BEHAVIORAL HEALTH & READMISSIONS IN MASSACHUSETTS ACUTE CARE HOSPITALS

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Behavioral Health & Readmissions in Massachusetts Acute Care Hospitals

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Executive Summary

Until recently, hospital readmission reduction efforts have focused primarily on medical or surgical conditions, with little emphasis on patients’ behavioral health conditions.\(^1,2\) Given the high hospital utilization and cost associated with behavioral health comorbidities,\(^3,4\) there is a growing recognition in the healthcare community that patients with comorbid behavioral health conditions may be at higher than average risk of readmission. Efforts to reduce avoidable readmissions should include identifying readmission risk factors associated with this group.

This report provides insights on the readmission patterns for individuals with comorbid behavioral health conditions in Massachusetts acute care hospitals. Using hospital inpatient discharge data from July 1, 2013 to June 30, 2014, this report examines the prevalence of behavioral health comorbidities and readmission rates associated with comorbid behavioral health conditions among hospitalized patients in Massachusetts on an all-payer, all-condition basis. This information will assist providers, administrators, policymakers, patients, family caregivers and patient advocates in better identifying opportunities to improve care for individuals with behavioral health comorbidities, with the goal of providing better care and reducing avoidable readmissions.

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Key Findings

1. Forty percent of hospitalized patients had at least one comorbid behavioral health condition within the one-year study period.

2. Sixty-one percent of hospitalized Medicaid patients had a comorbid behavioral health condition.

3. Hospitalized patients with any behavioral health comorbidity were 77% more likely to be readmitted than those without behavioral health comorbidity (20.2% vs. 11.4%).

4. Hospitalized Medicaid patients with comorbid co-occurring mental and substance use conditions were three times more likely to be readmitted than those without any behavioral health comorbidity (26.6% vs. 9.0%).

5. Young adults (age 18-44) with a behavioral health comorbidity were nearly three times more likely to be readmitted than those without any behavioral health comorbidity (18.0% vs. 6.5%).

6. Among patients discharged with heart failure—the most common current clinical focus of readmission reduction efforts—the presence of behavioral health comorbidity was associated with a readmission rate that was 56% higher than those without any behavioral health comorbidity (29.4% vs. 18.9%).
Introduction

Reducing avoidable readmissions is at the center of numerous payment reform and delivery system transformation efforts. Until recently, hospital readmission reduction efforts have focused primarily on medical or surgical conditions, with little emphasis on patients’ behavioral health conditions.\(^6,7\) Given the high hospital utilization and cost associated with behavioral health comorbidities,\(^8,9\) stakeholders share a growing awareness that the provision of behavioral health care is integral to any health system improvement programs,\(^10\) including readmission reduction. Stakeholders also recognize that patients with behavioral health comorbidities may have a higher than average risk of readmission, and therefore efforts to reduce avoidable readmissions should include identifying readmission risk factors associated with this group.

At the federal level, the Centers for Medicare and Medicaid Services (CMS) recently issued a proposed rule updating discharge planning requirements\(^11\) and requiring specific identification of behavioral health needs, post-hospital care planning, linkage to behavioral health services and follow-up services for all Medicare and Medicaid patients.

Some states have developed policies or programs to emphasize the importance of improved behavioral health care for the purposes of reducing avoidable readmissions. In 2012, the New York State Office of Mental Health developed the Psychiatric Services and Clinical Knowledge Enhancement System (PSYCKES) collaborative,\(^12\) which is the first state-level effort to better understand and intervene to reduce readmissions for patients following a psychiatric hospitalization. In 2014, Illinois Medicaid instituted a readmission penalty program, penalizing avoidable readmissions following a discharge for a primary behavioral health diagnosis.

