New York State Department of Health
Division of Quality and Evaluation
Office of Health Insurance Programs

NEW YORK
state department of
HEALTH

Statistical Brief #4

A Comparison of Potentially Preventable Hospital Readmissions where Preceding Admission was a Behavioral Health, Medical or Surgical Admission: New York State Medicaid Program, 2007

■ Wendy Patterson, Michael Lindsey, Patrick Roohan

Introduction

Hospital admissions can be classified into two broad groups, medical or surgical, according to the underlying condition of the patient and the primary method of treatment. Recent literature using national Medicare data suggests that these two groups of admissions may differ not only in terms of the frequency of subsequent readmissions but also in the types of readmissions that may occur[1]. However, previous analyses of potentially preventable readmissions (PPRs) for the New York State (NYS) Medicaid population have indicated that a third group of hospital admissions may be important for understanding the frequency and type of subsequent PPRs. These are hospital admissions for behavioral health issues; that is, issues related to mental health disorders and substance abuse[2].

This report focuses on the classification of NYS Medicaid inpatient admissions based on the diagnoses present during the admission into three groups: behavioral health, medical, and surgical. The PPR software developed by 3M™ was used to define the three admission groups, and to determine the PPRs. The software classifies each inpatient admission according to whether or not a behavioral health diagnosis is present. The behavioral health indicator does not distinguish between an admission with a mental health diagnosis and an admission with a substance abuse diagnosis, but instead classifies all these admissions as behavioral health. The software also identifies whether a medical or surgical All Patient Refined-Diagnostic Related Group (APR-DRG)[3] characterized the admission. Admissions identified as behavioral health by the software were placed in the behavioral health group. The remaining admissions were divided into the medical or surgical groups, using the medical/surgical indicator.

Only Medicaid admissions to acute care (Article 28) hospitals in 2007, in which the recipient was not dually enrolled in Medicaid and Medicare, were included in these analyses. The PPR software defines an at-risk admission as an admission that does not meet any of the exclusion criteria (major metastatic malignancy, other malignancies, trauma, burns, obstetrical, newborns, hospital stays in which the patient "left against medical advice", and deaths). Each at-risk hospital admission was classified into one of the three admission groups (behavioral health, medical, surgical). These groups were then compared in terms of their frequency, the rate at which they were followed by a PPR, the average number of subsequent PPRs per admission, the Major Diagnostic Category (MDC) associated with the PPR, and the length of time between admissions.

HIGHLIGHTS

■ Medicaid inpatient admissions were divided into three groups based on diagnoses present at admission: behavioral health (mental health or substance abuse), medical, and surgical.

■ Medical admissions accounted for the majority of the admissions at-risk of being followed by a potentially preventable readmission (52.8%), while behavioral health admissions accounted for 31.2% and surgical for 16.0% of the at-risk admissions.

■ The 30 day potentially preventable readmission (PPR) rate for the behavioral health admissions was 17.4%, substantially higher than the PPR rate for medical or surgical admissions (9.5% and 9.0%, respectively).

■ The average number of PPRs for a behavioral health admission was 1.61 compared to 1.47 for medical and 1.35 for surgical admissions.

■ Behavioral health admissions were most frequently followed by PPRs classified as Major Diagnostic Category (MDC) 20 - Alcohol/Drug Use and MDC 19 - Mental Diseases. Medical and surgical admissions were most frequently followed by PPRs associated with MDC 5 – Circulatory Disorders.

■ Regardless of the reason for admission, the majority of all PPRs occurred within 15 days of the preceding admission.

[1] Jencks, Williams, and Coleman, "Rehospitalization Among Patients in the Medicare Fee-For-Service Program" New England Journal of Medicine. 2009:360:1418-28.
[2] Statistical Brief #3, "A Comparison of Potentially Preventable Hospital Readmissions Among Medicaid Recipients with Behavioral Health and/or Substance Abuse Health Conditions, and All Other Recipients" August 2009.
[3] 3M Grouper Products Concepts Manual, 3M Corporation, July 2008.

Findings

At-Risk Admissions and Subsequent PPR Rates

The relative frequency of behavioral health, medical, and surgical at-risk admissions is presented in Figure 1. Medical admissions represented the majority of the at-risk admissions (52.8%), while behavioral health admissions accounted for 31.2% and surgical for 16.0% of the at risk admissions that could have been followed by a PPR. Medical at-risk admissions were by far the most common, however, behavioral health at-risk admissions accounted for nearly one third of all at-risk Medicaid admissions.

