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Scheduled and Unscheduled Hospital Readmissions among Diabetes Patients

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Abstract

Objective—The purpose of this study is to describe rates of scheduled and unscheduled readmissions among mid-life and older diabetes patients and examine associated factors.

Study Design and Methods—Using the 2006 California State Inpatient Dataset, we identified 124,967 patients aged 50 or older with diabetes who were discharged from acute care hospitals between April and September 2006, and examined readmissions in the 3 months following their index hospitalizations.

Results—About 26.3% of the patients were readmitted within the 3-month period, 87.2% of which were unscheduled readmissions. Patients with unscheduled readmissions were more likely to have a higher comorbidity burden, be ethnic minorities with public insurance, and live in lower income neighborhoods. Having a history of hospitalization in the 3 months preceding the index hospitalization was also a strong predictor of unscheduled readmissions. Almost one fifth of the unscheduled readmissions were potentially preventable based on AHRQ's PQI definitions, making up about 27,477 inpatient days and costing approximately 72.7 million dollars. Scheduled readmissions were less likely to occur in patients aged 80 or older, the uninsured, and those with an unscheduled index hospitalization.

Conclusion—The predictors of scheduled and unscheduled readmissions are different. Transition care to prevent unscheduled readmissions in acutely ill diabetes patients may help reduce rates, improving care. Further studies are needed on potential disparities in scheduled readmissions.

Keywords

Hospital Readmission; Preventable Hospitalization; Diabetes

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Diabetes affects about 23.6 million people in the United States and is the seventh leading cause of death.[1] Because of the complexity of the disease and its management, diabetes patients are more likely to use health care services than the general population,[1] with a total direct medical cost of about $116 billion and an average cost 2.3 times higher than people without diabetes.[1,2] Moreover, almost 6.3 million hospital stays in 2004 were by patients with diabetes as either a principal or coexisting condition, costing nearly $57.8 billion, or about 20% of total hospital costs, while hospitalizations principally for diabetes cost about $3.9 billion.[2]

A large portion of these hospital stays include readmissions by the same patients, and hospital readmission has been a major quality concern in diabetes care. Yet there are only a few population-based studies on readmission among diabetes patients and its risk factors. Jiang et al.[3] reported more than 30% of older diabetes patients were readmitted during the same year in five states in 1999. Readmissions accounted for 55.2% of total hospital stays, and the average total hospital cost for patients with readmissions was 2.5 times higher than those with no readmissions. They also reported a high risk of readmission in ethnic minority groups and variations in readmission rates by insurance type.[4,5] Robbins and colleagues[6–8] observed racial disparities in hospital readmissions in Pennsylvania hospitals between 1994 and 2001, and noted the positive effect of public health clinics in reducing hospital readmissions among low-income diabetes patients.

A gap in the literature on hospital readmission among diabetes patients has been the lack of differentiation of scheduled and unscheduled readmissions.[3–5] Readmissions were often assumed to be unscheduled, but this may not be true, especially for those with existing complex conditions such as diabetes. The need for attention to the type of readmission has been raised,[7] but only a small number of studies explicitly focused on unscheduled readmissions only.[6,7] No study appears to exist on the reasons for and factors associated with scheduled readmissions and whether they are similar to those associated with unscheduled readmissions.

Another gap in the literature on readmission is that studies have often focused on readmissions within one month of hospital discharge[6, 7,9] or those of Medicare patients.[9,10] This short observation window is because hospital readmission has been widely studied in terms of its relationship to hospital performance.[7,11] This may be too narrow an approach to evaluating readmission risk from the perspective of patients, however, for whom avoiding a later readmission is as just important as avoiding an early readmission. Studies focusing on patient risk for readmission have often used a 3-month window following hospital discharge,[5] which we adopted.

