Potentially Preventable Hospital and Emergency Department Events: Lessons from a Large Innovation Project

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ABSTRACT

Introduction: There are few proven strategies to reduce the frequency of potentially preventable hospitalizations and Emergency Department (ED) visits. To facilitate strategy development, we documented these events among complex patients and the factors that contribute to them in a large care-improvement initiative.

Methods: Observational study with retrospective audits and selective interviews by the patients' care managers among 12 diverse medical groups in California, Minnesota, Pennsylvania, and Washington that participated in an initiative to implement collaborative care for patients with both depression and either uncontrolled diabetes, uncontrolled hypertension, or both. We reviewed information about 373 adult patients with the required conditions who belonged to these medical groups and had experienced 389 hospitalizations or ED visits during the 12-month study period from March 30, 2014, through March 29, 2015. The main outcome measures were potentially preventable hospitalizations or ED visit events.

Results: Of the studied events, 28% were considered to be potentially preventable (39% of ED visits and 14% of hospitalizations) and 4.6% of patients had 40% of events. Only type of insurance coverage; patient lack of resources, caretakers, or understanding of care; and inability to access clinic care were more frequent in those with potentially preventable events. Neither disease control nor ambulatory care-sensitive conditions were associated with potentially preventable events.

Conclusion: Among these complex patients, patient characteristics, disease control, and the presence of ambulatory care-sensitive conditions were not associated with likelihood of ED visits or hospital admissions, including those considered to be potentially preventable. The current focus on using ambulatory care-sensitive conditions as a proxy for potentially preventable events needs further evaluation.

INTRODUCTION

As concern grows in most countries over increasing health care costs, more attention is focused on reducing waste and unnecessary services.[1] Eddy and Shah[2] have demonstrated that increasing quality of care alone will not have significant cost-saving potential. Emanuel[3] has highlighted the need to focus cost-reduction efforts on the areas with the most potential for both cost savings and quality improvement (unnecessary hospitalizations, Emergency Department [ED] visits, and specialist services).

In the US, the Centers for Medicare & Medicaid Services has implemented the first financial penalties on hospitals for excessive readmissions.[4] Attention likely will be increasingly directed to all hospitalizations because readmissions represent only approximately 9% of hospital admissions, and to avoidable ED visits because of the expense of providing care in this setting and its tendency to lead to unscheduled hospital admissions.[5,6]

There are three problems preventing effective action to reduce potentially preventable events (PPEs): 1) there are no validated methods for identifying patients most likely to have PPEs, 2) there is little evidence for effective prevention strategies, and 3) nearly all the studies of potentially avoidable hospital admissions are misleading because they have used an unproven methodology for measuring these events. This unproven methodology was based on the assumption that most avoidable admissions are caused by conditions believed by expert panels to be prevented by better ambulatory care (therefore called ambulatory care-sensitive conditions [ACSCs]).[7] These conditions were originally identified in the early 1990s by an expert panel of six academic physicians but without any study of those situations.[7] The Agency for Healthcare Research and Quality later labeled these conditions as a measure of quality for access to care (called Prevention Quality Indicators) and provided an updated expert panel review in 2009.[8] The conditions include

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diabetes with complications or hypoglycemia/acidosis, chronic obstructive lung disease, asthma, hypertension, heart failure, dehydration, bacterial pneumonia, urinary tract infections, angina without procedures, lower extremity amputations in diabetes patients, and perforated appendix.

For two decades, admissions for these conditions have been used as the main measure of PPEs.[9-16] However, to our knowledge there have been no published studies of actual cases to confirm either the proportion of hospitalizations attributed to these conditions that are preventable or the proportion of PPE hospitalizations represented by these diagnoses. This observational quality improvement study sought to learn the frequency of PPEs among the complex patients cared for in a large nationwide initiative to spread collaborative care for patients with uncontrolled depression and diabetes and/or cardiovascular disease and whether any characteristics of patients, conditions, or events are of value in predicting which patients are most likely to experience PPEs.