Differences in the PPR rates by admission group were observed as well. The 30 day PPR rate for the behavioral health admissions was 17.4%, substantially higher than the PPR rate for medical (9.5%) or surgical (9.0%) admissions (Figure 2). Therefore, while in terms of sheer magnitude there were many more medical at-risk admissions that could have been followed by a PPR, behavioral health at-risk admissions were nearly twice as likely to be followed by a PPR.

Average Number of PPRS and PPR Frequency By MDC

The PPR software defines initial admissions as at-risk admissions that were followed by a PPR. Nearly half (48.6%) of all 30 day PPRs were associated with behavioral health initial admissions, compared to 40.7% for medical and 10.7% for surgical initial admissions.

Behavioral health initial admissions also resulted in a higher average number of PPRs than the other two admission groups. Figure 3 illustrates that behavioral health initial admissions accounted for the highest average number of PPRs (1.61 per initial admission), followed by medical (1.47 per initial admission) and surgical (1.35 per initial admission).

The PPRs were classified according to their respective MDCs, and the three most common MDCs for each initial admission group are presented in Table 1. The most frequent MDCs for PPRs following a behavioral health initial admission were MDC 20 - Alcohol/Drug Use (37.1% of PPRs), and MDC 19 - Mental Diseases (29.8% of PPRs). PPRs for MDC 5 - Circulatory Disorders represented 6.2% of PPRs following behavioral health initial admissions.

The most frequent MDC for PPRs following a medical or surgical initial admission was MDC 5 - Circulatory Disorders (17.8% and 25.9%, respectively). For medical initial admissions, PPRs for MDC 4 - Respiratory Disorders and MDC 6 - Digestive Disorders were also common. PPRs for MDC 6 - Digestive Disorders were common after surgical initial admissions, as well as MDC 18 - Infectious Diseases.

Length Of Time Between Potentially Preventable Readmissions

The PPR software readmission interval is measured from one admission to another, that is, from the initial admission to the first PPR, from the first PPR to the second PPR, etc. Table 2 details the number of PPRs and percent of all PPRs by the number of days (up to 15 days) between admissions, for each of the three types of initial admissions.

A majority of all PPRs occurred by the fifteenth day after the preceding admission. For behavioral health and surgical initial admissions, roughly 70% of the PPRs had occurred by day 15, and 66.9% of PPRs after medical initial admissions had occurred by that time. Thirteen percent of PPRs after behavioral health initial admissions occurred either on the same day or one day after the preceding admission, but smaller percentages of PPRs occurred within a day after the preceding admission for medical and surgical initial admissions (10.4% and 8.2%, respectively).

A higher percentage of PPRs after behavioral health initial admissions tended to occur during a short time interval compared to medical and surgical initial admissions (35.4% for behavioral health within 5 days, compared to 31.9% for medical and 31.9% for surgical). However, by the fifteenth day this difference was less pronounced, and the percent of PPRs following surgical initial admissions was nearly equal to those of a behavioral health initial admission.

Data Source and Methods

The data used for these analyses were obtained from New York State's Medicaid claims and encounter records for calendar year 2007. The steps involved in the development of the dataset are outlined in Statistical Briefs #1 and #2. Statistical Brief #1 describes the creation of the data file and Statistical Brief #2 describes the logic employed to identify potentially preventable readmissions using the Potentially Preventable Readmission software created and distributed by 3M™ Corporation.

Statistical Briefs are produced by the New York State Department of Health, Office of Health Insurance Programs. If you have any questions or comments, please e-mail us at: omcmeds@health.state.ny.us.

Figure 1. Initial Admissions[1] At Risk for a Potentially Preventable Readmission by Admission Group: New York State Medicaid Program, 2007

- Behavioral Health: 31.2%
- Medical: 52.8%
- Surgical: 16.0%
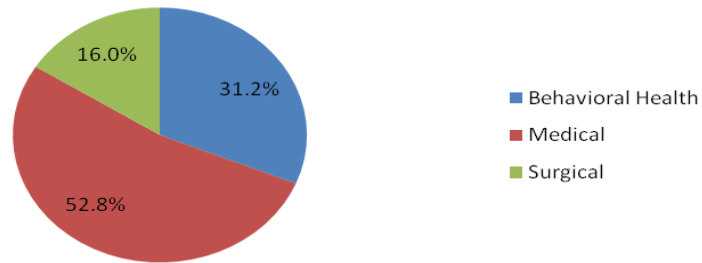
[1] All admissions that were not excluded according to defined PPR criteria

Figure 2. Thirty Day Potentially Preventable Readmission (PPR) Rate[1] by Initial Admission Group: New York State Medicaid Program, 2007