The purpose of this study was to examine and compare the demographic, socio-economic, and clinical factors associated with scheduled and unscheduled readmissions in mid-life and older diabetes patients, using a population-based dataset from California. We also examined common reasons for both scheduled and unscheduled readmissions, and estimated the cost as well as the extent of potentially preventable readmissions using the Preventive Quality Indicators (PQIs) of the U.S. Agency for Healthcare Research and Quality (AHRQ).[12]

Research Design and Methods

We analyzed the 2006 California State Inpatient Datasets (SID) developed as part of the Healthcare Cost and Utilization Project (HCUP) sponsored by AHRQ.[13] The California SID, publicly available datasets, include hospital-discharge abstract data, such as demographic characteristics, clinical information, resource use, and payers, from short-term, nonfederal, general, and specialty hospitals. California was selected for the analysis because it has a large and highly racially diverse population[14] and also provides in its SID an encrypted unique patient identifier (UPI) used to link hospital readmissions to a distinct patient. The California OSHPD[15] routinely monitors the quality of hospital inpatient data and corrects or edits the data, if necessary. They also ask reporting institutions to make corrections when their reports do not meet the error tolerance level (currently 2%) that the state has established.

Our sample included patients 50 years or older with diabetes as the principal or a secondary diagnosis, identified using AHRQ's Clinical Classification System (CCS 45, diabetes mellitus without complications, and CCS 50, diabetes mellitus with complications),[15] all of whom were admitted to California hospitals at least once between April and September 2006. We defined the first admission as the index hospitalization and, using the encrypted UPI, identified readmissions within three months of the index hospitalization. We counted no more than one readmission for each patient, as Jencks, Williams, and Coleman[9] did, and focused on the characteristics of the first readmission (e.g., scheduled or unscheduled) in the analysis. Similar to Jiang et al.'s[3] approach, we excluded patients with a missing UPI, with the same UPI but an inconsistent age (different by more than 1 year) or sex, or a missing admission or discharge month.

The outcome variables of this study were scheduled and unscheduled readmissions. We used the SCHED variable in the California SID,[16] referring to whether an admission is scheduled at least 24 hours in advance or not. Thus, we defined unscheduled readmissions as readmissions that were not scheduled at least 24 hours in advance and scheduled readmissions as those scheduled at least 24 hours in advance. The SCHED variable is derived from the type of admission (ToA) in the California hospital inpatient data report collected by the California OSPHD, from which the California SID is developed for the HCUP. The California OSHPD[15] provides detailed guidelines for each variable in the report, including the ToA, and also conducts multi-step validation checks and edits.

We examined patient socio-demographic and clinical characteristics potentially associated with readmissions variables, representing the three major categories of Andersen's Behavioral Model of Health Services Use.[17] This model posits that potential and realized health service use is determined by interactions among predisposing, enabling, and need characteristics of individuals and also the health care systems in the communities where they reside. Predisposing factors are individual characteristics existing prior to illness that determine the likelihood of seeking care and are measured by age, sex, and race. Enabling factors provide the means to utilize health services, and include both individual-level and community-level factors measured by primary payer type, resident location, and neighborhood median income. The California SID do not provide the patient's exact income level, so we used a proxy variable, median household income for the patient's ZIP code in 2006. Both perceived and evaluated health status determine the need for health services, measured by comorbidities, prior hospitalization history, and variables related to index hospitalizations. The severity of conditions was measured by the number of chronic conditions in the 18 body systems using the Chronic Conditions Index developed by AHRQ.[18] We counted only one chronic condition per body system, as was counted by Wolff et al.,[19] although some patients might have had more than one.

For data analysis, first, we computed unadjusted rates of scheduled and unscheduled readmissions within three months of the index hospitalization by patient demographic, socioeconomic, and clinical characteristics. Second, logistic regression models were developed to examine the predictors of scheduled and unscheduled hospital readmissions. The reference group for odds ratios was patients with no readmissions in the 0–3 months following their index hospitalizations. Third, we compared common clinical conditions between the scheduled and unscheduled readmission groups using the Clinical Classifications Software (CCS) for the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) developed by the AHRQ.[15] The CCS is a uniform and standardized coding system for aggregating over 14,000 diagnosis codes into smaller, mutually exclusive, clinically meaningful categories. We ran single-level CCS algorithm against our data, which categorized all the diagnoses into about 300 clinical conditions, among which we selected and compared the top 15 conditions for the scheduled and unscheduled readmission groups.