In Massachusetts, the Health Policy Commission’s CHART (Community Hospital Acceleration, Revitalization and Transformation) Investment Program has invested a total of $60 million in 25 programs focused on reducing avoidable hospital utilization for patients with behavioral health, social and clinical comorbidities. Several CHART investments are focused on improving care and reducing avoidable hospital utilization for individuals presenting to an emergency room with a behavioral health comorbidity; others are focused on reducing utilization for “high utilizers”—the vast majority of whom are found to have behavioral health comorbidities and unmet social needs.\(^13\)
Despite the growing recognition that efforts to reduce avoidable readmissions should include targeting interventions toward patients with behavioral health comorbidities, there is comparatively little information available on the prevalence of behavioral health comorbidities among hospitalized and readmitted patients on an all-payer, all-condition basis. To address the lack of relevant information and analysis, the Center for Health Information and Analysis (CHIA) released this report, Behavioral Health and Readmissions in Massachusetts Acute Care Hospitals, the first statewide, all-payer examination of the prevalence of behavioral health comorbidities and readmissions among hospitalized adults in Massachusetts acute care hospitals.
Prevalence of Behavioral Health Comorbidities among Patients in Massachusetts Acute Care Hospitals

This section examines the prevalence of behavioral health comorbidities among adult patients admitted to Massachusetts acute care hospitals.

- Analysis is based on the hospital inpatient discharge data from July 1, 2013 to June 30, 2014 (SFY 2014) and includes patients who were discharged from Massachusetts acute care hospitals.

- Using both primary and secondary diagnoses, adult patients (age 18+) were categorized into four mutually exclusive groups, based on a modified classification methodology developed by the Agency for Healthcare Research and Quality:  
  1. Mental disorders (MD) only
  2. Substance use disorders (SUD) only
  3. Both MD and SUD or co-occurring disorders (COD)
  4. No mention of MD or SUD (None)

- The unit of analysis is the patient.

**Key findings in this section include:**

- Forty percent of hospitalized patients had a comorbid behavioral health condition.

- Sixty-one percent of hospitalized Medicaid adults had a comorbid behavioral health condition, which was 69% higher than Medicare or commercial populations (at 36% each).

- Behavioral health comorbidity was more prevalent among younger adults (age 18-44) than older adults (age 75 and older), 57% and 26% respectively.

- Males were three times more likely to have comorbid substance use disorders than females (9% vs. 3%).

- Berkshires (48%), Fall River (47%), and Pioneer Valley/Franklin (46%) had the highest prevalence of patients with any comorbid behavioral health conditions.
Forty percent of hospitalized patients in Massachusetts acute care hospitals had at least one comorbid behavioral health condition (any mention of a diagnosis of mental disorder (MD), substance use disorder (SUD), or co-occurring MD/SUD (COD) in the patient’s discharge summary data from July 2013 to June 2014).

Of these patients with behavioral health comorbidity, 62% had a diagnosis of mental disorder only, 14% had a diagnosis of substance use disorder only, and 24% had both mental and substance use disorders.

This high prevalence of behavioral health comorbidity underscores the importance of behavioral health integration in care transition and discharge planning at acute care hospitals.

Of the patients with behavioral health comorbidity, 62% had mental disorders only, 14% had substance use disorders only, and 24% had co-occurring mental/substance use disorders.

Statewide Prevalence of Behavioral Health Comorbidity among Patients in Acute Care Hospitals

No BH Diagnosis: 60%
BH Diagnosis: 40%

Mental disorders only: 25%
Substance use disorders only: 6%
Co-occurring mental/substance use disorders: 9%

Note: Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges. BH = Behavioral Health.
Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
Comorbid behavioral health conditions were much more common among younger than older adults; 57% of adults age 18-44 had comorbid behavioral health conditions, compared to 26% of adults aged 75 and older.

Seventy-four percent of hospitalized patients with comorbid substance use disorders were under age 65.

Note: Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
Prevalence of Behavioral Health Comorbidity by Gender

There was no substantial difference between females and males in the overall prevalence of comorbid behavioral health conditions, at 41% and 38% respectively.

However, among patients with comorbid mental disorders only, two out of three were females.

Among patients with comorbid substance use disorders only, three out of four were males.

Males were three times more likely than females to have comorbid substance use disorders only (9% vs. 3%).