METHODS

Setting

This study was conducted within a large government-funded innovation award to spread an evidence-based model of collaborative care for patients with both active depression and uncontrolled diabetes, cardiovascular disease, or both in 18 diverse medical groups in 8 states in the US. Diabetes was considered uncontrolled if the most recent hemoglobin A_{1C} (HbA_{1C}) level was ≥ 8.0%, and cardiovascular disease was uncontrolled if the systolic blood pressure was ≥ 145 mmHg. A central group defined the care model and then trained facilitators in each medical group on ways to implement it in their care systems. However, as a quality improvement initiative, there were no research staff involved in supporting these efforts (www.icsi.org/supporting_systems_change/compass/). Required components of this care model included use of an electronic registry and tracking system, close follow-up by care managers (most of whom were registered nurses), frequent measurement of condition control, and weekly systematic case reviews with specialty consultants of all patients not improving. Twelve of these 18 medical groups agreed to participate in this review of ED and hospital events among their patients enrolled in the initiative.

Study Patients

Patients were eligible for inclusion in this study if they received care from one of the 12 participating groups, were enrolled in the care model throughout the period being studied (March 30, 2014, through March 29, 2015), and had one or more ED visits or hospitalizations in that period.

Data Sources

As part of the initiative, data were collected on patient characteristics through a practice-based electronic registry that was used for care of both individual patients and panels of patients as well as evaluation of the impact of the initiative. These data included patient age, sex, presence of depression, diabetes, cardiovascular disease, race/ethnicity, and insurance product (commercial, Medicaid, Medicare, or none). They also included Patient Health Questionnaire-9 scores (a survey-based measure of depression severity), blood pressure, HbA_{1C} (a blood test measuring level of blood sugar over long periods), and contact notes as well as date and reason for all known ED visits and hospitalizations.

Audit Procedures

Medical groups that had ≤ 100 patients meeting the audit criteria described above had all qualifying patients included in the audit process; those with < 100 patients had a randomly selected group of 100 patients included to avoid auditor burden and overweighting the sample with patients from a few large medical groups. Avoiding auditor burden and sample overweighting also led to selecting the most recent event of each type (ED or hospital). When available, the second most recent event was also identified in case the first was not auditable owing to missing documentation, a hospitalization for planned surgery, or an ED visit followed by a hospitalization within 24 hours (treated as a hospitalization). Thus, up to 2 of each event type were identified so that up to 1 per type of each event person would be audited.

A chart audit database tool (REDCap [Research Electronic Data Capture], Vanderbilt University, Nashville, TN)[17] contained patient demographic and clinical data to be verified by the auditor as well as questions about the patient, the event, and its preventability. Chart auditors had separate access to discharge summaries and these, as well as the care manager's personal knowledge of the patient's circumstances, were used to quantify and describe the following:

- Admission and discharge diagnoses
- Medical and nonmedical reasons for the event (lack of money, lack of caretaker, lack of patient understanding, inability to access clinic, mental illness, substance abuse, or other)
- Degree of control of depression, diabetes, and hypertension
- Patient treatment adherence
- Contacts with the care manager in the two weeks before the event
- Systematic case review in the two weeks before the event
- Whether the event was caused by any ACSCs.[7,9,18]

On the basis of these data and their own knowledge of the patient, care managers determined potential preventability using this definition: *A problem that might not have occurred or might have been managed at home or in clinic if the care manager had been aware of it in the prior two weeks.*

The audits were performed by the care managers of these patients because they had implicit knowledge of their patients that would facilitate identification of both medical and nonmedical causes. A consulting physician was available if there was need for additional input on the medical preventability of the event. Auditors were provided with a protocol and training to standardize the audit process, but testing of interrater reliability was not feasible because judgments were influenced by the care manager's implicit knowledge of the patient.

Analysis

Demographic and clinical characteristics were described for all patients as well as those with events using means and

standard deviations for continuous variables and percent for categorical variables. The frequencies and rates of events, care manager contacts, and systematic case reviews were determined per patient per month from data in the registry. The χ^2 test was used to test for homogeneity in the distribution of categorical variables, and the *t*-test was used for continuous variables. Logistic regression was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs) for the probability of a PPE in relation to patient characteristics, event characteristics, and ACSCs separately and collectively (ie, any ACSC). Models examining the relationship between the number of care manager contacts or systematic case reviews were adjusted for length of enrollment during the study period; otherwise all models were unadjusted. In a post hoc analysis, a single physician (LS) used the discharge diagnosis to group the medical reason for events by condition and to estimate the medical severity of each case as major (requiring in-person medical attention), minor (not requiring that), or intermediate/indeterminate. Logistic regression was used to examine levels of severity in the probability of PPEs.

This study was conducted from September 1, 2014, through June 30, 2015, and was reviewed by the institutional review boards at all participating groups and approved as exempt as a quality improvement study.