Last, the impacts of potentially preventable unscheduled readmissions (PPURs) were examined using the length of stay and hospital cost. *Potentially preventable readmissions* (PPRs) refers to hospital readmissions for ambulatory care-sensitive conditions that should not require in-hospital treatment if better discharge planning, care coordination, and timely, appropriate outpatient care is provided.[5,20] We defined PPRs based on the eight Prevention Quality Indicators (PQIs) of AHRQ (2008) that are applicable to readmissions among older people:[20] bacterial pneumonia, chronic obstructive pulmonary disease, dehydration, heart failure, hypertension, short-term diabetic complications, uncontrolled diabetes, and urinary infection. Length of stay was obtained from the California SID, and hospital cost per readmission was computed by multiplying hospital charges per readmission taken from the California SID by the cost-charge ratio variable provided by the HCUP. [13] Total hospital cost for a certain PQI condition was obtained by summing hospital costs for all unscheduled readmissions for the PQI condition. Average hospital cost was computed by dividing the total hospital cost by the total number of PPUR cases. The grand total cost of PPURs was the sum of the total hospital costs for unscheduled readmissions for all eight PQI conditions observed in this study.

Results

Our sample included a total of 124,967 diabetes patients 50 years of age or older who were discharged alive from California hospitals between April and September 2006. The majority were aged between 65 and 79, female, White, and Medicare patients (Table 1). These diabetes patients had about 3.8 chronic conditions each, on average (not shown)’ about 16.2% had a hospitalization history in the 3 months prior to the index hospitalization’ and only about one fifth (18.4%) of their index hospitalizations were scheduled at least 24 hours in advance. The most common reason for the index hospitalization was congestive heart failure (7.9%), followed by diabetes with complications (7.5%), coronary artherosclerosis (4.9%), and pneumonia (4.1%).

Approximately twenty-six percent (n=32,857) of the patients were readmitted within 0–3 months of their index hospitalizations, and a majority of the readmissions (87.2%) were unscheduled (Table 1). The risks for unscheduled and scheduled readmission varied by patients’ demographic, socioeconomic, and clinical characteristics (Table 1). While adjusting for other factors, patients aged 80 or older were slightly more likely (Odds Ratio [OR]=1.07[95% CI 1.02–1.12], compared to those aged between 50 and 64) to have an unscheduled readmission. Blacks (OR=1.17[1.11–1.23]) and Hispanics (OR=1.10[1.07–1.14]) were also more likely to have an unscheduled readmission than Whites. Patients with public insurance had a higher risk for an unscheduled readmission compared to patients with private insurance (OR for Medicare patients=1.39[1.33–1.46], & OR for Medicaid patients=1.53[1.45–1.62]). Patients residing in urban areas (OR=1.16[1.09–1.22], compared to rural) and those residing in lower income neighborhoods (OR=1.11[1.07–1.16], compared to higher income neighborhoods) had higher risks for an unscheduled readmission. The risk for unscheduled readmission consistently increased as the number of chronic conditions that a patient had increased: patients with 7 or more chronic conditions were nearly three times more likely to have an unscheduled readmission than those with diabetes only (OR=2.93[2.52–3.41]). An unscheduled readmission was more likely to occur in patients who had had one or more hospitalizations in the 3 months preceding the index hospitalization (OR=2.17[2.10–2.25]). Also, the risk for an unscheduled readmission increased when the index hospitalization was an unscheduled admission (OR=1.72[1.64–1.80]), or when it ended with a transfer to another post-acute or long-term institution (OR=1.28[1.24–1.32]). As length of stay rose, the likelihood of unscheduled readmission increased.