Note: Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges. Figures for male and female do not sum to total because of discharges with missing gender information.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
Medicaid patients had a high prevalence of behavioral health comorbidity. Patients with Medicaid were 69% more likely to have a comorbid behavioral health condition than those with Medicare or commercial insurance (61%, 36%, and 36% respectively).

Relative to the statewide patient population, Medicaid patients were also twice as likely to have comorbid substance use disorders only (12% vs. 6%), and two and half times more likely to have comorbid co-occurring mental and substance use disorders (24% vs. 9%).

Of those Medicaid patients with a behavioral health comorbidity, 41% had mental disorders only, 20% had substance use disorders only, and 39% had co-occurring mental and substance use disorders.

Note: Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges. Self-pay and other categories are excluded, which together accounts for 4% of patients, as well as a small number of discharges with missing payer information. Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
The prevalence of behavioral health comorbidity varied from 34% of patients in the Cape and Islands to 48% of patients in the Berkshires.

Berkshires (48%), Fall River (47%), and Pioneer Valley/Franklin (46%) had the highest prevalence of behavioral health comorbidity. The prevalence of behavioral health comorbidity was at least 15% higher in these three regions than in the state overall.

Note: Regions are defined by the Massachusetts Health Policy Commission. Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
Among patients with behavioral health comorbidity, the types of behavioral health conditions varied by region.

- Metro Boston and Pioneer Valley/Franklin had the highest proportion of behavioral health patients with comorbid substance use disorders only, at 17%.
- Berkshires and Pioneer Valley/Franklin had the highest proportion of behavioral health patients with comorbid co-occurring mental and substance use disorders, at 35% and 28%, respectively.
- Fall River and West Merrimack/Middlesex had the highest proportion of behavioral health patients with comorbid mental disorders only, at 70% and 68%.

Note: Regions are defined by the Massachusetts Health Policy Commission. Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges. Statewide patient number includes patients from out of state.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
Statewide Readmissions and Behavioral Health Comorbidity among Patients in Massachusetts Acute Care Hospitals

To better understand the impact of behavioral health comorbidity on readmission rates, CHIA first examined readmission rates among patients with and without behavioral health comorbidity at the statewide level, then analyzed readmission rates for patients with and without comorbid behavioral health conditions by age, payer type, region of patient residence, discharge diagnosis, and discharge setting.

**Key findings in this section include:**

- The 40% of all hospitalized adults who had a behavioral health comorbidity accounted for 46% of all hospitalizations and 60% of all readmissions.
- Patients with a behavioral health comorbidity were 77% more likely to be readmitted than those without any behavioral health comorbidity (20.2% vs. 11.4%).
- Patients with comorbid co-occurring mental and substance use disorders had the highest readmission rate, at 26.2%, which was higher than the readmission rate for a heart failure, at 22.5%.
- Younger adults with a behavioral health comorbidity had readmission rates three times higher than younger adults without a behavioral health comorbidity (18.0% v. 6.5%); younger adults with a behavioral health comorbidity had readmission rates as high as older adults with a behavioral health comorbidity.
- Medicaid patients with comorbid co-occurring mental and substance use disorders were three times more likely to be readmitted than those Medicaid patients without any behavioral health comorbidity (26.6% vs. 9.0%).
- The presence of a behavioral health comorbidity was associated with an increase in the readmission rate for the five most common discharge conditions for readmissions—heart failure, septicemia, chronic obstructive pulmonary disease (COPD), other pneumonia, and renal failure—by at least 47%. For heart failure patients, having a behavioral health comorbidity was associated with a 56% increase in readmission rate, from 18.9% to 29.4%.
- Forty-nine percent of discharges to home had some comorbid behavioral health conditions, and these patients were twice as likely to be readmitted as those without any behavioral health comorbidity.
The readmission rate for patients with comorbid behavioral health conditions was 77% higher than the readmission rate for patients without any behavioral health comorbidity (20.2% vs. 11.4%), and 30% higher than the statewide readmission rate (20.2% vs. 15.5%).