RESULTS

The numbers of patients and events (hospital admissions or ED visits) for each stage in the development of the audited sample are listed in Table 1. Of the 2620 patients enrolled in this initiative during the study year, 978 (37.3%) had 2286 events during the study year, an average of 1.4 ED visits and 1.0 hospitalizations each. The frequency of events per patient varied widely, with 18% having 1 and 1% having 10 or more. Those 1% had a total of 20% of all events, and 4.6% of the patients had 40% of total events.

After applying the exclusion rules below to the 522 patients with 954 events selected for possible audit, only 406 patients and 456 events were eligible for audit, and 373 patients (92% of those eligible) and 389 events (85%) had complete audits. The reasons that 498 events were not audited were as follows:

- One event type already audited for a patient: 118 or 23.7%
- Coincident ED visit and hospitalization: 39 or 7.8%
- Discharge information not available: 134 or 26.9%
- Planned admission: 43 or 8.6%
- Other: 74 or 14.9%
- Not able to be audited within the study time limits: 90 or 18.1%.

The audited sample resembled the unaudited population of all enrolled patients with events except for small differences in racial distribution (8.3% vs 10.6% black) and Hispanic ethnicity (13.3% vs 15.3%), and larger differences in insurance coverage (17.8% vs 24.8% commercial and 55.8% vs 46.5% Medicare).

Table 2 shows the distribution of characteristics of all patients who were enrolled in participating medical groups during the study period. Although these bivariate analyses suggest that some characteristics of patients or their care were significantly associated with either overall events or ED visits and hospitalizations separately, none of these associations was large enough to be clinically significant. Unadjusted logistic regression models predicting the probability of events were also conducted (data not shown in the Table). The main factors associated with both total events and ED/hospital events separately were having Medicaid or Medicare insurance (OR = 1.5, CI = 1.2-1.9) compared with commercial insurance, and patients with both diabetes and cardiovascular disease in addition to depression (OR = 2.2, CI = 1.3-3.6) compared with depression only. Additional patient characteristics were associated with greater likelihood of ED or hospital stays, but none of these associations was large. Degree of control of any of the 3 conditions had no relation to the likelihood of events (data not shown). Two features of the care model were significantly associated with a greater likelihood of events: The number of care manager contacts/month and the number of systematic case reviews/month.

Similar investigation of the relationship between patient characteristics and the presence of PPEs found even fewer statistically significant relationships. The only significant associations were that Hispanic patients were less likely to have PPEs (OR = 0.4, CI = 0.4-0.6) compared with whites, and patients on Medicaid were more likely to have PPEs (OR = 3.6, CI = 1.7-7.8) compared with those on commercial insurance. The likelihood of having audited PPE events was unrelated to the number of events a person had (as long as they had any). This is based on calculated ORs for having a PPE of 0.28 for those with a history of 1-2 events/y, 0.27 if 3-4, 0.55 if 5-6, 0.31 if 7-9, and 0.32 if 10 or more, all with overlapping 95% CIs.

In Table 3, the focus is on events rather than patients. Of the 389 events audited, 109 (28.0%) were considered to be PPEs (39% of the ED visits and 14% of the hospitalizations). PPEs were not associated with any of the conditions included in the ACSCs list, either individually or collectively, but they were associated with nonmedical factors considered by the care

Table 1. Numbers of patients and events in study of potentially preventable hospital and Emergency Department events[a]

	Patients	Events		
		Total	ED visit	Hospitalization
Group	N (%)	N (%)	N (%)	N (%)
At participating medical groups	2620	—	—	—
Patients with events in the study period	978 (37.3)	2286	1366	920
Selected for audit	522 (53.4)	954 (41.7)	504 (36.8)	450 (48.9)
With events eligible for audit	406 (77.8)	456 (47.8)	247 (49.0)	209 (46.4)
Completely audited	373 (91.8)	389 (85.3)	214 (86.6)	175 (83.7)
With PPE	107 (28.7)	109 (28.0)	84 (39.2)	25 (14.3)

[a] Each percentage is in relation to the row above.

ED = Emergency Department; PPE = potentially preventable events—a problem that might not have occurred or might have been managed at home or in clinic if the care manager had been aware of it in the prior two weeks.

managers to have contributed to the event. The ORs (95% CIs) for these factors compared with those without these factors were as follows: Lack of money or other resources, 2.9 (1.4-5.8); lack of caretaker, 3.5 (1.9-6.4); lack of patient understanding, 5.5 (3.4-8.9); and inability to access clinic for care, 1.9 (1.05-3.4).