Some factors predicting unscheduled readmissions also predicted scheduled readmissions in the same way: compared to men, women were less likely to have a scheduled readmission (OR=0.75[0.70–0.80]), but people with Medicare as the primary payer (OR=1.15[1.04–1.26]) were more likely to do so. The number of chronic conditions and length of stay also positively predicted the odds for both unscheduled and scheduled readmissions. Two other factors predicted both scheduled and unscheduled readmissions, but the directions were opposite: people aged 80 or over (OR=0.71[0.63–0.79], compared to people aged 50–64) and those with unscheduled index hospitalizations (OR=0.58[0.47–0.71], compared to scheduled index hospitalizations) were more likely to have an unscheduled readmission, but less likely to have a scheduled readmission. Unlike these factors, factors that positively predicted an unscheduled readmission but not a scheduled readmission were being an ethnic minority (compared to being White), having Medicaid as the primary payer (compared to private insurance), resident location, median income of the neighborhood, and disposition destination. Being uninsured negatively predicted a scheduled readmission only (OR=0.58[0.53–0.62], compared to people with private insurance).

The most common 15 diagnoses for both unscheduled and scheduled readmissions, covering more than 50% of all of those readmissions, are listed in Table 2. The most frequent condition among diabetes patients with an unscheduled readmission was congestive heart failure (8.8%), followed by diabetes mellitus with complications (7.2%), septicemia (5.8%), and pneumonia (3.9%). Among patients with scheduled readmissions, diabetes mellitus with complications (7.1%) was the third most common diagnosis, following coronary atherosclerosis (11.4%) and complications of device, implant, or graft (7.3%). Only 6 out of 15 conditions—congestive heart failure, diabetes mellitus with complications, complications of device, complications of surgical procedures or medical care, coronary atherosclerosis, and cardiac dysrhythmias—were common to both unscheduled and scheduled readmissions. In addition, 3 out of those 6 conditions—congestive heart failure, complication of device, and coronary atherosclerosis—were in very different ranks among unscheduled and scheduled readmissions.

Lastly, about 19.0% of unscheduled readmissions (n=5,432) were potentially preventable (Table 3). Among the eight conditions that can be managed in the ambulatory setting according to AHRQ’s PQI definitions, congestive heart failure, bacterial pneumonia, and urinary tract infections were the three most frequent conditions in our sample of hospitalized middle-aged and older diabetes patients. These potentially preventable unscheduled readmissions made up a total of 27,477 inpatient days and cost nearly $72.7 million. Among the 4,208 patients with scheduled readmissions, only 140 (3.3%) were categorized as potentially preventable using the same PQI definitions, comprising about 862 inpatient days and $1.9 million (not shown).

Discussion

In this population-based study using the 2006 California SID, more than 1 in every 4 hospitalized mid-life and older diabetes patients (26.3%) were readmitted within 3 months of their index hospitalization, and the majority of readmissions (87.2%) were unscheduled, which implies potential issues in quality and coordination of care for this vulnerable population.[21] Unscheduled readmissions were disproportionately higher for low-income, high-comorbid, ethnic-minority diabetes patients with public insurance living in urban areas. Disparities in diabetes care have been reported, due to lower access to preventive and primary care and a higher rate of hospitalization in socio-economically disadvantaged groups.[6,22] Our study confirms such disparities result in discrepancies in the experience of unscheduled readmissions. In addition, disparities in hospital readmissions among diabetes patients were reported in studies analyzing data from the 1990s ,[2,3,7] and our study demonstrates that such disparities continue.

We found about one fifth of the unscheduled readmissions were potentially preventable, for which nearly 27,500 inpatient days and 72.7 million dollars were spent. Those readmissions might have been avoided if good inpatient and transition care and outpatient follow-up had been provided.[5,6] Considering the large variations among states in readmission rates, lengths of stay, and costs for inpatient care, it would be difficult to determine national estimates based on our data. Nevertheless, the economic burden of caring for people with diabetes, along with patient-level safety concerns related to unscheduled readmissions, reinforces the need for continuing efforts to innovate transition and chronic care models and policies to support such models.