- Behavioral Health: 17.4%
- Medical: 9.5%
- Surgical: 9.0%
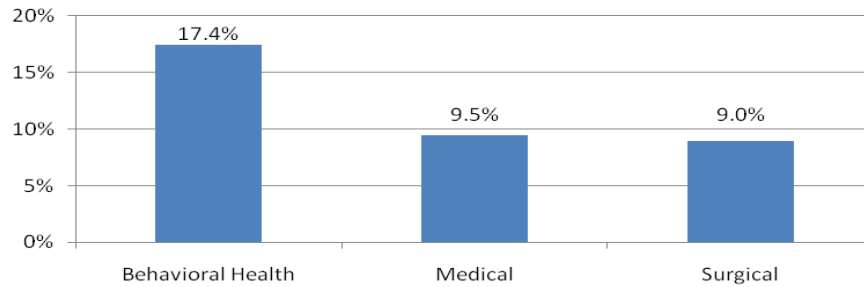
[1] Initial admissions divided by at risk admissions times 100 where at risk admissions are all admissions not excluded according to PPR criteria and initial admissions are at risk admissions followed by a PPR.

Figure 3. Average Number of Potentially Preventable Readmissions (PPR) per Initial Admission[1] by Initial Admission Group: New York State Medicaid Program, 2007
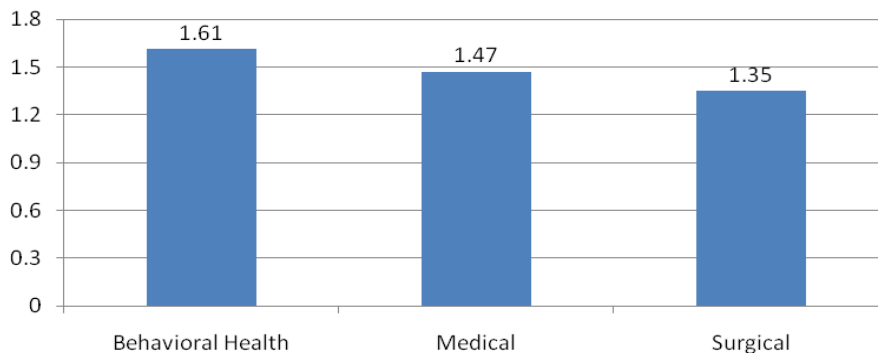
- Behavioral Health: 1.61
- Medical: 1.47
- Surgical: 1.35

[1] At risk admissions are all admissions not excluded according to PPR criteria and initial admissions are at risk admissions followed by a PPR.

Table 1. Top Three Major Diagnostic Categories for Potentially Preventable Readmissions (PPR) by Initial Admission[1] Group: New York State Medicaid Program, 2007

Behavioral Health Initial Admission		Medical Initial Admission		Surgical Initial Admission	
MDC 19 – Alcohol/Drug Use	37.1%	MDC 5 - Circulatory Disorders	17.8%	MDC 5 - Circulatory Disorders	25.9%
MDC 20 – Mental Diseases	29.8%	MDC 4 - Respiratory Disorders	15.4%	MDC 6 - Digestive Disorders	13.3%
MDC 5 - Circulatory Disorders	6.2%	MDC 6 - Digestive Disorders	10.5%	MDC 18 - Infectious Diseases	12.8%

[1] At risk admissions are all admissions not excluded according to PPR criteria and initial admissions are at risk admissions followed by a PPR

Table 2. Potentially Preventable Admission (PPR) Count and Cumulative Percent by Number of Days between Admissions and Initial Admission[1] Group: New York State Medicaid Program, 2007

Days between admissions	BEHAVIORAL HEALTH INITIAL ADMISSION		MEDICAL INITIAL ADMISSION		SURGICAL INITIAL ADMISSION	
	Count of PPRs	Cumulative Percent	Count of PPRs	Cumulative Percent	Count of PPRs	Cumulative Percent
0	1,432	5.1	715	3.0	128	2.1
1	2,320	13.3	1,739	10.4	382	8.2
2	1,851	19.8	1,519	16.8	409	14.8
3	1,615	25.6	1,280	22.3	366	20.6
4	1,405	30.5	1,220	27.4	348	26.2
5	1,366	35.4	1,065	31.9	350	31.9
6	1,370	40.2	1,007	36.2	346	37.4
7	1,380	45.1	963	40.3	324	42.6
8	1,138	49.1	891	44.1	269	46.9
9	1,079	53.0	848	47.6	236	50.7
10	918	56.2	825	51.1	219	54.3
11	920	59.5	791	54.5	218	57.8
12	854	62.5	749	57.7	201	61.0
13	803	65.3	795	61.0	220	64.5
14	845	68.3	740	64.2	180	67.4
15	755	71.0	649	66.9	165	70.1

[1] At risk admissions are all admissions not excluded according to PPR criteria and initial admissions are at risk admissions followed by a PPR