Of the ED events considered to be PPEs, 75 (89%) were considered able to be cared for in the clinic instead of the ED or hospital within the next week. That was also true for 20 (80%) of the 25 hospital admissions considered potentially preventable.

Table 4 summarizes the discharge diagnoses for audited events. For the ED, the most frequent conditions were traumatic, gastrointestinal, and orthopedic; these conditions also had the highest proportion of events rated as PPEs. In contrast, the most frequent problems leading to hospitalization were cardiovascular, infections, neurologic, gastrointestinal, and psychiatric, whereas cardiovascular and pulmonary problems had the greatest likelihood of being PPEs. Conditions considered major relative to minor severity were much less likely to be PPEs (OR = 0.28, CI = 0.14-0.58), whereas those rated intermediate in severity were also intermediate in the likelihood of being PPEs (OR = 0.49, CI = 0.29-0.84) (data not shown in tables).

DISCUSSION

These results suggest that even among a medically complex set of patients with major mental and physical problems, a sizable proportion of hospitalizations and (especially) ED visits were believed by their care managers to have been preventable. Surprisingly, the level of control of an individual's depression, diabetes, or hypertension had no relation to the likelihood either

Table 2. Bivariate analysis of patient characteristics and care factors in relation to events[a]

	All Events				ED visit			Hospitalization		
Characteristic[b]	Total patients	Patients with no events	Patients with events	p value	No	Yes	p value	No	Yes	p value
N	2620	1642	978		1956	664		2091	529	
Male sex	37.9	38.8	36.3	< 0.05	38.7	35.5	< 0.05	37.2	40.6	< 0.05
Age, y										< 0.05
18-39	6.9	6.5	7.6		6.5	8.3		7.3	5.3	
40-59	46.0	48.4	42.9		46.8	44.7		48.3	38.5	
≥ 60	46.8	45.2	49.6		46.8	47.0		44.4	56.3	
Race[c]				< 0.05			< 0.05			< 0.05
White	75.6	73.8	78.6		74.6	78.9		73.5	84.5	
Black	9.2	8.8	9.7		8.7	10.4		9.1	9.3	
Asian	1.9	1.9	1.8		1.8	1.8		1.8	1.9	
Hispanic ethnicity	16.0	16.9	14.5		15.5	17.5	< 0.05	17.4	11.0	< 0.05
Insurance				< 0.05			< 0.05			< 0.05
Commercial	27.3	30.4	22.1		28.3	25.0		29.6	19.3	
Medicaid	24.8	24.0	26.1		24.5	25.6		24.9	24.2	
Medicare	46.0	43.6	50.0		45.2	47.7		43.6	54.7	
None	1.9	2.0	1.7		2.0	1.7		2.0	1.7	
Conditions				< 0.05			< 0.05			< 0.05
Dep only	3.5	4.1	2.5		3.8	2.5		4.1	1.1	
Dep + Diab	47.7	51.4	41.4		48.5	45.9		51.6	32.9	
Dep + CV	11.5	11.4	11.5		11.8	10.7		11.1	13.2	
Dep + Diab + CV	37.4	33.1	44.6		35.9	40.9		33.3	52.8	
Disease control, mean										
PHQ-9 score	9.1	8.9	9.4		8.9	9.5		9.1	9.1	
SBP, mmHg	126.6	126.5	126.6		126.2	127.5		126.8	125.7	
DBP, mmHg	73.2	73.6	72.7		73.2	73.2		73.7	71.4	
HbA_{1C}, %	8.5	8.5	8.6		8.5	8.7		8.5	8.5	
Care manager contacts/mo, mean	1.0	0.9	1.2	< 0.05	0.9	1.3	< 0.05	1.0	1.3	< 0.05
Systematic case reviews/mo, mean	0.4	0.3	0.5		0.3	0.5		0.4	0.5	
Months enrolled in COMPASS, mean	11.1	11.1	11.2		11.1	11.2		11.0	11.5	

[a] All data are presented as percentages unless otherwise noted.

[b] χ^2 test was used to test for nonrandom distribution across categorical variables.

[c] Some responses to the race questionnaire are not included (Pacific Islander, Native American, Other, Unreported/Refused to answer) so answers do not add to 100%.