Our study is the first population-based study reporting that the predictors of scheduled and unscheduled hospital readmissions among diabetes patients are not similar. Several patient socio-demographic and economic factors—such as ethnicity, living in an urban area, and living in a lower median-income neighborhood—predicted unscheduled readmissions, but none of them predicted scheduled readmissions. Being uninsured, having an unscheduled index hospitalization, and being among the older elderly (aged 80+) decreased the odds of scheduled readmissions. Kossovky et al.'s[23] study appears to be the only published paper on scheduled as well as unscheduled readmissions. Examining 31-day readmissions using patients discharged from medical units in a single hospital in Geneva over a year, between 1995 and 1996, they reported findings consistent with ours: people aged 75 or older and those admitted through the emergency room for an index hospitalization in their study were less likely to have scheduled readmissions.

This is important because scheduled readmissions may be an indicator of better access to advanced procedures or treatments (e.g., elective chemotherapy, radiotherapy, or inpatient diagnostic procedures) and to better care coordination (i.e., the patient has a relationship with a provider who arranges a scheduled admission, avoiding an emergency admission). If so, the lower scheduled readmissions among the older elderly (80+), people with no insurance, and those with unscheduled index hospitalizations--controlling for all other factors, including comorbidities-- suggests adverse disparity in care for those groups. Therefore more empirical studies on the extent and characteristics of scheduled readmissions and potential disparities in receiving scheduled readmissions are needed.

Limitations of this study should be mentioned. We analyzed publicly available hospital discharge datasets' so, as in any secondary data analysis study, inaccurate or missing codes may exist, limiting the reliability of the reports of scheduled and unscheduled readmissions (the ToA variable) and also comorbidities. We counted all-cause readmissions and could not determine whether or not and to what extent a readmission was related to an index admission, which would be an important topic for future research. The validity of PQIs as the readmission quality indicators should be evaluated further. Because the dataset does not allow the linking of patient data across years, we examined one year of data. We had data on discharge and admission months, but data on exact dates were not available. No detailed data were available on the type and severity of diabetes, nor on the availability of primary care physicians and discharge planning services. Lastly, we analyzed California data only.

Despite these limitations, this study addressed several gaps in the literature on hospital readmissions of patients with diabetes. Using a recent, large, population-based dataset including mid-life and older diabetes patients with all types of insurance, we reported several socio-economic and clinical factors associated with both scheduled and unscheduled readmissions, and showed the predictors of the two types of readmissions were not parallel. The lower scheduled readmissions in the older and uninsured groups imply a potential lower access to advanced, coordinated follow-up services for these groups. The consistent, prevalent unscheduled readmissions among mid-life and older diabetes patients provide a rationale for continuing efforts to improve the organization and process of acute and chronic care and promote quality and timely primary care, thereby ultimately saving unnecessary social costs and ensuring patient safety.

Take-away Points

"This study uses a population-based dataset to examine socio-economic and clinical factors associated with scheduled and unscheduled readmissions after hospital discharge in older diabetics

1. A substantial percentage (12.8%) of readmissions were scheduled at least 24 hours in advance
2. The causes and predictors of scheduled and unscheduled readmissions were distinct, suggesting that scheduled readmissions should be separated from unscheduled readmissions in studies of readmission
3. The lower likelihood of scheduled readmissions among older and uninsured patients implies less access to advanced, coordinated healthcare services for these groups"

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Biography

Dr. Kim worked on the greater part of this manuscript while she worked at New York University. She joined the faculty at Seoul National University in South Korea in fall 2009.

