the fields of health services and NH research and many of the items were rigorously tested using focus groups and cognitive testing during the survey development process suggesting that responses were at least reasonably reliable across respondents. Despite these limitations, EPAC shows promise as a new tool to assess the quality of physician presence in the NH.

Conclusion

As increased attention is given to the quality of care provided to vulnerable elders, effective measures of processes of care are essential. The EPAC measure provides an important new metric that addresses processes of physician care. Development of similar measures based on DON perceptions should be explored as a way to evaluate processes that matter.

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Figure 1.
Weighted Distribution of EPAC

Figure 2.
Mean EPAC Scores by DON-Reported Items Used to Examine EPAC Validation

Figures 3.
Mean EPAC Scores by Administrator-Reported Items Used to Examine EPAC Validation

Table 1Processes of Care Items Used in EPAC Measure (n=2043)^{*}

Concept	Items	Likert Scoring [†]	Mean (sd)
(a) Medical Staff Attentiveness			
	When residents are at end of life are physicians open to staff suggestions about care?	4 point	3.19 (0.70)
	When residents are at end of life do physicians make referral for hospice?	4 point	2.90 (0.75)
	When residents are at end of life are residents' primary care physicians easy to contact?	4 point	3.23 (0.74)
	When residents are at end of life do physicians write orders for the appropriate amount of pain medication?	4point	3.18 (0.72)
(b) Physician Communication			
	When residents are at end of life, do physicians talk openly about the end of life with family members?	4-point	2.80 (0.79)
	How often do physicians communicate with other staff about the care of a resident?	5-point	3.50 (1.04)
	How often do physicians communicate with family members about the care of a resident?	5-point	3.36 (0.88)
(c) Staff Concerns			
About Physician Practice			
	How often do you {DON} have to re-contact physicians because the orders for medications are unclear?	Reversed 5-point	3.43 (0.75)
	How often to you {DON} have to contact the Medical Director because of concerns about a physician's decision about treatment, or lack of treatment, for a resident?	Reversed 5-point	4.15 (0.83)
	Does staff have difficulty reaching a resident's physician for advice about care of a resident?	Reversed 5-point	3.81 (0.84)
Final Effectiveness of Physician Accountability and Communication (EPAC) measure mean=-0.014; sd=1.87; Interquartile range=-1.312 to 1.299			

Note: DON = Director of Nursing

* Individual n's may differ due to item missingness.

[†] Survey item responses were based on either a 4-point Likert scale ranging from 1 (Never) to 4 (Always), or a 5-point Likert scale ranging from 1 (None of the time) to 5 (All of the time) . During concept building, some items were reverse coded 1 (All of the time) to 5 (None of the time) to ensure that higher values reflected more positive responses to all items.

Table 2**Survey Measures Used to Test the Validity of EPAC**

	%
<i>DON-reported survey items</i>	
In the past 3 months, how many resident hospitalizations and emergency department visits do you think could have been avoided if physicians paid greater attention to residents' changing symptoms or health statuses? (n=1992)	
None	39.9
Some	46.2
A lot	13.9
Is it the practice in your NH that meetings between staff and families are held to explain the family's role in its loved one's care? (n=2006)	
No	8.4
Working on it	9.4
Yes	82.2
How often in your NH would a resident like Mrs. Davis be referred to hospice...on admission? (n=1967)	
Never	19.7
Sometimes	53.4
Often	21.9
Always	5.0
How likely is it that the admitting physician at your nursing home would clarify... preferences regarding a "Do Not Resuscitate" order? (n=2012)	
Not at all	11.7
Somewhat	21.9
Very	66.4
<i>Administrator-reported survey items</i>	
Proportion of physicians salaried or contracted (n=1395)	
None	56.6
>0 to 25%	19.4
>25 to 50%	12.8
>50 to <100%	1.9
All	9.3
How often does Medical Director check up on physicians? (n=1434)	
None of the time	13.9
Some of the time	55.4
Most of the time	16.3
All of the time	9.3
Medical Director is the only physician	5.1
NHCOPR (n=1391)	
Weak: 0 to 1	29.9
Average: >1 to 2	44.6
Tight: >2 to 3	25.5
Number of Administrators in past 2 years (n=1580)	
1	67.1

	%
2	21.4
3 or more	11.5
Number of DONs in past 2 years (n=1578)	
1	58.8
2	27.5
3 or more	13.7
How often are physicians expected to lead team meetings? (n=1510)	
None of the time	73.4
A little bit of the time	16.1
Some/most/all of the time	10.5

Notes: EPAC = Effectiveness of Physician Accountability and Communication; NH=nursing home; DON=Director of Nursing; NHCOPR = Nursing Home Control of Physician Resources