CV = cardiovascular disease; DBP = diastolic blood pressure; Dep = depression; Diab = diabetes; ED = Emergency Department; HbA_{1c} = hemoglobin A_{1c}; PHQ-9 = Patient Health Questionnaire; SBP = systolic blood pressure.

of having events or of having events that were considered potentially preventable. It does not appear that any combination of typical medical characteristics would be of much clinical value in identifying patients who are more likely to have PPEs. The largest associations were with nonmedical factors like patient lack of resources, caretakers, understanding, and access to the clinic. Although history of frequent ED visits or hospitalizations does not identify patients at greater risk of preventable events, it seems useful to pay extra attention to the 5% of complex patients who have 5 or more events in a year, since they account for fully 40% of all events and because their audited events were just as likely to be PPEs as those with fewer events.

One of the more interesting findings from these audits was the lack of any association between PPEs and events caused by ACSCs. That was true overall as well as for each of the ACSCs individually, even in patients with two or three ACSCs contributing to their event. That lack of association was especially notable since most of this patient population had four of the ten ACSCs as a reason for enrollment in this program. This may be an important preliminary indication of potential problems with the ACSC list, which was created by expert opinion and, as far as we can tell, has never been validated by actual audit of events.[19] Neither the Web site nor an updated Agency for Healthcare Research and Quality review of the list provides any evidence for such validation, despite the fact that extensive literature has now been published using the ACSC list as a proxy measure of preventability.[7,8] The frequency of these conditions as reasons for hospitalizations has been shown to be associated with insurance status, racial and ethnic status, low income, older age, rural residence, geographic region, physician networks with a higher proportion of primary care physicians, and access.[11,13,16,20-23] The rate of ACSCs among hospital admissions is closely monitored as a marker for overuse.[13,14] But what if this rate turned out to be unrelated to preventability of admissions?

In the mid-1980s, peer review organizations sought to make medical record reviews more efficient by focusing on events more likely to have quality problems. The Minnesota Project studied the value of using 15 sentinel hospital admission conditions

Table 3. Event characteristics in relation to potentially preventable events (PPEs)[a]

Characteristic[b]	All events				ED visit			Hospitalization		
	Not PPE	PPE	Total	p value	Not PPE	PPE	p value	Not PPE	PPE	p value
N	280	109	389		130	84		150	25	
Patient insurance				< 0.05			< 0.05			
Commercial	21.4	9.4	18.1		26.9	12.1		16.7	0.0	
Medicaid	23.5	37.3	27.4		23.5	40.9		24.0	25.0	
Medicare	54.3	51.4	53.5		49.2	44.6		58.0	75.0	
Event because of ambulatory care sensitive conditions										
Overall (any)	56.1	56.0	56.0		45.6	46.4		66.0	88.0	
Diabetes	32.5	26.6	30.9		26.2	19.1		38.0	52.0	
Hypertension	18.2	1.5	16.7		12.3	8.3		23.3	28.0	
CHF	16.4	11.0	14.9	< 0.05	10.8	6.0		21.3	28.0	
Angina	2.9	4.6	3.3		2.3	3.6		3.3	8.0	
Could have been managed in				< 0.05			< 0.05			NA
Clinic next week	0.7	9.3	3.1	1.6		10.8	0.0		4.0	
Clinic following day	5.4	36.1	13.5	10.9		41.0	0.7		12.0	
Clinic the same day	13.7	34.3	20.0	26.6		37.4	2.7		32.0	
Only in ED/hospital	72.2	10.2	54.8	54.7		3.6	87.3		32.0	
Uncertain	7.9	10.2	8.6	6.3		7.2	9.4		20.0	
Event was avoidable for				< 0.05			< 0.05			< 0.05
Medical reasons	3.2	37.6	12.9		4.6	39.3		2.0	32.0	
Nonmedical reasons	5.4	40.4	15.2		10.8	39.3		0.7	44.0	
Nonmedical reasons for event										
Lack of money or other resources	6.4	16.5	9.3	< 0.05	6.2	15.5	< 0.05	6.7	20.0	
Lack of caretaker	8.6	22.8	13.1	< 0.05	11.5	22.6	< 0.05	6.0	32.0	< 0.05
Lack of patient understanding	25.4	65.1	36.5	< 0.05	36.2	64.3	< 0.05	16.0	68.0	
Inability to access clinic	12.5	21.1	14.9		17.7	25.0		8.0	8.0	
Mental illness	15.4	24.8	18.0	< 0.05	17.7	26.2		13.3	20.0	
Substance abuse	5.7	6.4	5.9		6.2	6.0		5.3	8.0	
Other	12.1	9.2	11.3		8.5	9.5		15.3	8.0	

[a] All data are presented as percentages unless otherwise noted.
[b] χ^2 test was used to test for nonrandom distribution across categorical variables.
CHF = congestive heart failure; ED = Emergency Department; NA = not applicable (cells too small to test).