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Table 1

Descriptive statistics, readmission rates, and risk factors of scheduled and unscheduled readmissions

		All (n = 124,967)		Unplanned Readmissions (n=28,649)			Planned Readmissions (n = 4,208)		
		n	%	Rate	O.R.§	C.I.	Rate	O.R.§	C.I.
Age	50–64	43,049	34.45	20.16			3.37		
	65–80	53,523	42.83	23.11	1.01	0.97–1.05	3.86	1.03	0.94–1.13
	80+	28,395	22.72	26.77	1.07‡	1.02–1.12	2.44	0.71*	0.63–0.79
Sex	Male	59,066	47.27	22.76			3.91		
	Female	65,901	52.73	23.07	0.96‡	0.94–0.99	2.88	0.75*	0.70–0.80
Race	White	68,447	54.77	21.94			3.45		
	Black	11,415	9.13	26.97	1.17*	1.11–1.23	3.50	1.11	0.99–1.24
	Hispanic	30,874	24.71	23.85	1.10*	1.07–1.14	3.09	0.97	0.90–1.05
	Other	14,231	11.39	22.42	1.02	0.97–1.07	3.46	1.07	0.97–1.19
Primary Payer	Medicare	81,637	65.33	25.05	1.39*	1.33–1.46	3.46	1.15‡	1.04–1.26
	Medicaid	12,786	10.23	27.03	1.53*	1.45–1.62	2.82	0.99	0.87–1.13
	Private	24,895	19.92	15.54			3.68		
	Uninsured¶	5,649	4.52	15.47	0.99	0.91–1.08	1.93	0.58*	0.47–0.71
Resident Location	Rural	8,647	6.92	19.76			3.99		
	Urban	116,320	93.08	23.16	1.16*	1.09–1.22	3.32	0.89	0.79–1.00
Median Income	High	25,499	20.40	21.31			3.60		
	Medium	63,653	50.94	22.66	1.03	1.00–1.07	3.23	0.94	0.87–1.02
	Low	35,815	28.66	24.55	1.11*	1.07–1.16	3.45	1.04	0.94–1.14
Number of Chronic	1	2,036	1.63	10.81			1.67		
Conditions	2	22,479	17.99	15.20	1.36*	1.17–1.57	3.35	1.89†	1.33–2.68
	3	32,986	26.40	19.00	1.68*	1.45–1.94	3.28	1.94†	1.37–2.75
	4	29,553	23.65	24.00	2.07*	1.79–2.39	3.46	2.21*	1.56–3.13
	5	20,091	16.08	28.05	2.36*	2.04–2.74	3.42	2.30*	1.62–3.27
	6	10,902	8.72	32.33	2.72*	2.34–3.16	3.74	2.66*	1.86–3.81

		All (n = 124,967)		Unplanned Readmissions (n=28,649)			Planned Readmissions (n = 4,208)		
		n	**%**	**Rate**	**O.R.§**	**C.I.**	**Rate**	**O.R.§**	**C.I.**
	7+	6,920	5.54	35.97	2.93*	2.52–3.41	3.22	2.33*	1.61–3.38
Admission History	Yes	20,290	16.24	38.75	2.17*	2.10–2.25	3.89	1.55*	1.43–1.68
	No	104,677	83.76	19.86			3.27		
Planned Admission	Yes	22,942	18.36	12.90			5.72		
	No	102,025	81.64	25.18	1.72*	1.64–1.80	2.84	0.58*	0.53–0.62
Disposition	Home	82,674	66.16	19.94			3.44		
	Other	42,293	33.84	28.77	1.28*	1.24–1.32	3.23	1.03	0.95–1.11
		mean	S.D.	Rate	O.R.§	C.I.	Rate	O.R.§	C.I.
Length of Stay		4.959	6.414		1.02*	1.02–1.02		1.01†	1.00–1.01

All statistics in the table were drawn from the index hospitalization records.

§The reference group is patients with no readmissions within 0–3 months (n=92,110), and 17 dummies for the 18 clinical condition groups in the logistic model were omitted from the table due to space limitations.

¶*Uninsured* includes no-charge, self-pay, and charity or indigent programs.