Patients with comorbid co-occurring mental and substance use disorders had the highest readmission rate, 26.2%, which was more than twice the rate of patients with no behavioral health comorbidity, 11.4%; and this rate was even higher than that of heart failure patients, whose rate was 22.5%.

Relative to patients without any behavioral health comorbidity, patients with comorbid mental disorders only and substance use disorders only also had higher readmission rates at 18.2% and 16.3%, respectively.

Note: Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges. BH = Behavioral Health, MD/SUD = Mental Disorders / Substance Use Disorders. Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
For every age group, readmission rates were higher with behavioral health comorbidity than without any behavioral comorbidity, and the difference in the rates was substantially higher among younger than older adults.

Younger adults (age 18-44) with a behavioral health comorbidity were three times more likely to be readmitted than those without a behavioral health comorbidity, (18.0% vs. 6.5%).

In contrast, older adults (age 75+) with a behavioral health comorbidity were one and half times more likely to be readmitted than those without a behavioral health comorbidity, (21.4% vs. 14.6%).

Note: Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges. BH = Behavioral Health.
Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
Medicaid patients with comorbid co-occurring mental and substance use disorders were three times more likely to be readmitted than those without any behavioral health comorbidity: 26.6% vs. 9.0%.

Without behavioral health comorbidities, Medicaid and commercial patients had similar readmission rates at 9.0% and 7.2%, respectively.

Across payers, patients with comorbid co-occurring mental and substance use disorders consistently had higher readmission rates than other subcategories of behavioral health comorbidity.

Medicare patients with comorbid co-occurring mental and substance use disorders had the highest readmission rate, at 30.3%, which is higher than patients admitted for medical/surgical diagnoses with high readmission rates (e.g., HIV with multiple major HIV related conditions at 29.7%).

These findings emphasize the importance of mitigating readmission risk as part of the treatment plan for patients with behavioral health comorbidities.

Note: Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges. BH = Behavioral Health, MD / SUD = Mental Disorders / Substance Use Disorders. Figure excludes self-pay and other categories, which together account for 4% of patients and 3% of discharges. A small number of discharges with missing payer information is also excluded.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
For all regions, the presence of behavioral health comorbidity substantially increased readmission rates 64-93%.

Without comorbid behavioral health conditions, readmission rates ranged from 10.3% in the Berkshires to 13.2% in New Bedford. With comorbid behavioral health conditions, readmission rates varied from 18.7% in the Cape and Islands to 21.9% in New Bedford.

Readmission rates for the Berkshires, Lower North Shore, and Metro West nearly doubled with behavioral health comorbidity.

Although these differences could be due to the other regional patient demographics and community characteristics including care transition practices, the quality of clinical care, and community-based resources, these differences also highlight opportunities for interventions.

Note: Regions are defined by the Massachusetts Health Policy Commission. Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges. Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
Under the current CMS’ Hospital Readmissions Reduction Program, hospitals face payment penalties for having higher than expected readmission rates for heart failure, pneumonia, COPD, heart attack and hip and knee replacements discharges.

For common discharge diagnoses for readmissions in Massachusetts, the readmission rates for patients with comorbid behavioral health conditions were 47-76% higher than for patients with these same discharge diagnoses who did not have a behavioral health comorbidity.

For heart failure patients, having a behavioral health comorbidity was associated with a 56% increase in the readmission rate (from 18.9% to 29.4%).

Thus, understanding the impact of behavioral health comorbidity on these and other discharge diagnoses could be very useful for improving care.