Table 4. Condition type and severity relationship to discharge diagnosis for events

	ED visits (N = 214)		Hospitalizations (N = 175)	
Type	n (%)	PPE, n (%)	n (%)	PPE, n (%)
Traumatic	37 (19.2)	8 (11.1)	10 (6.0)	1 (4.2)
Gastrointestinal	23 (11.9)	12 (16.7)	19 (11.3)	1 (4.2)
Orthopedic	17 (8.8)	11 (15.3)	4 (2.4)	1 (4.2)
Pain	15 (7.8)	1 (1.4)	13 (7.7)	1 (4.2)
Ear, nose, throat	15 (7.8)	7 (9.7)	0 (0)	0 (0)0
Endocrine	14 (7.3)	4 (5.6)	12 (7.1)	2 (8.3)
Infection	13 (6.7)	4 (5.6)	26 (15.5)	2 (8.3)
Neurologic	12 (6.2)	4 (5.6)	21 (12.5)	2 (8.3)
Pulmonary	8 (4.2)	3 (1.4)	17 (1.2)	4 (16.7)
Cardiovascular	5 (2.6)	3 (4.2)	32 (19.1)	6 (25.0)
Psychiatric	4 (2.1)	1 (0)	6 (10.1)	1 (4.2)
Other	30 (15.6)	21 (23.7)	7 (4.2)	3 (16.8)
Total[a]	193	72	168	24

[a] Does not add to 214 and 175 because there were 21 ED visits and 7 hospitalizations with no data for disease category.
ED = Emergency Department; PPE = potentially preventable event.

widely thought to reflect poor ambulatory care (similar to the ACSC list).[24] Review of 673 cases in that project found that only 10% of these cases suggested possible care quality problems. Although that rate made peer review more efficient than random case selection, it is hardly high enough to warrant use as a proxy for poor care or preventable admissions. However, expert panels concluded (without case review) that 50% to 70% of admissions for 96 of 174 conditions (including most of the ACSCs) should be preventable.[12]

The finding that patients with limited resources and lack of caretakers are more likely to have PPEs is not a surprise. However, it does suggest the importance of developing and testing strategies to address these factors. Nagasako et al[25] have demonstrated that adjusting for low socioeconomic status greatly reduced hospital readmission rates for each of the conditions currently penalized by the Centers for Medicare & Medicaid Services. This suggests a need to ensure that nonmedical factors are addressed by coordinated and proactive provision of social services and education in addition to medical and behavioral health care.

The association of events with the number of care manager contacts and systematic case reviews probably reflects the greater attention provided to patients who were experiencing difficulties that later led to events. However, it also suggests that these extra contacts might have provided an opportunity to prevent the events. Preventing unnecessary events is a new perspective for most health care professionals, who are trained to provide care, not to control costs.

Study limitations include the unusual complexity of these patients and that the primary outcome of PPEs was based on the subjective judgment of auditors who used both discharge summary information and personal knowledge from serving as their care managers. Although this familiarity allowed care managers to identify nonmedical reasons for an event, it prevented a determination of interrater reliability and introduced the potential for subjective bias in data collection. Finally, as a quality improvement study performed by diverse clinical personnel in a sample of complex patients over a limited duration, these findings can provide only limited and preliminary conclusions.

CONCLUSION

The main purpose of this quality improvement study was to learn enough about PPEs to inform strategies to reduce them. Each medical group participating in this study used its own data and knowledge of local conditions to identify and implement actions that might reduce PPEs. Despite being preliminary, these findings suggest the need for much more information about the actual preventability of expensive events like hospitalizations and ED visits before we continue to assume that certain diagnoses are preventable. ❖

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

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Ignorance

The superior physician helps before the early budding of the disease … .
The inferior physician begins to help when [the disease] has already developed;
he helps when destruction has already set in. And since his help comes when
the disease has already developed it is said of him that he is ignorant.

— *The Yellow Emperor's Classic of Internal Medicine, Bk 3 Sect 9,* Huang Ti Nei Ching Su Wen (Huangdi), c 2704 BC - 2598 BC, known as the Yellow Emperor, a legendary Chinese sovereign and culture hero