* $p < .0001$

† $p < .001$

‡ $p < .01$

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Table 2

Common clinical conditions for scheduled and unscheduled readmissions

	Unplanned Readmission			Planned Readmission		
Rank	**Condition**[§]	**n**	**%**	**Condition**[§]	**n**	**%**
1	Congestive heart failure (108)	2,507	8.75	Coronary atherosclerosis (101)	479	11.38
2	Diabetes mellitus with complications (50)	2,067	7.21	Complication of device' implant or graft (237)	309	7.34
3	Septicemia (2)	1,646	5.75	Diabetes mellitus with complications (50)	299	7.11
4	Pneumonia (122)	1,104	3.85	Osteoarthritis (203)	192	4.56
5	Complications of device' implant or graft (237)	1,022	3.57	Occlusion or stenosis of precerebral arteries (110)	167	3.97
6	Complications of surgical procedures or medical care (238)	987	3.45	Complications of surgical procedures or medical care (238)	165	3.92
7	Acute and unspecified renal failure (157)	967	3.38	Peripheral and visceral atherosclerosis (114)	126	2.99
8	Urinary tract infections (159)	920	3.21	Spondylosis (205)	112	2.66
9	Coronary atherosclerosis (101)	798	2.79	Congestive heart failure (108)	106	2.52
10	Fluid and electrolyte disorders (55)	782	2.73	Hyperplasia of prostate (164)	79	1.88
11	Nonspecific chest pain (102)	781	2.73	Biliary tract disease (149)	79	1.88
12	Acute cerebrovascular disease (109)	694	2.42	Heart valve disorders (96)	79	1.88
13	Skin and subcutaneous tissue infections (197)	671	2.34	Cardiac dysrhythmias (106)	77	1.83
14	Cardiac dysrhythmias (106)	667	2.33	Maintenance chemotherapy' radiotherapy (45)	70	1.66
15	Acute myocardial Infarction (100)	621	2.17	Gangrene (248)	65	1.54
Total		16,234	56.68		2,404	57.12

[§]Classified using the ClinicalConditions Software (AHRQ, 2009)

Table 3

Prevalence of and service use for potentially preventable unscheduled readmissions (PPURs)

PQI		n	PPUR rate (per 1,000 unscheduled readmissions[§])	Total length of stay for PPURs for each PQI (days)	Average length of stay per PPUR (days)[†]	Total hospital cost for PPURs for each PQI ($)	Average hospital cost per PPUR ($)[‡]
		a	**b**	**c**	**d**	**e**	**f**
TAPQ01	Diabetes Short-Term Complications	218	7.6	1,002.8	4.6	2,876,880.6	13,196.7
TAPQ05	COPD	412	14.4	2,018.8	4.9	5,406,264.0	13,122.0
TAPQ07	Hypertension	64	2.2	256.0	4.0	653,644.8	10,213.2
TAPQ08	CHF	2,618	91.4	13,613.6	5.2	37,432,425.8	14,298.1
TAPQ10	Dehydration	376	13.1	1,616.8	4.3	3,436,038.4	9,138.4
TAPQ11	Bacterial Pneumonia	947	33.1	5,303.2	5.6	14,432,469.4	15,240.2
TAPQ12	Urinary Tract Infection	704	24.6	3,238.4	4.6	7,445,715.2	10,576.3
TAPQ14	Uncontrolled Diabetes	93	3.2	427.8	4.6	998,475.9	10,736.3
	Total	5,432	189.6	27,477.4		72,681,914.1	

[§]The number of total unscheduled readmissions in our sample was 28,649.’

[†]Average length of stay (LOS) per PPUR (d) was calculated by dividing the sum of total LOS for PPURs for each of the eight PQI conditions listed in the second column (c) by the total number of PPUR cases with the condition (a).

[‡]Average hospital cost per PPUR (f) was calculated with the same logic using the average LOS: dividing the total hospital cost for PPURs for a certain PQI condition (e) by the total number of PPUR cases with the condition (a).