### Readmission Rates and Behavioral Health Comorbidity by Common Discharge Diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Rate with Behavioral Health</th>
<th>Rate with No Behavioral Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Failure</td>
<td>18.9%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Septicemia &amp; Disseminated Infections</td>
<td>15.8%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Chronic Obstructive Pulmonary Disease</td>
<td>15.4%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Other Pneumonia</td>
<td>12.7%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>18.1%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Kidney &amp; Urinary Tract Disorders</td>
<td>13.2%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Cardiac Arrhythmia &amp; Conduction Disorders</td>
<td>11.7%</td>
<td>15.5%</td>
</tr>
</tbody>
</table>

**Number of Discharges**

- Heart Failure: 19,846
- Septicemia & Disseminated Infections: 19,902
- Chronic Obstructive Pulmonary Disease: 15,017
- Other Pneumonia: 15,309
- Renal Failure: 10,406
- Kidney & Urinary Tract Disorders: 10,700
- Cardiac Arrhythmia & Conduction Disorders: 11,628

**Statewide Rate**: 15.5%

**Note**: Diagnostic categories are defined by the All-Payer Refined Diagnosis-Related Group (APR-DRG). Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
Readmission rates increased with the presence of behavioral health comorbidity for patients discharged to all post-acute care settings.

Nearly half of discharges to home had a comorbid behavioral health condition.

The readmission rate for patients discharged to home with co-occurring mental and substance use disorders was three times the rate for those without any behavioral health comorbidity (23.9% vs. 7.8%).

**Prevalence of behavioral health comorbidity**

<table>
<thead>
<tr>
<th>Discharge Setting</th>
<th>Mental Disorders</th>
<th>Substance Use Disorders</th>
<th>Co-Occurring Mental/Substance Use Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>49%</td>
<td>40%</td>
<td>43%</td>
</tr>
<tr>
<td>HHA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehab</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Number of Discharges**

- Home: 262,913
- HHA: 110,574
- SNF: 99,729
- Rehab: 23,028

**Readmission rates**

- Home: 7.8%
- HHA: 13.9%
- SNF: 22.5%
- Rehab: 22.5%

Note: SNF = Skilled nursing facility. HHA= Home with home health agency care. Analyses include discharges for adults (age 18+) with any payer and exclude obstetric discharges. The unit of this analysis is discharges. Hospice and other categories are excluded, which account for 3.7% of discharges. Discharges with missing discharge setting information are also excluded.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2013 – June 2014.
Conclusion

This report is the first statewide, all-payer examination of the prevalence of behavioral health comorbidities among hospitalized adults in Massachusetts acute care hospitals. Despite the limitations of using hospital administrative data to identify the presence or absence of a behavioral health condition—e.g., many behavioral health conditions may be undiagnosed and/or under-coded in the medical record or in billing codes—there is a high prevalence of behavioral health comorbidities among hospitalized adults in Massachusetts acute care hospitals.

Important differences in the prevalence of behavioral health comorbidities by payer type exist. Medicaid adults were 69% more likely to have a behavioral health comorbidity than Medicare or commercial populations. Age was also found to be an important factor—younger adults have nearly twice the prevalence of comorbid behavioral conditions as older adults. Additionally, the prevalence of behavioral comorbidities among hospitalized adults varies regionally across the Commonwealth.

The readmission rate for patients with behavioral health comorbidities was 77% higher than for patients without a behavioral health comorbidity. Hospitalized patients with comorbid co-occurring mental and substance use disorders had the highest readmission rate among all patients with behavioral health conditions. Among the most common discharge diagnoses that result in readmissions, the presence of a behavioral health comorbidity was associated with an increase in readmission rate following the discharge. This suggests that hospitals, payers, policymakers, patients, and families/advocates should be more aware of the increased readmission risk of any hospitalized patient who has a behavioral health comorbidity, and take steps to ensure a safe, effective, and supported period following hospitalization so as to reduce the likelihood of a readmission event.
Notes


6 See note 1 above.

7 See note 2 above.

8 See note 3 above.

9 See note 4 above.


12 New York State Office of Mental Health. PSYCKES Medicaid. Website. https://www.omh.ny.gov/omhweb/psyckes_medicaid/about/


14 Please see technical appendix for more information.

15 Statewide readmission rate in this report is an extension of the current Yale/CMS methodology used in CHIA's Hospital-Wide Adult All-Payer Readmissions in Massachusetts: 2011-2014, and includes primary psychiatric diagnoses.